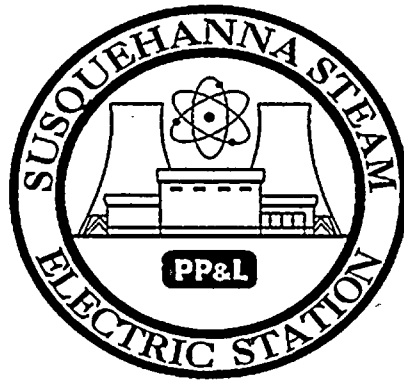


**SUSQUEHANNA STEAM ELECTRIC STATION**



**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
(NPDES)**

**RENEWAL PERMIT APPLICATION  
PERMIT NO. PA 0047325**

9999999999999999

**PP&L, INC.  
DECEMBER 6, 1999**



**Jerome S. Fields**  
Sr. Environmental Scientist - Nuclear

**PP&L, Inc.**  
Two North Ninth Street  
Allentown, PA 18101-1179  
Tel. 610.774.7889 Fax 610.774.7205  
jsfields@papl.com



December 6, 1999

Mr. Paul M. Swerdon  
Chief Permits Section  
Water Management Program  
Pennsylvania Department of Environmental Protection  
2 Public Square  
Wilkes-Barre, PA 18711-0790

SUSQUEHANNA STEAM ELECTRIC STATION  
APPLICATION-NPDES RENEWAL PERMIT PA-0047325  
CCN 741326 FILE R9-8A  
PLE-21639

---

Dear Mr. Swerdon:

PP&L, Inc. is submitting a NPDES renewal permit application for the Susquehanna Steam Electric Station (SES), Salem Township, Luzerne County, PA. The present NPDES permit no. PA-0047325 expires on June 21, 2000.

Included for Pennsylvania Department of Environmental Protection review are; 1) three copies of the application (one notarized), 2) an application fee of \$500.00, payable to the Commonwealth of Pennsylvania, and 3) copies of letters with certified mail receipts notifying Salem Township and Luzerne County of this renewal permit application.

If you have any questions please call me at (610) 774-7889.

Sincerely,

Jerome S. Fields, REM  
Sr. Environmental Scientist - Nuclear

Enclosure

99140.doc(lmc)





**Jerome S. Fields**  
Sr. Environmental Scientist - Nuclear

**PP&L, Inc.**  
Two North Ninth Street  
Allentown, PA 18101-1179  
Tel. 610.774.7889 Fax 610.774.7205  
jsfields@papl.com



September 3, 1999

Mr. Eugene Klein, Chief Clerk  
Luzerne County Courthouse  
200 North River Street  
Wilkes-Barre, PA 18711

SUSQUEHANNA STEAM ELECTRIC STATION  
NATIONAL POLLUTANT DISCHARGE ELIMINATION  
SYSTEM PERMIT RENEWAL: PA 0047325  
CCN 741326 FILE R9-8A  
PLE- 21516

Dear Mr. Klein:

In accordance with Act No. 14, P.L. 834, this letter is to notify you that PP&L, Inc. will submit a renewal National Pollutant Discharge Elimination System Permit application during the fourth quarter of 1999 to the Pennsylvania Department of Environmental Protection for the Susquehanna Steam Electric Station (SES). The Susquehanna SES is a two-unit nuclear station with a generating capacity of 1,150 megawatts per unit, located in Salem Township, Luzerne County, Pennsylvania.

If you have any questions concerning this permit renewal application, please call me.

Sincerely

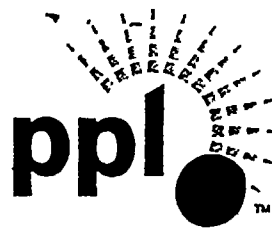
Jerome S. Fields,  
Senior Environmental Scientist-Nuclear

Certified Mail No. Z 232 731 657

Copy to:  
Ms. I. Hopkins, EPA Region III  
Mr. P. M. Swerdon, PaDEP

**Jerome S. Fields**  
Sr. Environmental Scientist - Nuclear

**PP&L, Inc.**  
Two North Ninth Street  
Allentown, PA 18101-1179  
Tel. 610.774.7889 Fax 610.774.7205  
jsfields@papl.com



September 3, 1999

Ms. Judith Boudman  
Secretary, Salem Township  
Salem Township Municipal Building  
400 Luzerne Avenue  
Berwick, PA 18603

**SUSQUEHANNA STEAM ELECTRIC STATION  
NATIONAL POLLUTANT DISCHARGE ELIMINATION  
SYSTEM PERMIT RENEWAL: PA 0047325  
CCN 741326 FILE R9-8A  
PLE- 21517**

---

Dear Ms. Boudman:

In accordance with Act No. 14, P.L. 834, this letter is to notify you that PP&L, Inc. will submit a renewal National Pollutant Discharge Elimination System Permit application during the fourth quarter of 1999 to the Pennsylvania Department of Environmental Protection for the Susquehanna Steam Electric Station (SES). The Susquehanna SES is a two-unit nuclear station with a generating capacity of 1,150 megawatts per unit, located in Salem Township, Luzerne County, Pennsylvania.

If you have any questions concerning this permit renewal application, please call me.

Sincerely,

**Jerome S. Fields**  
Senior Environmental Scientist-Nuclear

Certified Mail No. Z 232 731 656

Copy to:  
Ms. I. Hopkins, EPA Region III  
Mr. P. M. Swerdon, PaDEP

is your RETURN ADDRESS completed on the reverse side?

**SENDER:**

- Complete items 1 and/or 2 for additional services. Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1.  Addressee's Address
2.  Restricted Delivery

3. Article Addressed to:  
 Ms. J. Budman  
 Secretary, Salem Township  
 Salem Twp. Municipal Bldg.  
 400 Luzerne Avenue  
 Berwick, PA 18603

4a. Article Number  
 Z 232 731 656

4b. Service Type  
 Registered  Certified  
 Express Mail  Insured  
 Return Receipt for Merchandise  COD

7. Date of Delivery  
 SEP 07 1999

5. Received By: (Print Name)  
 Judy Budman

6. Signature (Addressee or Agent)  
 Judy Budman

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1994 102595-99-B-0223 Domestic Return Receipt

Thank you for using Return Receipt Service.

is your RETURN ADDRESS completed on the reverse side?

**SENDER:**

- Complete items 1 and/or 2 for additional services. Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1.  Addressee's Address
2.  Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:  
 Mr. Eugene Klein, Chief Clerk  
 Luzerne County Courthouse  
 200 North River Street  
 Wilkes-Barre, PA 18711

4a. Article Number  
 Z 232 731 657

4b. Service Type  
 Registered  Certified  
 Express Mail  Insured  
 Return Receipt for Merchandise  COD

7. Date of Delivery  
 SEP 07 1999

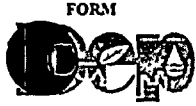
5. Received By: (Print Name)  
 Richard Khabovsky

6. Signature: (Addressee or Agent)  
 Richard Khabovsky

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.



**COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
PERMIT APPLICATION – GENERAL INFORMATION**

Before completing this form, read the step-by-step instructions provided in this Permit Application Package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application.

**SECTION A. PROJECT INFORMATION**

**Project Name**  
SUSQUEHANNA STEAM ELECTRIC STATION

**Project Description**  
The Susquehanna Steam Electric Stations consists of two boiling water reactors, each with a net electrical generating capacity of approximately 1,150 megawatts. The station owned by PP&L, Inc. (90%) and Allegheny Electric Cooperative Inc. (10%) is located on a 1,700 acre site in Salem Township, Luzerne County. Water is withdrawn from both the Susquehanna River and ground water for cooling, domestic, and station uses. PP&L, Inc. operates this station.

| Time Schedules | Project Milestone (Optional) |
|----------------|------------------------------|
| NA             |                              |
|                |                              |
|                |                              |
|                |                              |
|                |                              |
|                |                              |

Will your project involve the disturbance of any primary agricultural lands? If "yes", indicate the alternatives to this disturbance considered and the reasons they were not deemed feasible.

| <input checked="" type="checkbox"/> No | Alternative Considered | Reason Not Feasible |
|--|------------------------|---------------------|
| <input type="checkbox"/> Yes           | 1.                     |                     |
|  | 2.                     |                     |
|  | 3.                     |                     |

Will your project require any Commonwealth funds or Commonwealth-administered federal funds? If "yes", indicate the type, amount, and source of these funds.

| <input checked="" type="checkbox"/> No | Type | Amount | Source |
|--|------|--------|--------|
| <input type="checkbox"/> Yes           | 1.   | \$     |        |
|  | 2.   | \$     |        |
|  | 3.   | \$     |        |

## SECTION B. APPLICANT INFORMATION

|   |  |                                     |                |                        |     |
|---|--|-------------------------------------|----------------|------------------------|-----|
| DEP Client ID#  | Applicant Type / Code<br>PACOR Corporation/PA      |                                     |                |                        |     |
| Organization Name or Registered Fictitious Name<br>PP&L, Inc. | Employer ID# (EIN)<br>23-0959590                   | Dun & Bradstreet ID#<br>00-790-9427 |                |                        |     |
| Individual Last Name  | First Name   | MI                                  | Suffix         | SSN                    |     |
| Additional Individual Last Name                               | First Name   | MI                                  | Suffix         | SSN                    |     |
| Mailing Address Line 1<br>PP&L, Inc.                          | Mailing Address Line 2<br>2 N. 9th Street (GENA93) |                                     |                |                        |     |
| Address Last Line -- City<br>Allentown                        | State<br>PA  | ZIP+4<br>18101-1179                 | Country<br>USA |                        |     |
| Applicant Contact Last Name<br>Fields                         | First Name<br>Jerome                               | MI<br>S                             | Suffix         | Phone<br>(610)774-7889 | Ext |
| Applicant Contact Title<br>Sr. Env. Scientist-Nuclear         | Email<br>jsfields@papl.com                         |                                     |                | FAX<br>(610)774-7205   |     |

## SECTION C. SITE INFORMATION

|  |   |                                  |                                  |  |                                  |   |  |
|--|---|----------------------------------|----------------------------------|--|----------------------------------|---|--|
| Estimated Number of Applicant Employees to be Present at Site  |   |                                  |                                  |  |                                  |   |  |
| <input type="checkbox"/> 1-4   | <input type="checkbox"/> 5-9                    | <input type="checkbox"/> 10-19   | <input type="checkbox"/> 20-49   | <input type="checkbox"/> 50-99             | <input type="checkbox"/> 100-249 | <input checked="" type="checkbox"/> 250-499 | <input checked="" type="checkbox"/> 500+ |
| DEP Site ID#   | Site Name<br>Susquehanna Steam Electric Station |                                  |                                  |  |                                  |   |  |
| Site Location Line 1<br>Salem Township, Luzerne County   | Site Location Line 2                            |                                  |                                  |  |                                  |   |  |
| Site Location Last Line -- City<br>Berwick   | State<br>PA                                     | ZIP+4<br>18603-0467              | EPA ID#<br>PAD 000765883         |  |                                  |   |  |
| Detailed Written Directions to Site<br>Five miles north of Berwick, PA on US Route 11 or four miles south of Shickshinny, PA on US Route 11. |   |                                  |                                  |  |                                  |   |  |
| Description of Site<br>Two unit nuclear generating station   |   |                                  |                                  |  |                                  |   |  |
| County Name<br>Luzerne   | Municipality<br>Salem                           | City<br><input type="checkbox"/> | Boro<br><input type="checkbox"/> | Twp<br><input checked="" type="checkbox"/> | State<br>PA                      |   |  |
| County Name  | Municipality                                    | City<br><input type="checkbox"/> | Boro<br><input type="checkbox"/> | Twp<br><input type="checkbox"/>            | State                            |   |  |
| Site Contact Last Name<br>Castleberry  | First Name<br>Gary                              | MI<br>W                          | Suffix                           | Phone<br>(570)542-3970                     | Ext                              |   |  |
| Site Contact Title<br>Effluents Management-Supervisor  |   |                                  |                                  | FAX<br>(570)542-1857                       |                                  |   |  |
| Site Contact Firm<br>PP&L, Inc.  | Email<br>gwcastleberry@papl.com                 |                                  |                                  |  |                                  |   |  |
| Mailing Address Line 1<br>Susquehanna SES  | Mailing Address Line 2<br>P.O. Box 467          |                                  |                                  |  |                                  |   |  |
| Mailing Address Last Line -- City<br>Berwick   | State<br>PA                                     | ZIP+4<br>18603-0467              |                                  |  |                                  |   |  |
| Applicant to Site Relationship<br>OWNOP Owner/Operator   | If "Other" - Explain                            |                                  |                                  |  |                                  |   |  |
| SIC Codes (Two-Digit Codes - List All That Apply)<br>49  |   |                                  |                                  |  | (Optional: 4-Digit Code)<br>4911 |   |  |

## SECTION D. PERMIT COORDINATION

| QUESTION  | ANSWER                   |                                     |   | DEP Use |
|---|--------------------------|-------------------------------------|---|---------|
|   | Yes                      | No                                  | Additional Information Due to "Yes" Response  |         |
| 1.1 Will the project involve construction activity that disturbs five or more acres of land? If "Yes", specify total disturbed acreage.<br><i>Note: If more than 10 acres are disturbed, it is the applicant's responsibility to also notify the PA Historical and Museum Commission, PO Box 1026, Harrisburg, PA 17108-1026, Telephone (717) 787-3362.</i>             | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Total Disturbed Acreage:  | 4x66    |
| 1.2 Is a stormwater collection and discharge system proposed for this project?  | <input type="checkbox"/> | <input checked="" type="checkbox"/> |   | 4x66    |
| 1.3 Will any work associated with this project take place within 50 feet of a stream, waterway, or wetland; or is located in a FEMA delineated floodway? If "Yes", identify the stream, waterway, or wetland.   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Stream:<br>Waterway:<br>Wetland:  | 4x66    |
| 1.4 Does the project involve dredging or construction of any structure or placement of fill that encroaches on a stream, floodplain, or wetland? If "Yes", check the appropriate item(s).   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> Dredging<br><input type="checkbox"/> Bridge or Culvert Construction<br><input type="checkbox"/> Pier Construction<br><input type="checkbox"/> Outfall Pipe Construction<br><input type="checkbox"/> Other: | 4x66    |
| 2.1 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 storm water system? If "Yes", discuss in Project Description.   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | (Discuss in Section A, Project Description.)  | 4x62    |
| 2.2 Will the project involve the construction and operation of industrial waste treatment facilities?   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |   | 4x62    |
| 2.3 Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations? If "Yes", indicate estimated proposed flow (gal/day).<br>Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/ name of downstream sewage facilities in the Project Description, where applicable. | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Est Prop Flow (gal/day):<br><br>(Discuss in Section A, Project Description.)  | 4x62    |
| 3.1 Will land be subdivided for this project?   | <input type="checkbox"/> | <input checked="" type="checkbox"/> |   | 4x61    |
| 3.2 Will the proposed generate sewage?<br>If "Yes", indicate estimated flow (gal/day).<br>If "Yes", indicate number of persons to be served.<br>If "Yes", attach Act 537 approval letter.<br>If "Yes", sewage will be treated by (check appropriate item/box).  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Est Flow (gal/day):<br>Persons Served:<br>Treated by: <input type="checkbox"/> On-Site Soils System<br><input type="checkbox"/> On-Site Treatment Plant<br><input type="checkbox"/> Conveyed to Off-Site Trmt Plt                   | 4x61    |
| 3.3 If sewage planning was submitted and approved, indicate project name or code.   |                          |                                     | Proj Name/Code:   | 4x61    |
| 4.1 Does the project involve construction of a dam? If "Yes", identify the dam.   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Dam:  | 3140    |
| 4.2 Will the project interfere with the flow from, or otherwise impact, a dam? If "Yes", identify the dam.  | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Dam:  | 3140    |

**SECTION D. PERMIT COORDINATION (continued)**

| QUESTION  | ANSWER   |  |  |
|---|--|--|--|
|   | Yes  | No   | Additional Information Due to "Yes" Response   |
| 5.1 Will the project involve operations, excluding during the construction period, that produce air emissions (i.e., NOX, VOC, etc.)? If "Yes", identify the type and amounts of emissions.   | <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | Type Amount  |
| 6.1 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. And check all proposed sub-facilities.   | <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | Persons Served:<br>Emp/Guests:<br>Connections:<br>Sub-Facilities:<br><input type="checkbox"/> Distribution Sys <input type="checkbox"/> Source<br><input type="checkbox"/> Entry Point <input type="checkbox"/> Storage Fac<br><input type="checkbox"/> Water Trmt Plt <input type="checkbox"/> Pump Sta<br><input type="checkbox"/> Transmission Main |
| 6.2 If purchasing your water in bulk, excluding during the construction period, name the provider. Also, indicate the daily number of employees or guests served.   | <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | Provider:<br>Emp/Guests:   |
| 6.3 If to be served by public water supply, indicate name of supplier and attach letter from supplier stating that it will serve the project.   | <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | Supplier:  |
| 6.4 Will this project involve a new or increased drinking water withdrawal from a stream or other water body? If "Yes", provide name of stream.   | <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | Stream:  |
| 7.1 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, residual, infectious & chemotherapeutic) and how much. What are the proposed means of treatment, storage, reuse and disposal?  | <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | Type Amount Means<br><input type="checkbox"/> Treated<br><input type="checkbox"/> Stored<br><input type="checkbox"/> Reused<br><input type="checkbox"/> Disposed   |
| 8.1 Will your project involve the removal of coal, minerals, etc. as part of any earth disturbance activities?  | <input type="checkbox"/>   | <input checked="" type="checkbox"/>  |  |
| 9.1 Will your project involve operations within 200 feet of an oil or gas well? If "Yes", indicate Oil and Gas API#.  | <input type="checkbox"/>   | <input checked="" type="checkbox"/>  | API#:  |
| 10.1 Does your project involve installation of any of the following? If "Yes", list Substance & Capacity; may need a Storage Tank Site Specific Installation Permit.<br><ul style="list-style-type: none"> <li>• A field constructed underground storage tank?</li> <li>• An aboveground storage tank greater than 21,000 gallons capacity?</li> <li>• A tank greater than 1,100 gallons which will contain a highly hazardous substance?</li> <li>• A storage tank at a new facility?</li> </ul> | <input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/> | <input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/><br><input checked="" type="checkbox"/> | Substance Capacity   |

**SECTION E. FACILITY INFORMATION**

**Application Type**  
 New     Renewal     Modification     Transfer     Other-

**Modification of Existing Facility**  
 1. Will this project modify an existing facility, system, or activity?    Yes  No   
 2. Will this project involve an addition to an existing facility, system, or activity?    Yes  No   
*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 Source                     | _____       | <input type="checkbox"/> Public Water Supply System        | _____       |
| <input type="checkbox"/> Hazardous Waste Facility                | _____       | <input type="checkbox"/> Water Resource (withdrawal point) | _____       |
| <input type="checkbox"/> Municipal or Residential Waste Facility | _____       | <input type="checkbox"/> Oil & Gas Location                | _____       |
| <input type="checkbox"/> Mining Operation                        | _____       | <input type="checkbox"/> Oil & Gas Location / Coal Pillars | _____       |
| <input type="checkbox"/> Dam                                     | _____       | <input type="checkbox"/> Radiation Protection Facility     | _____       |
| <input type="checkbox"/> Water Obstruction or Encroachment       | _____       | <input type="checkbox"/> Other - _____                     | _____       |
| <input type="checkbox"/> Water Pollution Control Facility        | _____       | <input type="checkbox"/> Other - _____                     | _____       |

Latitude    DEG 41    MIN 5    SEC 30    Longitude    DEG 76    MIN 8    SEC 45

**SECTION F. CONSULTANT FOR THIS PROJECT**

Last Name    First Name    MI    Suffix

Title    Consulting Firm

Mailing Address Line 1    Mailing Address Line 2

Address Last Line -- City    State    ZIP+4    Country

Email    Phone    Ext    FAX

**SECTION G. CERTIFICATION**

I certify that I have the authority to submit this Permit 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.

*Robert F. Saunders*    12-2-99  
 Signature    Date

Type or Print Name    Robert F. Saunders, VP – Nuclear Site Operations







**COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
PERMIT APPLICATION – GENERAL INFORMATION**

**APPLICANT'S CHECKLIST**

Please check the following list to make sure that you have included all the required information. Place a checkmark next to each item 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.

**REQUIREMENT – Check  If Included**

1. **ATTACHMENTS.** The completion of the GIF may require the submission of some or all of the following. Where appropriate, include the appropriate attachment(s) with the completed GIF.
- a) Section A - Additional information attached - Lengthy Project Description
  - b) Section A - Additional information attached - Lengthy Time Schedules
  - c) Section C - Copy attached - 7.5 Minute Topographic Map (with drawn outline of site)
  - d) Section C - Additional information attached - Lengthy Detailed Written Directions to Site
  - e) Section D, Question 3.2 - Copy attached - Act 537 Approval Letter
  - f) Section D, Question 6.3 - Copy attached - Public Water Supplier's Agreement Letter to Serve the Project
2. **CONTACTS MADE.** According to information provided in Section D. Permit Coordination, the appropriate Regional/District Office has been contacted.
- a) Question Series 1 - If Yes - Local County Conservation District Office  
or Regional Soils & Waterways Section
  - b) Question Series 2 - If Yes - Regional Water Quality Permitting Section
  - c) Question Series 3 - If Yes - Regional Water Quality Planning Section
  - d) Question Series 4 - If Yes - Central Office Dam Safety Division
  - e) Question Series 5 - If Yes - Regional Air Quality Program
  - f) Question Series 6 - If Yes - Regional Water Supply Section  
and Community Health Office
  - g) Question Series 7 - If Yes - Regional Waste Management Program
  - h) Question Series 8 - If Yes - District Mining Permitting Section
  - i) Question Series 9 - If Yes - Regional Oil & Gas Program
  - j) Question Series 10 - If Yes - Division of Storage Tanks, Central Office
3. **BEFORE YOU DIG – CONTACT.** Pennsylvania One Call System at 1-800-242-1776.
4. **APPLICATION MAILED.** Permit application has been completed and properly signed according to instructions and type codes; and will be mailed to the appropriate DEP office.



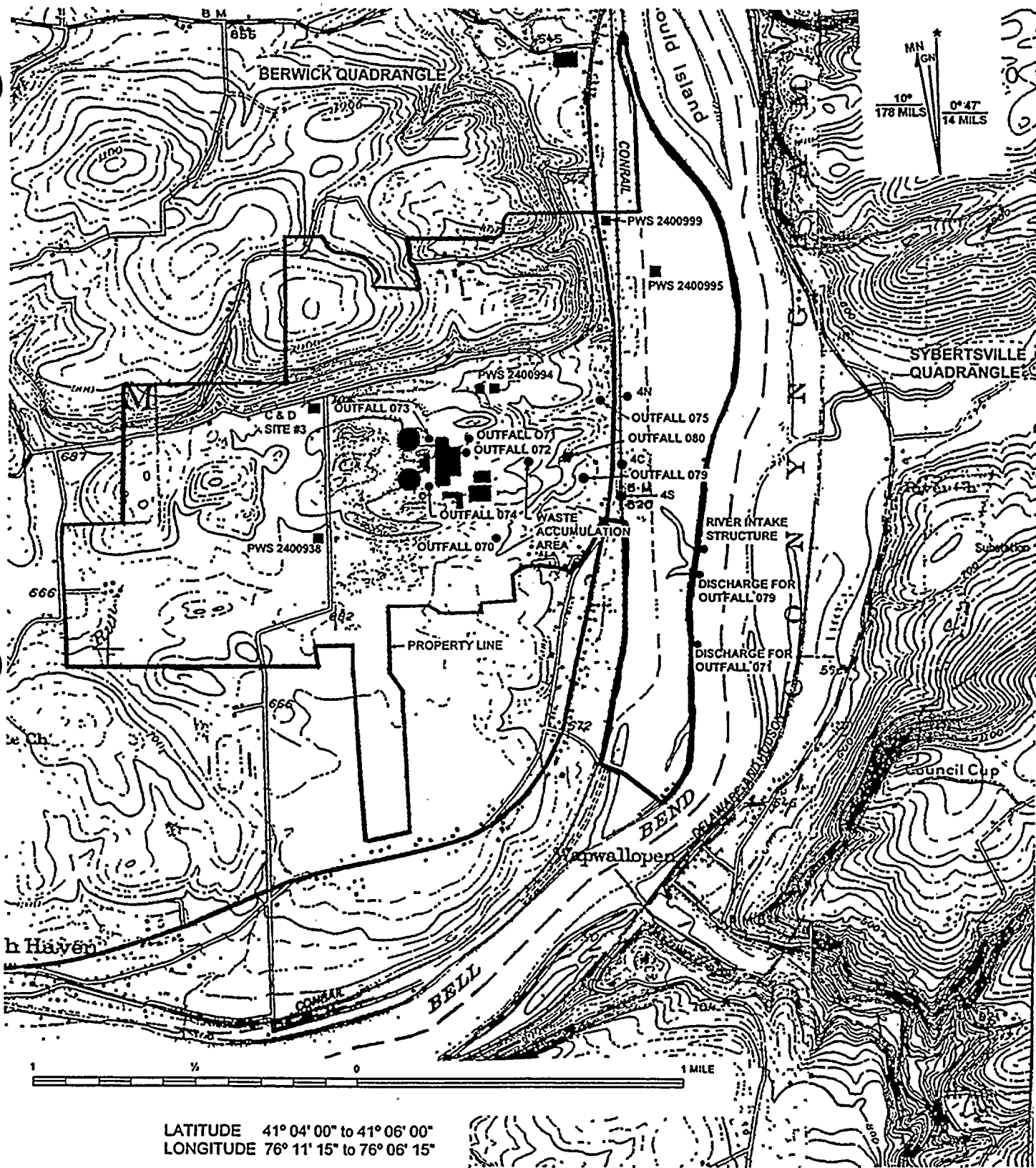


FIGURE 4-1  
TOPOGRAPHIC MAP  
SUSQUEHANNA SES



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL RESOURCES  
WATER MANAGEMENT PROGRAM

Project No.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

Application for NPDES Permit  
New and Existing Industrial Dischargers

SECTION A. APPLICANT IDENTIFIER

Applicant Name

PP&L, INC.

2 N. 9TH STREET

ALLENTOWN, PA 18101-1179

SECTION B. GENERAL INFORMATION

1. SIC Codes Corresponding SIC Description

1st 4 9 1 1 ELECTRIC SERVICES

2nd \_\_\_\_\_

3rd \_\_\_\_\_

4th \_\_\_\_\_

General Description and Nature of Business

Generation of electricity. The Susquehanna Steam Electric Station is a nuclear power station with two Boiling Water

Reactors with an electrical generating capacity of approximately 1,150 Mwe per reactor.

3. List all NPDES and Part II Water Quality Management Permits presently held for this facility

1. NPDES permit no. PA 0047325, June 22, 1995

2. Water Quality permit no. 4085411, October 7, 1985

Water Quality permit no. 4076203, May 25, 1977

000001

**SECTION B - (continued)**

4. Attach Topographic Map. See instructions. SEE FIGURES 4-1, 4-2, AND 4-3

5. Outfall Location: For each outfall, list the latitude and longitude of its location to the nearest second and the name of the receiving water. Where available, the receiving stream width and depth should also be provided using actual measurements or topographic map and navigational charts.

| FINAL<br>OUTFALL NUMBER<br><i>(list)</i> | LATITUDE |        |        | LONGITUDE |        |        | RECEIVING WATER<br><i>(Name)</i> | Low Flow<br>Stream |              |
|--|----------|--------|--------|-----------|--------|--------|----------------------------------|--------------------|--------------|
|  | 1.DEG    | 2.MIN. | 3.SEC. | 1.DEG.    | 2.MIN. | 3.SEC. |                                  | Ft.<br>Width       | Ft.<br>Depth |
| 070                                      | 41       | 5      | 15     | 76        | 8      | 45     | Lake Took-a-while                | 160                | 3            |
| 071                                      | 41       | 5      | 30     | 76        | 8      | 45     | Susquehanna River                | 1000               | 13           |
| 072                                      | 41       | 5      | 30     | 76        | 8      | 45     | Lake Took-a-while                | 160                | 3            |
| 073                                      | 41       | 5      | 30     | 76        | 8      | 45     | Lake Took-a-while                | 160                | 3            |
| 074                                      | 41       | 5      | 30     | 76        | 8      | 45     | Lake Took-a-while                | 160                | 3            |
| 075                                      | 41       | 5      | 30     | 76        | 8      | 30     | Lake Took-a-while                | 160                | 3            |
| 079                                      | 41       | 5      | 30     | 76        | 8      | 30     | Susquehanna River                | 1000               | 10           |
| 080                                      | 41       | 5      | 30     | 76        | 8      | 30     | Lake Took-a-while                | 160                | 3            |
| River Intake                             | 41       | 5      | 15     | 76        | 8      | 00     |                                  |                    |              |
| 071 at River                             | 41       | 5      | 00     | 76        | 8      | 00     |                                  |                    |              |
| 079 at River                             | 41       | 5      | 15     | 76        | 8      | 00     |                                  |                    |              |

6. Preparedness, Prevention, and Contingency (PPC) Planning

Does the facility have a PPC plan which has been reviewed and approved by the Department?

- Yes See note below Date of Approval
- No (attach 2 copies for review and approval)

Does the facility have any other related plans, such as a Pollution Incident Prevention (PIP) Plan or a Spill Prevention Control and Counter Measure (SPCC) Plan? Included with Best Management Practices in PPC Plan.

- Yes
- No

If yes, identify and indicate date(s) approved by the Department or EPA.

PPC Plan was previously submitted to the PaDEP with the last NPDES permit renewal application on July 15, 1994 (IPL-17914). At this time it is being updated and 2 copies will be forwarded to the PaDEP by June 1, 2000.

000002

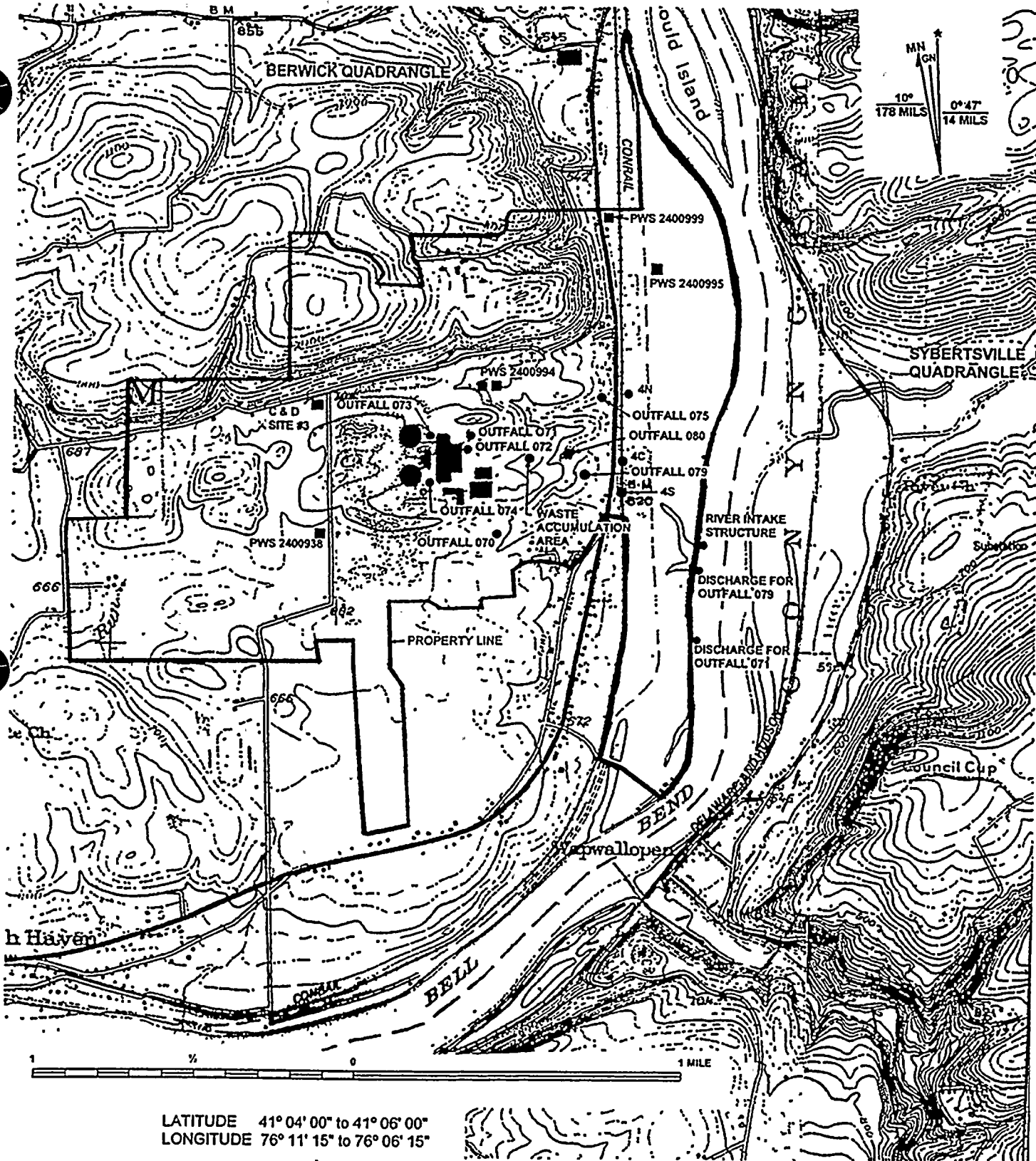


FIGURE 4-1  
 TOPOGRAPHIC MAP  
 SUSQUEHANNA SES

000003

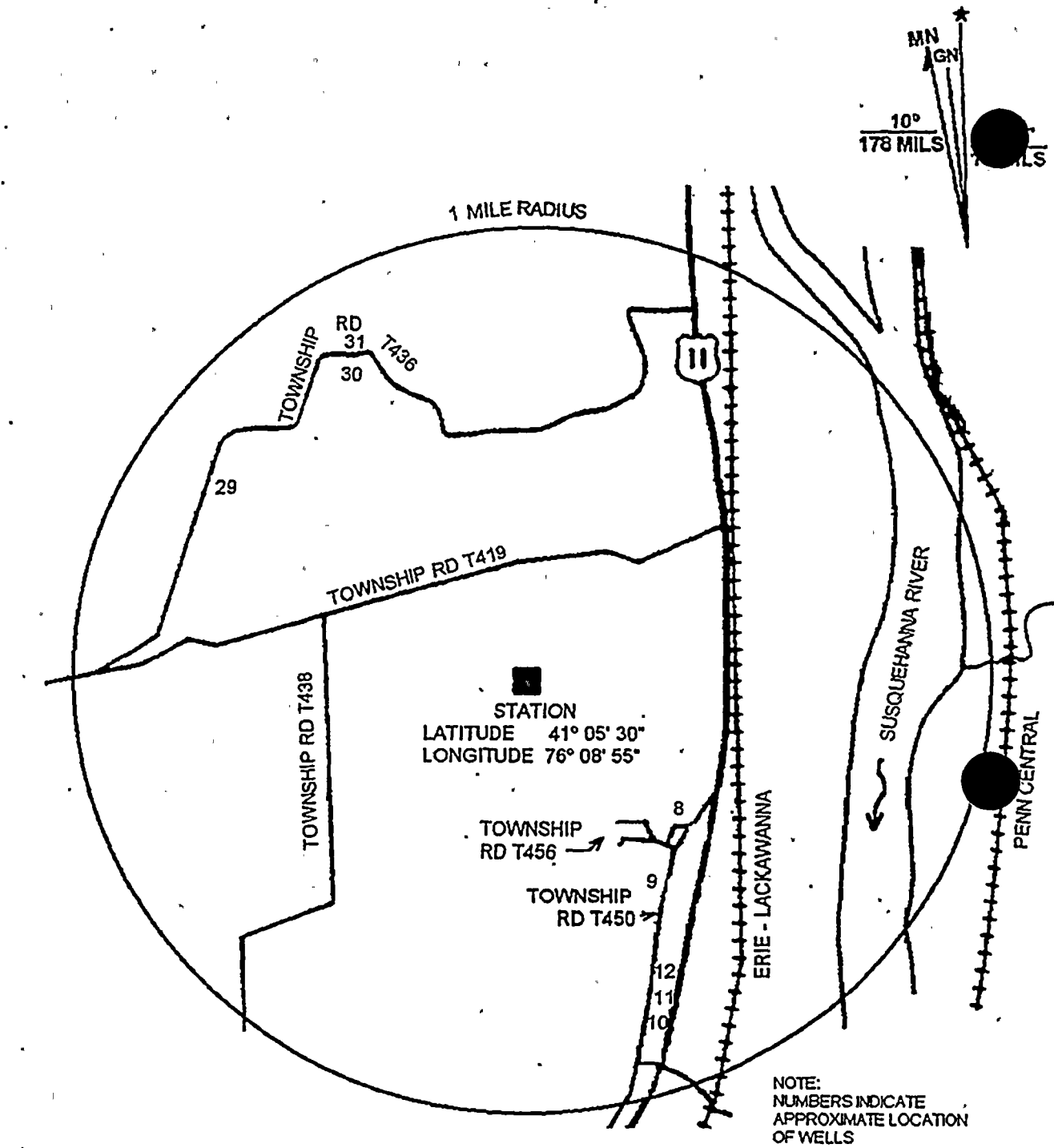


FIGURE 4-2  
SPRINGS USED FOR  
WATER SUPPLY WITH  
1 MILE OF THE STATIC  
SUSQUEHANNA SES

000004



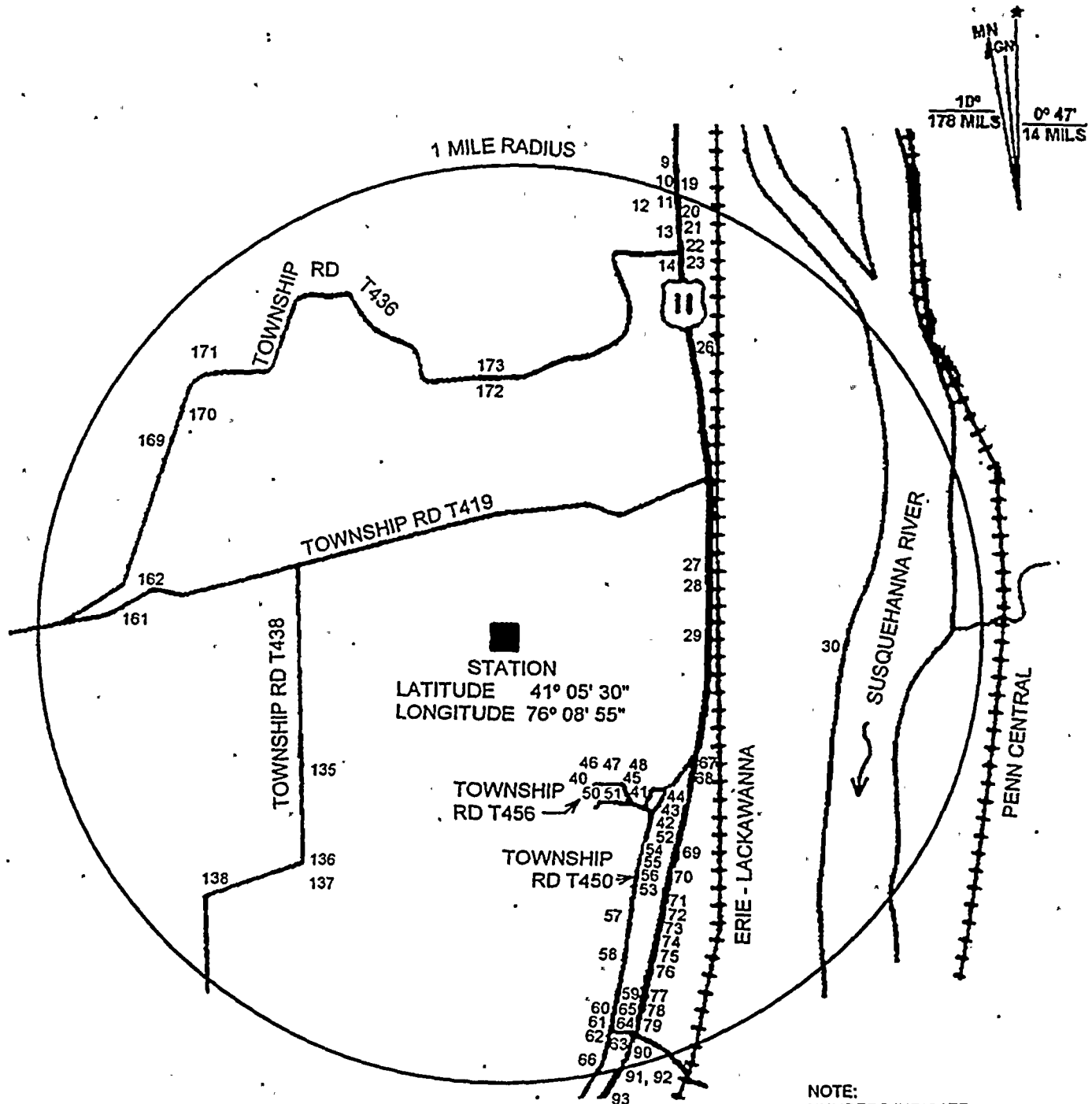
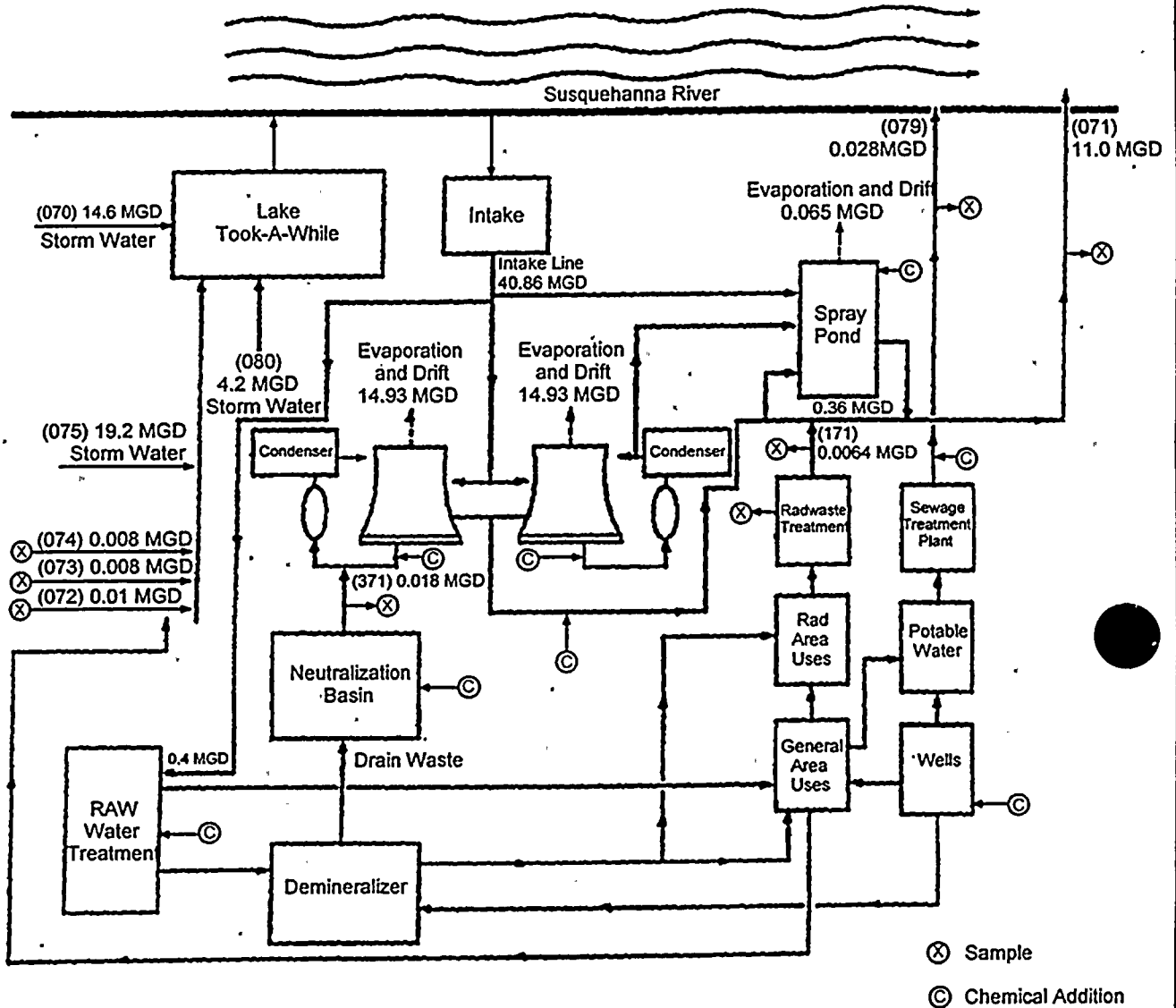


FIGURE 4-3  
WATER WELLS WITHIN  
1 MILE OF STATION  
SUSQUEHANNA SES

SECTION B - (continued)

7. Line Drawing. See instructions



Notes:

Data averaged over years 1996, 1997 and 1998 were used to determine river water withdrawal, consumptive use, and blowdown back to the river.

Outfalls 077 and 078 have not been included in this line drawing or permit renewal application since they do not discharge to the stormdrains.

**SECTION B - (continued)**

8. Site Plan and Stormwater Runoff - Use space below or an attachment. See instructions.

Complete this part for outfalls discharging process, non-contact cooling or sanitary wastewater in combination with stormwater.

The Department strongly recommends the separation of stormwater and other wastewaters. However, if this is impossible, complete this part. Section C must be completed for the other wastewater contribution. Complete Section D for the stormwater contribution. If the stormwater can be separated, complete Section D for the stormwater outfall, and Section C for any other wastewater outfalls.

See Figure 8-1

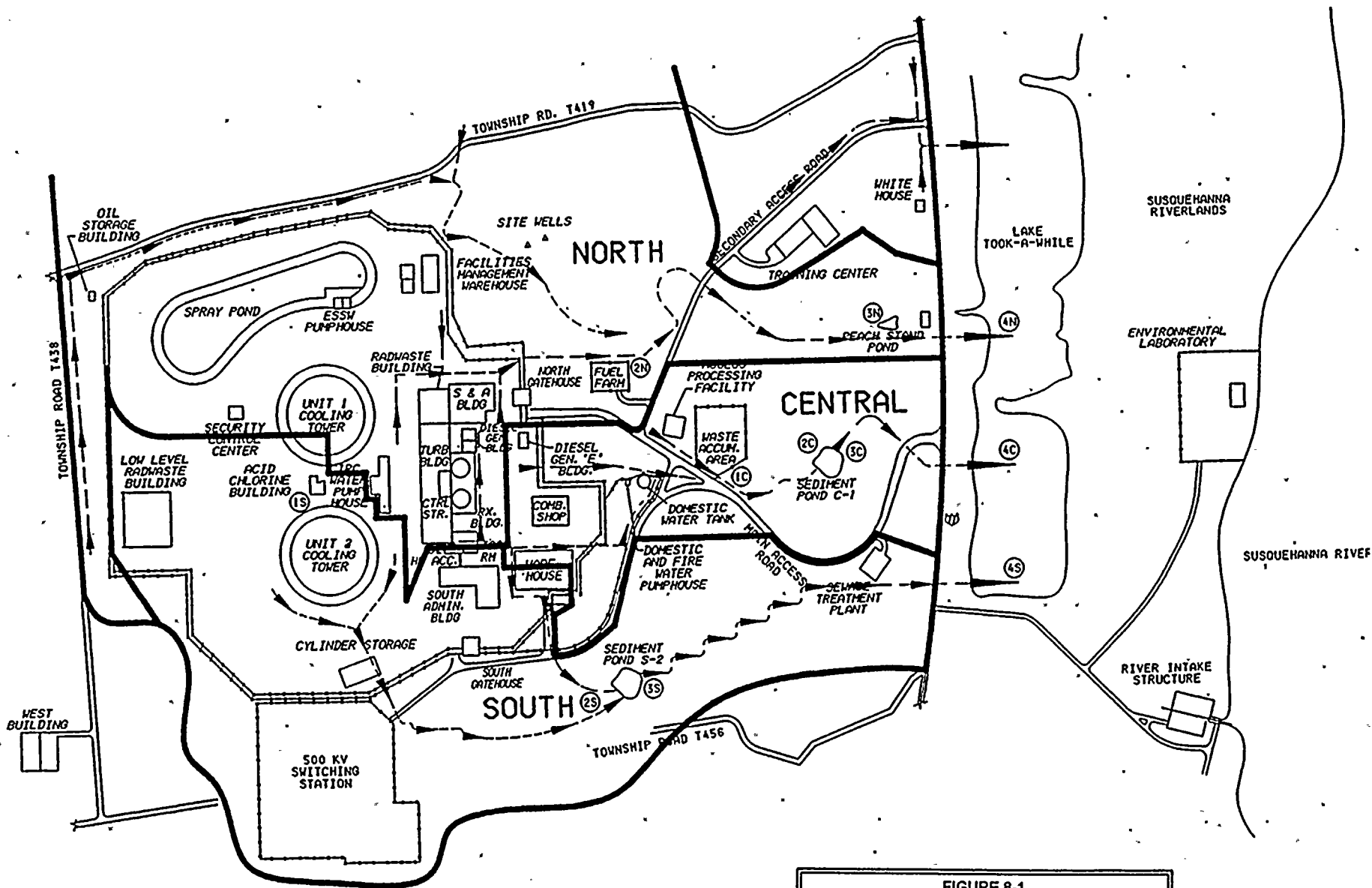


FIGURE 8-1  
 MAJOR DRAINAGE AREAS AND FLOWPATHS  
 SUSQUEHANNA SES

800000

**LIST OF CODES FOR FIGURE 8-1**  
**SITE PLAN AND STORMWATER RUNOFF**

**NORTH DRAINAGE AREA**

2N – Discharge of Storm Drain near North Gatehouse Parking Lot

3N – Effluent from Peach Stand Pond (Outfall 075)

4N – Influent to Lake Took-a-while

5 – Effluent from Lake Took-a-while

**CENTRAL DRAINAGE AREA**

1C – Waste Accumulation Area

2C – Influent to C-1 Pond

3C – Effluent from C-1 Pond (Outfall 080)

4C – Influent to Lake Took-a-while

5 – Effluent from Lake Took-a-while

**SOUTH DRAINAGE AREA**

1S – Acid and Chlorine Building (no longer stores acid or chlorine)

2S – Influent to S-2 Pond

3S – Effluent from S-2 Pond (Outfall 070)

4S – Influent to Lake Took-a-while

5 – Effluent from Lake Took-a-while

**SECTION B - (continued)**

**9. New Source Determination**

Referring to the instructions for this question, indicate when "construction" (as defined by EPA) and discharge began for the facilities causing each discharge? If "construction" has not begun, state when it will begin.

Do not complete this table for outfalls which only discharge sanitary wastewater or stormwater runoff (unless considered "process wastewater" under an EPA effluent guideline regulation).

| Date "Construction" Began* | Date Discharge Began** | Facilities Causing Discharge | Outfall(s) |
|----------------------------|------------------------|------------------------------|------------|
| N/A                        |                        |                              |            |
|                            |                        |                              |            |
|                            |                        |                              |            |
|                            |                        |                              |            |
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|                            |                        |                              |            |
|                            |                        |                              |            |

\* If "construction" began on different dates for facilities which contribute to the same outfall, list these dates separately (use additional sheets if necessary).

\*\* If not yet discharging, indicate date on which discharge is expected to begin.

## SECTION C - DATA REQUIREMENTS FOR PROCESS, NCCW, AND SANITARY WASTEWATER DISCHARGES

## I. OUTFALLS AND ASSOCIATED WASTEWATER TREATMENT TECHNOLOGIES

| Outfall Number    | Treatment Unit Description<br>(list in sequence) | Treatment Unit Code<br>(see Table 1) | Treatment Unit Design Flow Rate<br>10 <sup>6</sup> gal/day | Method for Handling and Disposal of Solid or Liquid Residue Resulting from Treatment<br>(list in sequence) | Handling and Disposal Code |
|-------------------|--|--------------------------------------|--|--|----------------------------|
| 070               | Discharge to Surface Water                       | 4-A                                  | Rain dependent   | N/A  |                            |
|                   | Sedimentation (settling)                         | 1-U                                  | Rain dependent   | N/A  |                            |
| 071               | Discharge to Surface Water                       | 4-A                                  | 20   | N/A  |                            |
|                   | Sedimentation (settling)                         | 1-U                                  | 20   | Landfill or Land Application   | 5-Q<br>5-P                 |
|                   | Disinfection (chlorine)                          | 2-F                                  | 20   | N/A  |                            |
|                   | Dechlorination (other) (optional)                | 2-E                                  | 20   | N/A  |                            |
|                   | Disinfection (other) (optional)                  | 2-H                                  | 20   | N/A  |                            |
|                   | Neutralization                                   | 2-K                                  | 20   | N/A  |                            |
| 171<br>(internal) | Diatomaceous Earth Filtration                    | 1-C                                  | 0.28   | Radioactive waste landfill   | 5-Q                        |
|                   | Ion Exchange                                     | 2-J                                  | 0.28   | Radioactive waste landfill   | 5-Q                        |
|                   | Neutralization                                   | 2-K                                  | 0.28   | N/A  |                            |
|                   | Evaporation (optional)                           | 1-F                                  | 0.28   | Radioactive waste landfill   | 5-Q                        |
|                   | Microstraining                                   | 1-N                                  | 0.002  | Radioactive waste landfill   | 5-Q                        |
| 371<br>(internal) | Neutralization                                   | 2-K                                  | 0.04   | N/A  |                            |
| 571<br>(internal) | Sedimentation (settling)                         | 1-U                                  |  | Landfill or Land Application   | 5-Q<br>5-P                 |
| 072               | Oil and Grease Removal                           | 4-H                                  | 0.023  | Recycle; Sale  | 4-C; 4-E                   |
|                   | Discharge to Surface Water via Storm Drains      | 4-A                                  | 0.023  | N/A  |                            |
|                   | Oil and Grease Removal                           | 4-H                                  | 0.018  | Recycle; Sale  | 4-C; 4-E                   |
|                   | Discharge to Surface                             | 4-A                                  | 0.018  | N/A  |                            |

**SECTION C - DATA REQUIREMENTS FOR PROCESS, NCCW, AND SANITARY WASTEWATER DISCHARGES**

**I. OUTFALLS AND ASSOCIATED WASTEWATER TREATMENT TECHNOLOGIES**

| Outfall Number | Treatment Unit Description (list in sequence) | Treatment Unit Code (see Table 1)           | Treatment Unit Design Flow Rate 10 <sup>6</sup> gal/day | Method for Handling and Disposal of Solid or Liquid Residue Resulting from Treatment (list in sequence) | Handling and Disposal Code |     |
|----------------|---|---|---|---|----------------------------|-----|
| 074            | Oil & Grease Removal                          | 4-H   | 0.018   | Recycle; sale   | 4-C; 4-E                   |     |
|                | Discharge to Surface Water via Storm Drains   | 4-H   | 0.018   | N/A   |                            |     |
| 075            | Discharge to Surface Water via Storm Drains   | 4-A   | Rain Dependent  | N/A   |                            |     |
|                | Sedimentation (settling)                      | 1-U   | Rain Dependent  | N/A   |                            |     |
| 079            | Grinding (comminutors)                        | 1-L   | 0.08  | N/A   | 5-O; 5-Q                   |     |
|                | Screening                                     | 1-T   | 0.08  | Incineration; Landfill  |                            |     |
|                | Equalization                                  | 1-Y   | 0.08  | N/A   |                            |     |
|                | Pre-aeration                                  | 3-E   | 0.08  | N/A   |                            |     |
|                | Activated Sludge                              | 3-A   | 0.08  | Belt filtration; Aerobic Digestion<br>Incineration; Landfill  |                            |     |
|                | Neutralization                                | 2-K   | 0.08  | N/A   |                            |     |
|                | Disinfection (chlorine)                       | 2-F   | 0.08  | N/A   |                            |     |
|                | Dechlorination (other)                        | 2-E   | 0.08  | N/A   |                            |     |
|                | Disinfection (other)                          | 2-H   | 0.08  | N/A   |                            |     |
|                | Discharge to Surface Water                    | 4-A   | 0.08  | N/A   |                            |     |
|                | 080   | Discharge to Surface Water Via Storm Drains | 4-A   | Rain Dependent  |                            | N/A |
|                |   | Sedimentation (settling)                    | 1-U   | Rain Dependent  |                            | N/A |



## ADDITIONAL INFORMATION FOR SECTION C-1

### ADDITIONAL OUTFALL DESCRIPTIONS

070 - The S-2 Pond, located on the South side of the Susquehanna SES site, is a storm water runoff outfall (SWRO). This SWRO outfall may contain occasional discharges of clarified water, demineralized water, well water, fire protection water, and other miscellaneous water. These discharges may also contain small amounts of chlorine, which will dissipate upon mixing with storm water in the pond, before the discharge reaches Lake Took-a-while. Due to the similarity of this outfall and Outfalls 075 and 080, only Outfall 075 was sampled for this NPDES permit application.

In addition, options are being reviewed to dry Cooling Tower sediment onsite. Dried sediment may be used as a coproduct or for beneficial uses to control site erosion and/or support warm season grasses on PP&L lands in the vicinity of the Susquehanna SES. Runoff from the sediment may enter this or the SWROs, however, this additional runoff will be negligible compared to present site runoff volume.

071 - Cooling Tower Blowdown includes input from the Unit 1 and Unit 2 Cooling Towers, internal discharges, and Emergency Spray Pond (Spray Pond) overflow, and other miscellaneous water. The Cooling Towers and Spray Pond contain river water used for cooling station main condensers and heat exchangers. Spray Pond discharge is based on pond level, and is dependent on make-up to the pond and rainfall. Assuming an estimated Spray Pond discharge of 250 gpm (0.36 MGD) and an average two-unit Cooling Tower discharge of 7,639 gpm (11-MGD), then the pond discharge adds only an additional 3.27% to the station blowdown. This amount however, is not captured in the blowdown flow recorders located upstream of the Spray Pond. Therefore, PP&L requests a daily Estimated Flow and not Recording Instrumentation for Outfall 071. We will continue to provide recorded readings from blowdown excluding the additional 250 gpm from the Spray Pond. Turbulence and river debris in the blowdown line downstream of the Spray Pond discharge have made flow recorders inoperable.

Evaporative losses in the Cooling Towers generally result in the cooling water being cycled 3 to 5 times the concentration of river water. Cooling Tower Basins each contain approximately 7 million gallons of water and the Spray Pond 25 million gallons.

In order to reduce fouling and corrosion in the Service Water and Circulating Water Systems, PP&L utilizes a chemical treatment program. Chemicals included in present and proposed treatment are listed in Section C, IV, "Information and Analysis of Effluent Quality for Other Potentially Toxic Pollutants" in this permit renewal application.

By definition closed cooling systems are not routinely discharged to the environment. When maintenance is performed on these systems, batch discharges are directed to the Cooling Tower Basins (Outfall 071) or the Sewage Treatment Plant (Outfall 079). Treatment of Emergency Diesel Generator Jacket Cooling Water (DGJCW) for corrosion and biofouling control continues to be problematic. Treatment chemicals used have included Isothiazolin, Glutaraldehyde, and a combination of Sodium Molybdate, Sodium Nitrite, and Methylbenzotriazole. Therefore, PP&L is evaluating the use Sodium Chromate as a possible treatment options and is including it in this NPDES permit renewal application.

Leakage from DGJCW systems discharges to the Service and Administrative Building sump, Outfall 072. Target concentration of chromate in the DGJCW systems will be between 150 and 250 mg/l. Assuming a worst-case scenario, leakage of 10% from any of the systems A – D (71 gallons each) at any one time or from system E (150 gallons) into Outfall 072 (2-10,000 gallon sumps) the chromate concentration in the sump discharge should be between 1.8 and 3.75 mg/l.

By definition closed cooling systems are not routinely discharged to the environment. When maintenance is performed on these system, batch discharges can be treated or directed to the Cooling Tower basins (Outfall 071), Sewage Treatment Plant (Outfall 079), or other storm water outfall with PaDEP concurrence. The following Table 1, Closed Cooling Systems lists station systems.

**TABLE 1**  
**CLOSED COOLING SYSTEMS**

| <u>SYSTEMS</u>  | <u>NO. OF SYSTEMS</u> | <u>SYSTEM VOLUME (gal)</u> |
|---|-----------------------|----------------------------|
| Units 1 & 2 Reactor Building<br>Closed Cooling Water                      | 2                     | 4,300                      |
| Units 1 & 2 Turbine Building<br>Closed Cooling Water                      | 2                     | 1,150                      |
| Units 1 & 2 Common Gaseous<br>Radwaste Recombiner<br>Closed Cooling Water | 3                     | 3,100                      |
| Units 1 & 2 Reactor Building<br>Chilled Water                             | 2                     | 4,750                      |
| Units 1 & 2 Turbine Building  | 2                     | 6,200                      |

Chilled Water

|  |   |       |
|--|---|-------|
| Control Structure Chilled Water                        | 1 | 1,200 |
| Radwaste Building<br>Chilled Water                     | 1 | 860   |
| A-D Emergency Diesel<br>Generator Jacket Cooling Water | 4 | 710   |
| E Emergency Diesel Generator<br>Jacket Cooling Water   | 1 | 1,500 |

INTERNAL OUTFALLS

171 - Liquid Radwaste discharge includes leakage and wastewater from the radiologically controlled area and also potentially from other sources of water in the Condensate Storage Tank bermed areas (former Outfalls 077 & 078) and mop water from outside the radiologically controlled area. Prior to combining with Outfall 071, this wastewater is passed through various treatment processes to reduce the concentration of radioactive materials. Approximately 90% of liquid radwaste are treated by one of two processes: filtration followed by ion-exchange demineralization, or ion-exchange demineralization followed by microstraining.

Less than 10% of liquid radwaste is from the laundry drainage system, which receives wastewater from equipment washdown stations and personnel decontamination facilities in the radiologically controlled area. PP&L-supplied clothing is sent to an outside contractor for cleaning. Miscellaneous wastes discharged through this system also include service water leakage, mop water from cleaning, and leakage from various pumps and valves. This water passes through microstraining filters prior to sampling the discharge.

271 - Waste Filter Bypass was previously eliminated from this NPDES permit since it is no longer in operation.

371 - Neutralization Basin internal discharge includes inputs from the demineralizer rinse water and chemical waste inputs from Circulating Water Pumphouse Building equipment and floor drains. There are two basins each with a capacity of approximately 20,000 gallons. The basins are used alternately and the contents are air sparged, recirculated, and samples prior to being directed to the suction side of the circulating water pumps.

471 - Waste Filter was previously eliminated from this NPDES permit because it is no longer in operation.

571 - Circulating Water Pumphouse Building sump receives leakage from the Circulating Water System that includes circulating water, seal water, and also equipment and floor drains.

The three remaining internal outfalls 171, 371, and 571 discharge into the Susquehanna River through Outfall 071.

072 - The Service and Administration (S&A) Building Low Volume Waste Sump receives inputs from the diesel generator oil unloading areas and building floor drain sumps, the emergency start-up transformer bermed areas, and the S&A Building Oil Storage Room floor drains. The sump contains two cells, each with approximately 10,000-gallon capacity. An oil and grease separator is provided to remove any fuel or transformer fluid leakage. DGJCW leakage may enter this sump. If Sodium Chromate should be used as a corrosion inhibitor in this system some leakage into this sump may occur. It is estimated that the chromate concentration would be no greater than 3.75 mg/l.

073 - Unit 1 Turbine Building Low Volume Waste Sump collects storm water drainage from the transformer, turbine lube oil, and oil circuit breaker bermed areas. This sump has two cells of approximately 8,700 gallons each; however, discharges are usually about 8,100 gallons. The storm water collected in this sump passes through an oil and grease separator prior to discharge.

074 - Unit 2 Turbine Building Low Volume Waste sump is similar to Outfall 073, only this Outfall 074 collects storm water from the Unit 2 side of the site. Because of the similarity between these outfalls only Outfall 073 was sampled for this NPDES permit renewal application.

075 - The Peach Stand Pond is a SWRO through which runoff from the station facilities and North side of the site flow into this pond. This outfall may contain occasional discharges of clarified water, demineralized water, well water, fire protection water, and other miscellaneous water. These discharges may contain small amounts of chlorine, which will dissipate upon mixing with storm water before entering Lake Took-a-while. Discharge from this outfall goes into Lake Took-a-while located east of US Route 11. Because this outfall and Outfalls 070 and 080 are similar, only this outfall was sampled for this NPDES permit renewal application.

077 - Unit 1 Condensate Storage Tank bermed area stormwater is discharged through Outfall 071, Cooling Tower Blowdown. Since there have been no discharges to the storm drains from this outfall, PP&L has decided not to include it in this NPDES permit renewal application.

078 - Unit 2 Condensate Storage Tank bermed area runoff like Outfall 077 is discharged Outfall 071, therefore, PP&L has also decided not to include this stormwater outfall in this NPDES permit renewal application.

079 - The Sewage Treatment Plant (STP) is designed to treat 80,000 gallons per day of sanitary wastes from the collection system onsite and from pump stations at the Training Center, Riverlands Recreation Area, Environmental Lab, West Building, and Vehicle Maintenance Garage. Sanitary wastes may contain small amounts of cleaning agents, and other chemicals. Material Safety Data Sheets for these chemicals recommend treatment at STPs prior to discharge (Susquehanna River).

080 - The C-1 Pond is a SWRO outfall located in the central drainage area just East of the station's protected area. This outfall may contain occasional discharges of clarified water, demineralized water, well water, fire protection water, and other miscellaneous water. These discharges may contain small amounts of chlorine, which will dissipate upon mixing with storm water before entering Lake Took-a-while. Since this outfall is similar to Outfall 070 and 075 it was not sampled. Sample data are provided from Outfall 075 in this application.

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 070 (S-2 Pond)**

**1. Process Wastewater**

a. Describe process and type of wastewater:  
N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_  
Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| <u>Quantity</u> | <u>Units of Measure</u> | <u>Of Product<br/>(or raw material used)</u> | <u>Month When Representative<br/>Production Occurs</u> | <u>Days/Month<br/>Production Occurs</u> |
|-----------------|-------------------------|--|--|---|
|                 |                         |  |  |   |

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr  
During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

For batch discharges report:

No. 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:  
N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_  
Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| <u>Quantity</u> | <u>Units of Measure</u> | <u>Of Product<br/>(or raw material used)</u> | <u>Month When Representative<br/>Production Occurs</u> | <u>Days/Month<br/>Production Occurs</u> |
|-----------------|-------------------------|--|--|---|
|                 |                         |  |  |   |

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr  
During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles \_\_\_\_\_ CYCLES/DAY

Length of each decant cycle \_\_\_\_\_ MIN.

Average decant discharge rate \_\_\_\_\_ GPM

SECTION C - (continued)

II. SOURCES OF WASTEWATER FOR OUTFALL 070

2. Other Wastewater Contributing to this Outfall

(Description) See No. 3 below.

a. Source(s):

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles

\_\_\_\_\_ CYCLES/DAY

Length of each decant cycle

\_\_\_\_\_ MIN.

Average decant discharge flow rate

\_\_\_\_\_ GPM

3. Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Runoff from paved roads, roof drains.

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? Rain dependent.

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER FOR OUTFALL (continued) 070**

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters.

| Rainfall (inches) |   | Drainage Area Size     | Units           |   | Conversion Factor |   | Volume                 | Units   |
|-------------------|---|------------------------|-----------------|---|-------------------|---|------------------------|---------|
|                   | X |                        | Ft <sup>2</sup> | X | 0.623             | = |                        | Gallons |
| 4.7               | X | 5.55 x 10 <sup>5</sup> | Yd <sup>2</sup> | X | 5.61              | = | 1.46 x 10 <sup>7</sup> | Gallons |
|                   | X |                        | Acres           | X | 27.152            | = |                        | Gallons |

**III. REQUIRED AND OPTIONAL ANALYSES**

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table 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 table to provide description of sampling points used.)

Optional Toxics Data is attached to Application

YES  NO



**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 071**

**1. Process Wastewater**

a. Describe process and type of wastewater:

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: 423

Category/Subcategory Steam Electric Power

c. Maximum Monthly Production Rate:

| Quantity               | Units of Measure | Of Product<br>(or raw material used) | Month When Representative<br>Production Occurs | Days/Month<br>Production Occurs |
|------------------------|------------------|--------------------------------------|--|---------------------------------|
| 1.65 x 10 <sup>6</sup> | mwh(net)         | Electricity                          | March 1998                                     | 31                              |

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

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

7.93 MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. 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:

N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_

Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| Quantity | Units of Measure | Of Product<br>(or raw material used) | Month When Representative<br>Production Occurs | Days/Month<br>Production Occurs |
|----------|------------------|--------------------------------------|--|---------------------------------|
|          |                  |                                      |  |                                 |

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles

\_\_\_\_\_ CYCLES/DAY

Length of each decant cycle

\_\_\_\_\_ MIN.

Average decant discharge rate

\_\_\_\_\_ GPM

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER FOR OUTFALL 071**

**2. Other Wastewater Contributing to this Outfall**

(Description) See No. 3 below.

a. Source(s): \_\_\_\_\_

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles

\_\_\_\_\_ CYCLES/DAY

Length of each decant cycle

\_\_\_\_\_ MIN.

Average decant discharge flow rate

\_\_\_\_\_ GPM

**3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater**

Internal discharges: Outfalls 171-Liquid Radwaste; 371-Neutralization Basis; 571-Circulating Water

a. Source(s): Pumphouse Bldg. Sump.

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? 12

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

N/A MGD

For intermittent or seasonal discharges report: (1998)

The long-term average discharge rate

|              |              |              |     |
|--------------|--------------|--------------|-----|
| <u>171</u>   | <u>371</u>   | <u>571</u>   |     |
| <u>0.014</u> | <u>0.017</u> | <u>0.054</u> | MGD |

The maximum daily discharge rate

|              |              |              |     |
|--------------|--------------|--------------|-----|
| <u>0.073</u> | <u>0.019</u> | <u>0.069</u> | MGD |
|--------------|--------------|--------------|-----|

SECTION C - (continued)

II. SOURCES OF WASTEWATER FOR OUTFALL (continued) 071

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters.

| Rainfall (inches) | Drainage Area Size | Units           | Conversion Factor | Volume  | Units   |
|-------------------|--------------------|-----------------|-------------------|---------|---------|
| X                 |                    | Ft <sup>2</sup> | X 0.623           | =       | Gallons |
| X                 |                    | Yd <sup>2</sup> | X 5.61            | =       | Gallons |
| 4.7               | 8                  | Acres           | X 27.152          | = 1,021 | Gallons |

(Emergency Spray Pond)

III. REQUIRED AND OPTIONAL ANALYSES

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table 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 table to provide description of sampling points used.)

Optional Toxics Data is attached to Application

YES  NO

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 072**

**1. Process Wastewater**

(Service and Admin. Bldg. Low Volume Waste Sump)

a. Describe process and type of wastewater:  
N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_  
Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| Quantity | Units of Measure | Of Product<br>(or raw material used) | Month When Representative<br>Production Occurs | Days/Month<br>Production Occurs |
|----------|------------------|--------------------------------------|--|---------------------------------|
|----------|------------------|--------------------------------------|--|---------------------------------|

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr  
During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

For batch discharges report:

No. 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:  
N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_  
Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| Quantity | Units of Measure | Of Product<br>(or raw material used) | Month When Representative<br>Production Occurs | Days/Month<br>Production Occurs |
|----------|------------------|--------------------------------------|--|---------------------------------|
|----------|------------------|--------------------------------------|--|---------------------------------|

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr  
During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles \_\_\_\_\_ CYCLES/DAY

Length of each decant cycle \_\_\_\_\_ MIN.

Average decant discharge rate \_\_\_\_\_ GPM

SECTION C - (continued)

II. SOURCES OF WASTEWATER FOR OUTFALL 072

2. Other Wastewater Contributing to this Outfall

(Description) See No. 3 below.

a. Source(s):

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles \_\_\_\_\_ CYCLES/DAY

Length of each decant cycle \_\_\_\_\_ MIN.

Average decant discharge flow rate \_\_\_\_\_ GPM

3. Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s):

b. Discharge Occurs: 1 hrs/day; -- days/wk; 33 days/yr; 12 months/yr (1998)

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. N/A \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate 0.011 \_\_\_\_\_ MGD

The maximum daily discharge rate 0.020 \_\_\_\_\_ MGD

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER FOR OUTFALL (continued) 072**

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters. N/A

| Rainfall (inches) | Drainage Area Size | Units           |   | Conversion Factor |   | Volume | Units   |
|-------------------|--------------------|-----------------|---|-------------------|---|--------|---------|
| X                 |                    | Ft <sup>2</sup> | X | 0.623             | = |        | Gallons |
| X                 |                    | Yd <sup>2</sup> | X | 5.61              | = |        | Gallons |
| X                 |                    | Acres           | X | 27.152            | = |        | Gallons |

**III. REQUIRED AND OPTIONAL ANALYSES**

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table 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 table to provide description of sampling points used.)

Optional Toxics Data is attached to Application

YES  NO

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 073**

**1. Process Wastewater**

(Unit 1 Turbine Bldg. Low Volume Waste Sump)

a. Describe process and type of wastewater:  
N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_  
Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| Quantity | Units of Measure | Of Product<br>(or raw material used) | Month When Representative<br>Production Occurs | Days/Month<br>Production Occurs |
|----------|------------------|--------------------------------------|--|---------------------------------|
|----------|------------------|--------------------------------------|--|---------------------------------|

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr  
During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

For batch discharges report:

No. 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:  
N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_  
Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| Quantity | Units of Measure | Of Product<br>(or raw material used) | Month When Representative<br>Production Occurs | Days/Month<br>Production Occurs |
|----------|------------------|--------------------------------------|--|---------------------------------|
|----------|------------------|--------------------------------------|--|---------------------------------|

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr  
During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles \_\_\_\_\_ CYCLES/DAY

Length of each decant cycle \_\_\_\_\_ MIN.

Average decant discharge rate \_\_\_\_\_ GPM

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER FOR OUTFALL 073**

**2. Other Wastewater Contributing to this Outfall**

(Description) See No. 3 below.

a. Source(s):

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles

\_\_\_\_\_ CYCLES/DAY

Length of each decant cycle

\_\_\_\_\_ MIN.

Average decant discharge flow rate

\_\_\_\_\_ GPM

**3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater**

a. Source(s): Miscellaneous wastewater – transformer area and parking area runoff.

b. Discharge Occurs: 1 hrs/day; - days/wk; 18 days/yr; 12 months/yr (1998)

During which months? Can occur in all months; dependent on parking lot area runoff.

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

N/A MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

0.011 MGD

The maximum daily discharge rate

0.030 MGD



**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER FOR OUTFALL (continued) 073**

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters. N/A

| Rainfall (inches) | Drainage Area Size | Units           |   | Conversion Factor |   | Volume | Units   |
|-------------------|--------------------|-----------------|---|-------------------|---|--------|---------|
| X                 |                    | Ft <sup>2</sup> | X | 0.623             | = |        | Gallons |
| X                 |                    | Yd <sup>2</sup> | X | 5.61              | = |        | Gallons |
| X                 |                    | Acres           | X | 27.152            | = |        | Gallons |

**III. REQUIRED AND OPTIONAL ANALYSES**

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table 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 table to provide description of sampling points used.)

Optional Toxics Data is attached to Application

YES  NO

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 074**

(Unit 2 Turbine Bldg., Low Volume Waste Sump)

**1. Process Wastewater**

a. Describe process and type of wastewater:  
N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_

Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| <u>Quantity</u> | <u>Units of Measure</u> | <u>Of Product<br/>(or raw material used)</u> | <u>Month When Representative<br/>Production Occurs</u> | <u>Days/Month<br/>Production Occurs</u> |
|-----------------|-------------------------|--|--|---|
|-----------------|-------------------------|--|--|---|

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr  
During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. 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:  
N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_

Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| <u>Quantity</u> | <u>Units of Measure</u> | <u>Of Product<br/>(or raw material used)</u> | <u>Month When Representative<br/>Production Occurs</u> | <u>Days/Month<br/>Production Occurs</u> |
|-----------------|-------------------------|--|--|---|
|-----------------|-------------------------|--|--|---|

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr  
During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles

\_\_\_\_\_ CYCLES/DAY

Length of each decant cycle

\_\_\_\_\_ MIN.

Average decant discharge rate

\_\_\_\_\_ GPM

SECTION C - (continued)

II. SOURCES OF WASTEWATER FOR OUTFALL 074

2. Other Wastewater Contributing to this Outfall

(Description) See No. 3 below.

a. Source(s):

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles

\_\_\_\_\_ CYCLES/DAY

Length of each decant cycle

\_\_\_\_\_ MIN.

Average decant discharge flow rate

\_\_\_\_\_ GPM

3. Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Miscellaneous wastewater – transformer area, parking area runoff.

b. Discharge Occurs: 1 hrs/day; -- days/wk; 21 days/yr; 12 months/yr (1998)

During which months? Can occur in all months, dependent on parking area runoff

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

N/A \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

0.013 \_\_\_\_\_ MGD

The maximum daily discharge rate

0.024 \_\_\_\_\_ MGD

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER FOR OUTFALL (continued) 074**

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters. N/A

| Rainfall (inches) | Drainage Area Size | Units           | Conversion Factor | Volume | Units   |
|-------------------|--------------------|-----------------|-------------------|--------|---------|
| X                 |                    | Ft <sup>2</sup> | X 0.623           | =      | Gallons |
| X                 |                    | Yd <sup>2</sup> | X 5.61            | =      | Gallons |
| X                 |                    | Acres           | X 27.152          | =      | Gallons |

**III. REQUIRED AND OPTIONAL ANALYSES**

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table 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 table to provide description of sampling points used.)

Optional Toxics Data is attached to Application

YES  NO

**SECTION C - (continued)**

**SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 075**

**1. Process Wastewater**

a. Describe process and type of wastewater:

N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_

Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| <u>Quantity</u> | <u>Units of Measure</u> | <u>Of Product<br/>(or raw material used)</u> | <u>Month When Representative<br/>Production Occurs</u> | <u>Days/Month<br/>Production Occurs</u> |
|-----------------|-------------------------|--|--|---|
|-----------------|-------------------------|--|--|---|

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. 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:

N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_

Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| <u>Quantity</u> | <u>Units of Measure</u> | <u>Of Product<br/>(or raw material used)</u> | <u>Month When Representative<br/>Production Occurs</u> | <u>Days/Month<br/>Production Occurs</u> |
|-----------------|-------------------------|--|--|---|
|-----------------|-------------------------|--|--|---|

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles

\_\_\_\_\_ CYCLES/DAY

Length of each decant cycle

\_\_\_\_\_ MIN.

Average decant discharge rate

\_\_\_\_\_ GPM

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER FOR OUTFALL 075**

**2. Other Wastewater Contributing to this Outfall**

(Description) See No. 3 below.

a. Source(s):

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles \_\_\_\_\_ CYCLES/DAY

Length of each decant cycle \_\_\_\_\_ MIN.

Average decant discharge flow rate \_\_\_\_\_ GPM

**3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater**

a. Source(s): Runoff from paved roads, roof drains; discharges from Outfalls 072, 073, and 074.

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? Rain dependent.

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER FOR OUTFALL (continued) 075**

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters.

| Rainfall (inches) |   | Drainage Area Size     | Units           |   | Conversion Factor |   | Volume                 | Units   |
|-------------------|---|------------------------|-----------------|---|-------------------|---|------------------------|---------|
|                   | X |                        | Ft <sup>2</sup> | X | 0.623             | = |                        | Gallons |
| 4.7               | X | 7.25 x 10 <sup>5</sup> | Yd <sup>2</sup> | X | 5.61              | = | 1.92 x 10 <sup>7</sup> | Gallons |
|                   | X |                        | Acres           | X | 27.152            | = |                        | Gallons |

**III. REQUIRED AND OPTIONAL ANALYSES**

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table 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 table to provide description of sampling points used.)

Optional Toxics Data is attached to Application

YES  NO

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 079**

**1. Process Wastewater (Sewage Treatment Plant)**

- a. Describe process and type of wastewater:  
N/A
- b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_  
Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| Quantity | Units of Measure | Of Product<br>(or raw material used) | Month When Representative<br>Production Occurs | Days/Month<br>Production Occurs |
|----------|------------------|--------------------------------------|--|---------------------------------|
|----------|------------------|--------------------------------------|--|---------------------------------|

- d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr  
During which months? \_\_\_\_\_
- For continuous discharges report:  
The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD
- For intermittent or seasonal discharges report:  
The long-term average discharge rate \_\_\_\_\_ MGD  
The maximum daily discharge rate \_\_\_\_\_ MGD
- For batch discharges report:  
No. 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:  
N/A
- b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_  
Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| Quantity | Units of Measure | Of Product<br>(or raw material used) | Month When Representative<br>Production Occurs | Days/Month<br>Production Occurs |
|----------|------------------|--------------------------------------|--|---------------------------------|
|----------|------------------|--------------------------------------|--|---------------------------------|

- d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr  
During which months? \_\_\_\_\_
- For continuous discharges report:  
The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD
- For intermittent or seasonal discharges report:  
The long-term average discharge rate \_\_\_\_\_ MGD  
The maximum daily discharge rate \_\_\_\_\_ MGD
- For batch discharges report:  
No. of decant cycles \_\_\_\_\_ CYCLES/DAY  
Length of each decant cycle \_\_\_\_\_ MIN.  
Average decant discharge rate \_\_\_\_\_ GPM



SECTION C - (continued)

II. SOURCES OF WASTEWATER FOR OUTFALL 079

2. Other Wastewater Contributing to this Outfall

(Description) See No. 3 below.

a. Source(s):

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles

\_\_\_\_\_ CYCLES/DAY

Length of each decant cycle

\_\_\_\_\_ MIN.

Average decant discharge flow rate

\_\_\_\_\_ GPM

3. Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Sanitary Wastes

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

During which months? All months

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

0.022 MGD\*

For intermittent or seasonal discharges report:

The long-term average discharge rate

N/A MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

\*Average discharge rate from March 1998, month of highest electrical production in 1998.

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER FOR OUTFALL (continued) 079**

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters. N/A

| Rainfall (inches) | Drainage Area Size | Units           |   | Conversion Factor |   | Volume | Units   |
|-------------------|--------------------|-----------------|---|-------------------|---|--------|---------|
| X                 |                    | Ft <sup>2</sup> | X | 0.623             | = |        | Gallons |
| X                 |                    | Yd <sup>2</sup> | X | 5.61              | = |        | Gallons |
| X                 |                    | Acres           | X | 27.152            | = |        | Gallons |

**III. REQUIRED AND OPTIONAL ANALYSES**

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table 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 table to provide description of sampling points used.)

Optional Toxics Data is attached to Application

YES  NO

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALL NUMBER 080**

**1. Process Wastewater**

(C-1 Pond)

a. Describe process and type of wastewater: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_

Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| <u>Quantity</u> | <u>Units of Measure</u> | <u>Of Product<br/>(or raw material used)</u> | <u>Month When Representative<br/>Production Occurs</u> | <u>Days/Month<br/>Production Occurs</u> |
|-----------------|-------------------------|--|--|---|
|                 |                         |  |  |   |

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

For batch discharges report:

No. 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: N/A

b. Applicable EPA Effluent Limitation Guideline: 40 CFR: \_\_\_\_\_

Category/Subcategory \_\_\_\_\_

c. Maximum Monthly Production Rate:

| <u>Quantity</u> | <u>Units of Measure</u> | <u>Of Product<br/>(or raw material used)</u> | <u>Month When Representative<br/>Production Occurs</u> | <u>Days/Month<br/>Production Occurs</u> |
|-----------------|-------------------------|--|--|---|
|                 |                         |  |  |   |

d. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production. \_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate \_\_\_\_\_ MGD

The maximum daily discharge rate \_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles \_\_\_\_\_ CYCLES/DAY

Length of each decant cycle \_\_\_\_\_ MIN.

Average decant discharge rate \_\_\_\_\_ GPM

SECTION C - (continued)

II. SOURCES OF WASTEWATER FOR OUTFALL 080

2. Other Wastewater Contributing to this Outfall

(Description) See No. 3 below.

a. Source(s):

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? \_\_\_\_\_

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

For batch discharges report:

No. of decant cycles

\_\_\_\_\_ CYCLES/DAY

Length of each decant cycle

\_\_\_\_\_ MIN.

Average decant discharge flow rate

\_\_\_\_\_ GPM

3. Total Process, Miscellaneous Non-Contact Cooling, and Sanitary Wastewater

a. Source(s): Runoff from paved roads, roof drains.

b. Discharge Occurs: \_\_\_\_\_ hrs/day; \_\_\_\_\_ days/wk; \_\_\_\_\_ days/yr; \_\_\_\_\_ months/yr

During which months? Rain dependent.

For continuous discharges report:

The average discharge rate associated with the month of maximum production.

\_\_\_\_\_ MGD

For intermittent or seasonal discharges report:

The long-term average discharge rate

\_\_\_\_\_ MGD

The maximum daily discharge rate

\_\_\_\_\_ MGD

**SECTION C - (continued)**

**II. SOURCES OF WASTEWATER FOR OUTFALL (continued) 080**

4. Stormwater Runoff (Only if in combination with any of the above wastewaters. If outfall consists of only stormwater, complete Section D) otherwise complete Section D for the stormwater contribution and Section C for contributions from other wastewaters.

| Rainfall (inches) |   | Drainage Area Size    | Units           |   | Conversion Factor |   | Volume                | Units   |
|-------------------|---|-----------------------|-----------------|---|-------------------|---|-----------------------|---------|
|                   | X |                       | Ft <sup>2</sup> | X | 0.623             | = |                       | Gallons |
| 4.7               | X | 1.6 x 10 <sup>5</sup> | Yd <sup>2</sup> | X | 5.61              | = | 4.2 x 10 <sup>6</sup> | Gallons |
|                   | X |                       | Acres           | X | 27.152            | = |                       | Gallons |

**III. REQUIRED AND OPTIONAL ANALYSES**

1. Optional Site-Specific Toxics Data

Use the space below (attach additional sheets if necessary) to provide any of the optional site-specific information discussed in Appendix 2. (The Analyses Results Table 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 table to provide description of sampling points used.)

Optional Toxics Data is attached to Application

YES  NO

SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

2. Summary of Required Analyses Worksheet

\*\*\*\* ALL DISCHARGERS SUBMIT THIS WORKSHEET WITH YOUR APPLICATION \*\*\*\*

| Outfall Number | Discharge Contains (see Instructions for Section C, Part II) |      |                |             | GW Cleanup | Storm-water | Pollutants or Pollutant Groupings which must be Sampled for and Analyzed | Required No. of Sample Events (see C.III) |
|----------------|--|------|----------------|-------------|------------|-------------|--|---|
|                | Process Waste  | NCCW | Sanitary Waste | Misc. Waste |            |             |  |   |
| River Intake   | X  |      |                |             |            |             | Groups 1,2,3,4,5,7,8 Total Kjeldahl Nitrogen (TKN)                       | 3   |
| 070            |  |      |                |             |            | X           | See Note 1   | ---                                       |
| 071            | X  |      |                |             |            |             | Groups 1,2,3,4,5,7,8, TKN  | 3   |
| 072            |  |      |                | X           |            |             | 2C,3C,4C,5C,7C,12C,16C,5M, 18M,23M                                       |   |
| 073            |  |      |                | X           |            |             | 2C,3C,4C,5C,7C,12C,16C   | 1   |
| 074            |  |      |                | X           |            |             | See Note 2   |   |
| 075            |  |      |                |             |            | X           | 1C,2C,4C,6C,7C,8C,9C,11C,12C, 14C,16C,18C,TKN                            | 1   |
| 079            |  |      | X              |             |            |             | 1C,4C,6C,9C,11C,12C,14C,17C, 18C,19C,6M,7M,13M,8V,11V,12V                | 1   |
| 080            |  |      |                |             |            | X           | See Note 1   |   |
|                |  |      |                |             |            |             |  |   |
|                |  |      |                |             |            |             |  |   |
|                |  |      |                |             |            |             |  |   |
|                |  |      |                |             |            |             |  |   |
|                |  |      |                |             |            |             |  |   |
|                |  |      |                |             |            |             |  |   |
|                |  |      |                |             |            |             |  |   |
|                |  |      |                |             |            |             |  |   |
|                |  |      |                |             |            |             |  |   |

Notes: 1) Outfalls 070, 075 and 080 are similar  
 2) Outfalls 073 and 074 are similar

\*\*\*\* SUBMIT THIS TABLE WITH YOUR APPLICATION \*\*\*\*

**REQUIRED AND OPTIONAL ANALYSES  
SECTION C. III – NOTES**

**SAMPLING LOCATIONS**

1. SUSQUEHANNA RIVER INTAKE
2. OUTFALL 071, COOLING TOWER BLOWDOWN
3. OUTFALL 072, SERVICE AND ADMINISTRATION BUILDING LOW VOLUME WASTE SUMP
4. OUTFALL 073, UNIT 1 TURBINE BUILDING LOW VOLUME SUMP
5. OUTFALL 075, PEACH STAND POND STORMWATER RUNOFF
6. OUTFALL 079, SEWAGE TREATMENT PLANT

Note: Since Outfall Outfalls 077 and 078, Unit 1 and 2 Condensate Storage Tank Areas have never discharged stormwater to the storm drains and can not since the discharge pipes have been flanged shut, PP&L requests elimination of these two outfalls from the NPDES renewal permit.

000043

## SUSQUEHANNA RIVER INTAKE NOTES

1. Memo from Analytical Laboratory Services Inc. (ALSI) listing exceptions to detection limits.
2. ALSI Cyanide procedures (2)
3. Teledyne Brown Engineering Environmental Services radiological procedures (3)
4. Other Notes:

15C, Fluoride One sample analyzed by Standard Methods Ed. 18 – 4500 and two samples analyzed by EPA method No. 300.0.

16C, Nitrate-Nitrite One sample analyzed by EPA method No. 353.2 and two samples by 300.0.

19C, Sulfate One sample analyzed by EPA Method No. 375.4 (detection limit 3,000 ug/l) and two samples by 300.0 (detection limit 500 ug/l).

21C, Sulfite EPA method No. 377.1 used for all three samples, however, one sample had a detection level of 4,000 ug/l while the other samples had a detection level of 2,000 ug/l. Reasons for higher detection levels for this parameter and some other NPDES analyses may be attributed to natural interference.

5M, Chromium (Hexavalent) Even though the same analytical method was used (Standard Methods – 3500D) three different detection levels were used. They were 20, 40, and 10 ug/l respectively.

8M, Mercury (Total) Detection level of one sample was 0.5 and the other two samples 0.2 ug/l.

15M, Phenols (Total) Two had a detection level of 10 and one 5 ug/l.

16M, Aluminum (Total) One sample had a detection level of 150 and the other two 100 ug/l.

21M, Iron (Dissolved) Two of the three samples had a detection level of 60 and the third 30 ug/l.

22M, Magnesium (Total) All three samples had a detection level of 50 ug/l. The magnesium concentrations were very high however, between 4,730 and 11,000 ug/l.



**Analytical Laboratory  
Services Inc.**

# Memo

**To:** Jerry Fields  
**From:** Sue Baer  
**Date:** May 14, 1999  
**Re:** NPDES Laboratory Reports

Following are the completed NPDES reports from the cooling tower blowdown (sample #129815), river intake (sample #129811), and outfall 072 (sample #130621) locations. Please note, the following ALSI reporting limits do not meet the recommended NPDES limits on these samples:

| <u>Analysis</u>  | <u>ALSI Reporting Limit</u> | <u>Analysis</u>            |
|------------------|-----------------------------|----------------------------|
| • Acroelin       | 20 ug/l                     | Volatile Organics by GC/MS |
| • Mercury*       | 0.5 ug/l                    | Total Metals by ICP        |
| • Aluminum       | 150 ug/l                    | Total Metals by ICP        |
| • Magnesium      | 50 ug/l                     | Total Metals by ICP        |
| • Zinc           | 10 ug/l                     | Total Metals by ICP        |
| • Dissolved Iron | 60 ug/l                     | Dissolved Metals           |
| • Phenols        | 10 ug/l                     | Phenols                    |
| • Sulfate*       | 3000 ug/l                   | Sulfate                    |
| • Cr+6           | 20 ug                       | Hexavalent Chromium        |

In some cases, this is no an issue if the sample result is above the reporting limit.

Also, I will be forwarding you a copy of our standard operating procedure (SOP) for free cyanide. Currently, this SOP is under revision and I thought I would wait and send you the most updated copy.

\*Due to new instrumentation at the laboratory, the sulfate and mercury reporting limits will meet NPDES reporting limits for the second and third samples.

RECEIVED

NOV 22 1999

Method: 09-CNDIS ENVIRONMENTAL SERVICE  
Revision: 3  
Date: September 28, 1998  
Page: 1 of 16

Document Title: Total Cyanide and Weak Dissociable Cyanide by MIDI  
Distillation (FREE)

UNCONTROLLED COPY

Document Control Number: \_\_\_\_\_

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Technical Director

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## 1 Scope and Application

- 1.1 The purpose of this procedure is to convert cyanide ion and complex cyanides to hydrocyanic acid by reduction in the MIDI distillation system with sulfuric acid in the presence of magnesium ions for the determination of total cyanide. The distillation of weak acid dissociable cyanide is also described in this procedure.
- 1.2 This standard operating procedure is adapted from Standard Methods 18<sup>th</sup> Edition 4500-CN C, Determination of Total Cyanide, 4500CN I, Weak Acid Dissociable Cyanide, EPA Methods 335.2 and 335.4, Cyanide, Total and SW-846 Method 9010B Rev. 2 December 1996, Total and Amenable Cyanide: Distillation, and Midi-Dist Instruction Manual.

## 2 Summary of Method

- 2.1 The MIDI distillation system is used to release hydrocyanic acid from the sample and to absorb it into a scrubber of sodium hydroxide solution. This absorbing solution is then tested for the presence of cyanide ion.

## 3 Interferences

**NOTE:** The interferences described in this section relate only to the distillations performed for TOTAL cyanide analysis. If weak and dissociable cyanides are to be distilled, refer to the procedure section for guidance on interferences.

- 3.1 Known interferences for this method are aldehydes, nitrate-nitrite, and oxidizing agents such as chlorine, thiocyanate, thiosulfate, and sulfide. Some interferences are minimized by the use of a distillation system. Verifications of the treatment of these interferences is accomplished by analyzing laboratory fortified sample matrices.
- 3.2 Lead acetate paper is used to test for sulfides since they interfere with the colorimetric procedure. If sulfides are present, the sample is treated with an excess of bismuth nitrate solution. (Note: An alternate treatment with cadmium carbonate may be used when analyzing samples by EPA Method 335.4.)
- 3.3 Sulfamic acid is used to treat all samples for the presence of nitrates and nitrites.
- 3.4 Thiocyanate is reported to be an interference at high levels although levels as high

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as 10mg/L do not interfere.

- 3.5 Fatty Acids, surfactants and detergents cause problems with foaming in the distillation process. These samples are to be handled with predistillation dilutions. If foaming remains a problem, acidify the sample with acetic acid (1.6 M) to pH 6.0 to 7.0. CAUTION: THIS PROCEDURE CAN PRODUCE LETHAL GAS. PERFORM THIS PROCEDURE IN A FUME HOOD. Extract the sample with iso-octane, hexane or chloroform (preference in order named) with a solvent volume equal to 20% of the sample volume. One extraction is usually adequate to reduce the compounds below the interference level. Avoid multiple extractions or a long contact time at low pH in order to keep the loss of HCN at a minimum. When the extraction is completed, immediately raise the pH of the sample to pH >12, using a 50% NaOH solution.
- 3.6 Other methods for removing interferences may be employed provided that they do not adversely affect the performance of the method. Before using a method other than those stated above, approval must be given by the laboratory manager and the client, and a method blank and Laboratory Control Sample (LCS) must be prepared using this method.

#### 4 Safety

- 4.1 The toxicity or carcinogenicity of each reagent used in this method has not been precisely defined. Each chemical should be handled as if it were a health hazard.
- 4.2 Each analyst should become familiar with the reagents used by referencing the Material Safety Data Sheet for each reagent. In doing so, the analyst will become familiar with the appropriate safety precautions for each reagent.
- 4.3 The following chemicals have the potential to be toxic or hazardous

4.3.1 Sulfuric Acid

4.3.2 Potassium Cyanide

- 4.4 Because of the toxicity of hydrogen cyanide (HCN), all distillation equipment must be fitted with final traps or performed under a hood.
- 4.5 Analysts must wear a fully-buttoned lab coat, safety glasses and PVC gloves at all times during the analysis.

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## 5 Apparatus and Materials

- 5.1 MIDI-Distillation System - This apparatus contains heating blocks, reflux flasks and absorbing flasks with connections for 10 samples.
- 5.2 Vacuum Pump equipped with trap.
- 5.3 Assorted Class A volumetric flasks and Class A volumetric pipets.
- 5.4 Calibrated pH meter
- 5.5 Balance, capable of weighing 0.01g
- 5.6 Lead Acetate Paper - (purchased from VWR #60792-009 or equivalent).
- 5.7 Graduated cylinders, various sizes
- 5.8 Ultrasonic cleaner
- 5.9 Autoclave
- 5.10 Boiling Chips - Chemware PTFE boiling stones or equivalent..
- 5.11 Aluminum foil

## 6 Reagents

- 6.1 All reagents are prepared from reagent grade chemicals. All preparations are recorded in the reagents-logbook.
- 6.2 Reagent Water - Reagent water is water in which an interferant is not observed at the analyte of interest. For this purpose, ALSI uses a deionization system which provides analyte-free, >16.0 megohm-cm deionized water on demand. All references to water in the method refer to reagent water unless otherwise specified.
- 6.3 Sodium Hydroxide (NaOH) - reagent grade or equivalent..

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- 6.4 Sodium Hydroxide Absorbing Solution (0.25 N) - Dissolve 10.0 g of sodium hydroxide pellets in deionized water and dilute to 1 liter in a Class A volumetric flask.
- 6.5 Magnesium Chloride ( $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ ) - reagent grade or equivalent.
- 6.6 Magnesium Chloride Solution (51%) (W/V) - Dissolve 510 g  $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$  in deionized water and dilute to 1 liter.
- 6.7 Sulfuric Acid, conc ( $\text{H}_2\text{SO}_4$ ) - Baker Ultra-Analyzed or equivalent.
- 6.8 Sulfuric Acid (50%) (V/V) - Using a graduated cylinder, slowly add 500 ml of concentrated  $\text{H}_2\text{SO}_4$  to 500 ml of deionized water in a glass flask or beaker. CAUTION: glassware will be hot. Use of a cold water bath is recommended to cool the flask while the solution is being prepared.
- 6.9 Sulfamic Acid - reagent grade or equivalent.
- 6.10 Sulfamic acid (4%) - Dissolve 40 g of sulfamic acid in deionized water and dilute to 1 liter in a Class A volumetric flask.
- 6.11 Bismuth Nitrate ( $\text{Bi}(\text{NO}_3)_3 \cdot 5 \text{H}_2\text{O}$ ) - reagent grade or equivalent.
- 6.11.1 Bismuth Nitrate Solution - Dissolve 30 g of  $\text{Bi}(\text{NO}_3)_3 \cdot 5 \text{H}_2\text{O}$  in approximately 100 ml of deionized water. Using a graduated cylinder, add 250 ml glacial acetic acid. Stir throughout the addition until dissolved. Dilute to 1 liter.
- 6.12 Glacial Acetic Acid - J.T. Baker Ultra-Analyzed or equivalent.
- 
- ~~6.13 Cyanide Stock Solution (1000 mg/L) - PREPARE IN A FUME HOOD, AVOID CONTACT WITH ACIDS, KCN IS HIGHLY TOXIC. Dissolve 2.0 g Potassium hydroxide (KOH) and 2.51 g potassium cyanide (KCN) in deionized water and dilute to 900 ml in a volumetric flask. Standardize with 0.0192 N  $\text{AgNO}_3$  following the procedure listed below. Then, remove 500 ml and dilute to the appropriate volume such that the resulting solution is 1000 mg/l. Prepare fresh weekly or restandardize weekly.~~
- 6.13.1 Pipet 20.0 ml of the stock solution to an Erlenmeyer flask. Add approximately 0.5 ml (5 drops) of the rhodanine indicator.

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- 6.13.2 Titrate with standard 0.0192 N silver nitrate to the first change in color from yellow to brownish-pink. The titration must be performed slowly with constant stirring.
- 6.13.3 Titrate a water blank using the same amount of sodium hydroxide and indicator as in the standard.
- 6.13.4 Calculate concentration of CN in mg/L in the 900 ml of cyanide solution as follows:

$$\text{mg/l CN} = \frac{(A - B) \times 1000}{C}$$

Where:

A = ml of AgNO<sub>3</sub> for titration of standard.  
 B = ml of AgNO<sub>3</sub> for titration of blank.  
 C = ml of standard titrated.

- 6.13.5 Calculate the volume of water to add to 500 ml of the Cyanide Stock Solution prepared in section 6.13 to achieve 1000 mg/l cyanide. Use the following equation.

$$\text{Vol. of Water to Add} = \frac{(500 \text{ ml} \times \text{Conc. of CN from step above})}{1000 \text{ mg/l}} - 500 \text{ to } 500 \text{ ml Std.}$$

- 6.13.6 Accurately measure out 500 ml of the Cyanide Stock Solution. To it, add the volume of additional water calculated above. The concentration of the Cyanide Stock Solution is now 1000 mg/l.
- ~~6.13.7 Titrate a 20.0 portion of the 1000 mg/l Cyanide Stock Solution to verify that it is now 1000 mg/l following the instructions in section 6.13.1 through 6.13.4. The acceptable range for the cyanide concentration is +/- 2%, or 980 to 1020 mg/l. If the concentration is out of this range, fresh standard must be prepared. The solution must be prepared fresh weekly or restandardized weekly. All standardization records should be maintained in the standards notebook.~~

- 6.14 Cyanide Spike Solution (5 mg/l) - In a 1000 ml volumetric flask, dilute 5.0 ml of stock standard (6.13) with 0.25 N NaOH. Dilute to mark and mix well. Prepare



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this solution daily. To spike a water sample, add 1.0 ml of the 5 mg/l Cyanide Spike Solution to 50 ml of sample to achieve a 0.1 mg/l spike.

- 6.15 Low Range Laboratory Control Sample (LCS) (0.05 mg/L) - Using a 1 ml Class A pipet, pipet 1 ml of the Cyanide Spike Solution (6.14) into a 100 ml volumetric flask Dilute to volume with 0.25 N NaOH and invert to mix. This will give the 0.05 mg/l solution required. Prepare this solution daily.
- 6.16 High Range Laboratory Control Sample (LCS) (0.400 mg/L) - Using an 8 ml Class A pipet, pipet 8 ml of the Cyanide Spike Solution (6.14) into a 100 ml volumetric flask Dilute to volume with 0.25 N NaOH and invert to mix. This will give the 0.400 mg/l solution required. Prepare this solution daily.
- 6.17 Reporting Limit Standard (RLS) (0.005 mg/L) Using a Class A volumetric pipet, pipet 5 mL of the Cyanide Spike Solution (6.14) into a Class A 50mL volumetric flask. Dilute to volume with 0.25 N NaOH and invert to mix. This forms a 0.5 mg/L solution. Using a 1mL Class A pipet, pipet 1mL of the 0.5 mg/L solution into a Class A 100mL volumetric flask. Dilute to volume with 0.25N NaOH and invert to mix. Distill 50mL of this solution to form the 0.005 mg/L RLS.
- 6.18 Sodium Acetate Trihydrate -  $\text{NaC}_2\text{H}_3\text{O}_2 \cdot 3\text{H}_2\text{O}$ , reagent grade or equivalent.
- 6.19 Acetate Buffer - Dissolve 410g sodium acetate trihydrate in 500 mL of reagent water. Add glacial acetic acid to yield a solution pH of 4.5. Verify pH with a calibrated pH meter.
- 6.20 Zinc Acetate,  $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot \text{H}_2\text{O}$ , reagent grade or equivalent.
- 6.21 Zinc Acetate Solution (100g/L) Dissolve 120g zinc acetate in 500mL reagent water in a Class A , 1000mL volumetric flask. Dilute to volume with reagent water and invert to mix.
- 6.22 Methyl Red Indicator
- 6.23 Ascorbic Acid - reagent grade or equivalent.
- 6.24 DPD Total Chlorine Reagent Powder Pillows - Purchased from HACH, cat.#14076-99 or equivalent.

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## 7 Glassware Cleaning

### 7.1 Cleaning of Volumetric Glassware.

7.1.1 This glassware is cleaned in accordance to the policies set forth in the glassware cleaning Standard Operating Procedure.

### 7.2 Cleaning of the distillation unit.

7.2.1 All glass parts are to be cleaned by washing with hot tap water and a brush, rinsed with 10% sulfuric acid and finally rinsed with deionized water. All tubing is to be washed using hot tap water.

7.2.2 If the absorber frit becomes stained or clogged from samples (especially soils) they may be soaked in conc. HCl for 20 minutes in an ultrasonic cleaner. Aqua-Regia may be used if the frit becomes completely clogged. Rinse thoroughly with deionized water after using acids to clean the frits.

7.2.3 The glassware may be autoclaved as an additional cleaning step after tubing and plastic fittings are removed. This is not normally needed and should be used only in the case of extremely contaminated glassware.

7.2.4 When not in use, the MIDI glassware must be labeled as either "Clean" or "Dirty". If it is not properly labeled (including date and technician), the unit must be presumed to be dirty.

7.2.5 Record all maintenance in the MIDI logbook.

## 8 Quality Control

~~8.1 Dilutions of the Low-Range LCS (6.15), High-Range LCS (6.16), spiking solution (6.14), and Reporting Limit Standard (RLS) are to be prepared fresh daily. All other non-cyanide containing reagents remain stable for 180 days.~~

8.2 A method blank sample consisting of DI water is to be distilled with each batch of samples and repeated every 20 samples.

8.3 The analyst should alternate between the use of a low-range LCS (0.05 mg/l) and a high range LCS (0.400 mg/l) on successive batches. If only one batch is being distilled in a day, then both the low range and high range LCS must be distilled

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with that batch.

- 8.4 A sample Matrix Spike (MS) is to be distilled at a frequency of one per 10 samples. Add 1mL of the 5.0 mg/l Cyanide Spike Solution to all samples requiring a matrix spike. Matrix Spike Duplicates (MSD) are to be distilled at a frequency of 1 per 20 samples.
- 8.5 A Reporting Limit Standard (RLS) should be distilled and analyzed once a month.
- 8.6 Sections 8.1 through 8.5 describe the required quality control for total cyanide distillation. Those samples requiring weak and dissociable cyanide distillation require a method blank and High Range LCS per batch as well as a matrix spike every 10 samples. Spike volumes and concentrations for total and weak and dissociable cyanides are the same.

## 9 Sample Collection, Preservation and Handling

- 9.1 Aqueous samples are placed in clean plastic bottles and preserved with sodium hydroxide to a pH greater than 12 at the time of sampling.
- 9.2 Samples are kept at 1-4.4°C until the time of distillation. After distillation, the absorbing solution is then kept at 1-4.4°C until the time of analysis.
- 9.3 Samples known or suspected of containing oxidizing agents such as chlorine are to be tested with DPD powder (10.2.2). A blue color indicates the need for treatment by ascorbic acid. Add ascorbic acid, a few crystals at a time until a drop of sample produces no color change. Then add an additional 0.6 g of ascorbic acid per liter of sample.

## 10 Procedure

### 10.1 Weak and Dissociable Cyanide Distillation.

10.1.1 For samples requiring the distillation and analysis of weak and dissociable cyanide, proceed to section 10.1.2. For those samples requiring total cyanide distillation and analysis, proceed to section 10.2.

10.1.2 Transfer 50mL of sample or the appropriate standard solution to a clean reflux flask using a Class A volumetric pipet or Class A graduated cylinder. Add 2-3 teflon boiling stones to the flask.

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- 10.1.3 Follow instructions in 10.4 through 10.14, then proceed to Section 10.1.4.
- 10.1.4 Add 2mL of acetate buffer and 2mL of zinc acetate solution to the air inlet tube.
- 10.1.5 Add 1 drop of methyl red indicator to the air inlet tube and rinse tube with 2-5 mL reagent water.
- 10.1.6 The methyl red indicator should turn pink in the reflux flask if the pH is within the range specified in the method (4.5-6.0). If a pink color does not persist for colorless samples, add 10% acetic acid drop-wise until a pink color persists. For colored samples, the red indicator may not be visible. Do not add acetic acid to colored samples. Note in the distillation logbook if a sample is colored and the methyl red indicator is not visible.
- 10.1.7 Once the distillation system is set, cover the reflux flask with aluminum foil. This will reduce the photo-decomposition of some metal-cyanide complexes by ultraviolet light.
- 10.1.8 Proceed to section 10.22

10.2 Transfer samples to a clean reflux flask.

- 10.2.1 For aqueous samples, test for the presence of sulfides using lead-acetate paper, by placing a drop of sample on the test paper. A change in color of the paper denotes the presence of sulfides. Treat a 50 ml portion of the sample containing sulfides with the bismuth nitrate solution (6.13) until there is no presence of sulfides. Transfer the treated sample to the reflux flask. (Note that the line on the reflux flask is 50 ml.) Add 2 to 3 boiling chips to the flask. Document check in the logbook.
- 10.2.2 For aqueous samples, test for the presence of chlorine using DPD total chlorine reagent powder pillows. Place 5mL of sample into a test tube and add powder pillow. The development of a pink color indicates the presence of chlorine. Add ascorbic acid, 10 crystals, to another 5 mL of sample. Recheck for chlorine. Repeat until no pink color forms. Add 10 times the amount of ascorbic acid used in 5mL of sample to the volume of sample to be analyzed (50 mL). Document check in the logbook.

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- 10.2.3 For solid samples, transfer a significant amount of sample to a plastic weigh dish. Using a stainless steel spatula, mix the sample until homogenous. Weigh approximately 1.0g of the mixed sample into the reflux flask. Dilute to the 50 ml line with deionized water. Add 2 to 3 boiling chips to the flask.
- 10.3 If a sample needs to be spiked, add 1.0 ml of the Cyanide Spike Solution (6.14) to 50 ml of sample to achieve a 0.1 mg/l spike.
- 10.4 Place the filled reflux flask into the rack containing the heating block.
- 10.5 Add 50 ml of 0.25 N NaOH into the absorber flask (note that the line on the absorbing flask is 50 ml), and place opposite the reflux flask. Make sure that both the reflux and the absorber flasks are clearly marked with the sample number.
- 10.6 Place a reflux impinger into the reflux flask. Make sure that the inlet tube is facing forward. This position will have the hose connections at the rear of the distillation apparatus.
- 10.7 Place an absorber impinger into the absorbing flask. There are two hoses coming from the absorbing impinger. One joins at the top and the other joins perpendicular to the impinger. The perpendicular hose should be facing the front of the distillation apparatus.
- 10.8 Make sure that all of the hoses are connected properly. The hose from the reflux impinger connects to the hose from the top of the absorbing impinger. The hose from the front of the absorber impinger is connected to the valve on the front of the MIDI.
- 
- ~~10.9 Place a cold-finger condenser into the reflux impinger and check to make sure that all connections are tight.~~
- 10.10 Repeat steps 10.3 through 10.8 for each sample to be run working from left to right in the heating block.
- 10.11 Turn off each vacuum valve by tightening the knobs on the front of the distillation apparatus.
- 10.12 Make sure that the vacuum pump and trap are installed properly.

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- 10.13 Turn cooling water on to a flow rate of 6 gallons per hour (GPH) for each sample being distilled. Note on the flow meter that there are two scales, one for GPH and one for number of samples. Again make sure that all water connections are made properly and that the tubes are not pinched to insure proper condensing of the sample and to keep the water lines from rupturing.
- 10.14 Turn on the vacuum and, using the knobs at the front of the distillation unit, adjust the vacuum in each sample to a rate of three bubbles per second in the reflux flask.
- 10.15 Allow the vacuum to draw for 5 minutes.
- 10.16 Add 10 ml of 4% sulfamic acid solution to the inlet tube of each sample with a Class A volumetric pipet.
- 10.17 Allow the vacuum to draw for 5 minutes.
- 10.18 Add 5 ml of 50% (v/v)  $H_2SO_4$  to the inlet tube of each sample with a Class A volumetric pipet.
- 10.19 Allow the vacuum to draw for 5 minutes.
- 10.20 Add 2 ml of 51% magnesium chloride solution to the inlet tube of each sample using a Class A volumetric pipet. If excessive foaming occurs a fresh aliquot of the sample must be diluted, and the entire procedure (starting at 10.1) is performed on the diluted sample.
- 10.21 Rinse the inlet tube with a minimal amount of DI water.
- ~~10.22 Turn the distillation unit on by pushing the red rocker switch until it lights.~~
- 10.23 Set the timer for 105 minutes. Additional lights on the top of the distillation unit will glow. The green light is the timer light and the amber light is to indicate when the heating block is heating. This setting allows for 15 minutes of heating time to achieve temperature and 90 minutes of reflux time.
- 10.24 After the timer has counted down to zero, the heating block will be turned off automatically.

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- 10.25 Let the unit cool for an additional 15 minutes with the vacuum and cooling water on. After cooling, shut off the vacuum and cooling water.
- 10.26 Remove the absorber impinger from the flask. Check that none of the receiving solution was lost or that none of the solution from the reflux flask was transferred during distillation to the absorber flask. This can be done by making sure that there is still 50 ml of receiving solution in the absorber flask. Disconnect the tubing and place the absorbing solution into a 125 ml amber bottle. Label with appropriate information and refrigerate at 1-4.4°C until analysis. Repeat this step for each sample distilled on the unit.

## 11 Calculations

- 11.1 Not applicable.

## 12 Reporting Results

- 12.1 In the "Daily Functions" menu of the LIM system select #6 "Preps Performed" entry.
- 12.2 Enter Test - (WC2)
- 12.3 Batch # - The batch # and the COC # assigned to the reagent blank are the same six characters. The reagent blanks are sequentially numbered in the wet chemistry log book with the 2 letter prefix CN followed by 4 digits; i.e., CN0001. To assign a reagent blank a COC # and subsequently the distillation batch # in the Preps Performed Entry Menu of the LIMS, consult the wet chemistry log book and locate the last blank for the WC2 distillation. Name the batch # the following number preceded by the CN prefix. The low or high range LCS will be labeled with the same number as the blank except it will be preceded by an "L", i.e., LCN0001.
- 12.4 Enter the date the distillation was started.
- 12.5 Enter the technician's initials responsible for finishing the prep.
- 12.6 Enter the initial and final volumes previously recorded in the wet chemistry logbook.

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- 12.7 Select B from the bottom of the screen to create a reagent blank in the LIMS once all of the preparatory factors have been entered.
- 12.7.1 Enter the appropriate final and initial volumes in ml (or grams for soils) for the reagent blank:
- 12.8 Review the labeling on bottles, the entries in the log book and the entries in the LIMS to verify that all entries match.



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**SOP Concurrence Form.**  
**for the Distribution and Revision of Standard Operating Procedures**

I have read, understood, and concurred with the Standard Operating Procedure (SOP) described above and will perform this procedure as it is written in the SOP.

Print Name

Signature

Date

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Document Title: Total Cyanide, Automatic Spectrophotometric

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Document Control Number: \_\_\_\_\_

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## 1 Scope and Application

- 1.1 This method is adapted from the U.S. EPA Method 335.4, "Determination of Total Cyanide by Semi-Automated Colorimetry", Method 335.3, "Cyanide, Total", and SW-846 Method 9012, "Total and Ammenable Cyanide." This method also references information found in Lachat's Quikchem method number 10-204-00-1-A. The current method detection limit can be found in the current year's method detection limit laboratory notebook.
- 1.2 This method is restricted for use by or under the supervision of analysts trained on the use of the Lachat. However, the trays may be loaded by analysts who are trained on this part of the analysis.
- 1.3 This method covers the determination of cyanide in drinking, ground, surface, and saline waters, domestic and industrial wastes, and soils and solids.

## 2 Summary of Method

- 2.1 Total cyanide from alkaline distillates is converted to cyanogen chloride, CNCl, by reaction with chloramine-T at pH less than 8. The CNCl then forms a red-blue dye by reacting with pyridine-barbituric acid reagent. The color is read at 570 nm.
- 2.2 Reduced volume versions of this method that use the same reagents and molar ratios are acceptable provided they meet the quality control and performance requirements stated in this method.
- 2.3 Limited performance-based method modifications may be acceptable provided they are fully documented and meet or exceed requirements expressed in Sect. 8.0, Quality Control.

---

## 3 Interferences

- 3.1 Several interferences are encountered with this method. Some of the known interferences are sulfides, thiocyanate, thiosulfate, sulfide, aldehydes, nitrate-nitrite, and oxidizing agents, such as chlorine. Multiple interferences may require the analysis of a series of laboratory fortified sample matrices (LFM) to verify the suitability of the chosen treatment. For total cyanide most interferences are eliminated by the distillation procedure.

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- 3.2 Sulfides adversely affect the colorimetric procedure. Sulfides are tested for by using lead acetate paper. If sulfides are present, the sample is treated with 50 ml of bismuth nitrate solution after the air flow is set and prior to the addition of the sulfuric acid in the distillation procedure.
- 3.3 Nitrates and/or nitrites are also a potential interference. All samples are treated with sulfamic acid in the distillation procedure to remove this interference.
- 3.4 Other compatible procedures for the removal or suppression of interferences may be employed provided they do not adversely affect the overall performance of the method. New procedures may not be implemented without the permission of the section leader and a Laboratory manager.
- 3.5 Method interferences may be caused by contaminants in the reagent water, reagents, glassware, and other sample processing apparatus that bias analyte response.

#### 4 Safety

- 4.1 The toxicity or carcinogenicity of each reagent used in this method has not been fully established. Each chemical should be regarded as a potential health hazard and exposure should be as low as reasonably achievable. Cautions are included for known extremely hazardous materials or procedures.
- 4.2 Each analyst should become familiar with the reagents used by reference the Material Safety Data Sheets (MSDS) for each reagent. In doing so, the analyst will become familiar with the appropriate precautions for each reagent.
- 4.3 The laboratory also operates under a formal safety plan.
- 
- 4.4 The following chemicals have the potential to be highly toxic or hazardous, consult MSDS:
- 4.4.1 Hydrochloric acid
  - 4.4.2 Silver nitrate
  - 4.4.3 Potassium cyanide
  - 4.4.4 Sulfuric acid
- 4.5 Because of the toxicity of evolved hydrogen cyanide (HCN), distillation should be

performed in a well vented hood.

- 4.6 Analysts must wear a buttoned lab coat, safety glasses, and PVC gloves at all times during the analysis.

## 5 Apparatus and Materials

- 5.1 Balance - Analytical, capable of accurately weighing to the nearest 0.0001 g. The current balance being used is the Mettler AG245 purchased through VWR catalog no 11274-666.
- 5.2 Glassware - Class A volumetric flasks and pipets as required.
- 5.3 Midi reflux distillation apparatus including boiling flask, condenser, and absorber purchased from Andrews Glass Co. or equivalent.
- 5.4 Heating mantel or heating block as required.
- 5.5 Automated continuous flow analysis equipment designed to deliver and react sample and reagents in the required ratios. A Lachat QuikChem AE system with an XYZ sampler and autodistillation capabilities is currently in use. It consists of a sampling device, a multi-channel pump, a reaction unit or manifold, a colorimetric detector, a data recording device and a heating unit.
- 5.6 Disposable culture tubes - Purchased from VWR catalog no. 60825-571 or equivalent.
- 5.7 Transfer pipets - Purchased from VWR catalog no. 14670-103 or equivalent.
- ~~5.8 Vacuum pump~~
- 5.9 Sonicator

## 6 Reagents

- 6.1 Reagent Water - Reagent water is water in which an interferant is not observed at the analyte of interest. For this purpose, ALSI uses a Filson Water Purification System which provides analyte-free, greater than 16 megohm-cm, DI water on demand.

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- 6.2 Degassing with helium. To prevent bubble formation, degas all solutions, except the standards, with helium. Use He at 140 kPa (20 lb/in<sup>2</sup>) through a helium degassing tube (Lachat Part #50100). Bubble He vigorously through the solution for one minute. Zero grade helium is purchased from MG Industries. Alternatively, degassing may be performed by sonication and vacuum.
- 6.3 Sodium hydroxide (NaOH) - pellets, purchased from VWR catalog no. JT3722-7 or equivalent.
- 6.4 Reagent 1, Carrier, 0.25 N Sodium Hydroxide - By Volume: In a 1-L volumetric flask, dissolve 10.0 g sodium hydroxide (NaOH) in approximately 800 ml water. When the pellets are completely dissolved, dilute to the mark and invert three times to mix. This solution is good for six (6) months.
- 6.5 Potassium phosphate, monobasic, anhydrous (KH<sub>2</sub>PO<sub>4</sub>) - Purchased from VWR catalog no. JT 3246-1 or equivalent.
- 6.6 Reagent 2, Phosphate Buffer, 0.71 M - By Volume: In a 1-L volumetric flask, dissolve 97 g potassium phosphate in approximately 800 ml water. Dilute to the mark and invert three times to mix. This solution is good for six (6) months.
- 6.7 Chloramine-T - Purchased from VWR catalog no. JTE494-6 or equivalent.
- 6.8 Reagent 3, Chloramine-T - By Volume: To a 500-ml volumetric flask, add about 250 ml water. Then add 2.0 g chloramine-T. Dilute to the mark and invert three times to mix. PREPARE FRESH DAILY.
- 6.9 Pyridine - Purchased from VWR catalog no. JT3348.11 or equivalent.
- 
- 6.10 Barbituric acid - Purchased from Aldrich catalog no. 18,569-8 or equivalent.
- 6.11 Hydrochloric acid, conc. (HCl) - Purchased from VWR catalog no. JT9535-33 or equivalent.
- 6.12 Reagent 4, Pyridine Barbituric Acid Reagent - By Volume: IN THE FUME HOOD, place 15.0 g barbituric acid in a 1-L beaker and add 100.0 ml water, rinsing down the sides of the beaker to wet the barbituric acid. Add 75 ml pyridine (C<sub>5</sub>H<sub>5</sub>N) with stirring and mix until the barbituric acid dissolves. Add 15 ml concentrated

hydrochloric acid (12 M HCl) and mix. Transfer to a 1-L volumetric flask, dilute to the mark, and invert three times to mix. This solution is good for six (6) months.

- 6.13 Potassium Cyanide (KCN) - Purchased from VWR catalog no. EM-PX1435-1 or JT3080-4 or equivalent.
- 6.14 Potassium Hydroxide (KOH) - Purchased from VWR catalog no. JT3140-11 or equivalent.
- 6.15 Silver Nitrate Solution (AgNO<sub>3</sub>)(0.0192 N) - Purchased from Baxter catalog no. 6910 or equivalent.
- 6.16 Indicator - paradimethylaminobenzalrhodanine, purchased from Baxter catalog no. 2560 or equivalent.
- 6.17 Cyanide Stock Solution (1000 mg/L) - PREPARE IN A FUME HOOD, AVOID CONTACT WITH ACIDS, KCN IS HIGHLY TOXIC. Dissolve 2.0 g potassium hydroxide (KOH) and 2.51 g potassium cyanide (KCN) in 900 ml of deionized water. Standardize with 0.0192 N AgNO<sub>3</sub>, following the procedure listed below. Then, remove 500 mL and dilute to the appropriate volume such that the resulting solution is 1000 mg/L. Prepare fresh weekly or restandardize weekly.
  - 6.17.1 Pipet 20.0 mL of the stock solution to an Erlenmeyer flask. Add approximately 0.5 mL (5 drops) of the rhodanine indicator.
  - 6.17.2 Titrate with standard 0.0192 N silver nitrate to the first change in color from yellow to brownish-pink. The titration must be performed slowly with constant stirring.

6.17.3 Titrate a DI water blank using the same amount of sodium hydroxide and indicator as used in the titration of the standard.

6.17.4 Calculate concentration of CN in mg/L in the 900 mL of cyanide solution as follows:

$$CN (mg/L) = \frac{(A-B) \times 1000}{C}$$

where:



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A = ml of AgNO<sub>3</sub> for titration of standard.  
 B = ml of AgNO<sub>3</sub> for titration of blank.  
 C = ml of standard titrated.

6.17.5 Calculate the volume of water to add to 500 mL of the Cyanide Stock Solution prepared in Section 6.17 to achieve 1000mg/L cyanide. Use the following equation.

$$\text{Vol. of Water to add to 500 mL Std.} = \frac{(500 \text{ mL} \times \text{Conc. of CN from step above})}{1000 \text{ mg/L}} - 500$$

6.17.6 Accurately measure out 500 mL of the Cyanide Stock Solution. To it, add the volume of additional water calculated above. The concentration of the Cyanide Stock Solution is now 1000 mg/L.

6.17.7 Titrate a 20.0 mL portion of the 1000 mL Cyanide Stock Solution to verify that it is now 1000 mg/L following the instructions in Section 6.18.1 through 6.18.4. The acceptable range for the cyanide concentration is +/- 2%, or 980 to 1020 mg/L. If the concentration is out of this concentration range, fresh standard must be prepared. The solution must be prepared fresh weekly or re-standardized weekly. All standardization records should be maintained in the standards logbook.

6.18 Working Calibration Standard (5 mg/L) and Cyanide Spike Solution (5 mg/L) - In a 1000 ml volumetric flask, dilute 5.0 ml of Cyanide Stock Solution (6.17) with 0.25 N NaOH. Dilute to mark and mix well. This must be made up daily. One mL of this solution is added to 50 mL of sample to yield a 0.10 mg/L spike.

6.19 Stock Calibration Verification Standard (1000 mg/L) - Prepare and standardize in the same manner as the Cyanide Stock Solution except a different lot of KCN must be used. Standardize as in 6.17.1 through 6.17.4. Label as Stock CVS. This solution must be prepared fresh weekly or re-standardized weekly.

6.20 Working Calibration Verification Standard (5 mg/L) - Prepare a 5 mg/L working standard from the Stock CVS in the same manner as the Working Calibration Standard (6.18) was prepared. Label as Working CVS. This must be made up daily.

## 7 Instrument Calibration

7.1 Refer to the Lachat protocol and maintenance document Section 1.0, Changing of

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the Manifold; Section 2.0, Running of the Lachat; and Section 3.0, Calibration. The method to be downloaded for this analysis is cyanides. This protocol contains the pertinent information needed to calibrate the instrument and to determine if the calibration is valid.

7.1.7 The R values should be 0.9950 or above for the chords of the curve being used for the samples.

7.1.8 The PIF (peak integrity factor) must be  $> 0.75$  for detectable samples.

7.2 Prepare a series of six (6) standards as described starting in 7.2.1, and a reagent blank by pipetting suitable volumes of Working Calibration Standard solution (6.18) into volumetric flasks for daily calibration. These standards should be diluted with 0.25 N NaOH (6.4). The carrier that is being used to dilute the standards should be the same carrier that is being used on the Lachat manifold. NOTE: All standard dilutions must be recorded in the standards logbook located in the wet chemistry area on the bookshelf with the other laboratory notebooks. Also the dilution scheme outlined below is only to give an example of the sample dilutions. The amounts may be changed proportionally depending on the amount needed and also on available glassware.

7.2.1 A set of six (6) Working Standards is made from the 5.0 mg/L Working Calibration Stock Standard (6.18). These are:

0.500 0.250 0.100 0.050 0.010 0.005 mg CN<sup>-</sup>/L

7.2.2 First, prepare the 0.5 mg/L standard by diluting 20.0 mL of the 5.0 mg/L Working Calibration Standard (6.18) to 200mL with 0.25 N NaOH (6.4) in a 200 mL volumetric flask.

7.2.3 Prepare the other five calibration standards by diluting the following volumes of the 0.5 mg/L standard to 100mL with 0.25 N NaOH (6.4) in 100mL volumetric flasks.

| ML of 0.5 mg/L Standard<br>Diluted to 100 mL | Concentration<br>mg/L |
|--|-----------------------|
| 1  | 0.005                 |
| 4  | 0.020                 |
| 10   | 0.050                 |

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20 0.10  
50 0.25

7.2.4 The reagent blank consists of only Reagent 1 - 0.25 N NaOH. Do not use DI water.

7.3 After the calibration has been established, it must be verified by the analysis of a 0.1 mg/L Initial Calibration Verification Std (ICVS). If measurements exceed +/- 10% of the true value, the problem must be investigated and corrected prior to the analysis of any samples. The analysis may have to be terminated and the instrument recalibrated. The new calibration must be verified before continuing analysis.

7.3.1 ICVS (0.1 mg/L) - Using a Class A pipet, dilute 2.0 mL of 5 mg/L Working Calibration Verification Standard (6.20) with Reagent 1 - 0.25 N NaOH (6.4) in a 100 mL volumetric flask. Invert three times to mix.

## 8 Quality Control

8.1 A method blank must be prepared and analyzed with each distillation batch. The method blank must be less than 2xMDL or less than 5% of the sample concentration. If the method blank is not within acceptable limits, all samples with a detectable result in the batch must be re-distilled or reported with a qualifying comment.

8.2 A nondistilled Continuing Calibration Standard (7.3.1) and a Calibration Blank (7.2.4) must be run at the beginning of the analysis, after every ten samples and at the end of the run to verify the calibration curve. Analysis of the calibration blank is to verify that the instrument is free from contamination at +/- the reporting limit. The concentration of the CCS must be within 10% of the true value. If the concentration is not within +/- 10%, the source of the problem must be identified and corrected before proceeding with the on-going analysis. Once the problem has been corrected, re-analyze samples following the last acceptable CCS. For more information on ways to change the frequency of the Continuing Calibration Standards and blanks in the Lachat software, consult the information screens in the software under the windows entitled: tray definition and submit, data quality management, auto qc set scheduling, qc set definition, and help for dqm.

8.3 The distilled Laboratory Control Sample (LCS) checks the efficiency of the

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distillation procedure as well as the entire analytical procedure. The analyst should alternate between the use of a low-range LCS (0.05 mg/L) and a high range LCS (0.400 mg/L) on successive distillation batches. If only one batch of samples is analyzed in a day, a high and low LCS must be analyzed in that batch. The LCS must have a recovery within +/- 10% of the true value, or within calculated control limits, whichever is tighter. If the LCS fails, the cause of the failure must be investigated and corrected before proceeding with the on-going analysis. After corrected, all samples in that batch must be redistilled. If samples are outside of the holding times, consult a laboratory supervisor or manager.

- 8.4 Sample matrix spikes must be prepared and analyzed at a frequency of one every ten drinking water samples, or one in every 20 other samples. For water samples, add 1.0 mL of the 5 mg/L Cyanide Spike Solution to 50 mL of sample to achieve a 0.1 mg/L spike. Recoveries must be within the established control limits that are based on historical matrix spike recovery data. In the absence of calculated control limits, the percent recovery must be within +/- 10% of the true value. If the recovery limits fall outside of acceptable range, but the LCS recovery is within acceptable limits, the recovery problem is judged to be sample matrix related. The result should be reported with a qualifying comment. If the LCS also fails, the problem is judged to be system related, and the batch must be re-distilled.
- 8.5 Matrix Spike Duplicates (MSD) must be run at a rate of one every 10 samples. Duplicates must have an RPD within the established control limits that are based on historical RPD data. In the absence of calculated control limits, the RPD must be less than 20%. If the duplicate is not acceptable, it must be redistilled. If the sample cannot be redistilled and rerun before a holding time violation will occur, consult the supervisor or a laboratory manager.
- 8.6 A Quality-Control-Check Standard should be performed on a quarterly basis. The QC Check Standard should be a blind standard from a commercial source such as Environmental Resource Associates or other commercial supplier. The recovery must be within the acceptable range provided by the supplier. If the standard is not within these limits, the source of the problem must be identified and corrected before proceeding with further analysis.
- 8.7 A Reporting Limit Standard (RLS) must be distilled and analyzed at a rate of one every month. Recoveries must be within the established control limits that are based on historical recovery data. In the absence of calculated control limits, the

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recovery must be within +/-RLS. If the recovery is not acceptable, consult the supervisor or a laboratory manager.

- 8.8 The absorbance and wavelength of the 510nm filter used for the analysis is validated on an annual basis. This is done by an external vendor, and documentation is kept on file.
- 8.9 Samples reading a high negative absorbance must be re-analyzed to determine if the high negative absorbance is due to an instrument problem or the sample matrix itself. If the matrix is determined to be the cause of the problem, report the result with a qualifying comment on the Lab Report.

## 9 Sample Collection, Preservation and Handling

- 9.1 Samples should be collected in plastic or glass bottles. All bottles must be thoroughly cleaned and rinsed with reagent water. The volume collected should be sufficient to insure a representative sample, allow for replicate analysis (if required), and minimize waste disposal.
- 9.2 Samples must be preserved with sodium hydroxide to a pH>12 and cooled to 1-4.4°C at the time of collection.
- 9.3 Samples should be analyzed as soon as possible after collection. If storage is required, preserved samples are maintained at 1-4.4°C and may be held for up to 14 days.
- 9.4 The color reaction is pH sensitive. Therefore, distillates or preserved samples and standards should be carefully matched with respect to NaOH concentration. Samples for analysis on the Lachat must be in a 0.25M NaOH receiving solution because the carrier on the Lachat is 0.25M NaOH. Any other NaOH molarity will give inconsistent results when analyzed on the Lachat.

## 10 Procedure

- 10.1 Calibrate the system daily as described in Section 7.
- 10.2 After an acceptable calibration is performed and the CVS has been checked and verified, samples may be run. Samples must be distilled before running. See the Prep Department SOP for cyanide distillation.

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10.3 Each sample tube should be filled 1/2 to 3/4 full with sample.

10.5 Sample numbers must be entered before sample submission. See Section 4 of the Lachat protocol and maintenance document for more information. Samples should be submitted under the sample submit screen in the Lachat. The only time a dilution factor should appear as part of the sample submit screen is when there was a manual dilution performed. The operator category should contain the name of both the person who is performing the analysis as well as the name of the one who is filling the trays if they differ.

10.6 Any dilutions made should be done using the carrier solution which is the 0.25 M NaOH solution (6.4). This includes standards and sample dilutions.

10.7 The following is a list of criteria that is specific for the cyanide analysis. Also included with this method is a packet of the screens printed from the cyanide method definition program. Any change in these screens should be documented with the Lachat data. See Appendix A.

|                                 |                           |
|---------------------------------|---------------------------|
| 10.7.1 Sample throughput:       | 80 samples/h; 40 s/sample |
| Pump speed:                     | 35                        |
| Cycle period:                   | 50 s                      |
| Inject to start of peak period: | 23 s                      |
| Inject to end of peak period:   | 61 s                      |

10.7.2 QuickChem AE Settings:

|                         |          |
|-------------------------|----------|
| Parameter, Data Window: |          |
| Top Scale Response:     | 0.50 abs |
| Bottom Scale Response:  | -0.05    |

Segment/Boundaries:

A - 500 ug CN/L  
C - 50 ug CN/L  
D - 10 ug CN/L  
E - 5 ug CN/L  
F - 0 ug CN/L

Results/Approval, Reports:

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In the default RDF, change:  
Set Default Chord 0 to Set Default Chord 3  
(Peak should be centered in chord 3.)

This change must be made to both the sample and the calibration RDFs. This change may be saved but when updated software is installed the trays must be changed from chord 0 back to chord 3.

10.4 Allow 15 minutes for heating unit to warm up to 60° C.

## 11 Calculations

- 11.1 The concentration of cyanide in  $\mu\text{g/l}$  will be shown directly on the runtime report. Calculations are determined by a graph of absorbance versus concentration. If the data meet the criteria outlined in this document, then those results can be reported in the computer system to two significant figures.
- 11.2 The only time a sample needs to be multiplied by a dilution factor is when a manual dilution was performed.
- 11.3 To determine amenable cyanide, use the following calculation:

$$\text{Amenable Cyanide} = \text{Total Cyanide (mg/L)} - \text{Cyanide in Chlorinated Sample (mg/L)}$$

If the Amenable cyanide is a negative concentration using this calculation, the comment on the lab report using the standard verbiage "ACN".

---

## 12 Reporting-Results

- 12.1 Report results in mg/l to three significant figures.
- 12.2 Duplicates, spikes, and the internal QC samples all need to be reported under the QA screen when entering results.
- 12.3 If a sample is below the current reporting limit, then the sample should be reported as ND (non-detectable).

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APPENDIX A

Define Timing Periods

| Channel Specific Method Definition   |  |
|--|--|
| Info   | Miscellaneous  |
| <p>Periods Made</p>  | <p>Automatic Timing for Cyanide</p>  |
| <p>Meth</p> <p>Channel<br/>                     1 cyanide<br/>                     2 inactive<br/>                     3 inactive<br/>                     4 inactive<br/>                     5 inactive<br/>                     6 inactive<br/>                     7 inactive</p> <p>Number of<br/>                     Notes:</p> | <p>Cycle Period of Channel ..... 52.00 s</p> <p>Detector e</p> <p>Inject to Start of Peak Period .. 22.00 s</p> <p>ESC to quit</p> |

Define Visual Data Window Parameters

| Channel Specific Method Definition   |  |
|--|--|
| Info   | Miscellaneous  |
| <p>Data Window Chart Made</p>  | <p>Realtime Presentation Parameters</p>  |
| <p>Meth</p> <p>Channel<br/>                     1 cyanide<br/>                     2 inactive<br/>                     3 inactive<br/>                     4 inactive<br/>                     5 inactive<br/>                     6 inactive<br/>                     7 inactive</p> <p>Number of<br/>                     Notes:</p> | <p>Detector e</p> <p>Window Heading .....cyanide</p> <p>Left Border .....10.0 X free left side of screen</p> <p>Right Border .....90.0 X free left side of screen</p> <p>Bottom Border .....10.0 X free bottom of screen</p> <p>Top Border .....90.0 X free bottom of screen</p> <p>Top Scale Response .... 0.50</p> <p>Bottom Scale Response ..-0.05</p> <p>ESC to quit</p> |



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APPENDIX A

Define parameters for screen-based chart recorder mode

Channel Specific Method Definition

Info Standards Evaluation Presentation Timing Miscellaneous

Data Window Chart Mode

Chart Recorder Parameters

Detector 0

Bottom Border .....0 X from bottom of chart  
Top Border .....99 X from bottom of chart

Channel  
1 Cyanide  
2 Inactive  
3 Inactive  
4 Inactive  
5 Inactive  
6 Inactive  
7 Inactive

Number of Notes:

ESC to quit

Select either Automatic or Manual Timing Mode

Channel Specific Method Definition

Info Standards Evaluation Presentation Timing Miscellaneous

Periods Mode

Automatic / Manual Timing Mode Select

Valve and peak detection timing can be determined either  
A. Automatically, where standard assumptions are in effect, or  
B. Manually, where user specifies all timing periods.

Do you want to select MANUAL timing? N

Press Esc to exit.

|            |       |          |         |        |
|------------|-------|----------|---------|--------|
| 5 Inactive | 1 A-B | 500.000- | 250.000 | Normal |
| 6 Inactive | 2 B-C | 250.000- | 100.000 | Normal |
| 7 Inactive | 3 C-D | 100.000- | 0.000   | Normal |

Number of Notes:

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APPENDIX A

Define the order standards will be run in a calibration.

| File Description | Method | Definition Main Menu   | Channels | Standards | Tying | Options          | Programs |
|------------------|--------|------------------------|----------|-----------|-------|------------------|----------|
|                  |        | Definition Calibration |          |           |       |                  |          |
|                  |        |                        |          |           |       | Protocol Actions |          |

Method Status

Calibration Protocol

Specify the order of running standards in a calibration.  
 eg. "AA BB CC" will run duplicates of Stds A, B, and C.

Calibration Injection Protocol  
 AA BB CC DD EE FF GG

Number of Standards Defined: 7      Cycle Period: 50.0 s  
 Probe in Sample Period: 30.0 s

Notes:

Define actions taken by system after a calibration.

| File Description | Method | Definition Main Menu   | Channels | Standards | Tying | Options          | Programs |
|------------------|--------|------------------------|----------|-----------|-------|------------------|----------|
|                  |        | Definition Calibration |          |           |       |                  |          |
|                  |        |                        |          |           |       | Protocol Actions |          |

Method Status

Post Calibration Action

This question applies to calibrations that pass all tests.  
 Must the user also APPROVE the calibration? Y

5 inactive  
 6 inactive  
 7 inactive

Number of Standards Defined: 7      Cycle Period: 50.0 s  
 Probe in Sample Period: 30.0 s

Notes:

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### APPENDIX A

Define Probe Sample Time & Pump Mode Times

| File Description  | Channels | Standards | Timing | Options | Programs |
|---|----------|-----------|--------|---------|----------|
| Fluid System Timing<br>System Unit Timing                         |          |           |        |         |          |
| Method Status   |          |           |        |         |          |
| Instrument Fluidic Timing   |          |           |        |         |          |
| Cycle Period (The LONGEST Channel Cycle Period) ..... 20.00 s     |          |           |        |         |          |
| Probe Sample Period..... 20.00 s                                  |          |           |        |         |          |
| Probe Sample Period is set MANUALLY Press Space Bar to change.    |          |           |        |         |          |
| Period of Inactivity for Pump to go to Standby Speed ... 120.00 s |          |           |        |         |          |
| Period of Pump at Normal Speed to Allow Analysis ..... 30.00 s    |          |           |        |         |          |
| ESC to quit   |          |           |        |         |          |
| Notes: Probe In Sample Period: 20.0 s                             |          |           |        |         |          |

Options that may be activated during runtime.

| File Description   | Method Definition | Main Menu | Channels | Standards | Timing | Options | Programs |
|--|-------------------|-----------|----------|-----------|--------|---------|----------|
| Runtime Display Options<br>Auto Dilution Options<br>Hardware Mapping |                   |           |          |           |        |         |          |
| Method Status  |                   |           |          |           |        |         |          |
| Runtime Display Options  |                   |           |          |           |        |         |          |
| Do you want to record peaks on the chart recorder? .....Y            |                   |           |          |           |        |         |          |
| Do you want to display individual chord windows? .....Y              |                   |           |          |           |        |         |          |
| Do you want the Master printer to echo the runtime reports? ...N     |                   |           |          |           |        |         |          |
| Number of Standards Defined: 7      Cycle Period: 20.0 s             |                   |           |          |           |        |         |          |
| Notes:      Probe In Sample Period: 20.0 s                           |                   |           |          |           |        |         |          |

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APPENDIX A

Hardware Assignments for Detectors and Valves

Method Definition Main Menu  
 File Description Channels Standards Timing Options Programs

Runtime Display Options  
 Auto Dilution Options  
 Hardware Mapping

Method Status  
 Hardware Mapping Utility

CAUTION: Use this utility with care!

| Chan | Alpha | Beta | Valves | Units |
|------|-------|------|--------|-------|
| 1    | 1     | 5    | 1      | ppb   |
| 2    | 2     | 6    | 2      |       |
| 3    | 3     | 7    | 3      |       |
| 4    | 4     | 8    | 4      |       |
| 5    | 9     | 12   | 5      |       |
| 6    | 10    | 13   | 6      |       |
| 7    | 11    | 14   | 7      |       |

Number of  
 Notes:

Reference 1 .. 15  
 Reference 2 .. 16

Detector Numbers refer to A/D Converters.  
 Values may range from 1 to 16.

Valve Numbers refer to Digital I/O lines.  
 Values may range from 1 to 7; 0 disables.

Press (Esc) to exit.

OC Set Definition

1 Check Standard Set

1.1 Chk Std A @ Cup 1, Repts 2

1.1.1 Channels: test1

1.1.1.1 Max Allowed Relative X Exceeded -> User Decides Action  
 1.1.1.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.2 Channels:

OC Set Definition

1.1.2.1 Max A  
 1.1.2.2 Max A

- Automatic OC Sets use "Auto OC Set Scheduling".  
 - Manual OC Sets are placed in the sample trays.

1.1.3 Channels:

An Automatically Scheduled Set?.... Y

1.1.3.1 Max A  
 1.1.3.2 Max A

Esc to Exit; PgUp / PgDn for previous / next menu

1.1.4 Channels:

1.1.4.1 Max Allowed Relative X Exceeded -> User Decides Action  
 1.1.4.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.5 Channels: test2

1.1.5.1 Max Allowed Relative X Exceeded -> User Decides Action  
 1.1.5.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.6 Channels: test6

1.1.6.1 Max Allowed Relative X Exceeded -> User Decides Action  
 1.1.6.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.7 Channels: test7

1.1.7.1 Max Allowed Relative X Exceeded -> User Decides Action  
 1.1.7.2 Max Allowed Relative X Exceeded -> Just Message Given

1.2 Chk Std C @ Cup 2, Repts 2

1.2.1 Channels: test1

1.2.1.1 Max Allowed Absolute Diff Exceeded -> User Decides Action  
 1.2.1.2 Max Allowed Absolute Diff Exceeded -> Just Message Given

Enter: Select, AltD: Delete, AltI: Insert, AltA: Insert After

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CC Set Definition  
1 Check Standard Set

1.1 Chk Std A & Cup 1, Repts 2

1.1.1 Channels

1.1.1.1 Max A  
1.1.1.2 Max A

1.1.2 Channels

1.1.2.1 Max A  
1.1.2.2 Max A

1.1.3 Channels

1.1.3.1 Max Allowed Relative X Exceeded -> User Decides Action  
1.1.3.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.4 Channels test4

1.1.4.1 Max Allowed Relative X Exceeded -> User Decides Action  
1.1.4.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.5 Channels test5

1.1.5.1 Max Allowed Relative X Exceeded -> User Decides Action  
1.1.5.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.6 Channels test6

1.1.6.1 Max Allowed Relative X Exceeded -> User Decides Action  
1.1.6.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.7 Channels test7

1.1.7.1 Max Allowed Relative X Exceeded -> User Decides Action  
1.1.7.2 Max Allowed Relative X Exceeded -> Just Message Given

1.2 Chk Std C & Cup 2, Repts 2

1.2.1 Channels test1

1.2.1.1 Max Allowed Absolute Diff Exceeded -> User Decides Action  
Enters Select, AltD: Delete, AltI: Insert, AltA: Insert After

CC Sample Definition

CC Sample ID Chk Std A

Position on Sampler ..... 1 (Auto Scheduled)

Number of Replicate Samplings ... 2

Reporting Code ..... ChkSt

Dilute CC Sample To Ratio ..... 1.0

Esc to Exit: PgUp / PgDn for previous / next conc

CC Set Definition  
1 Check Standard Set

1.1 Chk Std A & Cup 1, Repts 2

1.1.1 Channels test1

1.1.1.1 Max Allowed Relative  
1.1.1.2 Max Allowed Relative

1.1.2 Channels test2

1.1.2.1 Max Allowed Relative  
1.1.2.2 Max Allowed Relative

1.1.3 Channels test3

1.1.3.1 Max Allowed Relative  
1.1.3.2 Max Allowed Relative

1.1.4 Channels test4

1.1.4.1 Max Allowed Relative X Exceeded -> User Decides Action  
1.1.4.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.5 Channels test5

1.1.5.1 Max Allowed Relative X Exceeded -> User Decides Action  
1.1.5.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.6 Channels test6

1.1.6.1 Max Allowed Relative X Exceeded -> User Decides Action  
1.1.6.2 Max Allowed Relative X Exceeded -> Just Message Given

1.1.7 Channels test7

1.1.7.1 Max Allowed Relative X Exceeded -> User Decides Action  
1.1.7.2 Max Allowed Relative X Exceeded -> Just Message Given

1.2 Chk Std C & Cup 2, Repts 2

1.2.1 Channels test1

1.2.1.1 Max Allowed Absolute Diff Exceeded -> User Decides Action  
Enters Select, AltD: Delete, AltI: Insert, AltA: Insert After

CC Channel Definition

Channel Name test1

Known Concentration 10.00000

Use Beta Detector ..... N

Chord To Use to Determine Conc ... 0

Esc = Exit: PgUp/PgDn = previous/next

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```

for conu;
1.1.3.1 Max Allowed Relative X Exceeded -> User Decides Action
1.1.3.2 Max Allowed Relative X Exceeded -> Just Message Given
1.1.4 Channels test4
1.1.4.1 Max Allowed Relative X Exceeded -> User Decides Action
1.1.4.2 Max Allowed Relative X Exceeded -> Just Message Given

      GC Test / Action Definition

Do this runtime test with this Sample for this Channel

      Max Absolute Difference Exceeded      (or= to change)

Do:
  Perform action if the absolute difference
  between the determined concentration and
  "known" concentration exceeds 10.000
  change)

... and associate the following message with this runtime action.
Max Abs Diff Exceeded (!) 0.3 ug/L -> Recall & Repeat

Esc to Exit, PgDn for next conu, PgUp for previous conu

1.2.3.3 Max Allowed Absolute Diff Exceeded -> Just Message Given
1.2.4 Channels test4
1.2.4.1 Max Allowed Absolute Diff Exceeded -> User Decides Action
Enter Select, AltD: Delete, AltI: Insert, AltA: Insert After
    
```

Detector selection: Channel Specific

Info Standards Evaluation Presentation Timing Allocation

Name of Channel:   
 OutChas Method Number:   
 Detector Selection:

Method Status:   
 Status for 1.Cyanide:

Mesh: Beta Detector Activation for cyanide

"Optical Dilution" is possible by using 2 detectors with different path lengths. The short path length cell is used for higher concentrations, the long for lower concentrations.

NOTE: The software requires that the a Detector be the higher concentration range detector if a 2nd b Detector is active.

Are both a and b Detectors active? N

There will be a concentration range where either of the 2 detectors could give satisfactory results.

You will need to specify the 'transition' concentration, as determined by the a Detector, below which the b Detector's results are used.

Concentration to switch to b Detector ... 0.000 add

ESC to quit

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APPENDIX A

Concentration values for the calibration standards.

Channel Specific Method Definition

Info Standards Evaluation Presentation Timing Miscellaneous

Units  
Format  
Concentrations

Status for I.cyanide

| Seg Stas | Std     | cyanide<br>ppb |
|----------|---------|----------------|
| A        | 500.000 |                |
| B        | 250.000 |                |
| C        | 100.000 |                |
| D        | 50.000  |                |
| E        | 10.000  |                |
| F        | 5.000   |                |
| G        | 0.000   |                |

Notes: Concentrations MUST be in descending order.  
ESC to exit

Define segment boundaries for multi-segment linear calibration.

Channel Specific Method Definition

Info Standards Evaluation Presentation Timing Miscellaneous

Calibration  
Boundaries Strategies Pass/Fail

Status for I.cyanide

| Std | ppb     | Detector e | Boundary Segments |
|-----|---------|------------|-------------------|
| A   | 500.000 | Ax 1       |                   |
| B   | 250.000 | Bx 12      |                   |
| C   | 100.000 | Cx 21      |                   |
| D   | 50.000  | D          | 3                 |
| E   | 10.000  | E          | 3                 |
| F   | 5.000   | F          | 3                 |
| G   | 0.000   | Gx 3       |                   |
| H   | 0.000   | H          | 3                 |
| I   | 0.000   | I          | 3                 |
| J   | 0.000   | J          | 3                 |
| K   | 0.000   | K          | 3                 |
| L   | 0.000   | L          | 3                 |
| M   | 0.000   | M          | 3                 |
| N   | 0.000   | N          | 3                 |

(\*) sets a boundary, (space) removes a boundary.  
Esc to quit

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### APPENDIX A

Define System Unit Signal Processing Technique

Channel Specific Method Definition

Info Standards Evaluation Presentation Timing Miscellaneous

Calibration  
Signal Processing  
Auto Dilution Triggers

Method Status  
Status for I.cyanide

Method  
System Unit Signal Processing for cyanide

1  
2  
3  
4  
5  
6  
7  
8  
9  
0  
C

Detector a

Press the Space Bar to Change Signal Processing Scheme.

System Unit Signal Processing Scheme Direct Absorbance

AOC Setting No. -1 ( 0 or -1 to Set Automatically )

ESC to quit



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**SOP Concurrence Form**  
**for the Distribution and Revision of Standard Operating Procedures**

I have read, understood, and concurred with the Standard Operating Procedure (SOP) described above and will perform this procedure as it is written in the SOP.

| Print Name | Signature | Date  |
|------------|-----------|-------|
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |
| _____      | _____     | _____ |

**DETERMINATION OF GROSS ALPHA AND/OR GROSS BETA  
ACTIVITY IN WATER SAMPLES**

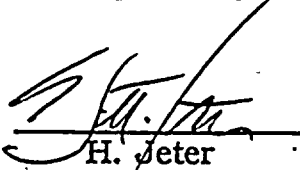


**1.0 INTRODUCTION**

This procedure is used to measure the overall radioactivity of water samples without identifying the radioactive species present. No chemical separation techniques are involved.

One liter of the sample is acidified with nitric acid, then evaporated on a hot plate. Different volumes may be used if the sample has a significant salt content or if unusual sensitivity is desired. If requested by the customer, the sample is filtered through No. 54 filter paper before evaporation, removing particles greater than 30 microns in size. Other filter media may be used in order to comply with a client's specifications.

After evaporation in a beaker, the sample is rinsed into a 2-inch diameter stainless steel planchet which is stamped with a concentric ring pattern to distribute residue evenly. Final evaporation to dryness takes place under heat lamps. Samples which appear to be hygroscopic are dried again under heat lamps just prior to counting.

Residue mass is determined by weighing the planchet before and after mounting the sample. The planchet is counted for alpha and/or beta activity on an automatic proportional counter. Results are calculated using empirical

| Issue or<br>Revision | Pages | Prepared By   | Effective<br>Date | Approved by<br>Manager<br>Environmental<br>Analysis   | Approved By<br>Manager<br>Quality<br>Assurance   |
|----------------------|-------|---|-------------------|---|--|
| Reissue              | 8     | <br>H. Jeter | 03/20/96          | <br>D. Martin | <br>J. Guenther |

self-absorption curves which allow for the change in effective counting efficiency caused by the residue mass.

## 2.0 DETECTION CAPABILITY

Detection capability depends upon sample volume actually represented on the planchet, background and efficiency of the counting instrument, and upon self-absorption of alpha and beta particles by the mounted sample. Because the radioactive species are not identified, no decay corrections are made and the reported activity refers to the counting time.

Minimum detectable level (MDL) for water samples is nominally 1.6 picoCuries per liter for gross beta at the 4.66 sigma level, assuming that 1 liter of sample is used and that 1/2 gram of sample residue is mounted on the planchet. These figures are based upon a nominal counting time of 50 minutes and upon representative values of counting efficiency and background of 0.2 and 1.2 cpm, respectively. The MDL for gross alpha activity is nominally 2.3 picoCuries per liter at the 4.66 sigma level also assuming that 1 liter of sample is used and that 1/2 gram of sample residue is mounted on the planchet. These figures are based upon a nominal 200 minute counting time and upon a representative efficiency of 0.02 and a background of 0.1 cpm.

The MDL becomes significantly lower as the mount weight decreases because of reduced self-absorption. At a zero mount weight, the 4.66 sigma MDL for gross beta is 0.9 picoCuries per liter and the MDL for gross alpha is 0.3 picoCuries per liter. These values reflect a beta counting efficiency of 0.38 and an alpha counting efficiency of 0.18. Different counting intervals may be used to obtain the desired detection limits.

### **3.0 SAMPLE SELECTION PROCEDURE**

- (a) Using the Sample Receipt Form or Work List with the Teledyne sample number, locate the sample (or sample group) in the Sample Receiving and Storage Room and transport them to the Alpha/Beta Laboratory.
- (b) Begin filling out the Radiochemical Work Sheet - Gross Beta/Gross Alpha, entering the customer name, the sample numbers in numerical order, the desired analyses (alpha and/or beta), sample collection dates, the sample preparation date and the initials of the analyst.
- (c) Make an entry in the Alpha/Beta Laboratory Data Book showing customer name, sample numbers, sample type, collection dates and desired analyses.

### **4.0 SAMPLE PREPARATION PROCEDURES**

This section describes how water samples are filtered (if required), then evaporated. The residue of each sample is dried on a 2-inch stainless steel planchet which is stamped with a concentric ring pattern.

- (a) Choose a clean beaker sized to contain the sample aliquot. Mark it with the Teledyne sample number.
- (b) Shake the sample container to distribute any particulate matter evenly. Decant the desired aliquot into a clean graduated cylinder, then transfer it to the numbered beaker.
- (c) If filtration is requested by the customer, obtain another beaker of the same size and write the sample number on it. Place a glass funnel in a funnel rack over the empty beaker. Fold a 18.5 cm diameter No. 54 filter paper disk into quarters and place it in the mouth of the funnel. Gravity filter the sample from its original beaker into the identically numbered beaker. Rinse the original beaker and the filter paper with deionized water from a wash bottle. Different filter media may be used in order to comply with a client's specifications.
- (d) Add approximately 5 ml concentrated  $\text{HNO}_3$  to the sample from a dropping bottle. Place the beaker on a hot plate under the hood in the Alpha-Beta Laboratory and set the hot plate for high surface temperature.

- (e) Evaporate the sample gently to dryness. Take care to reduce hot plate temperature as the sample volume decreases in order to avoid loss by spattering from the beaker. Remove from the hot plate.
- (f) Prepare a 2-inch stainless steel concentric ring planchet for each water sample by first wiping it clean with a Kimwipe. Write sample number, customer name, and desired analyses (alpha and/or beta) on a gummed label and stick to back of planchet.
- (g) Take the labeled group of planchets to the Radiochemistry Counting Room on a sample tray and weigh each on the analytical balance. Record this tare weight in the Alpha-Beta Laboratory Data Book beside the sample number. Return the tray of tared planchets to the Alpha-Beta Laboratory.
- (h) Wet the interior sides and bottom of the sample beaker with a fine steam of 2M  $\text{HNO}_3$  from a wash bottle. Using a rubber policeman mounted on a glass stirring rod, police the interior of the beaker thoroughly to bring any adhering material into suspension in the liquid. Transfer the solution from each sample beaker to its correspondingly numbered planchet. Repeatedly wash the beaker with small amounts of 2M  $\text{HNO}_3$  from a wash bottle and collect the washings in the planchet.  
  
NOTE: If a film of sample residue remains in the beaker, rinse with ethanol from a wash bottle. Use the policeman to remove the residue, then transfer it to the planchet.
- (i) Place the filled planchets in the sample tray under heat lamps in the Light Hood. Add a few drops of 0.1% laboratory aerosol to each planchet. Evaporate to dryness. Remove and allow to cool. If any residue is found on the outside edge of a planchet, scrape it off with a spatula and return it into the planchet.
- (j) Take sample tray to the analytical balance within 1/2 hour after removing from the Light Hood. Weigh each planchet and record final weight next to the corresponding tare weight in the Alpha-Beta Laboratory Data Book.
- (k) Subtract the tare weight from the final weight for each sample and record this mount weight on the Radiochemical Work Sheet and in the Data Book. Submit the Radiochemical Work Sheet and the tray of finished planchets to the Radiochemistry Counting Room for radioassay.

## 5.0 SAMPLE COUNTING PROCEDURE

Before carrying out the steps below, inspect the residue in the planchets. If these residues appear to have gained moisture from the air, place the tray of planchets under heat lamps and dry again.

- (a) Verify that the sample tray containing a group of sample planchets contains the same sample numbers as the accompanying Radiochemical Work Sheet - Gross Beta/Gross Alpha.
- (b) Write counting sequence numbers on the work sheet following the order that the sample numbers appear on the sheet. Begin with the number 1 if starting a new sample counting group; otherwise use the number which follows the last sequence number assigned.
- (c) Remove the sample planchets from the tray in sequence number order, verifying in each case that the sample number on the back of the planchet matches the sequence number. Transfer each to a plastic planchet holder and then to the selected counter in sequence number order.
- (d) Write the counting start date and the number of the automatic proportional counter on the work sheet.
- (e) Load a counting blank, an alpha check source and a beta check source with each counting group. Set the counting interval and initiate the counting sequence. Counts are normally set for 50 minutes but the intervals can be modified to obtain desired sensitivity.
- (f) After all samples in the group have been counted, copy the printed counts and counting interval for each sample onto the Radiochemical Work Sheet in the space provided.
- (g) Unload the sample planchets from the holders and store in the rack for processed alpha and beta samples.

## 6.0 CALCULATION OF THE SAMPLE ACTIVITY OR OF THE MDL

- (a) Sample activity and the 2-sigma counting uncertainty are calculated as follows:

$$\frac{\text{Net pCi}}{\text{Unit volume}} = \frac{N/\Delta t - \beta}{2.22(v)(\epsilon)} \pm \frac{2\sqrt{(N/\Delta t + \beta)/\Delta t}}{2.22(v)(\epsilon)}$$

net activity
counting uncertainty

- where:
- N = total counts from sample (counts)
  - $\Delta t$  = counting time for sample (min)
  - $\beta$  = background rate of counter (cpm)
  - 2.22 =  $\frac{\text{dpm}}{\text{pCi}}$
  - v = volume of sample analyzed
  - $\epsilon$  = efficiency of the counter

- (b) Establishing and reporting activities that are equal to or less than the detection limit:

If the net activity  $\left(\frac{N/\Delta t - \beta}{2.22(v)(\epsilon)}\right)$  is equal to or is less than a designated multiple of the background counting uncertainty, the activity is below the limits of detection and is called "less than" (L.T.) or "minimum detectable level" (MDL).

The L.T. value can be specified by stating only the counting uncertainty at a predetermined multiple ( $\sigma m$ ) of the one sigma statistics. A sigma multiple ( $\sigma m$ ) of 4.66 is used for calculation of the L.T. values unless the customer requests another value such as 2.83.

$$\text{thus L.T.} = \frac{\sigma m \sqrt{\beta/\Delta t}}{2.22(v)(\epsilon)}$$

## **7.0 CALIBRATION OF EQUIPMENT FOR GROSS ALPHA, GROSS BETA ANALYSES**

Automatic proportional counters are used for measurement of gross alpha and gross beta analyses for all sample media. The preparation of each sample type has been described in separate procedures. The final "mounting" is in a 2-inch steel planchet which is positioned in the counting instrument. Alpha and beta standards are also prepared and measured in 2-inch planchets.

Alpha standards are prepared by diluting EPA Am-241 or Th-230 standard solutions (traceable to NIST) and by evaporating measured aliquots in planchets. The efficiency of the instrument is then determined by dividing the cpm measured by the dpm value. Routine measurements of check sources are plotted on control charts as described in PRO-032-27.

The absorption (called self-absorption) of alphas by the sample mass in the planchet (thus reducing the count rate) is determined as follows: A known activity of Am-241 or Th-230 is evaporated with varying amounts of  $\text{Na}_2\text{CO}_3$  salt. This salt has been shown to have the same self-absorption properties as finely divided silt. Residue weights between 0 and 1.5 grams are distributed in 2-inch planchets. From the radiometric determinations a curve is constructed with the apparent instrument efficiency monotonically decreasing with increasing "mount weight". An algebraic expression of this curve is stored in a computer and is referenced during data reduction to yield the counting efficiency corresponding to the measured mount weight.

Determinations of beta counting efficiencies and self-absorption curves are similar to the methods used for alpha. Beta standards are prepared by diluting EPA Cs-137 standard solutions (traceable to NIST). Measur



aliquots of these solutions are evaporated in planchets to prepare standards in the same geometry used for counting samples. Self-absorption curves are prepared by evaporating standard solutions with varying weights of  $\text{Na}_2\text{CO}_3$  salts. Beta check sources are counted routinely and the results are plotted on control charts as described in PRO-032-027.



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DETERMINATION OF TOTAL RADIUM  
IN WATER SAMPLES

### 1.0 INTRODUCTION

This procedure presents a radiometric method for determining total radium activity (alpha) in water samples. Stable barium carrier is added to the sample and radium is co-precipitated with barium sulfate. The precipitate is collected and mounted on a millipore filter. The precipitate mass is determined by weighing the filter before and after mounting the sample. The filter, mounted in a planchet, is counted on an automatic proportional counter. Results are calculated using an empirical self absorption curve which allows for the change in effective alpha counting efficiency caused by the precipitate mass. The calculation includes a factor to compensate for activity attributed to alpha emitting daughters of Ra-226 which are re-establishing secular equilibrium during the time period between the precipitation and the midcount time.

This procedure is based on Method 900.1 of the Environmental Protection Agency, described in EPA-600/4-80-032, August 1980.

### 2.0 DETECTION CAPABILITY

Detection capability depends upon sample size, chemical yield, the counting interval, the ingrowth factor for alpha daughters of Ra-226, and the efficiency and background of the counting instrument. The MDL for total radium activity (alpha) is nominally 0.5 picocurie per liter at the 4.66 sigma

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|                           |              |                     |             |                       |                     |
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level (0.3 pCi/l at the 2.83 sigma level). The MDL is based on a 50-minute counting time, a chemical yield of 0.90, an ingrowth factor of 1.5, a sample volume of 1l, a detector background of 0.15 cpm and efficiency of 0.16 for precipitate mass of 0.03 gram.

### 3.0 SAMPLE SELECTION PROCEDURE

- (a) Using the Sample Receipt Form with the Teledyne Isotopes sample number, locate the sample (or sample group) in the Sample Receiving Storage Room and transport them to the Alpha-Beta Laboratory.
- (b) Begin filling out the Radiochemical Work Sheet, entering the customer name, the sample number, total radium (as the analysis), sample collection date, the sample preparation date and the initials of the analyst.
- (c) Make an entry in the Laboratory Data Book showing customer name, sample numbers, sample type, collection dates and desired analysis.

### 4.0 CHEMICAL SEPARATION PROCEDURES

- (a) Write the Teledyne Isotopes sample number on a 2-liter beaker. Shake the sample container and decant into the beaker, filling to the 1 liter mark.
- (b) Adjust pH to 3 with  $\text{HNO}_3$  as follows: Using a dropping bottle, add conc  $\text{HNO}_3$  to the sample while stirring with a clean glass rod. Withdraw the rod periodically and touch to pH paper. Continue until a pH 3 color indication is obtained.
- (c) Allow beaker to stand approximately 10 minutes to settle any particulate matter.
- (d) Gravity filter the sample through a 18.5 cm diameter fiberglass filter which is folded in quarters and inserted in the mouth of a glass funnel. Receive the filtrate in another 2-liter beaker which is marked with the sample number.
- (e) Using a volumetric pipet, add 2.00 ml standardized Ba carrier to the filtered sample (nominally 18 mg Ba/ml). Stir with a glass rod.
- (f) Place the filtered sample beaker (now containing Ba carrier) on a hotplate and bring to near boiling.
- (g) Using a disposable pipet, add 3 ml  $\text{K}_2\text{SO}_4$  reagent (nominally 60 mg  $\text{K}_2\text{SO}_4$ /ml) to the sample. Stir with a glass rod. Record the date and time of this addition in the laboratory data book.



- (h) Allow the sample beaker to remain on the hotplate another 30 minutes (at a temperature slightly below the boiling point). A fine white  $\text{BaSO}_4$  precipitate should form and fall to the bottom of the beaker. Remove beaker from the hotplate and allow to cool.

#### 5.0 MOUNTING THE PRECIPITATE

- (a) Prepare a new 2-inch stainless steel planchet for each sample by first wiping it clean with a kimwipe. Write customer name, sample number, and analysis (TOT Ra) on a gummed label and stick to the back of the planchet.
- (b) Place a 0.45  $\mu\text{m}$  millipore filter in each labeled planchet. Weigh each (including its filter) on an analytical balance and record this tare weight beside the sample number in the Laboratory Data Book.
- (c) Set up a vacuum filter (millipore) apparatus for each sample by inserting a fritted glass filter holder in a 1-liter sidearm flask. Taking the samples in numerical order, place the millipore filter on the vacuum apparatus, add the specially designed funnel and fix in place with a clamp.
- (d) Vacuum filter the sample into the correspondingly numbered millipore apparatus. Filtration is fastest if the precipitate is allowed to remain at the bottom of the beaker and is filtered last.
- (e) In the last phases of filtration, rinse the sample beaker with deionized water from a wash bottle and add this rinse to the funnel. Do not use a methanol rinse.
- (f) Disconnect the vacuum apparatus. Remove the filter gently with a spatula and transfer it to its planchet (observing the numerical order of samples).
- (g) Place planchets (containing their filters with precipitates) in a fiber tray in a hot air oven (100°C), or under heat lamps, to dry.
- (h) Take the tray containing dried samples to the analytical balance. Weigh each planchet and record final weight next to the corresponding tare weight in the Laboratory Data Book.
- (i) Subtract the tare weight from the final weight and record this mount weight in Laboratory Data Book and on the Radiochemical Work Sheet. Divide mount weight by the carrier standardization value (written on the Ba carrier flask) to obtain chemical yield. Record yield on the Radiochemical Work Sheet and in Laboratory Data Book.
- (j) Complete the entries on the Radiochemical Work Sheet, adding the sample aliquot used and the date and time of  $\text{K}_2\text{SO}_4$  addition. Submit the Radiochemical Work Sheet and the tray of finished

planchets to the Radiochemistry Counting Room for radioassay.

#### 6.0 SAMPLE COUNTING PROCEDURE

- (a) Verify that the sample tray containing a group of sample planchets contains the same sample numbers as the accompanying Radiochemical Work Sheets.
- (b) Write counting sequence numbers on the work sheets following the order that the sample numbers appear on the sheet. Begin with the number 1 if starting a new sample counting group; otherwise use the number which follows the last sequence number assigned.
- (c) Remove the sample planchets from the tray in sequence number order, verifying in each case that the sample number on the back of the planchet matches the sequence number. Transfer each to a plastic planchet holder and then to the counting cassette in sequence number order.
- (d) Write the counting start date and time, and the number of the automatic proportional counter on the first work sheet.
- (e) Load the cassette into the counter and set the counting mode for alpha. Set the counting interval for 50 minutes unless a different interval is specified for greater sensitivity.
- (f) After all samples in the group have been counted, copy the printed counts and counting interval for each sample onto the Radiochemical Work Sheet in the space provided. Also record the count date and time for each sample (certain automatic proportional counters print the count start time; others do not, requiring a summation of counting intervals from the first sample count).
- (g) Unload the sample planchets from the holders and store in the rack for processed alpha and beta samples.

#### 7.0 CALCULATION OF THE SAMPLE ACTIVITY OR OF THE MDL

- (a) Sample activity and the 2 sigma counting error are calculated as follows:

## 7.0 CALCULATION OF THE SAMPLE ACTIVITY OR OF THE MDL

- (a) Sample activity and the 2 sigma counting error are calculated as follows:

$$\frac{\text{Net pCi}}{\text{unit volume}} = \frac{\frac{N}{\Delta t} - \beta}{2.22(v)(p)(\epsilon)} \pm \frac{2 \sqrt{\frac{N + \beta}{\Delta t}}}{2.22 (v)(p)(\epsilon)}$$

net activity
counting error

where: N = total counts from sample (counts)

$\Delta t$  = counting time for sample (min)

$\beta$  = background rate of counter for alpha (cpm)

$$2.22 = \frac{\text{dpm}}{\text{pCi}}$$

v = volume of sample analyzed

$\epsilon$  = efficiency of the counter for Ra-226 alpha, determined empirically as a function of precipitate mass.

p = Radium-226 alpha ingrowth factor:

$$p = 1 + 3(1 - e^{-\lambda t})$$

$\lambda$  = decay constant of Rn-222,  $0.007551 \text{ hr}^{-1}$

t = elapsed time (hrs) from the time of  $\text{BaSO}_4$  separation to the mid-point of the counting period.

- (b) Establishing and reporting activities that are equal to or less than the detection limit:

If the net activity  $\left( \frac{N}{\Delta t} - \beta \right) / \left( 2.22(v)(p)(\epsilon) \right)$  is equal to or is less than a

designated multiple of the background counting error, the activity is

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below the limits of detection and is called "less than" (L.T.) or "minimum detectable level" (MDL).

The L.T. value can be specified by stating only the counting error at a predetermined multiple ( $\sigma_m$ ) of the one sigma statistics. A sigma multiple ( $\sigma_m$ ) of 4.66 is used for calculation of the L.T. values unless the customer requests another value such as 2.83.

$$\text{thus L.T.} = \frac{\sigma_m \sqrt{\frac{B}{\Delta t}}}{2.22 (v)(p)(\epsilon)}$$

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## DETERMINATION OF RA-226 IN WATER

### 1.0 INTRODUCTION

The procedure describes the method of determining Ra-226 in water samples by the emanation technique. Radon-222 is equilibrated with the parent radionuclide, Ra-226, and then transferred through a closed system to an evacuated one-liter alpha chamber. The Rn-222 and daughters activities are measured in successive counting periods.

### 2.0 DETECTION CAPABILITY

The minimum detectable level (MDL) for water samples is nominally 0.2 pCi/liter for Ra-226 at the 4.66 sigma confidence level. This figure based upon a sample volume of 0.4 liter, a counting time of 1000 minutes, and upon representative values of counting efficiency (for Rn-222 and two alpha emitting daughters) and background of 2.00 and 2.3 cpm, respectively.

### 3.0 SAMPLE SELECTION PROCEDURE

- (a) Using the Sample Receipt Form with the Teledyne Brown Engineering - Environmental Services sample number, locate the sample or sample group in the appropriate storage area. Transport the sample(s) to the Gas Analysis Laboratory.
- (b) Select a flask for use. Write the following information on a tag and attach to the flask: customer name, Teledyne #, volume of sample, flask ID, and date and time of sample preparation for the

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Ra-226 determination.

#### **4.0 SAMPLE PREPARATION PROCEDURES**

- (a) Transfer 0.4 liter of water to the labeled emanation flask and close the flask from the atmosphere through the tapered, ground seal. Different volumes of sample may be used in order to obtain different minimum detection levels and depending on the availability of sample volume. It may be necessary to apply a small quantity of vacuum grease to the tapered surface.
- (b) Connect the inner tube of the flask to the helium supply and pass helium through the flask for a minimum of five minutes. The bubbling purges radon from the sample.
- (c) Close the valve between the helium cylinder and the flask.
- (d) Close the two stopcocks on the emanation flask.
- (e) Set flask aside for approximately two weeks to permit the Rn-222 activity to equilibrate with the Ra-226, if any, in the water.

#### **5.0 DETECTOR LOADING**

After approximately two weeks, proceed with the following steps.

- (a) Attach the outer tube of the flask to an evacuated 1 liter volume alpha counting chamber through the gas handling system.
- (b) Attach the inner tube of the flask to the helium supply.
- (c) Open the stopcock on the flask which will permit Rn-222 (and any residual helium) to pass into the 1 liter counting chamber.
- (d) Slowly open the stopcock first and then the valve to the helium supply. The helium will flow through the flask and into the 1 liter counting chamber. Monitor the pressure on the vacuum gauge.
- (e) When the pressure reaches one atmosphere (760 mm Hg), close all valves.

## 6.0 SAMPLE COUNTING

- (a) Push the RESET button on the scaler and push the START button. Record the start time.
- (b) Record Count at approximately 60 minute intervals until ingrowth of Rn-222 daughters is complete as indicated by a maximum count. If activity is indicated by the count, recount the following day for 60 minutes to verify the presence of Rn-222 by the decay.

## 7.0 STANDARDS AND CONTROL OF COUNTERS

A Ra-226 standard which is NIST traceable, is counted in the same manner as described above once per month in each counter. The efficiency of the combined radon extraction from the sample and the nuclear counting is determined with the standard.

## 8.0 CALCULATION OF RA-226 ACTIVITY

The Ra-226 activity is determined from the Rn-222 activity as follows:

$$\frac{\text{Net pCi}}{\text{unit volume}} = \frac{\frac{N}{\Delta t} - \beta (e^{\lambda t_2})}{2.22 (v) (\epsilon) (1 - e^{-\lambda t_1})} \pm \frac{2 \sqrt{\frac{\left(\frac{N}{\Delta t} + \beta\right)}{\Delta t}} (e^{\lambda t_2})}{2.22 (v) (\epsilon) (1 - e^{-\lambda t_1})}$$

net activity
counting error

where:

N = total counts from sample (counts)

Δt = counting time for sample (min)

β = background rate of counter (cpm)

2.22 =  $\frac{\text{dpm}}{\text{pCi}}$

v = volume of sample analyzed

ε = efficiency of the counter

$1 - e^{-\lambda t_1}$  = determines the "ingrowth" of Rn-222 from Ra-226 during the time lapse of  $t_1$

$t_1$  = the time lapse of the first helium purge to the second helium purge

$\lambda$  = the decay constant for Rn-222

$e^{\lambda t_2}$  = the correction for Rn-222 decay from the mid count time to the time it was transferred to the counting chamber.

$t_2$  = the time lapse from transfer to chamber to mid count time

Establishing and reporting activities that are equal to or less than the detection limit:

If the net activity is equal to or is less than a specified multiple of the background counting error, the activity is below the limits of detection and is called "less than" (L.T.) or "minimum detectable level" (MDL).

The L.T. value can be specified by stating only the counting error at a predetermined multiple ( $\sigma_m$ ) of the one sigma statistics. A sigma multiple ( $\sigma_m$ ) of 4.66 is used for calculation of the L.T. values unless the customer requests another value such as 2.83.

$$\text{thus L.T.} = \frac{\sigma_m \sqrt{\frac{B}{\Delta t}} (e^{\lambda t_2})}{2.22 (v) (\epsilon) (1 - e^{-\lambda t_1})}$$

DETERMINATION OF RA-226 IN SOILINTRODUCTION

The initial preparation of a soil sample for Ra-226 determination by the emanation technique is to transfer one gram of dry soil into a labeled emanation flask. To that are added 10 ml of 6N HCl and 340 ml of distilled water. Close the flask from the atmosphere through the tapered, ground seal. Proceed with step 4.0 (b) of PRO-022-65.

SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River) \_\_\_\_\_ )
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_) \_\_\_\_\_ )
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_) \_\_\_\_\_ )
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_) \_\_\_\_\_ )

|     | 1. POLLUTANT GROUP 1           | 2. LEVEL PRESENT       |                 |  |          |  |          | 3. UNITS           |                  | 4. Coefficient of Effluent Variability (CV) |         |
|-----|--------------------------------|------------------------|-----------------|--|----------|--|----------|--------------------|------------------|---|---------|
|     |                                | a. Maximum Daily Value |                 | b. Maximum 30-Day Value (if available) |          | c. Long-Term Avg. Value (if available) |          | d. No. of Analyses | a. Concentration |   | b. Mass |
|     |                                | (1) Concentration      | (2) Mass        | (1) Concentration                      | (2) Mass | (1) Concentration                      | (2) Mass |                    |                  |   |         |
| 1C  | Biochemical Oxygen Demand, BOD | 4                      | N/A             |  |          | 2.67                                   | N/A      | 3                  | mg/l             | N/A   |         |
| 2C  | Chemical Oxygen Demand, COD    | <15                    | N/A             |  |          | <15                                    | N/A      | 3                  | mg/l             | N/A   |         |
| 3C  | Total Organic Carbon, TOC      | 2.8                    | N/A             |  |          | 2.67                                   | N/A      | 3                  | mg/l             | N/A   |         |
| 4C  | Total Suspended Solids, TSS    | 10                     | N/A             |  |          | <7                                     | N/A      | 3                  | mg/l             | N/A   |         |
| 5C  | Total Dissolved Solids, TDS    | 281                    | N/A             |  |          | 188.33                                 | N/A      | 3                  | mg/l             | N/A   |         |
| 6C  | Ammonia as N                   | <0.10                  | N/A             |  |          | <0.10                                  | N/A      | 3                  | mg/l             | N/A   |         |
| 7C  | Oil and Grease                 | <2                     | N/A             |  |          | <2                                     | N/A      | 3                  | mg/l             | N/A   |         |
| 8C  | Bromide                        | <2                     | N/A             |  |          | <1                                     | N/A      | 3                  | mg/l             | N/A   |         |
| 9C  | Chlorine, Total Residual       | 0.06                   | N/A             |  |          | <0.043                                 | N/A      | 3                  | mg/l             | N/A   |         |
| 10C | Temperature winter             | 3 Value                |                 | Value                                  |          | 3 Value                                |          | 1                  | (°C)             | (°C)  | (°C)    |
| 11C | Temperature summer             | 23.3 Value             |                 | Value                                  |          | Value                                  |          | 2                  | (°C)             | (°C)  | (°C)    |
| 12C | pH                             | 7.47<br>Minimum        | 7.84<br>Maximum | X                                      |          | X                                      |          | 3                  | standard units   | standard units                              |         |

2.a. Maximum Daily Value - Report the highest daily value or daily average from the last year of data. Report both mass and concentration.  
 2.b. Maximum 30-Day Value - Determine the average of all daily values during each calendar month and report the highest average.  
 2.c. Long Term Average Value - The average of all values within the last year and report both mass and concentration.  
 2.d. Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River) \_\_\_\_\_ )
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_) \_\_\_\_\_ )
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_) \_\_\_\_\_ )
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_) \_\_\_\_\_ )

|     | Pollutant Group 2              | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      | 4. Units              |               | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |              |        |                      |            |              |                 |
|-----|--------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|---|---|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |                                |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      | c. Number of Analysis | Concentration |   | Mass  | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |                                |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |   |   |              |              |        |                      |            |              |                 |
| 13C | Color                          |                                     | 1                              | 110.2                     | 40                 | N/A  | 28.33                  | N/A  | 3                     | c.u.          | N/A   |   |              |              |        |                      |            |              |                 |
| 14C | Fecal Coliform                 |                                     |                                | 9222D                     | 90                 | N/A  | 28.62                  | N/A  | 3                     | #/100ml       | N/A   |   |              |              |        |                      |            |              |                 |
| 15C | Fluoride                       | 100                                 | 50                             | 300.0                     | 170                | N/A  | <110                   | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 16C | Nitrate-Nitrite (as N)         |                                     | 50                             | 300.0                     | 850                | N/A  | 593.3                  | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 17C | Nitrogen, Total Organic (as N) |                                     | 1,000                          | Calc                      | <1,000             | N/A  | <1,000                 | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 18C | Phosphorus (as P), Total       |                                     | 100                            | 365.1                     | <100               | N/A  | <100                   | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 19C | Sulfate (as SO <sub>4</sub> )  | 1,000                               | 500                            | 300.0                     | 62,500             | N/A  | 37,367                 | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 20C | Sulfide (as S)                 | 1,000                               | 1,000                          | 376.1                     | <1,000             | N/A  | <1,000                 | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 21C | Sulfite (as SO <sub>3</sub> )  | 2,000                               | 2,000                          | 377.1                     | <4,000             | N/A  | <2,667                 | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 22C | Surfactants (MBAS)             | 25                                  | 25                             | 5540c                     | 39                 | N/A  | 35.67                  | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| —   | Total Kjeldahl-Nitrogen        |                                     | 1,000                          | 351.4                     | <1,000             | N/A  | <1,000                 | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
  - \* Make copies of this table and check appropriate box.
  - \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the need for establishing a large number of effluent limits and/or monitoring requirements on the final NPDES permit.

000106

SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2 (continued) | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        | 4. Units |                       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |      |              |              |        |                      |            |              |                 |
|-----|-------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|----------|-----------------------|---|---|------|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |                               |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |          | c. Number of Analysis |   | Concentration   | Mass | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |                               |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass     |                       |   |   |      |              |              |        |                      |            |              |                 |
| 1M  | Antimony, Total               | 200                                 | 10                             | 200.7                     | <10                | N/A  | <10                    | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 2M  | Arsenic, Total                | 50                                  | 3                              | 200.7                     | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 3M  | Beryllium, Total              | 5                                   | 2                              | 200.7                     | <2                 | N/A  | <2                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 4M  | Cadmium, Total                | 5                                   | 1                              | 200.7                     | <1                 | N/A  | <1                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 5M  | Chromium, Total               | 50                                  | 3                              | 200.7                     | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 5M  | Chromium, Hexavalent          | 10                                  | 10                             | 3500D                     | <40                | N/A  | <23.33                 | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 6M  | Copper, Total                 | 20                                  | 10                             | 200.7                     | <10                | N/A  | <10                    | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 7M  | Lead, Total                   | 100                                 | 3                              | 200.7                     | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 8M  | Mercury, Total                | 0.2                                 | 0.2                            | 245.1                     | <0.5               | N/A  | <0.3                   | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 9M  | Nickel, Total                 | 40                                  | 20                             | 200.7                     | <20                | N/A  | <20                    | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 10M | Selenium, Total               | 75                                  | 10                             | 200.7                     | <10                | N/A  | <10                    | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 11M | Silver, Total                 | 10                                  | 1                              | 200.7                     | <1                 | N/A  | <1                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 12M | Thallium, Total               | 100                                 | 10                             | 200.7                     | <10                | N/A  | <10                    | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 13M | Zinc, Total                   | 5                                   | 10                             | 200.7                     | 10                 | N/A  | <10                    | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 14M | Cyanide, Total                | 20                                  | 5                              | 335.3                     | 8                  | N/A  | <6                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 14M | Cyanide, Free                 | 5                                   | 5                              | 4500I                     | <5                 | N/A  | <5                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

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

\* Make copies of this table and check appropriate box.

\*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

000107

SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2 (continued) | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        | c. Number of Analysis | 4. Units      |      | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |      |              |              |        |                      |            |              |                 |      |
|-----|-------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|-----------------------|---------------|------|---|---|------|--------------|--------------|--------|----------------------|------------|--------------|-----------------|------|
|     |                               |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |                       | Concentration | Mass |   | Concentration   | Mass | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |      |
|     |                               |                                     |                                |                           | Concentration      | Mass | Concentration          |                       |               |      |   |   |      |              |              |        |                      |            |              |                 | Mass |
| 15M | Phenols, Total                | 5                                   | 10                             | 420.2                     | <10                | N/A  | <10                    | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 16M | Aluminum, Total               | 100                                 | 150                            | 200.7                     | <150               | N/A  | <76.7                  | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 17M | Barium, Total                 | 100                                 | 10                             | 200.7                     | 40                 | N/A  | 33.33                  | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 18M | Boron, Total                  | 100                                 | 50                             | 200.7                     | <50                | N/A  | <50                    | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 19M | Cobalt, Total                 | 50                                  | 3                              | 200.7                     | <3                 | N/A  | <3                     | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 20M | Iron, Total                   | 30                                  | 30                             | 200.7                     | 570                | N/A  | 370                    | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 21M | Iron, Dissolved               | 30                                  | 60                             | 200.7                     | <60                | N/A  | <50                    | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 22M | Magnesium, Total              | 30                                  | 50                             | 200.7                     | 11,000             | N/A  | 7,077                  | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 23M | Molybdenum, Total             | 100                                 | 10                             | 200.7                     | <10                | N/A  | <10                    | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 24M | Manganese, Total              | 10                                  | 3                              | 200.7                     | 110                | N/A  | 96                     | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 25M | Tin, Total                    | 800                                 | 10                             | 200.7                     | <10                | N/A  | <10                    | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |
| 26M | Titanium, Total               | 400                                 | 10                             | 200.7                     | <10                | N/A  | <10                    | N/A                   | 3             | µg/l | N/A   |   |      |              |              |        |                      |            |              |                 |      |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
  - \* Make copies of this table and check appropriate box.
  - \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for optional analyses or the need for establishing a large number of effluent limits and/or monitoring requirements on the final NPDES permit.

000108



SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Susquehanna River)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 3<br>Volatile Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      | c. Number of Analysis | 4. Units      |      | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |      |              |              |        |                      |            |              |                 |
|-----|--|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|------|---|---|------|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |  |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      |                       | Concentration | Mass |   | Concentration   | Mass | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |  |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |      |   |   |      |              |              |        |                      |            |              |                 |
| 1V  | Acrolein                               | 10                                  | 20                             | 624                       | <20                | N/A  | <20                    | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 2V  | Acrylonitrile                          | 10                                  | 10                             | 624                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 3V  | Benzene                                | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 5V  | Bromoform                              | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 6V  | Carbon Tetrachloride                   | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 7V  | Chlorobenzene                          | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 8V  | Chlorodibromomethane                   | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 9V  | Chloroethane                           | 10                                  | 2                              | 624                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 10V | 2-Chloroethylvinyl Ether               | 10                                  | 5                              | 624                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 11V | Chloroform                             | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 12V | Dichlorobromomethane                   | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 14V | 1,1-Dichloroethane                     | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 15V | 1,2-Dichloroethane                     | 10                                  | 2                              | 624                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 16V | 1,1-Dichloroethylene                   | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 17V | 1,2-Dichloropropane                    | 10                                  | 2                              | 624                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 18V | 1,3-Dichloropropylene                  | 10                                  | 2                              | 624                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 19V | Ethylbenzene                           | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.  
 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.  
 \* Make copies of this table and check appropriate box.  
 \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

000109

SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River) \_\_\_\_\_ )
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_) \_\_\_\_\_ )
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_) \_\_\_\_\_ )
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_) \_\_\_\_\_ )

|     | Pollutant Group 3<br>Volatile Organics<br>(continued) | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      | c. Number of Analysis | 4. Units      |      | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |      |              |              |        |                      |            |              |                 |
|-----|---|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|------|---|---|------|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |   |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      |                       | Concentration | Mass |   | Concentration   | Mass | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |   |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |      |   |   |      |              |              |        |                      |            |              |                 |
| 20V | Methyl Bromide  | 10                                  | 3                              | 624                       | <3                 | N/A  | <3                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 21V | Methyl Chloride                                       | 10                                  | 2                              | 624                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 22V | Methylene Chloride                                    | 10                                  | 3                              | 624                       | <3                 | N/A  | <3                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 23V | 1,1,2,2-Tetrachloroethane                             | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 24V | Tetrachloroethylene                                   | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 25V | Toluene   | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 26V | 1,2-Trans-Dichloroethylene                            | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 27V | 1,1,1-Trichloroethane                                 | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 28V | 1,1,2-Trichloroethane                                 | 10                                  | 2                              | 624                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 29V | Trichloroethylene                                     | 10                                  | 1                              | 624                       | <1                 | N/A  | <1                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 31V | Vinyl Chloride  | 10                                  | 2                              | 624                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.  
 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.  
 \* Make copies of this table and check appropriate box.  
 \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 4<br>Acid-Fraction Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      | 4. Units              |               | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |              |        |                      |            |              |                 |
|-----|---|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|---|---|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |   |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      | c. Number of Analysis | Concentration |   | Mass  | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |   |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |   |   |              |              |        |                      |            |              |                 |
| 1A  | 2-Chlorophenol                              | 10                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 2A  | 2,4-Dichlorophenol                          | 10                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 3A  | 2,4-Dimethylphenol                          | 10                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 4A  | 4,6-Dinitro-o-Cresol                        | 10                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 5A  | 2,4-Dinitrophenol                           | 50                                  | 15                             | 625                       | <15                | N/A  | <15                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 6A  | 2-Nitrophenol                               | 10                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 7A  | 4-Nitrophenol                               | 50                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 8A  | p-Chloro-m-Cresol                           | 10                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 9A  | Pentachlorophenol                           | 50                                  | 25                             | 625                       | <25                | N/A  | <25                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 10A | Phenol                                      | 10                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 11A | 2,4,6-Trichlorophenol                       | 10                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
- \* Make copies of this table and check appropriate box.
- \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River) \_\_\_\_\_ )
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_) \_\_\_\_\_ )
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_) \_\_\_\_\_ )
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_) \_\_\_\_\_ )

|     | Pollutant Group 5<br>Base-Neutral Fraction Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      | 4. Units              |               | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |              |        |                      |            |              |                 |
|-----|---|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|---|---|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |   |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      | c. Number of Analysis | Concentration |   | Mass  | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |   |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |   |   |              |              |        |                      |            |              |                 |
| 1B  | Acenaphthene  | 10                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 2B  | Acenaphthylene                                      | 10                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 3B  | Anthracene  | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 4B  | Benzidine   | 50                                  | 20                             | 625                       | <20                | N/A  | <20                    | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 5B  | Benzo (a) Anthracene                                | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 6B  | Benzo (a) Pyrene                                    | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 7B  | 3,4-Benzo-fluoranthene                              | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 8B  | Benzo (ghi) Perylene                                | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 9B  | Benzo (k) Fluoranthene                              | 10                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 10B | Bis (2-Chloro-ethoxy) Methane                       | 10                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 11B | Bis (2-Chloro-ethyl) Ether                          | 10                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 12B | Bis (2-Chloro-isopropyl) Ether                      | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 13B | Bis (2-Ethyl-hexyl) Phthalate                       | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |
| 14B | 4-Bromophenyl Phenyl Ether                          | 10                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A  | 3                     | µg/l          | N/A   |   |              |              |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
- \* Make copies of this table and check appropriate box.
- \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the need for establishing a large number of effluent limits and/or monitoring requirements on the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River) \_\_\_\_\_ )
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_) \_\_\_\_\_ )
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_) \_\_\_\_\_ )
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_) \_\_\_\_\_ )

|     | Pollutant Group 5 Base-Neutral Fraction Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      |                       | 4. Units      |      | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |      |              |              |        |                      |            |              |                 |
|-----|--|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|------|---|---|------|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |  |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      | c. Number of Analyses | Concentration | Mass |   | Concentration   | Mass | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |  |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |      |   |   |      |              |              |        |                      |            |              |                 |
| 15B | Butyl Benzyl Phthalate                           | 10                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 16B | 2-Chloronaphthalene                              | 10                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 17B | 4-Chlorophenyl Phenyl Ether                      | 10                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 18B | Chrysene   | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 19B | Dibenzo (a, h) Anthracene                        | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 20B | 1,2-Dichlorobenzene                              | 10                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 21B | 1,3-Dichlorobenzene                              | 10                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 22B | 1,4-Dichlorobenzene                              | 10                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 23B | 3,3'-Dichlorobenzidine                           | 50                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 24B | Diethyl Phthalate                                | 20                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 25B | Dimethyl Phthalate                               | 20                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 26B | Di-N-Butyl Phthalate                             | 20                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 27B | 2,4-Dinitrotoluene                               | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 28B | 2,6-Dinitrotoluene                               | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 29B | Di-N-Octyl Phthalate                             | 20                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |
| 30B | 1,2-Diphenylhydrazine (as Azobenzene)            | 10                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |              |        |                      |            |              |                 |

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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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

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

\* Make copies of this table and check appropriate box.

\*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River) \_\_\_\_\_ )
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_) \_\_\_\_\_ )
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_) \_\_\_\_\_ )
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_) \_\_\_\_\_ )

|     | Pollutant Group 5 Base-Neutral Fraction Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        | 4. Units |                       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |      |              |              |        |                      |            |              |                 |
|-----|--|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|----------|-----------------------|---|---|------|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |  |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |          | c. Number of Analysis |   | Concentration   | Mass | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |  |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass     |                       |   |   |      |              |              |        |                      |            |              |                 |
| 31B | Fluoranthene                                     | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 32B | Fluorene   | 10                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 33B | Hexachlorobenzene                                | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 34B | Hexachlorobutadiene                              | 10                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 35B | Hexachlorocyclopentadiene                        | 10                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 36B | Hexachloroethane                                 | 10                                  | 5                              | 625                       | <5                 | N/A  | <5                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 37B | Indeno (1,2,3-cd) Pyrene                         | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 38B | Isophorone                                       | 10                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 39B | Naphthalene                                      | 10                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 40B | Nitrobenzene                                     | 10                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 41B | N-Nitrosodimethylamine                           | 20                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 42B | N-Nitrosodi-N-Propylamine                        | 20                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 43B | N-Nitrosodiphenylamine                           | 20                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 44B | Phenanthrene                                     | 10                                  | 3                              | 625                       | <3                 | N/A  | <3                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 45B | Pyrene   | 10                                  | 2                              | 625                       | <2                 | N/A  | <2                     | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |
| 46B | 1,2,4-Trichlorobenzene                           | 10                                  | 10                             | 625                       | <10                | N/A  | <10                    | N/A      | 3                     | µg/l  | N/A   |      |              |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

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

\* Make entries in this table and check appropriate box.

\*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements on the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results N/A

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River) \_\_\_\_\_ )
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_) \_\_\_\_\_ )
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_) \_\_\_\_\_ )
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_) \_\_\_\_\_ )

|     | Pollutant Group 6 Pesticides                    | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      |                       | 4. Units      |      | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|-----|---|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|     |   |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      | c. Number of Analysis | Concentration | Mass |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |   |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |      |   |   |              |        |                      |            |              |                 |
| 1P  | Aldrin  | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 2P  | Alpha BHC                                       | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 3P  | Beta BHC  | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 4P  | Gamma BHC                                       | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 5P  | Delta BHC                                       | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 6P  | Chlordane                                       | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 7P  | 4,4'-DDT  | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 8P  | 4,4'-DDE  | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 9P  | 4,4'-DDD  | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 10P | Dieldrin  | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 11P | Alpha-Endosulfan                                | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 12P | Beta-Endosulfan                                 | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 13P | Endosulfan Sulfate                              | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 14P | Endrin  | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 15P | Endrin Aldehyde                                 | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 16P | Heptachlor                                      | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 17P | Heptachlor Epoxide                              | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 25P | Toxaphene                                       | 10                                  |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
| 26P | Dioxin: 2, 3, 7, 8-Tetrachloro-dibenzo-P Dioxin |                                     |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
  - \* Make copies of this table and check appropriate box.
  - \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 7 PCBs | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      | c. Number of Analysis | 4. Units      |      | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |      |              |               |        |                       |            |              |                 |
|-----|------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|------|---|---|------|--------------|---------------|--------|-----------------------|------------|--------------|-----------------|
|     |                        |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      |                       | Concentration | Mass |   | Concentration   | Mass | Raw Material | Manu-factured | Stored | Inter-mediate Product | By-Product | Intake Water | Other (Explain) |
|     |                        |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |      |   |   |      |              |               |        |                       |            |              |                 |
| 18P | PCB-1242               | 20                                  | 0.2                            | 608                       | <0.2               | N/A  | <0.2                   | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |               |        |                       |            |              |                 |
| 19P | PCB-1254               | 20                                  | 0.2                            | 608                       | <0.2               | N/A  | <0.2                   | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |               |        |                       |            |              |                 |
| 20P | PCB-1221               | 20                                  | 0.2                            | 608                       | <0.2               | N/A  | <0.2                   | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |               |        |                       |            |              |                 |
| 21P | PCB-1232               | 20                                  | 0.2                            | 608                       | <0.2               | N/A  | <0.2                   | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |               |        |                       |            |              |                 |
| 22P | PCB-1248               | 20                                  | 0.2                            | 608                       | <0.2               | N/A  | <0.2                   | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |               |        |                       |            |              |                 |
| 23P | PCB-1260               | 20                                  | 0.2                            | 608                       | <0.2               | N/A  | <0.2                   | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |               |        |                       |            |              |                 |
| 24P | PCB-1016               | 20                                  | 0.2                            | 608                       | <0.2               | N/A  | <0.2                   | N/A  | 3                     | µg/l          | N/A  |   |   |      |              |               |        |                       |            |              |                 |
|     |                        |                                     |                                |                           |                    |      |                        |      |                       |               |      |   |   |      |              |               |        |                       |            |              |                 |
|     |                        |                                     |                                |                           |                    |      |                        |      |                       |               |      |   |   |      |              |               |        |                       |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.  
 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.  
 \* Make copies of this table and check appropriate box.  
 \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source Susquehanna River) \_\_\_\_\_ )
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_) \_\_\_\_\_ )
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_) \_\_\_\_\_ )
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_) \_\_\_\_\_ )

|    | Pollutant Group 8 Radioactivity    | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      |                       | 4. Units      |      | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|----|------------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|    |                                    |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      | c. Number of Analysis | Concentration | Mass |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|    |                                    |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |      |   |   |              |        |                      |            |              |                 |
| 1R | Radioactivity:<br>(1) Alpha, Total | Not Available                       |                                | Note 1                    | <2                 | N/A  | <2                     | N/A  | 3                     | pCi/l         | N/A  |   |   |              |        |                      |            |              |                 |
| 2R | (2) Beta, Total                    | " "                                 |                                | Note 1                    | <4                 | N/A  | <3                     | N/A  | 3                     | pCi/l         | N/A  |   |   |              |        |                      |            |              |                 |
| 3R | (3) Radium, Total                  | " "                                 |                                | Note 1                    | <3                 | N/A  | <2                     | N/A  | 3                     | pCi/l         | N/A  |   |   |              |        |                      |            |              |                 |
| 4R | (4) Radium 226, Total              | " "                                 |                                | Note 1                    | 0.72               | N/A  | 0.58                   | N/A  | 3                     | pCi/l         | N/A  |   |   |              |        |                      |            |              |                 |
|    |                                    |                                     |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
|    |                                    |                                     |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
- \* Make copies of this table and check appropriate box.
- \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

Note 1- Procedures used are from Teledyne Brown Engineering are attached.

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**OUTFALL 071**  
**COOLING TOWER BLOWDOWN NOTES**

1. Cooling Tower Blowdown, Outfall 071 samples were collected over three 24-hour periods between March and June 1999. One set of samples was collected during an unscheduled one-unit outage in March. Blowdown flows were 5,568 MGD during this outage and 11,952 MGD and 13,068 MGD respectively for the other two sampling events. Sample results for parameters having the highest concentrations in the March sample are listed under Maximum Daily Value for both concentration and mass. It is possible that the Maximum Daily Value for mass for this sample could be lower than the average mass value (lbs./day) of all three samples since the daily discharge in March was less than one half of the discharge for the other two sampling events.
2. See comments on Susquehanna River Intake parameters for 15C, 16C, 19C, 21C, 5M, 16M, 21M, and 22M.

SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown Flows= 5.568MGD, 11.952MGD, & 13.068MGD
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | 1. POLLUTANT GROUP 1           | 2. LEVEL PRESENT       |                 |  |          |  |          | 3. UNITS           |                  | 4. Coefficient of Effluent Variability (CV) |         |
|-----|--------------------------------|------------------------|-----------------|--|----------|--|----------|--------------------|------------------|---|---------|
|     |                                | a. Maximum Daily Value |                 | b. Maximum 30-Day Value (if available) |          | c. Long-Term Avg. Value (if available) |          | d. No. of Analyses | a. Concentration |   | b. Mass |
|     |                                | (1) Concentration      | (2) Mass        | (1) Concentration                      | (2) Mass | (1) Concentration                      | (2) Mass |                    |                  |   |         |
| 1C  | Biochemical Oxygen Demand, BOD | 7                      | 325.06          |  |          | 6                                      | 492.46   | 3                  | mg/l             | lbs/d                                       |         |
| 2C  | Chemical Oxygen Demand, COD    | 40                     | 3987.19         |  |          | 31                                     | 2670.70  | 3                  | mg/l             | lbs/d                                       |         |
| 3C  | Total Organic Carbon, TOC      | 8.7                    | 404.00          |  |          | 8.53                                   | 723.19   | 3                  | mg/l             | lbs/d                                       |         |
| 4C  | Total Suspended Solids, TSS    | 53                     | 5283.02         |  |          | 32.61                                  | 2916.26  | 3                  | mg/l             | lbs/d                                       |         |
| 5C  | Total Dissolved Solids, TDS    | 1440                   | 156941.45       |  |          | 765.33                                 | 74615.11 | 3                  | mg/l             | lbs/d                                       |         |
| 6C  | Ammonia as N                   | <0.1                   | <10.90          |  |          | <0.1                                   | <8.50    | 3                  | mg/l             | lbs/d                                       |         |
| 7C  | Oil and Grease                 | <2                     | <217.97         |  |          | <2                                     | <170.07  | 3                  | mg/l             | lbs/d                                       |         |
| 8C  | Bromide                        | <2                     | <92.87          |  |          | <1.37                                  | <104.77  | 3                  | mg/l             | lbs/d                                       |         |
| 9C  | Chlorine, Total Residual       | <0.05                  | <5.45           |  |          | <0.05                                  | <4.25    | 3                  | mg/l             | lbs/d                                       |         |
| 10C | Temperature winter             | 25 Value               |                 | Value                                  |          | 25 Value                               |          | 1                  | (°C)             | (°C)  | (°C)    |
| 11C | Temperature summer             | 25 Value               |                 | Value                                  |          | 21.75 Value                            |          | 2                  | (°C)             | (°C)  | (°C)    |
| 12C | pH                             | 8.66<br>Minimum        | 8.77<br>Maximum |  |          |  |          | 3                  | standard units   | standard units                              |         |

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

2.b. Maximum 30-Day Value - Determine the average of all daily values during each calendar month and report the highest average.

2.c. Long Term Average Value - The average of all values within the last year and report both mass and concentration.

2.d. Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

| Pollutant Group 2                  | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |          |                        |          |                       | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|------------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|----------|------------------------|----------|-----------------------|---------------|-------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|                                    |                                     |                                |                           | a. Max Daily Value |          | b. Average of Analyses |          | c. Number of Analysis | Concentration | Mass  |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|                                    |                                     |                                |                           | Concentration      | Mass     | Concentration          | Mass     |                       |               |       |   |   |              |        |                      |            |              |                 |
| 13C Color                          |                                     |                                | 110.2                     | 30                 | N/A      | 26.67                  | N/A      | 3                     | c.u.          | N/A   |   |   |              |        |                      |            |              |                 |
| 14C Fecal Coliform                 |                                     |                                | 9222D                     | 24                 | N/A      | 8.67                   | N/A      | 3                     | #/100ml       | N/A   |   |   |              |        |                      |            |              |                 |
| 15C Fluoride                       | 100                                 | 50                             | 300.0                     | 330                | 35.97    | 243.33                 | 22.09    | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 16C Nitrate-Nitrite (as N)         |                                     |                                | 300.0                     | 2340               | 108.66   | 1940                   | 157.96   | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 17C Nitrogen, Total Organic (as N) |                                     |                                | Calculation               | 1510               | 150.52   | <666.67                | <101.98  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 18C Phosphorus (as P), Total       |                                     |                                | 365.1                     | 850                | 84.73    | 603.33                 | 52.49    | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 19C Sulfate (as SO <sub>4</sub> )  | 1,000                               | 500                            | 300.0                     | 215,000            | 23432.23 | 122033.3               | 11908.41 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 20C Sulfide (as S)                 | 1,000                               | 1,000                          | 376.1                     | 3000               | 299.04   | <1666.67               | <151.49  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 21C Sulfite (as SO <sub>3</sub> )  | 2,000                               | 2,000                          | 377.1                     | <4000              | <398.72  | <2666.67               | <236.52  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 22C Surfactants (MBAS)             | 25                                  | 25                             | 5540C                     | 83                 | 8.27     | 54                     | 4.90     | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| — Total Kjeldahl-Nitrogen          |                                     | 1,000                          | 351.4                     | 1,200              | 119.62   | <1,067                 | 90.73    | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
  - \* Make copies of this table and check appropriate box.
  - \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for optional analyses or the need for establishing a large number of effluent limits and/or monitoring requirements on the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2 (continued) | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |        |                        |        |                       | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|-----|-------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|--------|------------------------|--------|-----------------------|---------------|-------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|     |                               |                                     |                                |                           | a. Max Daily Value |        | b. Average of Analyses |        | c. Number of Analysis | Concentration | Mass  |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |                               |                                     |                                |                           | Concentration      | Mass   | Concentration          | Mass   |                       |               |       |   |   |              |        |                      |            |              |                 |
| 1M  | Antimony, Total               | 200                                 | 10                             | 200.7                     | <10                | <1.09  | <10                    | <0.85  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 2M  | Arsenic, Total                | 50                                  | 3                              | 200.7                     | <3                 | <0.33  | <3                     | <0.26  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 3M  | Beryllium, Total              | 5                                   | 2                              | 200.7                     | <2                 | <0.22  | <2                     | <0.17  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 4M  | Cadmium, Total                | 5                                   | 1                              | 200.7                     | <2                 | <0.22  | <2                     | <0.17  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 5M  | Chromium, Total               | 50                                  | 3                              | 200.7                     | <3                 | <0.33  | <3                     | <0.26  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 5M  | Chromium, Hexavalent          | 10                                  | 10                             | 3500D                     | <20                | <2.18  | <16.67                 | <1.55  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 6M  | Copper, Total                 | 20                                  | 10                             | 200.7                     | 20                 | 2.18   | 16.67                  | 1.55   | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 7M  | Lead, Total                   | 100                                 | 3                              | 200.7                     | 4                  | 0.19   | <3.33                  | <0.27  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 8M  | Mercury, Total                | 0.2                                 | 0.5                            | 245.1                     | <0.5               | <0.023 | <0.3                   | <0.022 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 9M  | Nickel, Total                 | 40                                  | 20                             | 200.7                     | <20                | <2.18  | <20                    | <1.70  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 10M | Selenium, Total               | 75                                  | 10                             | 200.7                     | <10                | <1.09  | <10                    | <0.85  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 11M | Silver, Total                 | 10                                  | 1                              | 200.7                     | <1                 | <0.12  | <1                     | <0.09  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 12M | Thallium, Total               | 100                                 | 10                             | 200.7                     | <10                | <1.09  | <10                    | <0.85  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 13M | Zinc, Total                   | 5                                   | 10                             | 200.7                     | 20                 | 1.99   | 16.67                  | 1.34   | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 14M | Cyanide, Total                | 20                                  | 5                              | 335.3                     | <5                 | <0.54  | <5                     | <0.42  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 14M | Cyanide, Free                 | 5                                   | 5                              | 4500I                     | <5                 | <0.54  | <5                     | <0.42  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
- \* Make copies of this table and check appropriate box.
- \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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**SECTION C - (continued)**

**III. REQUIRED AND OPTIONAL ANALYSES**

**3. Analyses Results**

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2 (continued) | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |       |                        |        |                       | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|-----|-------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|-------|------------------------|--------|-----------------------|---------------|-------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|     |                               |                                     |                                |                           | a. Max Daily Value |       | b. Average of Analyses |        | c. Number of Analysis | Concentration | Mass  |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |                               |                                     |                                |                           | Concentration      | Mass  | Concentration          | Mass   |                       |               |       |   |   |              |        |                      |            |              |                 |
| 15M | Phenols, Total                | 5                                   | 10                             | 420.2                     | <10                | 1.0   | <10                    | <0.85  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 16M | Aluminum, Total               | 100                                 | 150                            | 200.7                     | 700                | 32.51 | 353.33                 | 59.53  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 17M | Barium, Total                 | 100                                 | 10                             | 200.7                     | 10                 | 1.09  | 10                     | 0.85   | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 18M | Boron, Total                  | 100                                 | 20                             | 200.7                     | 150                | 16.35 | <90                    | <12.76 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 19M | Cobalt, Total                 | 50                                  | 3                              | 200.7                     | <3                 | <0.33 | <3                     | <0.26  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 20M | Iron, Total                   | 30                                  | 30                             | 200.7                     | 1960               | 91.02 | 1486.67                | 166.67 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 21M | Iron, Dissolved               | 30                                  | 60                             | 200.7                     | 300                | 13.93 | 186.67                 | 25.51  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 22M | Magnesium, Total              | 30                                  | 50                             | 200.7                     | 37,000             | 4,033 | 22,333                 | 3,146  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 23M | Molybdenum, Total             | 100                                 | 10                             | 200.7                     | 36                 | 3.92  | <18.67                 | <3.06  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 24M | Manganese, Total              | 10                                  | 3                              | 200.7                     | 230                | 25.07 | 187.33                 | 19.56  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 25M | Tin, Total                    | 800                                 | 10                             | 200.7                     | 10                 | 1.09  | <10                    | <0.85  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 26M | Titanium, Total               | 400                                 | 10                             | 200.7                     | <10                | <1.09 | <10                    | <0.85  | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.  
 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.  
 \* Make copies of this table and check appropriate box.  
 \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the need for establishing a large number of effluent limits and/or monitoring requirements on the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 3<br>Volatile Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |       |                        |       | c. Number of Analysis | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |      |              |              |        |                      |            |              |                 |
|-----|--|-------------------------------------|--------------------------------|---------------------------|--------------------|-------|------------------------|-------|-----------------------|---------------|-------|---|---|------|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |  |                                     |                                |                           | a. Max Daily Value |       | b. Average of Analyses |       |                       | Concentration | Mass  |   | Concentration   | Mass | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |  |                                     |                                |                           | Concentration      | Mass  | Concentration          | Mass  |                       |               |       |   |   |      |              |              |        |                      |            |              |                 |
| 1V  | Acrolein                               | 10                                  | 20                             | 624                       | <20                | <2.18 | <20                    | <1.70 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 2V  | Acrylonitrile                          | 10                                  | 10                             | 624                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 3V  | Benzene                                | 10                                  | 1                              | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 5V  | Bromoform                              | 10                                  | 1                              | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 6V  | Carbon Tetrachloride                   | 10                                  | 1                              | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 7V  | Chlorobenzene                          | 10                                  | 1                              | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 8V  | Chlorodibromomethane                   | 10                                  | 1                              | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 9V  | Chloroethane                           | 10                                  | 2                              | 624                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 10V | 2-Chloroethylvinyl Ether               | 10                                  | 5                              | 624                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 11V | Chloroform                             | 10                                  | 1                              | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 12V | Dichlorobromomethane                   | 10                                  | 1                              | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 14V | 1,1-Dichloroethane                     | 10                                  | 1                              | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 15V | 1,2-Dichloroethane                     | 10                                  | 2                              | 624                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 16V | 1,1-Dichloroethylene                   | 10                                  | 1                              | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 17V | 1,2-Dichloropropane                    | 10                                  | 2                              | 624                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 18V | 1,3-Dichloropropylene                  | 10                                  | 2                              | 624                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 19V | Ethylbenzene                           | 10                                  | 1                              | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.  
 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.  
 \* Make copies of this table and check appropriate box.  
 \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 3<br>Volatile Organics<br>(continued) | Acceptable Detection Level**<br>(µg/l) | 1. Detection Level Used<br>(µg/l) | 2. EPA Method Number Used | 3. Level Present   |       |                        |       | c. Number of Analysis | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|-----|---|--|-----------------------------------|---------------------------|--------------------|-------|------------------------|-------|-----------------------|---------------|-------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|     |   |  |                                   |                           | a. Max Daily Value |       | b. Average of Analyses |       |                       | Concentration | Mass  |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |   |  |                                   |                           | Concentration      | Mass  | Concentration          | Mass  |                       |               |       |   |   |              |        |                      |            |              |                 |
| 20V | Methyl Bromide  | 10                                     | 3                                 | 624                       | <3                 | <0.33 | <3                     | <0.26 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 21V | Methyl Chloride                                       | 10                                     | 3                                 | 624                       | <3                 | <0.33 | <3                     | <0.26 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 22V | Methylene Chloride                                    | 10                                     | 2                                 | 624                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 23V | 1,1,2,2-Tetrachloroethane                             | 10                                     | 1                                 | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 24V | Tetrachloroethylene                                   | 10                                     | 1                                 | 324                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 25V | Toluene   | 10                                     | 1                                 | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 26V | 1,2-Trans-Dichloroethylene                            | 10                                     | 1                                 | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 27V | 1,1,1-Trichloroethane                                 | 10                                     | 1                                 | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 28V | 1,1,2-Trichloroethane                                 | 10                                     | 2                                 | 624                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 29V | Trichloroethylene                                     | 10                                     | 1                                 | 624                       | <1                 | <0.12 | <1                     | <0.09 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 31V | Vinyl Chloride  | 10                                     | 2                                 | 624                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.  
 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.  
 \* Make copies of this table and check appropriate box.  
 \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number \_\_\_\_\_
- Intake Sampling Results - Optional (Specify Source 071, Cooling Tower Blowdown) )
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_) )
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_) )
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_) )

|     | Pollutant Group 4 Acid-Fraction Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |       |                        |       |                       | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|-----|--|-------------------------------------|--------------------------------|---------------------------|--------------------|-------|------------------------|-------|-----------------------|---------------|-------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|     |  |                                     |                                |                           | a. Max Daily Value |       | b. Average of Analyses |       | c. Number of Analysis | Concentration | Mass  |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |  |                                     |                                |                           | Concentration      | Mass  | Concentration          | Mass  |                       |               |       |   |   |              |        |                      |            |              |                 |
| 1A  | 2-Chlorophenol                           | 10                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 2A  | 2,4-Dichlorophenol                       | 10                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 3A  | 2,4-Dimethylphenol                       | 10                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 4A  | 4,6-Dinitro-o-Cresol                     | 10                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 5A  | 2,4-Dinitrophenol                        | 50                                  | 15                             | 625                       | <15                | <1.63 | <15                    | <1.27 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 6A  | 2-Nitrophenol                            | 10                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 7A  | 4-Nitrophenol                            | 50                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 8A  | P-Chloro-m-Cresol                        | 10                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 9A  | Pentachlorophenol                        | 50                                  | 25                             | 625                       | <25                | <2.72 | <25                    | <2.12 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 10A | Phenol                                   | 10                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 11A | 2,4,6-Trichlorophenol                    | 10                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
- \* Make copies of this table and check appropriate box.
- \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 5<br>Base-Neutral Fraction Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |       |                        |       | c. Number of Analysis | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |      |              |              |        |                      |            |              |                 |
|-----|---|-------------------------------------|--------------------------------|---------------------------|--------------------|-------|------------------------|-------|-----------------------|---------------|-------|---|---|------|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |   |                                     |                                |                           | a. Max Daily Value |       | b. Average of Analyses |       |                       | Concentration | Mass  |   | Concentration   | Mass | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |   |                                     |                                |                           | Concentration      | Mass  | Concentration          | Mass  |                       |               |       |   |   |      |              |              |        |                      |            |              |                 |
| 1B  | Acenaphthene  | 10                                  | 3                              | 625                       | <3                 | <0.33 | <3                     | <0.26 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 2B  | Acenaphthylene                                      | 10                                  | 3                              | 625                       | <3                 | <0.33 | <3                     | <0.26 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 3B  | Anthracene  | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 4B  | Benzidine   | 50                                  | 20                             | 625                       | <20                | <2.18 | <20                    | <1.70 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 5B  | Benzo (a) Anthracene                                | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 6B  | Benzo (a) Pyrene                                    | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 7B  | 3,4-Benzo-fluoranthene                              | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 8B  | Benzo (ghi) Perylene                                | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 9B  | Benzo (k) Fluoranthene                              | 10                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 10B | Bis (2-Chloro-ethoxy) Methane                       | 10                                  | 3                              | 625                       | <3                 | <0.33 | <3                     | <0.26 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 11B | Bis (2-Chloro-ethyl) Ether                          | 10                                  | 3                              | 625                       | <3                 | <0.33 | <3                     | <0.26 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 12B | Bis (2-Chloro-isopropyl) Ether                      | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 13B | Bis (2-Ethyl-hexyl) Phthalate                       | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |
| 14B | 4-Bromophenyl Phenyl Ether                          | 10                                  | 3                              | 625                       | <3                 | <0.33 | <3                     | <0.26 | 3                     | µg/l          | lbs/d |   |   |      |              |              |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility Influent, Intake water and background.
- \* Make copies of this table and check appropriate box.
- \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

| Pollutant Group 5<br>Base-Neutral Fraction Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |       |                        |       |                       |               | 4. Units |              | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |        |                      |            |              |                 |
|---|-------------------------------------|--------------------------------|---------------------------|--------------------|-------|------------------------|-------|-----------------------|---------------|----------|--------------|---|---|--------|----------------------|------------|--------------|-----------------|
|   |                                     |                                |                           | a. Max Daily Value |       | b. Average of Analyses |       | c. Number of Analysis | Concentration | Mass     | Raw Material |   | Manufactured  | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|   |                                     |                                |                           | Concentration      | Mass  | Concentration          | Mass  |                       |               |          |              |   |   |        |                      |            |              |                 |
| 15B Butyl Benzyl Phthalate                          | 10                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 16B 2-Chloronaphthalene                             | 10                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 17B 4-Chlorophenyl Phenyl Ether                     | 10                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 18B Chrysene  | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 19B Dibenzo (a, h) Anthracene                       | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 20B 1,2-Dichlorobenzene                             | 10                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 21B 1,3-Dichlorobenzene                             | 10                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 22B 1,4-Dichlorobenzene                             | 10                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 23B 3,3'-Dichlorobenzidine                          | 50                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 24B Diethyl Phthalate                               | 20                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 25B Dimethyl Phthalate                              | 20                                  | 10                             | 625                       | <10                | <1.09 | <10                    | <0.85 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 26B Di-N-Butyl Phthalate                            | 20                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 27B 2,4-Dinitrotoluene                              | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 28B 2,6-Dinitrotoluene                              | 10                                  | 2                              | 625                       | <2                 | <0.22 | <2                     | <0.17 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 29B Di-N-Octyl Phthalate                            | 20                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |
| 30B 1,2-Diphenylhydrazine (as Azobenzene)           | 10                                  | 5                              | 625                       | <5                 | <0.54 | <5                     | <0.42 | 3                     | µg/l          | lbs/d    |              |   |   |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
  - \* Make copies of this table and check appropriate box.
  - \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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**SECTION C - (continued)**

**III. REQUIRED AND OPTIONAL ANALYSES\***

**3. Analyses Results**

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

| Pollutant Group 5<br>Base-Neutral Fraction Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      |                       | 4. Units      |      | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|---|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|   |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      | c. Number of Analysis | Concentration | Mass |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|   |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |      |   |   |              |        |                      |            |              |                 |
| 31B   | Fluoranthene                        | 10                             | 2                         | 625                | <2   | <0.22                  | <2   | <0.17                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 32B   | Fluorene                            | 10                             | 3                         | 625                | <3   | <0.33                  | <3   | <0.26                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 33B   | Hexachlorobenzene                   | 10                             | 2                         | 625                | <2   | <0.22                  | <2   | <0.17                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 34B   | Hexachlorobutadiene                 | 10                             | 5                         | 625                | <5   | <0.54                  | <5   | <0.42                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 35B   | Hexachlorocyclopentadiene           | 10                             | 10                        | 625                | <10  | <1.09                  | <10  | <0.85                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 36B   | Hexachloroethane                    | 10                             | 5                         | 625                | <5   | <0.54                  | <5   | <0.42                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 37B   | Indeno (1,2,3-cd) Pyrene            | 10                             | 2                         | 625                | <2   | <0.22                  | <2   | <0.17                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 38B   | Isophorone                          | 10                             | 3                         | 625                | <3   | <0.33                  | <3   | <0.26                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 39B   | Naphthalene                         | 10                             | 3                         | 625                | <3   | <0.33                  | <3   | <0.26                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 40B   | Nitrobenzene                        | 10                             | 3                         | 625                | <3   | <0.33                  | <3   | <0.26                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 41B   | N-Nitrosodimethylamine              | 20                             | 3                         | 625                | <3   | <0.33                  | <3   | <0.26                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 42B   | N-Nitrosodi-N-Propylamine           | 20                             | 3                         | 625                | <3   | <0.33                  | <3   | <0.26                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 43B   | N-Nitrosodiphenylamine              | 20                             | 3                         | 625                | <3   | <0.33                  | <3   | <0.26                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 44B   | Phenanthrene                        | 10                             | 3                         | 625                | <3   | <0.33                  | <3   | <0.26                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 45B   | Pyrene                              | 10                             | 2                         | 625                | <2   | <0.22                  | <2   | <0.17                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |
| 46B   | 1,2,4-Trichlorobenzene              | 10                             | 5                         | 625                | <5   | <0.54                  | <5   | <0.42                 | 3             | µg/l | lbs/d                                       |   |              |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
- \* Make copies of this table and check appropriate box.
- \*\* It is in the permittee's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements on the final NPDES permit.

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SECT - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results **N/A**

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 6 Pesticides                    | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        | 4. Units |                       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |      |              |               |        |                       |            |              |                 |
|-----|---|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|----------|-----------------------|---|---|------|--------------|---------------|--------|-----------------------|------------|--------------|-----------------|
|     |   |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |          | c. Number of Analysis |   | Concentration   | Mass | Raw Material | Manu-factured | Stored | Inter-mediate Product | By-Product | Intake Water | Other (Explain) |
|     |   |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass     |                       |   |   |      |              |               |        |                       |            |              |                 |
| 1P  | Aldrin  | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 2P  | Alpha BHC                                       | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 3P  | Beta BHC  | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 4P  | Gamma BHC                                       | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 5P  | Delta BHC                                       | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 6P  | Chlordane                                       | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 7P  | 4,4'-DDT  | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 8P  | 4,4'-DDE  | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 9P  | 4,4'-DDD  | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 10P | Dieldrin  | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 11P | Alpha-Endosulfan                                | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 12P | Beta-Endosulfan                                 | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 13P | Endosulfan Sulfate                              | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 14P | Endrin  | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 15P | Endrin Aldehyde                                 | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 16P | Heptachlor                                      | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 17P | Heptachlor Epoxide                              | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 25P | Toxaphene                                       | 10                                  |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |
| 26P | Dioxin: 2, 3, 7, 8-Tetrachloro-dibenzo-P Dioxin |                                     |                                |                           |                    |      |                        |          |                       |   |   |      |              |               |        |                       |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.  
 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.  
 \* Make copies of this table and check appropriate box.  
 \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 7 PCBs | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |        |                        |        |                       | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|-----|------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|--------|------------------------|--------|-----------------------|---------------|-------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|     |                        |                                     |                                |                           | a. Max Daily Value |        | b. Average of Analyses |        | c. Number of Analyses | Concentration | Mass  |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |                        |                                     |                                |                           | Concentration      | Mass   | Concentration          | Mass   |                       |               |       |   |   |              |        |                      |            |              |                 |
| 18P | PCB-1242               | 20                                  | 0.2                            | 608                       | <0.2               | <0.022 | <0.2                   | <0.016 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 19P | PCB-1254               | 20                                  | 0.2                            | 608                       | <0.2               | <0.022 | <0.2                   | <0.016 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 20P | PCB-1221               | 20                                  | 0.2                            | 608                       | <0.2               | <0.022 | <0.2                   | <0.016 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 21P | PCB-1232               | 20                                  | 0.2                            | 608                       | <0.2               | <0.022 | <0.2                   | <0.016 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 22P | PCB-1248               | 20                                  | 0.2                            | 608                       | <0.2               | <0.022 | <0.2                   | <0.016 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 23P | PCB-1260               | 20                                  | 0.2                            | 608                       | <0.2               | <0.022 | <0.2                   | <0.016 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 24P | PCB-1016               | 20                                  | 0.2                            | 608                       | <0.2               | <0.022 | <0.2                   | <0.016 | 3                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
|     |                        |                                     |                                |                           |                    |        |                        |        |                       |               |       |   |   |              |        |                      |            |              |                 |
|     |                        |                                     |                                |                           |                    |        |                        |        |                       |               |       |   |   |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.  
 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.  
 \* Make copies of this table and check appropriate box.  
 \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 071, Cooling Tower Blowdown
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|    | Pollutant Group 8 Radioactivity    | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      |                       | 4. Units      |      | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|----|------------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|    |                                    |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      | c. Number of Analysis | Concentration | Mass |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|    |                                    |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |      |   |   |              |        |                      |            |              |                 |
| 1R | Radioactivity:<br>(1) Alpha, Total | Not Available                       |                                | Note 1                    | <5 E0              | N/A  | <3 E0                  | N/A  | 3                     | pCi/l         | N/A  |   |   |              |        |                      |            |              |                 |
| 2R | (2) Beta, Total                    | " "                                 |                                | Note 1                    | 7.2 E0             | N/A  | <3.3 E0                | N/A  | 3                     | pCi/l         | N/A  |   |   |              |        |                      |            |              |                 |
| 3R | (3) Radium, Total                  | " "                                 |                                | Note 1                    | <3 E0              | N/A  | <2.3 E0                | N/A  | 3                     | pCi/l         | N/A  |   |   |              |        |                      |            |              |                 |
| 4R | (4) Radium 226, Total              | " "                                 |                                | Note 1                    | 1.7 E0             | N/A  | <7.7 E-1               | N/A  | 3                     | pCi/l         | N/A  |   |   |              |        |                      |            |              |                 |
|    |                                    |                                     |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |
|    |                                    |                                     |                                |                           |                    |      |                        |      |                       |               |      |   |   |              |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
  - \* Make copies of this table and check appropriate box.
  - \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

Note 1 -- Procedures used are from Teledyne Brown Engineering. Procedures precede Intake sampling results.

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**OUTFALL 072, SERVICE AND ADMINISTRATION  
BUILDING LOW VOLUME SUMP NOTES**

No comments

000132



SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 072, Service and Administration Building Low Volume Waste Sump Flow=0.01MGD
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | 1. POLLUTANT GROUP 1           | 2. LEVEL PRESENT       |                 |  |          |  |          | 3. UNITS           |                  | 4. Coefficient of Effluent Variability (CV) |         |
|-----|--------------------------------|------------------------|-----------------|--|----------|--|----------|--------------------|------------------|---|---------|
|     |                                | a. Maximum Daily Value |                 | b. Maximum 30-Day Value (if available) |          | c. Long-Term Avg. Value (if available) |          | d. No. of Analyses | a. Concentration |   | b. Mass |
|     |                                | (1) Concentration      | (2) Mass        | (1) Concentration                      | (2) Mass | (1) Concentration                      | (2) Mass |                    |                  |   |         |
| 1C  | Biochemical Oxygen Demand, BOD |                        |                 |  |          |  |          |                    |                  |   |         |
| 2C  | Chemical Oxygen Demand, COD    | <15                    | <1.25           |  |          | <15                                    | <1.25    | 1                  | mg/l             | lbs/d                                       |         |
| 3C  | Total Organic Carbon, TOC      | 2.5                    | 0.21            |  |          | 2.5                                    | 0.21     | 1                  | mg/l             | lbs/d                                       |         |
| 4C  | Total Suspended Solids, TSS    | 5                      | 0.42            |  |          | 5                                      | 0.42     | 1                  | mg/l             | lbs/d                                       |         |
| 5C  | Total Dissolved Solids, TDS    | 210                    | 17.51           |  |          | 210                                    | 17.51    | 1                  | mg/l             | lbs/d                                       |         |
| 6C  | Ammonia as N                   |                        |                 |  |          |  |          |                    |                  |   |         |
| 7C  | Oil and Grease                 | <2                     | <0.17           |  |          | <2                                     | <0.17    | 1                  | mg/l             | lbs/d                                       |         |
| 8C  | Bromide                        |                        |                 |  |          |  |          |                    |                  |   |         |
| 9C  | Chlorine, Total Residual       |                        |                 |  |          |  |          |                    |                  |   |         |
| 10C | Temperature winter             | Value                  |                 | Value                                  |          | Value                                  |          |                    | (°C)             | (°C)  | (°C)    |
| 11C | Temperature summer             | Value                  |                 | Value                                  |          | Value                                  |          |                    | (°C)             | (°C)  | (°C)    |
| 12C | pH                             | 7.38<br>Minimum        | 7.87<br>Maximum | X                                      | X        | X                                      | X        | 4                  | standard units   | standard units                              |         |

- 2.a. Maximum Daily Value - Report the **highest** daily value or daily average from the last year of data. Report both mass and concentration.
- 2.b. Maximum 30-Day Value - Determine the average of all daily values during each calendar month and report the highest average.
- 2.c. Long Term Average Value - The average of all values within the last year and report both mass and concentration.
- 2.d. Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 072, Service and Administrative Building Low Volume Waste Sump
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2              | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |       |                        |       | 4. Units              |               | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |              |        |                      |            |              |                 |
|-----|--------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|-------|------------------------|-------|-----------------------|---------------|---|---|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |                                |                                     |                                |                           | a. Max Daily Value |       | b. Average of Analyses |       | c. Number of Analysis | Concentration |   | Mass  | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |                                |                                     |                                |                           | Concentration      | Mass  | Concentration          | Mass  |                       |               |   |   |              |              |        |                      |            |              |                 |
| 13C | Color                          |                                     |                                |                           |                    |       |                        |       |                       |               |   |   |              |              |        |                      |            |              |                 |
| 14C | Fecal Coliform                 |                                     |                                |                           |                    |       |                        |       |                       |               |   |   |              |              |        |                      |            |              |                 |
| 15C | Fluoride                       | 100                                 |                                |                           |                    |       |                        |       |                       |               |   |   |              |              |        |                      |            |              |                 |
| 16C | Nitrate-Nitrite (as N)         |                                     | 100                            | 353.2                     | 390                | 32.53 | 390                    | 32.53 | 1                     | µg/l          | lbs/d                                       |   |              |              |        |                      |            |              |                 |
| 17C | Nitrogen, Total Organic (as N) |                                     |                                |                           |                    |       |                        |       |                       |               |   |   |              |              |        |                      |            |              |                 |
| 18C | Phosphorus (as P), Total       |                                     |                                |                           |                    |       |                        |       |                       |               |   |   |              |              |        |                      |            |              |                 |
| 19C | Sulfate (as SO <sub>4</sub> )  | 1,000                               |                                |                           |                    |       |                        |       |                       |               |   |   |              |              |        |                      |            |              |                 |
| 20C | Sulfide (as S)                 | 1,000                               |                                |                           |                    |       |                        |       |                       |               |   |   |              |              |        |                      |            |              |                 |
| 21C | Sulfite (as SO <sub>3</sub> )  | 2,000                               |                                |                           |                    |       |                        |       |                       |               |   |   |              |              |        |                      |            |              |                 |
| 22C | Surfactants (MBAS)             | 25                                  |                                |                           |                    |       |                        |       |                       |               |   |   |              |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

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

\* Make copies of this table and check appropriate box.

\*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 072, Service and Administration Building Low Volume Waste Sump
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2 (continued) | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |       |                        |       |                       | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|-----|-------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|-------|------------------------|-------|-----------------------|---------------|-------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|     |                               |                                     |                                |                           | a. Max Daily Value |       | b. Average of Analyses |       | c. Number of Analysis | Concentration | Mass  |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |                               |                                     |                                |                           | Concentration      | Mass  | Concentration          | Mass  |                       |               |       |   |   |              |        |                      |            |              |                 |
| 1M  | Antimony, Total               | 200                                 |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 2M  | Arsenic, Total                | 50                                  |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 3M  | Beryllium, Total              | 5                                   |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 4M  | Cadmium, Total                | 5                                   |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 5M  | Chromium, Total               | 50                                  | 5                              | 200.7                     | <5                 | <0.42 | <5                     | <0.42 | 1                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 5M  | Chromium, Hexavalent          | 10                                  | 10                             | 3500D                     | <10                | <0.83 | <10                    | <0.83 | 1                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 6M  | Copper, Total                 | 20                                  |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 7M  | Lead, Total                   | 100                                 |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 8M  | Mercury, Total                | 0.2                                 |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 9M  | Nickel, Total                 | 40                                  |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 10M | Selenium, Total               | 75                                  |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 11M | Silver, Total                 | 10                                  |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 12M | Thallium, Total               | 100                                 |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 13M | Zinc, Total                   | 5                                   |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 14M | Cyanide, Total                | 20                                  |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 14M | Cyanide, Free                 | 5                                   |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
- \* Make copies of this table and check appropriate box.
- \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 072, Service and Administration Building Low Volume Waste Sump
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2 (continued) | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      | 4. Units              |               | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |              |        |                      |            |              |                 |
|-----|-------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|---|---|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |                               |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      | c. Number of Analysis | Concentration |   | Mass  | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |                               |                                     |                                |                           | Concentration      | Mass | Concentration          | Mass |                       |               |   |   |              |              |        |                      |            |              |                 |
| 15M | Phenols, Total                | 5                                   |                                |                           |                    |      |                        |      |                       |               |   |   |              |              |        |                      |            |              |                 |
| 16M | Aluminum, Total               | 100                                 |                                |                           |                    |      |                        |      |                       |               |   |   |              |              |        |                      |            |              |                 |
| 17M | Barium, Total                 | 100                                 |                                |                           |                    |      |                        |      |                       |               |   |   |              |              |        |                      |            |              |                 |
| 18M | Boron, Total                  | 100                                 | 50                             | 200.7                     | 60                 | 5.00 | 60                     | 5.00 | 1                     | µg/l          | lbs/d                                       |   |              |              |        |                      |            |              |                 |
| 19M | Cobalt, Total                 | 50                                  |                                |                           |                    |      |                        |      |                       |               |   |   |              |              |        |                      |            |              |                 |
| 20M | Iron, Total                   | 30                                  |                                |                           |                    |      |                        |      |                       |               |   |   |              |              |        |                      |            |              |                 |
| 21M | Iron, Dissolved               | 30                                  |                                |                           |                    |      |                        |      |                       |               |   |   |              |              |        |                      |            |              |                 |
| 22M | Magnesium, Total              | 30                                  |                                |                           |                    |      |                        |      |                       |               |   |   |              |              |        |                      |            |              |                 |
| 23M | Molybdenum, Total             | 100                                 | 10                             | 200.7                     | 12                 | 1.00 | 12                     | 1.00 | 1                     | µg/l          | lbs/d                                       |   |              |              |        |                      |            |              |                 |
| 24M | Manganese, Total              | 10                                  |                                |                           |                    |      |                        |      |                       |               |   |   |              |              |        |                      |            |              |                 |
| 25M | Tin, Total                    | 800                                 |                                |                           |                    |      |                        |      |                       |               |   |   |              |              |        |                      |            |              |                 |
| 26M | Titanium, Total               | 400                                 |                                |                           |                    |      |                        |      |                       |               |   |   |              |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.  
 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.  
 \* Make copies of this table and check appropriate box.  
 \*\* It is in applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the need for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

00013

**OUTFALL 073, UNIT 1 TURBINE  
BUILDING LOW VOLUME SUMP NOTES**

A sample was collected from Outfall 073 and not Outfall 074, Unit 2 Turbine Building Sump since their discharges are similar.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 073, Unit 1 Turbine Building Low Volume Sump Flow=0.0081MGD
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | 1. POLLUTANT GROUP 1           | 2. LEVEL PRESENT       |                 |  |          |  |          | 3. UNITS           |                  | 4. Coefficient of Effluent Variability (CV) |         |
|-----|--------------------------------|------------------------|-----------------|--|----------|--|----------|--------------------|------------------|---|---------|
|     |                                | a. Maximum Daily Value |                 | b. Maximum 30-Day Value (if available) |          | c. Long-Term Ave. Value (if available) |          | d. No. of Analyses | a. Concentration |   | b. Mass |
|     |                                | (1) Concentration      | (2) Mass        | (1) Concentration                      | (2) Mass | (1) Concentration                      | (2) Mass |                    |                  |   |         |
| 1C  | Biochemical Oxygen Demand, BOD |                        |                 |  |          |  |          |                    |                  |   |         |
| 2C  | Chemical Oxygen Demand, COD    | 41                     | 2.77            |  |          | 41                                     | 2.77     | 1                  | mg/l             | lbs/d                                       |         |
| 3C  | Total Organic Carbon, TOC      | 7.6                    | 0.51            |  |          | 7.6                                    | 0.51     | 1                  | mg/l             | lbs/d                                       |         |
| 4C  | Total Suspended Solids, TSS    | <5                     | <0.34           |  |          | <5                                     | <0.34    | 1                  | mg/l             | lbs/d                                       |         |
| 5C  | Total Dissolved Solids, TDS    | 711                    | 48.03           |  |          | 711                                    | 48.03    | 1                  | mg/l             | lbs/d                                       |         |
| 6C  | Ammonia as N                   |                        |                 |  |          |  |          |                    |                  |   |         |
| 7C  | Oil and Grease                 | <2                     | <0.14           |  |          | <2                                     | <0.14    | 1                  | mg/l             | lbs/d                                       |         |
| 8C  | Bromide                        |                        |                 |  |          |  |          |                    |                  |   |         |
| 9C  | Chlorine, Total Residual       |                        |                 |  |          |  |          |                    |                  |   |         |
| 10C | Temperature winter             | Value                  |                 | Value                                  |          | Value                                  |          |                    | (°C)             | (°C)  | (°C)    |
| 11C | Temperature summer             | Value                  |                 | Value                                  |          | Value                                  |          |                    | (°C)             | (°C)  | (°C)    |
| 12C | pH                             | 7.60<br>Minimum        | 7.87<br>Maximum | X                                      | X        | X                                      | X        | 4                  | standard units   | standard units                              |         |

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

2.b. Maximum 30-Day Value - Determine the average of all daily values during each calendar month and report the highest average.

2.c. Long Term Average Value - The average of all values within the last year and report both mass and concentration.

2.d. Minimum three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and receiving water.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 073, Unit 1 Turbine Building Low Volume Sump
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10. \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2              | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |      |                        |      | 4. Units              |               | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |                |        |                        |             |              |                 |
|-----|--------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|------|------------------------|------|-----------------------|---------------|---|---|--------------|----------------|--------|------------------------|-------------|--------------|-----------------|
|     |                                |                                     |                                |                           | a. Max Daily Value |      | b. Average of Analyses |      | c. Number of Analysis | Concentration |   | Mass  | Raw Material | Manu- factured | Stored | Inter- mediate Product | By- Product | Intake Water | Other (Explain) |
|     |                                |                                     |                                |                           | Concen- tration    | Mass | Concen- tration        | Mass |                       |               |   |   |              |                |        |                        |             |              |                 |
| 13C | Color                          |                                     |                                |                           |                    |      |                        |      |                       |               |   |   |              |                |        |                        |             |              |                 |
| 14C | Fecal Coliform                 |                                     |                                |                           |                    |      |                        |      |                       |               |   |   |              |                |        |                        |             |              |                 |
| 15C | Fluoride                       | 100                                 |                                |                           |                    |      |                        |      |                       |               |   |   |              |                |        |                        |             |              |                 |
| 16C | Nitrate-Nitrite (as N)         |                                     | 0.10                           | 353.2                     | 170                | 0.01 | 170                    | 0.01 | 1                     | µg/l          | lbs/d                                       |   |              |                |        |                        |             |              |                 |
| 17C | Nitrogen, Total Organic (as N) |                                     |                                |                           |                    |      |                        |      |                       |               |   |   |              |                |        |                        |             |              |                 |
| 18C | Phosphorus (as P), Total       |                                     |                                |                           |                    |      |                        |      |                       |               |   |   |              |                |        |                        |             |              |                 |
| 19C | Sulfate (as SO <sub>4</sub> )  | 1,000                               |                                |                           |                    |      |                        |      |                       |               |   |   |              |                |        |                        |             |              |                 |
| 20C | Sulfide (as S)                 | 1,000                               |                                |                           |                    |      |                        |      |                       |               |   |   |              |                |        |                        |             |              |                 |
| 21C | Sulfite (as SO <sub>3</sub> )  | 2,000                               |                                |                           |                    |      |                        |      |                       |               |   |   |              |                |        |                        |             |              |                 |
| 22C | Surfactants (MBAS)             | 25                                  |                                |                           |                    |      |                        |      |                       |               |   |   |              |                |        |                        |             |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.

Make copies of this table and check appropriate box.

It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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**OUTFALL 075**  
**PEACH STAND POND NOTES**

A sample was collected from Outfall 075 representing all three stormwater outfalls. The other outfalls are Outfall 070, S-2 Sedimentation Pond and Outfall 080, C-1 Pond.

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SECTION (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 075, Peach Stand Pond Stormwater Runoff Flow=0.279417MGD
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | 1. POLLUTANT GROUP 1           | 2. LEVEL PRESENT       |                 |  |          |  |          | 3. UNITS           |                  | 4. Coefficient of Effluent Variability (CV) |         |
|-----|--------------------------------|------------------------|-----------------|--|----------|--|----------|--------------------|------------------|---|---------|
|     |                                | a. Maximum Daily Value |                 | b. Maximum 30-Day Value (if available) |          | c. Long-Term Avg. Value (if available) |          | d. No. of Analyses | a. Concentration |   | b. Mass |
|     |                                | (1) Concentration      | (2) Mass        | (1) Concentration                      | (2) Mass | (1) Concentration                      | (2) Mass |                    |                  |   |         |
| 1C  | Biochemical Oxygen Demand, BOD | 4                      | 9.32            |  |          | 4                                      | 9.32     | 1                  | µg/l             | lbs/d                                       |         |
| 2C  | Chemical Oxygen Demand, COD    | <2                     | <4.66           |  |          | <2                                     | <4.66    | 1                  | µg/l             | lbs/d                                       |         |
| 3C  | Total Organic Carbon, TOC      |                        |                 |  |          |  |          |                    |                  |   |         |
| 4C  | Total Suspended Solids, TSS    | <1                     | <2.33           |  |          | <1                                     | <2.33    | 1                  | µg/l             | lbs/d                                       |         |
| 5C  | Total Dissolved Solids, TDS    |                        |                 |  |          |  |          |                    |                  |   |         |
| 6C  | Ammonia as N                   | 0.12                   | 0.28            |  |          | 0.12                                   | 0.28     | 1                  | µg/l             | lbs/d                                       |         |
| 7C  | Oil and Grease                 | <2                     | <4.66           |  |          | <2                                     | <4.66    | 1                  | µg/l             | lbs/d                                       |         |
| 8C  | Bromide                        |                        |                 |  |          |  |          |                    |                  |   |         |
| 9C  | Chlorine, Total Residual       | 0                      | 0               |  |          | 0                                      | 0        | 1                  | µg/l             | lbs/d                                       |         |
| 10C | Temperature winter             | Value                  |                 | Value                                  |          | Value                                  |          | 1                  | (°C)             | (°C)  | (°C)    |
| 11C | Temperature summer             | 15 Value               |                 | Value                                  |          | 15 Value                               |          | 1                  | (°C)             | (°C)  | (°C)    |
| 12C | pH                             | 7.67<br>Minimum        | 7.67<br>Maximum |  |          |  |          | 1                  | standard units   | standard units                              |         |

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- a. Maximum Daily Value - Report the **highest** daily value or daily average from the last year of data. Report both mass and concentration.
- b. Maximum 30-Day Value - Determine the average of all daily values during each calendar month and report the highest average.
- c. Long Term Average Value - The average of all values within the last year and report both mass and concentration.
- d. Minimum of three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and intake water.

SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 075, Peach Stand Pond Stormwater Runoff Flow=0.279417MGD
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2              | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |       |                        |       |                       | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |               |        |                       |            |              |                 |
|-----|--------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|-------|------------------------|-------|-----------------------|---------------|-------|---|---|---------------|--------|-----------------------|------------|--------------|-----------------|
|     |                                |                                     |                                |                           | a. Max Daily Value |       | b. Average of Analyses |       | c. Number of Analyses | Concentration | Mass  |   | Raw Material  | Manu-factured | Stored | Inter-mediate Product | By-Product | Intake Water | Other (Explain) |
|     |                                |                                     |                                |                           | Concentration      | Mass  | Concentration          | Mass  |                       |               |       |   |   |               |        |                       |            |              |                 |
| 13C | Color                          |                                     |                                |                           |                    |       |                        |       |                       |               |       |   |   |               |        |                       |            |              |                 |
| 14C | Fecal Coliform                 |                                     |                                | 9222D                     | 1,700              | N/A   | 1,700                  | N/A   | 1                     | #/100ml       | N/A   |   |   |               |        |                       |            |              |                 |
| 15C | Fluoride                       | 100                                 |                                |                           |                    |       |                        |       |                       |               |       |   |   |               |        |                       |            |              |                 |
| 16C | Nitrate-Nitrite (as N)         |                                     | 500                            | 300.0                     | 1,150              | 2.67  | 1,150                  | 2.67  | 1                     | µg/l          | lbs/d |   |   |               |        |                       |            |              |                 |
| 17C | Nitrogen, Total Organic (as N) |                                     |                                |                           |                    |       |                        |       |                       |               |       |   |   |               |        |                       |            |              |                 |
| 18C | Phosphorus (as P), Total       |                                     | 100                            | 365.1                     | <100               | <0.23 | <100                   | <0.23 | 1                     | µg/l          | lbs/d |   |   |               |        |                       |            |              |                 |
| 19C | Sulfate (as SO <sub>4</sub> )  | 1,000                               |                                |                           |                    |       |                        |       |                       |               |       |   |   |               |        |                       |            |              |                 |
| 20C | Sulfide (as S)                 | 1,000                               |                                |                           |                    |       |                        |       |                       |               |       |   |   |               |        |                       |            |              |                 |
| 21C | Sulfite (as SO <sub>3</sub> )  | 2,000                               |                                |                           |                    |       |                        |       |                       |               |       |   |   |               |        |                       |            |              |                 |
| 22C | Surfactants (MBAS)             | 25                                  |                                |                           |                    |       |                        |       |                       |               |       |   |   |               |        |                       |            |              |                 |
| —   | Total Kjeldahl-Nitrogen        |                                     | 1,000                          | 351.4                     | <1,000             | <2.33 | <1,000                 | <2.33 | 1                     | µg/l          | lbs/d |   |   |               |        |                       |            |              |                 |

- 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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.
- \* Make copies of this table and check appropriate box.
- \*\* It is in the permit's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements on the original NPDES permit.

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OUTFALL 079  
SEWAGE TREATMENT PLANT NOTES

No comments

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 079, Sewage Treatment Plant Flow=0.01718MGD
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for Information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | 1. POLLUTANT GROUP 1           | 2. LEVEL PRESENT       |                 |  |          |  |          | 3. UNITS           |                  | 4. Coefficient of Effluent Variability (CV) |         |
|-----|--------------------------------|------------------------|-----------------|--|----------|--|----------|--------------------|------------------|---|---------|
|     |                                | a. Maximum Daily Value |                 | b. Maximum 30-Day Value (if available) |          | c. Long-Term Avege. Value (if available) |          | d. No. of Analyses | a. Concentration |   | b. Mass |
|     |                                | (1) Concentration      | (2) Mass        | (1) Concentration                      | (2) Mass | (1) Concentration                        | (2) Mass |                    |                  |   |         |
| 1C  | Biochemical Oxygen Demand, BOD | 11                     | 1.58            |  |          | 11                                       | 1.58     | 1                  | mg/l             | lbs/d                                       |         |
| 2C  | Chemical Oxygen Demand, COD    |                        |                 |  |          |  |          |                    |                  |   |         |
| 3C  | Total Organic Carbon, TOC      |                        |                 |  |          |  |          |                    |                  |   |         |
| 4C  | Total Suspended Solids, TSS    | 7                      | 1.00            |  |          | 7  | 1.00     | 1                  | mg/l             | lbs/d                                       |         |
| 5C  | Total Dissolved Solids, TDS    |                        |                 |  |          |  |          |                    |                  |   |         |
| 6C  | Ammonia as N                   | 25                     | 3.58            |  |          | 25                                       | 3.58     | 1                  | mg/l             | lbs/d                                       |         |
| 7C  | Oil and Grease                 |                        |                 |  |          |  |          |                    |                  |   |         |
| 8C  | Bromide                        |                        |                 |  |          |  |          |                    |                  |   |         |
| 9C  | Chlorine, Total Residual       | 0.02                   | 0.003           |  |          | 0.003                                    | 0.0005   | 14                 | mg/l             | lbs/d                                       |         |
| 10C | Temperature winter             | Value                  |                 | Value                                  |          | Value                                    |          |                    | (°C)             | (°C)  | (°C)    |
| 11C | Temperature summer             | 23 Value               |                 | Value                                  |          | 21.75 Value                              |          | 6                  | (°C)             | (°C)  | (°C)    |
| 12C | pH                             | 7.22<br>Minimum        | 7.40<br>Maximum | X                                      | X        | X  | X        | 14                 | standard units   | standard units                              |         |

2.a. Maximum Daily Value - Report the highest daily value or daily average from the last year of data. Report both mass and concentration.  
 2.b. Maximum 30-Day Value - Determine the average of all daily values during each calendar month and report the highest average.  
 2.c. Long Term Average Value - The average of all values within the last year and report both mass and concentration.  
 2.d. Minimum three sampling events required for process wastewater discharges and a minimum of one sampling event for all other discharges, treatment facility influent and receiving water.

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SECTION - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 079, Sewage Treatment Plant
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2              | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |       |                        |       |                       | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|-----|--------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|-------|------------------------|-------|-----------------------|---------------|-------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|     |                                |                                     |                                |                           | a. Max Daily Value |       | b. Average of Analyses |       | c. Number of Analysis | Concentration | Mass  |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |                                |                                     |                                |                           | Concentration      | Mass  | Concentration          | Mass  |                       |               |       |   |   |              |        |                      |            |              |                 |
| 13C | Color                          |                                     |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 14C | Fecal Coliform                 |                                     |                                | 9222D                     | 11                 | N/A   | 11                     | N/A   | 1                     | #/100ml       | N/A   |   |   |              |        |                      |            |              |                 |
| 15C | Fluoride                       | 100                                 |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 16C | Nitrate-Nitrite (as N)         |                                     | 100                            | 353.2                     | 4,790              | 0.69  | 4,790                  | 0.69  | 1                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 17C | Nitrogen, Total Organic (as N) |                                     | 1,000                          | Calculation               | 3,100              | 0.44  | 3,100                  | 0.44  | 1                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 18C | Phosphorus (as P), Total       |                                     | 100                            | 365.1                     | 9,760              | 1.40  | 9,760                  | 1.40  | 1                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 19C | Sulfate (as SO <sub>4</sub> )  | 1,000                               | 3,000                          | 375.4                     | 105,000            | 15.04 | 105,000                | 15.04 | 1                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 20C | Sulfide (as S)                 | 1,000                               |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 21C | Sulfite (as SO <sub>3</sub> )  | 2,000                               |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| 22C | Surfactants (MBAS)             | 25                                  |                                |                           |                    |       |                        |       |                       |               |       |   |   |              |        |                      |            |              |                 |
| —   | Total Kjeldahl-Nitrogen        |                                     | 1,000                          | 351.4                     | 28,100             | 4.03  | 28,100                 | 4.03  | 1                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

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

\* Make copies of this table and check appropriate box.

\*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

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**SECTION C - (continued)**

**III. REQUIRED AND OPTIONAL ANALYSES\***

**3. Analyses Results**

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 079, Sewage Treatment Plant
- Intake Sampling Results - Optional (Specify Source \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 2 (continued) | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |         |                        |         | 4. Units              |               | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |              |        |                      |            |              |                 |
|-----|-------------------------------|-------------------------------------|--------------------------------|---------------------------|--------------------|---------|------------------------|---------|-----------------------|---------------|---|---|--------------|--------------|--------|----------------------|------------|--------------|-----------------|
|     |                               |                                     |                                |                           | a. Max Daily Value |         | b. Average of Analyses |         | c. Number of Analysis | Concentration |   | Mass  | Raw Material | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |                               |                                     |                                |                           | Concentration      | Mass    | Concentration          | Mass    |                       |               |   |   |              |              |        |                      |            |              |                 |
| 1M  | Antimony, Total               | 200                                 |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 2M  | Arsenic, Total                | 50                                  |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 3M  | Beryllium, Total              | 5                                   |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 4M  | Cadmium, Total                | 5                                   |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 5M  | Chromium, Total               | 50                                  |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 5M  | Chromium, Hexavalent          | 10                                  |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 6M  | Copper, Total                 | 20                                  | 10                             | 200.7                     | 10                 | 0.0014  | 10                     | 0.0014  | 1                     | µg/l          |   |   |              |              |        |                      |            |              |                 |
| 7M  | Lead, Total                   | 100                                 | 6                              | 200.7                     | <6                 | <0.0009 | <6                     | <0.0009 | 1                     | µg/l          |   |   |              |              |        |                      |            |              |                 |
| 8M  | Mercury, Total                | 0.2                                 |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 9M  | Nickel, Total                 | 40                                  |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 10M | Selenium, Total               | 75                                  |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 11M | Silver, Total                 | 10                                  |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 12M | Thallium, Total               | 100                                 |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 13M | Zinc, Total                   | 5                                   | 20                             | 200.7                     | 70                 | 0.01    | 70                     | 0.01    | 1                     | µg/l          |   |   |              |              |        |                      |            |              |                 |
| 14M | Cyanide, Total                | 20                                  |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |
| 14M | Cyanide, Free                 | 5                                   |                                |                           |                    |         |                        |         |                       |               |   |   |              |              |        |                      |            |              |                 |

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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.

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

\* Make entries in this table and check appropriate box.

\*\* It is in the permittee's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements on the final NPDES permit.

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SECTION C - (continued)

III. REQUIRED AND OPTIONAL ANALYSES\*

3. Analyses Results

- Outfall Sampling Results (Locate Sampling Point on Line Drawing Required by Question A.10)
- Outfall Number 079, Sewage Treatment Plant \_\_\_\_\_
- Intake Sampling Results - Optional (Specify \_\_\_\_\_)
- Upstream Background Sample Results - Optional (Specify Location of Sample \_\_\_\_\_)
- Treatment Facility Influent Sampling Results (Locate Sampling Point on Line Drawing required by Question A.10 \_\_\_\_\_)
- New Discharge (Describe basis for information presented, see Instructions for Section C, Part II \_\_\_\_\_)

|     | Pollutant Group 3<br>Volatile Organics | Acceptable Detection Level** (µg/l) | 1. Detection Level Used (µg/l) | 2. EPA Method Number Used | 3. Level Present   |         |                        |         |                       | 4. Units      |       | 5. Coefficient of Effluent Variability (CV) | 6. If you have any reason to expect the pollutant to be normally present in this discharge, check the appropriate block or describe another reason. |              |        |                      |            |              |                 |
|-----|--|-------------------------------------|--------------------------------|---------------------------|--------------------|---------|------------------------|---------|-----------------------|---------------|-------|---|---|--------------|--------|----------------------|------------|--------------|-----------------|
|     |  |                                     |                                |                           | a. Max Daily Value |         | b. Average of Analyses |         | c. Number of Analysis | Concentration | Mass  |   | Raw Material  | Manufactured | Stored | Intermediate Product | By-Product | Intake Water | Other (Explain) |
|     |  |                                     |                                |                           | Concentration      | Mass    | Concentration          | Mass    |                       |               |       |   |   |              |        |                      |            |              |                 |
| 1V  | Acrolein                               | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 2V  | Acrylonitrile                          | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 3V  | Benzene                                | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 5V  | Bromoform                              | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 6V  | Carbon Tetrachloride                   | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 7V  | Chlorobenzene                          | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 8V  | Chlorodibromomethane                   | 10                                  | 1                              | 624                       | <1                 | <0.0001 | <1                     | <0.0001 | 1                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 9V  | Chloroethane                           | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 10V | 2-Chloroethylvinyl Ether               | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 11V | Chloroform                             | 10                                  | 1                              | 624                       | <1                 | <0.0001 | <1                     | <0.0001 | 1                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 12V | Dichlorobromomethane                   | 10                                  | 1                              | 624                       | <1                 | <0.0001 | <1                     | <0.0001 | 1                     | µg/l          | lbs/d |   |   |              |        |                      |            |              |                 |
| 14V | 1,1-Dichloroethane                     | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 15V | 1,2-Dichloroethane                     | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 16V | 1,1-Dichloroethylene                   | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 17V | 1,2-Dichloropropane                    | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 18V | 1,3-Dichloropropylene                  | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |
| 19V | Ethylbenzene                           | 10                                  |                                |                           |                    |         |                        |         |                       |               |       |   |   |              |        |                      |            |              |                 |

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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 Analyses - Determine the average of all samples taken within the past year. Report both mass and concentration.  
 3.c A minimum of three Sampling Events required for process wastewater discharges, and a minimum of one Sampling Event for all other discharges, treatment facility influent, intake water and background.  
 \* Make copies of this table and check appropriate box.  
 \*\* It is in the applicant's interest to achieve a level of detection at least equal to (or preferably more sensitive than) those listed. This will minimize uncertainty and therefore the need for additional analyses or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

**SECTION C (continued)**NPDES Number PA 0047325**IV. INFORMATION AND ANALYSIS OF EFFLUENT QUALITY FOR OTHER POTENTIALLY TOXICS POLLUTANTS**1. Information on Chemical Additives Known or Expected to be Present in the Discharge

(Notes 2-11 attached)

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

| Outfall | Chemical substance or compound<br>Trade Names or Specific Ingredients <sup>(2)</sup>  | Manufacturer<br>Name and Address                             | Average & Maximum<br>USAGE<br>RATE<br>lbs/day  | CONCENTRATION |          |       | Lowest Possible Analytical<br>Detection Level (µg/l) | Whole product<br>96 Hr LC50<br>(mg/l) and species <sup>(1)</sup> | Whole product<br>48 Hr LC50<br>(mg/l) and species <sup>(1)</sup> |
|---------|---|--|--|---------------|----------|-------|--|--|--|
|         |   |  |  | In-System     | Effluent | Units |  |  |  |
| 071     | Acrylic Acid Sulfonated Acrylic Acid Copolymer Dispersant, 32.125                     | Calgon Corp.<br>P.O. Box 1346<br>Pittsburgh, PA 15230-1346   | Avg. 950<br>Max 2,000<br><br>(180,000 lbs./yr) | 2,400         | 2,400    | µg/l  | 1,500  | Rainbow Trout (4,900 mg/l)                                       | Daphnia Magna (2,800 mg/l)                                       |
| 071     | Hydroxy ethylidene disphosponic acid (HEDP), 32.127                                   | "  | Avg. 750<br>Max 1,500<br><br>(90,000 lbs./yr)  | 4,000         | 4,000    | µg/l  | 83   | Rainbow Trout (368 mg/l)   | Daphnia Magna (527 mg/l)   |
| 071     | Solution of Quaternary Alkyl Ammonium Compound Molluscide and General Biocide, 32.126 | "  | Avg. 800<br>Max 1,200<br>(10,000 lbs./yr.)     | 10,600        | 100      | µg/l  | 100 µg/l   | Bluegill Sunfish (0.32-0.59 mg/l)                                | Daphnia Magna (0.094 mg/l)                                       |
| 071     | Sodium Bromide, 32.114  | "  | Avg. 500<br>Max 1,000                          | 3,300         | 3,300    | µg/l  | 125  | Rainbow Trout <sup>(9)</sup> (0.23 mg/l)                         | Daphnia Magna (0.71 mg/l)  |
| 071/072 | Magnesium Nitrate and 5-chloro-2-methyl-4-isothiazolin-1, 32.53                       | BetzDearborn Inc.<br>4636 Somerton Road<br>Trevose, PA 19057 | See Note 4                                     | ---           | ---      | ---   | ---  | Rainbow Trout (8.7 mg/l)   | Daphnia Magna (2.9 mg/l)   |
| 071/072 | Glutaraldehyde 40%-70%, 32.70   | Calgon Corp<br>P.O. Box 1346<br>Pittsburgh, PA 15230-1346    | See Note 5                                     | ---           | ---      | ---   | ---  | Flathead Minnow (12 mg/l)  | Daphnia Magna (12 mg/l)  |

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



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

1. Information on Chemical Additives Known or Expected to be Present in the Discharge

(Notes 2-11 attached)

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

| Outfall | Chemical substance or compound<br>Trade Names or Specific Ingredients                            | Manufacturer<br>Name and Address  | Average & Maximum USAGE RATE<br>lbs/day           | CONCENTRATION |          |       | Lowest Possible Analytical Detection Level (µg/l) | Whole product 96 Hr LC50 (mg/l) and species <sup>(1)</sup> | Whole product 48 Hr LC50 (mg/l) and species <sup>(1)</sup> |
|---------|--|---|---|---------------|----------|-------|---|--|--|
|         |  |   |   | In-System     | Effluent | Units |   |  |  |
| 071     | Proprietary Descaling Agent  | BetzDearborn, Inc.<br>4636 Somerton Rd<br>Trevose, PA 19053                             | See Note 6  | ---           | ---      | ---   | ---   | ---  |  |
| 071     | Bentonite Clay Slurry, 32.128  | Calgon Corp.<br>P.O. Box 1346<br>Pittsburgh, PA 15230-1346                              | Avg - 1,400<br>Max - 4,000<br><br>(8,000 lbs./yr) | 0             | 8,000    | µg/l  | 100   | ---  |  |
| 071     | Alkyl Dimethyl Benzyl Ammonium Chloride (ADBAC) and Dodecyl Guanidine Hydrochloride (DGH), 32.69 | BetzDearborn, Inc.<br>4636 Somerton Rd<br>Trevose, PA 19053                             | Avg - 770<br>Max - 10,000                         | 15,000        | <200     | µg/l  | 200   | Fathead Minnow (2.9 mg/l)<br>Daphnia Magna (0.2 mg/l)      |  |
| 071/079 | Sodium Hypochlorite, 15%, 32.63  | Manley-Regan Chemicals<br>532 East Emaus Street<br>P.O. Box 280<br>Middletown, PA 17057 | Avg - 5,000<br>Max - 10,000                       | 33,000        | 33,000   | µg/l  | 400   | Ceriodaphnia Dubia (1.23 mg/l)                             |  |
| 071     | Rotenone, 32.15  | AgroEvo Environmental Health<br>95 Chestnut Ridge Rd<br>Montvale, NJ 07645              | See Note 7  | ---           | ---      | ---   | ---   | ---  |  |
| 071     | Fluridone, 32.46   | SePro<br>11550 N. Meridian<br>Carmel IN 46032   | See Note 7  | ---           | ---      | ---   | ---   | ---  |  |

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

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## SECTION C (continued)

NPDES Number PA 0047325

## IV. INFORMATION AND ANALYSIS OF EFFLUENT QUALITY FOR OTHER POTENTIALLY TOXICS POLLUTANTS

## 1. Information on Chemical Additives Known or Expected to be Present in the Discharge

(Notes 2-11 attached)

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

| Outfall | Chemical substance or compound<br>Trade Names or Specific Ingredients             | Manufacturer<br>Name and Address   | Average & Maximum USAGE RATE<br>lbs/day   | CONCENTRATION                |          |       | Lowest Possible Analytical Detection Level (µg/l) | Whole product 96 Hr LC50 (mg/l) and species <sup>(1)</sup> | Whole product 48 Hr LC50 (mg/l) and species <sup>(1)</sup> |
|---------|---|--|---|------------------------------|----------|-------|---|--|--|
|         |   |  |   | In-System                    | Effluent | Units |   |  |  |
| 071/079 | Sodium Bisulfite, 32.113  | Allied Corp.<br>Chemical Sector<br>P. O. Box 1139R<br>Morristown NJ 07960                | Avg - 183<br>Max - 400                    | 0                            | 500      | µg/l  | 125   | Mosquito Fish (240 mg/l)                                   | Mosquito Fish (240 mg/l)                                   |
| 071     | Sodiumdichloro-S-triazinetriiron . and Sodium Bromide, 32.115                     | Calgon Corp.<br>P.O. Box 1346<br>Pittsburgh PA 15230-1346                                | Avg. - 70<br>Max - 300                    | 200-500                      | <200     | µg/l  | 50  | Sheephead Minnow (3.42 mg/l)                               | Fathead Minnow (0.7 mg/l)                                  |
|         |   |  |   | (As free available chlorine) |          |       |   |  |  |
| 071     | Sulfuric Acid, 32.57  | Allied Corp.<br>P.O. Box 2064R<br>Morristown, NJ 07960                                   | (≈435,000 lbs./yr.)                       | ---                          | ---      | ---   | ---   | ---  | ---  |
| 071     | 2-(Tert-butylamino)-4-Chloro-6-(Ethylamino)-s-Triazine; Terbutylazine(Algicide)   | FMC Corp. Process Additives Division<br>1735 Market Street<br>Philadelphia, PA 19103     | (13,800 lbs. twice a year)                | 67,000                       | 2,200    | µg/l  | ---   | Rainbow Trout (3.8 mg/l)                                   | Daphnia Magna (39 mg/l)                                    |
| 071     | 2-phosphono-1,2,4-butanetricarboxylic acid aqueous solution (corrosion inhibitor) | Bayer Corp. Product Safety & Reg. Affairs<br>100 Bayer Road<br>Pittsburgh, PA 15205-9741 | (864 lbs. four times a year)              | 4,000                        | 131      | µg/l  | ---   | ---  | Rainbow Trout (5,300 mg/l)                                 |
| 071     | Depositrol PY5206   | BetzDearborn, Inc.<br>4636 Somerton Road<br>Trevose, PA 19053                            | Avg. - 96 lbs./day<br>Max. - 385 lbs./day | 32,000                       | 1,140    | µg/l  | 12,000  | Fathead Minnow (1,680 mg/l)                                | Daphnia Magna (1,635 mg/l)                                 |

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

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

1. Information on Chemical Additives Known or Expected to be Present in the Discharge

(Notes 2-11 attached)

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

| Outfall     | Chemical substance or compound<br>Trade Names or Specific Ingredients | Manufacturer<br>Name and Address   | Average & Maximum<br>USAGE<br>RATE<br>lbs/day | CONCENTRATION |          |       | Lowest Possible Analytical Detection Level (µg/l) | Whole product 96 Hr LC50 (mg/l) and species <sup>(1)</sup> | Whole product 48 Hr LC50 (mg/l) and species <sup>(1)</sup> |
|-------------|---|--|---|---------------|----------|-------|---|--|--|
|             |   |  |   | In-System     | Effluent | Units |   |  |  |
| 072         | Sodium Chromate   | Mallinckrodt Baker Inc.<br>222 Red School Lane<br>Phillipsburg, NJ 08865 | See Note 8                                    | --            | ---      | --    | ---   | ---  |  |
| 071/072/079 | Miscellaneous   | Various  | See Note 9                                    | --            | ---      | --    | ---   | ---  |  |

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

## SECTION C-IV NOTES

- Note (2) Equivalent chemicals from other suppliers may be purchased. Product concentrations may change; however, the concentration of active ingredients discharged should remain about the same. Approval numbers are included for those chemicals listed in the Susquehanna Approved Materials Manual. Other chemicals will be approved prior to their use onsite.
- Note (3) Toxicity of hypobromous acid is expressed as bromine.
- Note (4) Approximately 25 gallons/year of this biocide is injected into the closed system cooling water to a maximum average effluent concentration of 330 mg/l of product or 5.0 mg/l as active isothiazolin. Occasionally these systems are drained to the Cooling Tower basin. This product would not be expected to be detected in the Cooling Tower blowdown.
- Note (5) Glutaraldehyde is added to closed cooling water systems to maintain microbiological control. A maximum concentration of 300 mg/l active or 600 mg/l product is used. Occasionally these systems are drained to the Cooling Tower blowdown. This product would not be expected to be detected in the Cooling Tower blowdown.
- Note (6) The Cooling Tower blowdown is isolated when this descaling agent is used in Circulating Water System (4,000 gal/treatment). Treatment has been very infrequent.
- Note (7) Rotenone and Fluridone are products used in the Emergency Spray Pond that has been permitted for use by the Pa Fish and Boat Commission and the PaDEP.

The Emergency Spray Pond is treated when needed with 1,000 lbs. of Rotenone to a level of 5 mg/l; however, it is detoxified with potassium permanganate at a rate equal to this concentration prior to discharge and, therefore, is not expected to be present in Outfall 071. Also, 32 lbs. of Fluridone will be applied as necessary to an area of 8/10 surface acre along the pond's edge.

- Note (8) Sodium Chromate may be used as a corrosion inhibitor and biocide in the Emergency Diesel Generator Jacket Water (DGJW) Systems. Sodium Chromate addition of 4 lbs. to 710 gallons each of diesels A through D and 7.5 lbs. to 1480 gallons for the larger E diesel's DGJW system. Then systems will maintain a concentration of less than 500 mg/l as Chromate. If there is any leakage from these systems it would enter the Service and Administration Building sump (2-10,000 gallons lbs.), Outfall 072. This sump is manually discharged for 10,000 gallons

at any given time. Assuming leakage of 20 gallons into a 10,000-gallon sump, the effluent concentration is estimated to be  $\leq 1.0$  mg/l. This product will not be used unless other treatment strategies are unsuccessful at protecting the Emergency Diesel Generators from corrosion and biocide fouling.

Note (9) Miscellaneous chemicals used in very small quantities for cleaning surfaces, cooling coils, decontamination of floors, walls, and equipment, cleaning agents, liquid dye for flow tests, laboratory reagents and standards, etc. The following are some of these chemicals:

| <u>Chemical/SAMM #</u>           | <u>Est. gal/yr.</u> |
|----------------------------------|---------------------|
| Coil Rite, C-10.384              | a                   |
| Acti-Klean, C-10.326             | a                   |
| By-Pas, E-10.11                  | 220                 |
| Organic Orange, E-10.35          | 110                 |
| Citirikleen, E-10.29             | a                   |
| MSA/Cleaner/Sanitizèr II, E-10.8 | 288, b              |
| Rhodamine WT Dye, 32.68          | a                   |
| Spartan SD-20, C-10.167          | a                   |
| Touch It Up, E-10.4              | a                   |
| 601-Nami-Lo, C-10.74             | a                   |
| Powerline PPL10, 32.90           | 50                  |
| Cobratec TT-50-S, 32.87          | a                   |
| Yellow/Green liquid dye, 32.42   | a                   |
| Clarifloc C-9490 polymer, 32.109 | 10-15, c            |
| Nalco 9905, 32.81                | 220, c              |
| Ethylene Glycol mixture, 16.20   | d                   |
| Iron Oxalate, 32.129             | 500 lbs./yr.        |
| Polyfloc CP1160, 32.130          | 20 lbs./yr.         |
| Polyfloc AP1100, 32.131          | 20 lbs./yr.         |
| Propylene Glycol Mixture, 16.36  | a, d                |
| EPA 2000 WCI-140, B-10.27        | a                   |
| Trisodium Phosphate, A-20.24     | a                   |
| Sodium Hydroxide, 32.59          | 500                 |

Key

- a. Not available
- b. Ounces
- c. Flocculent aid used infrequently for dewatering sludge
- d. Present in equipment onsite and has potential for entering storm drains. Preventative maintenance and analysis of replacement chemicals such as Propylene Glycol will minimize any adverse impacts to the environment.

Some of these chemicals may be discharged to the Cooling Tower Basins/ Blowdown, Sewage Treatment Plant, or storm drains in accordance with their Material Safety Data Sheet recommendations.

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SAMM 32.125

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PCL-401



P.O. Box 1348  
Pittsburgh, PA 15230-1348  
Phone--(412)494-8000

### MATERIAL SAFETY DATA SHEET

#### Section 1. PRODUCT IDENTIFICATION

PRODUCT NAME: PCL-401

CHEMICAL DESCRIPTION: Aqueous solution of anionic copolymer  
PRODUCT CLASS: Water treatment  
MSDS CODE: 0544-08-09-96

#### Section 2. INFORMATION ON INGREDIENTS

| Chemical Name | CAS Number | % by Weight | OSHA PEL | ACGIH TLV |
|---------------|------------|-------------|----------|-----------|
|---------------|------------|-------------|----------|-----------|

\*No ingredients listed in this section.\*

This product is not considered to be hazardous according to the criteria of the U.S. Federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and is not a controlled product under WHMIS in Canada.

#### Section 3. HAZARDS IDENTIFICATION

\*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*

This product poses little or no immediate health hazard.

\*\*\*\*\*

PRIMARY ROUTES OF ENTRY: None

TARGET ORGAN: None

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Unknown

#### POTENTIAL HEALTH EFFECTS:

EYE CONTACT: This product would not be expected to produce irritation upon contact with the eyes.

SKIN CONTACT: The product is not expected to cause skin irritation upon contact. Data indicate that this product will not produce an allergic skin reaction or be absorbed through the skin in harmful amounts.

INGESTION: This product would be regarded as practically non-toxic if swallowed.

INHALATION: This product is not expected to present an inhalation hazard.

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Issue Date: 10/30/96

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Continued on Page 2

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**SUBCHRONIC, CHRONIC:**

No applicable information was found concerning any potential health effects resulting from subchronic or chronic exposure to the product.

**CARCINOGENICITY:**

NTP:

\*No ingredients listed in this section\*

IARC:

\*No ingredients listed in this section\*

OSHA:

\*No ingredients listed in this section\*

**Section 4: FIRST AID MEASURES**

**EYE CONTACT:** Not expected to require first aid measures. However, follow good industrial hygiene practices and, in case of contact, flush eyes with plenty of water.

**SKIN CONTACT:** Not expected to require first aid measures. However, follow good industrial hygiene practices and, in case of contact, wash affected skin areas thoroughly with soap and water.

**INGESTION:** Not an expected route of overexposure. If swallowed, do not induce vomiting. Call a physician. This product would be expected to be practically non-toxic by ingestion.

**INHALATION:** Not an expected route of overexposure.

**Section 5: FIRE-FIGHTING MEASURES**

**FLASH POINT:** > 200°F

This product is not by definition a "flammable liquid" or a "combustible liquid".

**LOWER FLAMMABLE LIMIT:** Not available

**UPPER FLAMMABLE LIMIT:** Not available

**AUTO-IGNITION TEMPERATURE:** Not available

**EXTINGUISHING MEDIA:** Use extinguishing media appropriate for the surrounding fire.

**FIRE-FIGHTING INSTRUCTIONS:** Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential.

**FIRE & EXPLOSION HAZARDS:** Product emits toxic gases under fire conditions.

**DECOMPOSITION PRODUCTS:** Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, nitrogen oxides, and sulfur oxides.

**NFPA RATINGS:** Health = 0

Flammability = 1

Reactivity = 0

Special Hazard = None

Hazard rating scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe



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**Section 6. ACCIDENTAL RELEASE MEASURES**

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Wearing appropriate personal protective equipment, contain spill, collect onto inert absorbent and place into suitable container. Spilled product may make floor slippery; spills should be cleaned up immediately to prevent falls.

**Section 7. HANDLING AND STORAGE**

**HANDLING:** As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the product and ensure prompt removal from eyes, skin and clothing. Wash thoroughly after handling. Keep container closed when not in use.

**STORAGE:** No specific information.

**Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**PERSONAL PROTECTIVE EQUIPMENT:**

**EYE/FACE PROTECTION:** Chemical splash goggles recommended as a good industrial hygiene practice.  
**SKIN PROTECTION:** No special requirement.  
**RESPIRATORY PROTECTION:** None required.

**ENGINEERING CONTROLS:** No specific recommendations.

**Section 9. PHYSICAL AND CHEMICAL PROPERTIES**

**BOILING POINT:** Not available      **SOLUBILITY IN WATER:** Complete  
**VAPOR PRESSURE:** Similar to water      **SPECIFIC GRAVITY:** 1.18 - 1.20 @ 25°C  
**VAPOR DENSITY (air=1):** Similar to water      **pH:** 4.2 - 5.0 @ 25°C  
**%VOLATILE BY WEIGHT:** ~66 (water)      **FREEZING POINT:** 25°F  
**APPEARANCE AND ODOR:** Clear, colorless to pale yellow, slightly viscous liquid.

**Section 10. STABILITY AND REACTIVITY**

**CHEMICAL STABILITY:** Stable      **HAZARDOUS POLYMERIZATION:** Will not occur  
**CONDITIONS TO AVOID:** No specific information.

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PCL-401**INCOMPATIBILITY:** Strong oxidizers.**DECOMPOSITION PRODUCTS:** Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, nitrogen oxides, and sulfur oxides.**Section 11. TOXICOLOGICAL INFORMATION****ON PRODUCT:**Product Oral LD<sub>50</sub> (rat): > 5 g/kgProduct Dermal LD<sub>50</sub> (rabbit): > 2 g/kg

Eye Irritation: The product produced no irritation when instilled in rabbit eyes (unwashed).

Skin Irritation: The primary skin irritation index (rabbits) is 0.09/8.

**Section 12. ECOLOGICAL INFORMATION****ON PRODUCT:****Environmental data:**

TOC: 128,000 ppm

COD: 910,000 ppm

BOD: &lt; 5,000 ppm

**ON INGREDIENTS:**Chemical Name

Anionic copolymer

Aquatic Toxicity Data:48 hr LC<sub>50</sub> (Daphnia magna): 2,800 ppm96 hr LC<sub>50</sub> (bluegill sunfish): > 10,000 ppm96 hr LC<sub>50</sub> (rainbow trout): 4,900 ppm**Section 13. DISPOSAL CONSIDERATIONS****RCRA STATUS:** Discarded product, as sold, would not be considered a RCRA Hazardous Waste.**DISPOSAL:** Dispose of in accordance with local, state and federal regulations.**Section 14. TRANSPORT INFORMATION****DOT CLASSIFICATION:**

Class/Division: Not restricted

Proper Shipping Name: Not applicable

Label: None

Packing Group: Not applicable

ID Number: Not applicable

**Section 15. REGULATORY INFORMATION****OSHA Hazard Communication Status:** Nonhazardous**MSDS Code:** 0544-08-09-95**Issue Date:** 10/30/96

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PCL-401

TSCA: The ingredients of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.

CERCLA reportable quantity of EPA hazardous substances in product:

Chemical Name RQ:  
No ingredients of this product have CERCLA reportable quantities.

Product RQ: Not applicable (Notify EPA of product spills exceeding this amount.)

SARA TITLE III:

Section 302 Extremely Hazardous Substances:

Chemical Name CAS # RQ TPQ  
There are no SARA 302 Extremely Hazardous Substances in this product.

Section 311 and 312 Health and Physical Hazards:

Immediate Delayed Fire Pressure Reactivity  
[no] [no] [no] [no] [no]

Section 313 Toxic Chemicals:

Chemical Name CAS # % by Weight  
There are no reportable SARA 313 Toxic Chemicals in this product.

Section 16. OTHER INFORMATION

HMIS RATINGS: Health = 0 Flammability = 1 Reactivity = 0  
Personal Protective Equipment = A

Hazard rating scale: 0=Minimal 1=Slght 2=Moderate 3=Serious 4=Severe

MSDS REVISION SUMMARY: Supersedes MSDS issued on 06/23/83. The MSDS has been changed in Section 9.

While this information and recommendations set forth herein are believed to be accurate as of the date hereof, CALSON CORPORATION MAKES NO WARRANTY WITH RESPECT HERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

PREPARED BY: P.J. Maloney

MSDS Code: 0544-08-09-98  
Issue Date: 10/30/88

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PCL-57



P.O. Box 1346  
Pittsburgh, PA 15230-1346  
Phone--(412)494-8000

### MATERIAL SAFETY DATA SHEET

#### Section 1. PRODUCT IDENTIFICATION

PRODUCT NAME: PCL-57

CHEMICAL DESCRIPTION: Aqueous solution of organic phosphonate  
PRODUCT CLASS: Water treatment  
MSDS CODE: 0658-06-20-95

#### Section 2. INFORMATION ON INGREDIENTS

| <u>Chemical Name</u>                             | <u>CAS Number</u> | <u>% by Weight</u> | <u>OSHA PEL</u>  | <u>ACGIH TLV</u> |
|--|-------------------|--------------------|------------------|------------------|
| 1-Hydroxyethylidene-1,1-diphosphonic acid (HEDP) | 2809-21-4         | 60                 | None established | None established |
| Phosphorous acid                                 | 13598-36-2        | 3                  | None established | None established |

#### Section 3. HAZARDS IDENTIFICATION

\*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*

**DANGER!**  
May cause severe eye damage.  
May cause skin and respiratory tract irritation.  
May be harmful if swallowed.

\*\*\*\*\*

PRIMARY ROUTES OF ENTRY: Eye and skin contact, inhalation, ingestion

TARGET ORGANS: Eye, skin, blood, bone, mucous membranes

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: May aggravate anemia.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: This product may cause irreversible eye damage upon contact depending on the length of exposure, solution concentration and first aid measures.

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**SKIN CONTACT:** Exposure to this product may cause moderate to severe irritation of the skin. This product is not expected to be absorbed through the skin in harmful amounts or to produce an allergic skin reaction.

**INGESTION:** The low pH of the product would indicate that it may produce severe irritation or burns to the mouth, throat, esophagus, and stomach if swallowed.

**INHALATION:** This product is not expected to present an inhalation hazard unless mists or vapors are generated. Breathing mist of HEDP may be irritating to the mucous membranes of the respiratory tract.

**SUBCHRONIC, CHRONIC:**

Some blood effects have been produced by HEDP in chronic feeding studies with rats. A product containing 60% HEDP was administered to beagle dogs at dietary concentrations of 1,000, 3,000, or 10,000 ppm for 90 days with no adverse hematologic, biochemical or histopathologic effects.

Numerous publications in the scientific literature discuss the effects of HEDP related to bone resorption in tissue and cell culture, and in animals. The effects of HEDP related to bone mineralization, calcium absorption, and metabolism of calcium and phosphate have also been evaluated.

**CARCINOGENICITY:****NTP:**

\*No ingredients listed in this section\*

**IARC:**

\*No ingredients listed in this section\*

**OSHA:**

\*No ingredients listed in this section\*

---

**Section 4. FIRST AID MEASURES**

---

**EYE CONTACT:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Seek medical aid immediately.

**SKIN CONTACT:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical aid immediately. Wash clothing before reuse.

**INGESTION:** If swallowed, do NOT induce vomiting. Give large quantities of water. Seek medical aid immediately. 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. Seek medical aid.

---

**Section 5. FIRE-FIGHTING MEASURES**

---

**FLASH POINT:** > 200°F (TCC)

This product is not by definition a "flammable liquid" or a "combustible liquid".

**LOWER FLAMMABLE LIMIT:** Not available

**UPPER FLAMMABLE LIMIT:** Not available

**IGNITION TEMPERATURE:** Not available

**PCL-57**

**EXTINGUISHING MEDIA:** Use extinguishing media appropriate for the surrounding fire.

**FIRE-FIGHTING INSTRUCTIONS:** Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential.  
Use water to keep fire-exposed containers cool.

**FIRE & EXPLOSION HAZARDS:** Product emits toxic gases under fire conditions.

**DECOMPOSITION PRODUCTS:** Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, phosphines, and phosphorus oxides.

**NFPA RATINGS:** Health = 3 Flammability = 1 Reactivity = 0 Special Hazard = None

Hazard rating scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

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**Section 6. ACCIDENTAL RELEASE MEASURES**

---

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Wearing appropriate personal protective equipment, contain spill, collect onto inert absorbent and place into suitable container. Spilled product may be neutralized carefully with weak caustic solutions or sodium carbonate. Neutralization releases large amounts of heat.

---

**Section 7. HANDLING AND STORAGE**

---

**HANDLING:** Do not get in eyes.  
Avoid contact with skin and clothing.  
Avoid breathing vapor or mist.  
Use with adequate ventilation.  
Wash thoroughly after handling.  
Keep container closed when not in use.

**STORAGE:** Do not store near incompatible materials.  
Store in a cool, dry, well-ventilated location.

---

**Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

---

**PERSONAL PROTECTIVE EQUIPMENT:**

**EYE/FACE PROTECTION:** Chemical splash goggles and face shield

**SKIN PROTECTION:** Chemical resistant gloves and protective clothing

**RESPIRATORY PROTECTION:** If airborne concentrations become irritating, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements (29 CFR 1910.134).

**ENGINEERING CONTROLS:** Use local exhaust ventilation at elevated temperatures or if mists are generated.

**WORK PRACTICES:** Eye wash station and safety shower should be accessible in the immediate area of use. Avoid using in confined spaces.

|               |
|---------------|
| <b>PCL-57</b> |
|---------------|

UNSATISFACTORY MATERIALS OF CONSTRUCTION: Product is corrosive to mild steel.

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## Section 9. PHYSICAL AND CHEMICAL PROPERTIES

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|  |                                      |
|--|--------------------------------------|
| BOILING POINT: 226°F (108°C)                                 | SOLUBILITY IN WATER: Complete        |
| VAPOR PRESSURE: Similar to water                             | SPECIFIC GRAVITY: 1.41 - 1.47 @ 25°C |
| VAPOR DENSITY (air=1): Similar to water                      | pH: < 2 (1% active solution)         |
| %VOLATILE BY WEIGHT: ~ 37 (water)                            | FREEZING POINT: -13°F (-25°C)        |
| APPEARANCE AND ODOR: Clear, pale yellow liquid with no odor. |                                      |

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## Section 10. STABILITY AND REACTIVITY

---

CHEMICAL STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Temperatures greater than 200°C (392°F). At this temperature, product can form flammable phosphine gas.

INCOMPATIBILITY: Strong oxidizers and bases

DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, phosphines, and phosphorus oxides.

---

## Section 11. TOXICOLOGICAL INFORMATION

---

ON PRODUCT:  
See the following information on ingredients.

ON INGREDIENTS:

| <u>Chemical Name</u>                             | <u>Oral LD<sub>50</sub><br/>(rat)</u> | <u>Dermal LD<sub>50</sub><br/>(rabbit)</u> | <u>Inhalation LC<sub>50</sub><br/>(rat)</u> |
|--|---------------------------------------|--|---|
| 1-Hydroxyethylidene-1,1-diphosphonic acid (HEDP) | 2400 mg/kg (60% soln)                 | >7940 mg/kg (60% soln)                     | Not available                               |
| Phosphorous acid                                 | 1895 mg/kg                            | Not available                              | Not available                               |

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## Section 12. ECOLOGICAL INFORMATION

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ON PRODUCT:

**Environmental data:**

Longed exposure of terrestrial or aquatic environments to acidic conditions can be expected to produce adverse effects by releasing toxic cations, e.g., metals.

|               |
|---------------|
| <b>PCL-57</b> |
|---------------|

**ON INGREDIENTS:**

Chemical Name  
1-Hydroxyethylidene-1,1-diphosphonic acid

Aquatic Toxicity Data  
48 hr LC<sub>50</sub> (Daphnia magna): 527 ppm  
96 hr LC<sub>50</sub> (rainbow trout): 368 ppm  
96 hr LC<sub>50</sub> (bluegill sunfish): 868 ppm

**Section 13. DISPOSAL CONSIDERATIONS**

RCRA STATUS: Discarded product, as sold, would be considered a RCRA Hazardous Waste based on the characteristic of corrosivity. The EPA Hazardous Waste Number is D002.

DISPOSAL: Dispose of in accordance with local, state and federal regulations.

**Section 14. TRANSPORT INFORMATION****DOT CLASSIFICATION:**

Class/Division: 8

Proper Shipping Name: Corrosive liquid, acidic, organic, n.o.s. (contains 1-Hydroxyethylidene-1,1-diphosphonic acid)

Label: Corrosive

Packing Group: III

ID Number: UN 3265

**Section 15. REGULATORY INFORMATION**

OSHA Hazard Communication Status: Hazardous

TSCA: The ingredients of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.

CERCLA reportable quantity of EPA hazardous substances in product:

|   |           |
|---|-----------|
| <u>Chemical Name</u>  | <u>RQ</u> |
| No ingredients of this product have CERCLA reportable quantities. |           |

Product RQ: Not applicable (Notify EPA of product spills exceeding this amount.)

**SARA TITLE III:****Section 302 Extremely Hazardous Substances:**

|   |              |           |            |
|---|--------------|-----------|------------|
| <u>Chemical Name</u>  | <u>CAS #</u> | <u>RQ</u> | <u>TPQ</u> |
| There are no SARA 302 Extremely Hazardous Substances in this product. |              |           |            |

**Section 311 and 312 Health and Physical Hazards:**

|                    |                 |              |                  |                    |
|--------------------|-----------------|--------------|------------------|--------------------|
| Immediate<br>[yes] | Delayed<br>[no] | Fire<br>[no] | Pressure<br>[no] | Reactivity<br>[no] |
|--------------------|-----------------|--------------|------------------|--------------------|



PCL-57

**Section 313 Toxic Chemicals:**Chemical NameCAS #% by Weight

There are no reportable SARA 313 Toxic Chemicals in this product.

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**Section 16. OTHER INFORMATION**

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HMIS RATINGS:    Health = 3                      Flammability = 1                      Reactivity = 0  
                    Personal Protective Equipment = X (to be specified by user depending on use conditions)

Hazard rating scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

MSDS REVISION SUMMARY: Supersedes MSDS issued on 2/14/95. The MSDS has been changed in Section 14.

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While this information and recommendations set forth herein are believed to be accurate as of the date hereof, CALGON CORPORATION MAKES NO WARRANTY WITH RESPECT HERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

PREPARED BY:    P.J. Maloney

32726

H-130M



P.O. Box 1346  
Pittsburgh, PA 15230-1346  
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### MATERIAL SAFETY DATA SHEET

#### Section 1. PRODUCT IDENTIFICATION

PRODUCT NAME: H-130M

CHEMICAL DESCRIPTION: Solution of quaternary alkyl ammonium compound

PRODUCT CLASS: Molluscicide

MSDS CODE: 0B75-02-08-95

#### Section 2. INFORMATION ON INGREDIENTS

| <u>Chemical Name</u>              | <u>CAS Number</u> | <u>% by Weight</u> | <u>OSHA PEL</u>                         | <u>ACGIH TLV</u>                        |
|-----------------------------------|-------------------|--------------------|---|---|
| Didecyltrimethylammonium chloride | 7173-51-5         | 50                 | None established                        | None established                        |
| Ethanol                           | 64-17-5           | 10                 | TWA 1000 ppm,<br>1900 mg/m <sup>3</sup> | TWA 1000 ppm,<br>1880 mg/m <sup>3</sup> |

#### Section 3. HAZARDS IDENTIFICATION

##### \*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*

**DANGER!**

May cause severe eye and skin damage.

May be harmful if swallowed.

May cause respiratory tract irritation.

Flammable/Combustible liquid and vapor.

PRIMARY ROUTES OF ENTRY: Eye and skin contact, inhalation, ingestion

TARGET ORGANS: Eye, skin, mucous membranes, central nervous system

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: No data available.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: This product may cause severe irritation and damage upon contact with the eye.

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**SKIN CONTACT:** Direct or prolonged contact with this product can cause severe skin irritation and possibly skin burns. Data indicate that this product will not be absorbed through the skin in harmful amounts and will not cause an allergic skin reaction.

**INGESTION:** If swallowed, this product would be expected to cause immediate burning pain in the mouth, throat, and abdomen, severe swelling of the larynx, skeletal muscle paralysis affecting the ability to breathe, circulatory shock, convulsions.

**INHALATION:** Solvent vapors or mist of product can cause irritation of mucous membranes if inhaled. Exposure to ethanol concentrations of over 1000 ppm may cause headache, irritation of the eyes, nose and throat, and, if long continued, drowsiness and fatigue, loss of appetite and inability to concentrate.

**SUBCHRONIC, CHRONIC:**

This product was found to be not teratogenic in rats treated with 10-50 mg/kg on days 6 to 15 gestation, not mutagenic in Ames Salmonella test with or without metabolic activation, and not clastogenic in Chinese hamster ovary cells with or without metabolic activation. There was no evidence of chromosomal damage in the bone marrow of rats treated with 600 mg/kg.

**CARCINOGENICITY:**

NTP:

\*No ingredients listed in this section\*

IARC:

\*No ingredients listed in this section\*

OSHA:

\*No ingredients listed in this section\*

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**Section 4. FIRST AID MEASURES**

---

**EYE CONTACT:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Seek medical aid immediately.

**SKIN CONTACT:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical aid immediately. Wash clothing before reuse.

**INGESTION:** If swallowed, give large amounts of water to dilute the toxicant. If immediately available, demulcents such as milk, vegetable oil or egg whites can be given. Do NOT induce vomiting as it is likely to cause considerable mucosal damage. If vomiting does occur, give fluids again. Get medical attention immediately.

**NOTE TO PHYSICIAN:** Probable mucosal damage may contraindicate the use of gastric lavage.

Measures against circulatory shock, as well as oxygen and measures to support breathing manually or mechanically, may be needed. If persistent, convulsions may be controlled by the cautious intravenous injection of a short-acting barbiturate drug.

**INHALATION:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical aid.

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## Section 5. FIRE-FIGHTING MEASURES

**FLASH POINT:** 109°F (Setflash)  
This product is a fire hazard.

**LOWER FLAMMABLE LIMIT:** Not available      **UPPER FLAMMABLE LIMIT:** Not available

**AUTO-IGNITION TEMPERATURE:** Not available

**EXTINGUISHING MEDIA:** Use dry chemical, "alcohol" foam, carbon dioxide, or water spray.

**FIRE-FIGHTING INSTRUCTIONS:** Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential.  
Use water to keep fire-exposed containers cool.

**FIRE & EXPLOSION HAZARDS:** Product emits toxic gases under fire conditions. Heated solvent vapors can travel to an ignition source and flash back.

**DECOMPOSITION PRODUCTS:** Thermal decomposition may produce carbon monoxide, carbon dioxide, organic materials, hydrogen chloride, amines, and nitrogen oxides.

**NFPA RATINGS:** Health = 3      Flammability = 2      Reactivity = 0      Special Hazard = None

Hazard rating scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

## Section 6. ACCIDENTAL RELEASE MEASURES

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Remove all sources of ignition. Ventilate area of spill. Wearing appropriate personal protective equipment, contain spill, collect onto inert absorbent and place into suitable container. Do not allow to contaminate sewers and waterways. Spilled product may make floor slippery; spills should be cleaned up immediately to prevent falls.

## Section 7. HANDLING AND STORAGE

**HANDLING:** It is a violation of Federal law to use this product in a manner inconsistent with its labeling.  
Do not get in eyes, on skin or clothing.  
Avoid breathing vapor or mist.  
Use with adequate ventilation.  
Wash thoroughly after handling.  
Keep container closed when not in use.

**STORAGE:** Keep away from heat and flame.  
Do not contaminate water, food, or feed by storage.  
Maximum storage temperature: 140°F

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## Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

---

### PERSONAL PROTECTIVE EQUIPMENT:

**EYE/FACE PROTECTION:** Chemical splash goggles and face shield

**SKIN PROTECTION:** Chemical resistant gloves and protective clothing

**RESPIRATORY PROTECTION:** If airborne concentrations exceed published exposure limits, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements (29 CFR 1910.134).

**ENGINEERING CONTROLS:** Use local and/or general exhaust ventilation to maintain airborne concentrations below exposure limits.

**WORK PRACTICES:** Eye wash station and safety shower should be accessible in the immediate area of use.

---

## Section 9. PHYSICAL AND CHEMICAL PROPERTIES

---

**BOILING POINT:** Not available

**SOLUBILITY IN WATER:** Complete

**VAPOR PRESSURE:** Not available

**SPECIFIC GRAVITY:** 0.93 @ 25°C

**VAPOR DENSITY (air=1):** Not available

**pH:** 7.0 - 8.0 (1% solution)

**%VOLATILE BY WEIGHT:** 50

**FREEZING POINT:** Not available

**APPEARANCE AND ODOR:** Colorless to pale yellow, slightly viscous liquid with alcohol odor.

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## Section 10. STABILITY AND REACTIVITY

---

**CHEMICAL STABILITY:** Stable

**HAZARDOUS POLYMERIZATION:** Will not occur

**CONDITIONS TO AVOID:** Do not use this product in conjunction with soap or any anionic wetting agent.

**INCOMPATIBILITY:** Strong oxidizers and reducers

**DECOMPOSITION PRODUCTS:** Thermal decomposition may produce carbon monoxide, carbon dioxide, organic materials, hydrogen chloride, amines, and nitrogen oxides.

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Section 11. TOXICOLOGICAL INFORMATION

ON PRODUCT:

Product Dermal LD50 (rabbit): 4300 mg/kg (based on 80% active)
Eye irritation: Instillation of 0.1 ml to the eye with or without washing resulted in extreme irritation that did not clear by day 7, post-dose.
Skin irritation: Application of 0.5 ml to abraded and non-abraded skin resulted in severe redness and swelling, as well as scabbing and blanching of the skin that did not clear by day 7, post-dose.
Skin sensitization: In a dermal sensitization study of didecyldimethylammonium chloride conducted in guinea pigs, there was no evidence of photoallergy or contact sensitization.
Toxicological data on chronic effects:

For didecyldimethylammonium chloride:

- Dermal subchronic toxicity (90 day - rat): no systemic toxicity observed.
-Reproductive effects (2 generation rat study): treatment at or below the level which produces mild toxic effects shows no reproductive effects.
-Oral chronic toxicity (dog - 1 year): no target organ effects.
-Pharmacokinetics (dog): this material does not accumulate in body tissues.

ON INGREDIENTS:

Table with 4 columns: Chemical Name, Oral LD50 (rat), Dermal LD50 (rabbit), Inhalation LC50 (rat). Rows include Didecyldimethylammonium chloride and Ethanol.

Section 12. ECOLOGICAL INFORMATION

ON PRODUCT:

Environmental data:

This product is toxic to fish. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit...
Semi Continuous Activated Sludge Test: 91 - 97%

ON INGREDIENTS:

Table with 2 columns: Chemical Name, Aquatic Toxicity Data. Row includes Didecyldimethylammonium chloride and its toxicity to various aquatic species.

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**Section 13. DISPOSAL CONSIDERATIONS**

RCRA STATUS: Discarded product, as sold, would be considered a RCRA Hazardous Waste based on the characteristic of Ignitability. The EPA Hazardous Waste Number is D001.

DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**Section 14. TRANSPORT INFORMATION**

DOT CLASSIFICATION:

Class/Division: 8

Proper Shipping Name: Corrosive liquid, flammable, n.o.s. (contains Didecylmethylammonium chloride and Ethanol)

Label: Corrosive, Flammable liquid

Packing Group: II

ID Number: UN 2920

**Section 15. REGULATORY INFORMATION**

SHA Hazard Communication Status: Hazardous

TSCA: Pesticides are exempted by TSCA (the Toxic Substances Control Act), under Section 3(2)(a)ii, from the provisions of the Act.

CERCLA reportable quantity of EPA hazardous substances in product:

Chemical Name

RQ

No ingredients of this product have CERCLA reportable quantities.

Product RQ: Not applicable

(Notify EPA of product spills exceeding this amount.)

SARA TITLE III:

Section 302 Extremely Hazardous Substances:

Chemical Name

CAS #

RQ

TPQ

There are no SARA 302 Extremely Hazardous Substances in this product.

Section 311 and 312 Health and Physical Hazards:

Immediate  
[yes]

Delayed  
[no]

Fire  
[yes]

Pressure  
[no]

Reactivity  
[no]

Section 313 Toxic Chemicals:

Chemical Name

CAS #

% by Weight

There are no reportable SARA 313 Toxic Chemicals in this product.

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Section 16. OTHER INFORMATION

HMIS RATINGS: Health = 3 Flammability = 2 Reactivity = 0  
Personal Protective Equipment = X (to be specified by user depending on use conditions)

Hazard rating scale: 0-Minimal 1-Slight 2-Moderate 3-Serious 4-Severe

MSDS REVISION SUMMARY: Supersedes MSDS issued on 2/4/94. The MSDS has changed in Sections 11 and 14.

While this information and recommendations set forth herein are believed to be accurate as of the date hereof, CALSON CORPORATION MAKES NO WARRANTY WITH RESPECT HERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

PREPARED BY: P.J. Maloney



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MATERIAL SAFETY DATA SHEET

Section 1. PRODUCT IDENTIFICATION

PRODUCT NAME: H-940  
CHEMICAL DESCRIPTION: Aqueous solution of alkali metal halide  
PRODUCT CLASS: Biocide  
MSDS CODE: 0A48-11-04-93

Section 2. INFORMATION ON INGREDIENTS

| Chemical Name  | CAS Number | % by Weight | OSHA PEL         | ACGIH TLV        |
|----------------|------------|-------------|------------------|------------------|
| Sodium bromide | 7647-15-6  | 40          | None established | None established |

Section 3. HAZARDS IDENTIFICATION

\*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*

WARNING!  
May cause eye and skin irritation.

\*\*\*\*\*

PRIMARY ROUTES OF ENTRY: Eye and skin contact, inhalation of mist

TARGET ORGANS: Eye, skin

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin disorders.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: This product may produce irritation upon contact with the eye.

SKIN CONTACT: This solution was found to be non-irritating to the skin in animal tests. It is not expected to be absorbed in harmful amounts. Prolonged or repeated skin exposure may result in skin irritation and dermatitis. Failure to decontaminate could result in superficial burns.

INGESTION: This product would be regarded as practically non-toxic if swallowed. Excessive ingestion of sodium bromide may produce rashes, depression, emaciation and, in severe cases, psychosis and mental deterioration.

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**INHALATION:** This product would not be expected to be an inhalation hazard unless the product is misted or sprayed. Bromide rashes may occur when bromide inhalation is prolonged. The systemic effects of bromide ion are chiefly mental: drowsiness, irritability, vertigo, confusion, hallucinations.

**SUBCHRONIC, CHRONIC:**

A three-generation reproduction study in rats fed 4800 mg/kg of solid sodium bromide showed a decrease in fertility. Other animal tests with sodium bromide produced adverse reproductive effects. The physiological effects of sodium bromide are attributable to the bromide ion. Metabolically, bromide has a biologic half-life of about 12 days, is not incorporated into fat or blood proteins, and none is extractable from plasma or hemolyzed blood cells by ether. Nor does the bromide ion interfere with thyroid activity even at large daily doses for extended periods of time.

**CARCINOGENICITY:**

- NTP:** \*No ingredients listed in this section\*
- IARC:** \*No ingredients listed in this section\*
- OSHA:** \*No ingredients listed in this section\*

**Section 4. FIRST AID MEASURES**

**EYE CONTACT:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Seek medical aid.

**SKIN CONTACT:** In case of contact, flush skin with plenty of water. Remove contaminated clothing. Seek medical aid if irritation persists. Wash clothing before reuse.

**INGESTION:** Not an expected route of overexposure. If swallowed, do not induce vomiting. Call a physician. This product would be expected to be practically non-toxic by ingestion.

**INHALATION:** Not an expected route of overexposure. However, if exposure by inhalation is suspected, remove to fresh air. Aid in breathing if necessary and seek medical aid if symptoms occur.

**Section 5. FIRE-FIGHTING MEASURES**

**FLASH POINT:** None

**LOWER FLAMMABLE LIMIT:** Not applicable      **UPPER FLAMMABLE LIMIT:** Not applicable

**AUTO-IGNITION TEMPERATURE:** Not applicable

**EXTINGUISHING MEDIA:** This material does not burn. If exposed to fire from another source, use suitable fire extinguishing agent for that fire.

**FIRE-FIGHTING INSTRUCTIONS:** Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential.

**FIRE & EXPLOSION HAZARDS:** Product emits toxic gases under fire conditions.

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**DECOMPOSITION PRODUCTS:** In fires fueled by other material, hydrogen bromide or bromine may be released.

**NFPA RATINGS:** Health = 2 Flammability = 0 Reactivity = 0 Special Hazard = None

Hazard rating scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

**Section 6. ACCIDENTAL RELEASE MEASURES**

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Wearing appropriate personal protective equipment, contain spill, collect onto inert absorbent and place into suitable container.

**Section 7. HANDLING AND STORAGE**

**HANDLING:** It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Avoid contact with eyes, skin and clothing. Avoid breathing mist. Use with adequate ventilation. Wash thoroughly after handling. Keep container closed when not in use.

**STORAGE:** Store in a cool, dry, well-ventilated location. The recommended minimum storage temperature is 0°F (-17.8°C).

**Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**PERSONAL PROTECTIVE EQUIPMENT:**

**EYE/FACE PROTECTION:** Chemical splash goggles

**SKIN PROTECTION:** Chemical resistant gloves

**RESPIRATORY PROTECTION:** When misting may occur in the work area, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements (29 CFR 1910.134).

**ENGINEERING CONTROLS:** Use local exhaust ventilation where mist or spray may be generated.

**WORK PRACTICES:** An eye wash station should be accessible in the immediate area of use.

**Section 9. PHYSICAL AND CHEMICAL PROPERTIES**

**BOILING POINT:** 217 -219°F (103 -104°C)

**SOLUBILITY IN WATER:** Complete

**VAPOR PRESSURE:** Similar to water

**SPECIFIC GRAVITY:** 1.43 @ 25°C

**VAPOR DENSITY (air=1):** Similar to water

**pH:** 5.5 - 9.0 @ 25°C

**%VOLATILE BY WEIGHT:** 60 (water)

**FREEZING POINT:** -10°F (-23.3°C)

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APPEARANCE AND ODOR: Clear, colorless to pale yellow liquid with no odor.

**Section 10. STABILITY AND REACTIVITY**

CHEMICAL STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Overheating.

INCOMPATIBILITY: Product is incompatible with strong oxidizers and acids and is mildly corrosive to aluminum. Sodium bromide is rapidly attacked by bromine trifluoride.

DECOMPOSITION PRODUCTS: In fires fueled by other material, hydrogen bromide or bromine may be released.

**Section 11. TOXICOLOGICAL INFORMATION**

ON PRODUCT:

Product Oral LD<sub>50</sub> (rat): > 5000 mg/kg

Product Dermal LD<sub>50</sub> (rabbit): > 2000 mg/kg

**Section 12. ECOLOGICAL INFORMATION**

ON PRODUCT:

Aquatic toxicity data:

The product is an aqueous sodium bromide solution. This data is not on the product as is, but rather on the activated product which is hypobromous acid. Values presented are for hypobromous acid expressed as bromine.

48 hr LC<sub>50</sub> (Daphnia magna): 0.71 ppm

96 hr LC<sub>50</sub> (bluegill sunfish): 0.52 ppm

96 hr LC<sub>50</sub> (rainbow trout): 0.23 ppm

Environmental data:

Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

**Section 13. DISPOSAL CONSIDERATIONS**

RCRA STATUS: Discarded product, as sold, would not be considered a RCRA Hazardous Waste.

DISPOSAL: Dispose of in accordance with local, state and federal regulations.

**Section 14. TRANSPORT INFORMATION**

DOT CLASSIFICATION:

Class/Division: Not restricted

Proper Shipping Name: Not applicable

MSDS Code: 0A48-11-04-93

Issue Date: 09/12/96

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Continued on Page 5

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'97

november 17, 1997

32:114

Assigned to: ????

H-940

Label: None  
Packing Group: Not applicable  
ID Number: Not applicable

Section 15. REGULATORY INFORMATION

OSHA Hazard Communication Status: Hazardous  
TSCA: Pesticides are exempted by TSCA (the Toxic Substances Control Act), under Section 3(2)(a)ii, from the provisions of the Act.  
CERCLA reportable quantity of EPA hazardous substances in product:

Chemical Name RQ  
No ingredients of this product have CERCLA reportable quantities.

Product RQ: Not applicable (Notify EPA of product spills exceeding this amount.)

SARA TITLE III:

Section 302 Extremely Hazardous Substances:

Chemical Name CAS # RQ TPQ  
There are no SARA 302 Extremely Hazardous Substances in this product.

Section 311 and 312 Health and Physical Hazards:

|           |         |      |          |            |
|-----------|---------|------|----------|------------|
| Immediate | Delayed | Fire | Pressure | Reactivity |
| [yes]     | [yes]   | [no] | [no]     | [no]       |

Section 313 Toxic Chemicals:

Chemical Name CAS # % by Weight  
There are no reportable SARA 313 Toxic Chemicals in this product.

Section 16. OTHER INFORMATION

HMIS RATINGS: Health = 2\* Flammability = 0 Reactivity = 0  
Personal Protective Equipment = X (to be specified by user depending on use conditions)

\*There are potential chronic health effects to consider.

Hazard rating scale: 0-Minimal 1-Slight 2-Moderate 3-Serious 4-Severe

MSDS REVISION SUMMARY: Supersedes MSDS issued on 08/19/94. The MSDS has been changed in Sections 7, 9, and 12.

While this information and recommendations set forth herein are believed to be accurate as of the date hereof, CALSON CORPORATION MAKES NO WARRANTY WITH RESPECT HERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

PREPARED BY: P.J. Maloney

**BETZDEARBORN MATERIAL  
SAFETY DATA SHEET**

EFFECTIVE DATE: 08-APR-1999  
PRINTED DATE: 08-APR-1999

32.53

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**1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME : SLIMICIDE C-68**

**PRODUCT APPLICATION AREA: WATER-BASED MICROBIAL 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)**

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**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  |
|------------|--|
| 10377-60-3 | MAGNESIUM NITRATE<br>Oxidizer; irritant (eyes and skin)  |
| 26172-55-4 | 5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE<br>Corrosive; toxic (by ingestion and skin absorption)<br>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.

PRODUCT NAME : SLIMICIDE C-68  
EFFECTIVE DATE: 08-APR-1999

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## 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. Store between 20-100F for no more than 6 months. Store upright in original vented containers. Product evolves CO<sub>2</sub> slowly. Store samples in plastic bottles due to pressure build-up.

---

## 8) EXPOSURE CONTROLS/PERSONAL PROTECTION

| CHEMICAL NAME | EXPOSURE LIMITS |
|---------------|-----------------|
|---------------|-----------------|

|                   |  |
|-------------------|--|
| 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 |  |
|-----------------------------|--|

|   |  |
|---|--|
| SC: Note-mfg. sugg. exp. limit:0.1 mg/m <sup>3</sup> TWA;0.3mg/m <sup>3</sup> STEL total (isothiazoline). |  |
|---|--|

### 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

PRODUCT NAME : SLIMICIDE C-68  
EFFECTIVE DATE: 08-APR-1999

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## 9) PHYSICAL AND CHEMICAL PROPERTIES

|                            |         |                       |        |
|----------------------------|---------|-----------------------|--------|
| Specific Grav. (70F, 21C)  | 1.033   | Vapor Pressure (mmHG) | ~ 18.0 |
| Freeze Point (F)           | 28      | Vapor Density (air=1) | < 1.00 |
| Freeze Point (C)           | -2      |                       |        |
| Viscosity (cps 70F, 21C)   | 8       | % Solubility (water)  | 100.0  |
| Odor                       |         | Slight                |        |
| Appearance                 |         | Light Yellow To Green |        |
| 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

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## 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"

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## 11) TOXICOLOGICAL INFORMATION

|                           |              |
|---------------------------|--------------|
| Oral LD50 RAT:            | >5,000 mg/kg |
| Teratology :              | NEGATIVE     |
| Dermal LD50 RABBIT:       | >2,000 mg/kg |
| NOTE - Estimated value    |              |
| Skin Sensitization HUMAN: | POSITIVE     |
| Non-Ames Mutagenicity :   | NEGATIVE     |



EFFECTIVE DATE: 08-APR-1999

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Rainbow Trout 96 Hour Static Acute Bioassay

LC50: 8.7 mg/L  
 No Effect Level: 6.5 mg/L

Daphnia magna 48 Hour Flow-Thru Bioassay

Mortality was observed in lowest concentration tested. Test concentrations were analytically verified.

LC50: 2.9 mg/L  
 10% Mortality: .6 mg/L

Bluegill Sunfish 96 Hour Static Acute Bioassay

LC50: 12.1 mg/L  
 No Effect Level: 6.5 mg/L

Fathead Minnow 96 Hour Flow-Thru Bioassay

Test concentrations were analytically verified.

LC50: 6.6 mg/L  
 No Effect Level: 2.5 mg/L

Rainbow Trout 14 Day Chronic Bioassay

LC50: 4.6 mg/L  
 No Effect Level: 3.3 mg/L

Fathead Minnow 36 Day Early Life Stage Test

Lowest Effect Level: 4 mg/L  
 No Effect Level: 1.3 mg/L

Sheepshead Minnow 96 Hour Static Acute Bioassay

LC50: 20 mg/L  
 No Effect Level: 12 mg/L

BIODEGRADATION

COD (mg/gm): 17 Calculated  
 TOC (mg/gm): 6 Calculated  
 BOD-5 (mg/gm): 0 Calculated  
 BOD-28 (mg/gm): 0 Calculated

PRODUCT NAME : SLIMICIDE C-68  
EFFECTIVE DATE: 08-APR-1999

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### 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.

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### 14) TRANSPORT INFORMATION

DOT HAZARD: Corrosive to skin  
UN / NA NUMBER: UN3265  
DOT EMERGENCY RESPONSE GUIDE #: 153

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### 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:

3876- 143

#### 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.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:

| CAS#       | CHEMICAL NAME     | RANGE    |
|------------|-------------------|----------|
| 10377-60-3 | MAGNESIUM NITRATE | 2.0-5.0% |

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### CALIFORNIA REGULATORY INFORMATION

#### CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

PRODUCT NAME : SLIMICIDE C-68  
EFFECTIVE DATE: 08-APR-1999

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**MICHIGAN REGULATORY INFORMATION**

No regulated constituent present at OSHA thresholds

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**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<br>DATE | REVISIONS TO SECTION: | SUPERCEDES  |
|--------------|-------------------|-----------------------|-------------|
|              | -----             | -----                 | -----       |
| MSDS status: | 22-AUG-1995       | REVISED FORMAT        | ** NEW **   |
|              | 12-MAR-1996       | ;EDIT:9               | 22-AUG-1995 |
|              | 21-JUN-1996       | 15                    | 12-MAR-1996 |
|              | 28-SEP-1996       | 3,5,14                | 21-JUN-1996 |
|              | 02-SEP-1997       | 12                    | 28-SEP-1996 |
|              | 01-MAY-1998       | 15;EDIT:9             | 02-SEP-1997 |
|              | 08-APR-1999       | ;EDIT:9               | 01-MAY-1998 |

H-550



P.O. Box 1346  
Pittsburgh, PA 15230-1346  
Phone-(412)494-8000  
CHEMTREC® 1-800-424-9300

### MATERIAL SAFETY DATA SHEET

#### Section 1. PRODUCT IDENTIFICATION

PRODUCT NAME: H-550

CHEMICAL DESCRIPTION: Glutaraldehyde, 50% aqueous solution

PRODUCT CLASS: Biocide

MSDS CODE: 0B85-01-29-96

#### Section 2. INFORMATION ON INGREDIENTS

| <u>Chemical Name</u> | <u>CAS Number</u> | <u>% by Weight</u> | <u>OSHA PEL</u>  | <u>ACGIH TLV</u>                           |
|----------------------|-------------------|--------------------|------------------|--|
| Glutaraldehyde       | 111-30-8          | 50                 | None established | Celling 0.2 ppm,<br>0.62 mg/m <sup>3</sup> |

#### Section 3. HAZARDS IDENTIFICATION

\*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*

Clear, colorless liquid with sharp odor.

**DANGER!**

May cause severe eye and skin damage.

Harmful if inhaled.

May be fatal if swallowed.

Harmful if absorbed through skin.

Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Causes asthmatic signs and symptoms in hyper-reactive individuals.

\*\*\*\*\*

PRIMARY ROUTES OF ENTRY: Eye and skin contact, inhalation, skin absorption, ingestion

TARGET ORGANS: Eye, skin, mucous membranes

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin contact may aggravate an existing dermatitis.  
Inhalation of material may aggravate asthma and inflammatory or fibrotic pulmonary disease.

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**POTENTIAL HEALTH EFFECTS:**

**EYE CONTACT:** Liquid will cause a severe and persistent conjunctivitis, seen as excess redness and marked swelling of the conjunctiva with profuse discharge. Severe corneal injury may develop, which could permanently impair vision if prompt first-aid and medical treatment are not obtained. Vapor will cause stinging sensations in the eye with excess tear production, blinking, and possibly a slight excess redness of the conjunctiva.

**SKIN CONTACT:** Brief contact with the product will cause itching with mild to moderate local redness and possibly swelling. Prolonged contact may result in pain, severe redness and swelling, with ulceration, tissue destruction, and possibly bleeding into the inflamed area. Glutaraldehyde may be absorbed through intact skin. Therefore, prolonged or widespread contact with the product may result in the absorption of potentially harmful amounts of material and may affect the central nervous system producing headache, dizziness, and dullness. This product may cause allergic contact dermatitis in a small portion of individuals. Sensitization reactions usually result from contact with the liquid, but occasionally there may be a reaction to glutaraldehyde vapor.

**INGESTION:** Swallowing this product may cause moderate to marked irritation and possibly chemical burns of the mouth, throat, esophagus, and stomach, with discomfort or pain in the mouth, throat, chest, and abdomen, nausea, vomiting, diarrhea, dizziness, faintness, drowsiness, weakness, thirst, circulatory shock, collapse, and coma.

**INHALATION:** Product vapor is irritating to the respiratory tract, causing stinging sensations in the nose and throat, discharge from the nose, possibly bleeding from the nose, coughing, chest discomfort and tightness, difficulty with breathing, and headache. Severe exposure may cause central nervous system depression with dizziness and drowsiness. The odor threshold of glutaraldehyde is 0.04 ppm whereas the irritation threshold is 0.3 ppm. If vapors are concentrated enough to be irritating, the TLV is probably being exceeded. Inhalation of product can cause signs and symptoms of an asthmatic attack in hyper-reactive individuals.

**SUBCHRONIC, CHRONIC:**

Repeated skin contact may cause a cumulative dermatitis.

**CARCINOGENICITY:****NTP:**

\*No ingredients listed in this section\*

**IARC:**

\*No ingredients listed in this section\*

**OSHA:**

\*No ingredients listed in this section\*

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**Section 4. FIRST AID MEASURES**

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**EYE CONTACT:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Do not remove contact lenses, if worn. Seek medical aid immediately.

**SKIN CONTACT:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical aid immediately. Wash clothing before reuse.

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**INGESTION: DO NOT INDUCE VOMITING.** Do not give anything to drink. Seek medical advice with urgency. Note to Physician: Aspiration may cause lung damage. Probable mucosal damage may contraindicate the use of gastric lavage.

**INHALATION:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical aid.

**Section 5. FIRE-FIGHTING MEASURES**

**FLASH POINT:** None  
Non-flammable (aqueous solution): After water evaporates, remaining material will burn.

**LOWER FLAMMABLE LIMIT:** Not determined      **UPPER FLAMMABLE LIMIT:** Not determined

**AUTO-IGNITION TEMPERATURE:** Not available

**EXTINGUISHING MEDIA:** Use alcohol-type or all-purpose-type foam, applied by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

**FIRE-FIGHTING INSTRUCTIONS:** Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential.

**FIRE & EXPLOSION HAZARDS:** No unusual hazards.

**DECOMPOSITION PRODUCTS:** Thermal decomposition or combustion may produce carbon dioxide and carbon monoxide.

**NFPA RATINGS:** Health = 3      Flammability = 0      Reactivity = 0      Special Hazard = None

Hazard rating scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

**Section 6. ACCIDENTAL RELEASE MEASURES**

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Wear suitable protective equipment. Toxic to fish; avoid discharge to natural waters. Very low concentrations (5 ppm or less of glutaraldehyde) can be degraded in a biological treatment system. Thus, small spills can be flushed with large quantities of water. Large quantities or "slugs" can be harmful to the treatment system. Thus, large spills should be collected for disposal. It may also be possible to decontaminate spilled material by careful application of aqueous sodium hydroxide or dibasic ammonium phosphate solution. Depending on conditions, considerable heat and fumes can be liberated by the decontamination reaction.

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**Section 7. HANDLING AND STORAGE**

**HANDLING:** It is a violation of Federal law to use this product in a manner inconsistent with its labeling.  
Do not get in eyes, on skin or clothing.  
Avoid breathing vapor.  
Use with adequate ventilation.  
Wash thoroughly after handling. Keep container closed when not in use.  
Remove contaminated clothing and wash before reuse.  
Discard contaminated leather articles such as shoes and belt.

**STORAGE:** Glutaraldehyde solutions can be stored and handled in polyethylene, stainless steel, or reinforced epoxy-plastic equipment. For short storage times (up to about 1 month), temperatures of up to 100°F (38 °C) can be tolerated but the preferred maximum storage temperature is about 80°F (27 °C).

**Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**PERSONAL PROTECTIVE EQUIPMENT:**

**EYE/FACE PROTECTION:** Chemical splash goggles and face shield

**SKIN PROTECTION:** Chemical resistant gloves and protective clothing

(Recommended glove materials include rubber, nitrile (NBR), butyl, and polyethylene.)

**RESPIRATORY PROTECTION:** If airborne concentrations exceed published exposure limits, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements (29 CFR 1910.134).

**ENGINEERING CONTROLS:** General (mechanical) room ventilation is expected to be satisfactory if this material is kept in covered equipment or if the solution is highly diluted. However, if vapors are strong enough to irritate the nose or eyes, the exposure limits are probably being exceeded and special ventilation may be required.

**WORK PRACTICES:** Eye wash station and safety shower should be accessible in the immediate area of use.

**SATISFACTORY MATERIALS OF CONSTRUCTION:** Stainless steel types 304 and 316, Nickel, Polyethylene, and Fiberglass-reinforced plastics: Polyester (e.g., Atiac 382) and Vinylester (e.g., Derakane 411 or 470).  
Recommended gasket materials: Silicone, Teflon, Kalrez, or Grafoil.

**UNSATISFACTORY MATERIALS OF CONSTRUCTION:** Glutaraldehyde solutions are incompatible with many commonly used materials of construction such as carbon steel, iron, aluminum, tin, zinc, copper and monel. Lined steel containers are not recommended for bulk storage, since pinholes could cause product contamination. Rubber linings are also unsuitable because of swelling. Do not use Viton.

**Section 9. PHYSICAL AND CHEMICAL PROPERTIES**

**BOILING POINT:** 214.2°F (101.2°C) @ 760 mmHg .

**SOLUBILITY IN WATER:** Complete

**VAPOR PRESSURE:** 15.0 mmHg @ 20°C

**SPECIFIC GRAVITY:** 1.127 - 1.133 @ 20/20°C

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VAPOR DENSITY (air=1): 1.05

pH: 3.1 - 4.5 @ 25°C

%VOLATILE BY WEIGHT: Not available

FREEZING POINT: -6°F (-21°C)

APPEARANCE AND ODOR: Clear, colorless liquid with sharp odor.

VISCOSITY: 21 cps @ 20°C

**Section 10. STABILITY AND REACTIVITY**

CHEMICAL STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Avoid high temperature and evaporation of water. Although polymerization may occur, it is not hazardous.

INCOMPATIBILITY: Alkalies catalyze an aldol-type condensation reaction, which is exothermic but not expected to be violent.

DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce carbon dioxide and carbon monoxide.

**Section 11. TOXICOLOGICAL INFORMATION****ON PRODUCT:**

**Toxicological data on Inhalation effects:** An NTP inhalation study indicated that glutaraldehyde exposure in rats and mice resulted in a spectrum of necrotic, inflammatory, and regenerative lesions in the upper respiratory tract. The no-observed-adverse-effect level for respiratory lesions in rats was 125 parts per billion. The study, however, did not detect any no-observed-adverse-effect level for mice. Inflammation was found in the frontal nasal passage of the mouse at concentrations as low as 62.5 ppb.

**Toxicological data on chronic effects:** Studies in humans have shown that glutaraldehyde is neither phototoxic nor a photosensitizer. Subchronic drinking water studies in rats, mice and dogs using concentrations up to 1000 ppm showed no evidence for any target organ toxicity. In vitro studies for genotoxicity using a variety of assays have given results varying from no activity to weakly positive; however, all in vivo studies for genotoxicity have been uniformly negative. Several developmental toxicity studies have demonstrated that at maternally nontoxic doses, glutaraldehyde does not produce fetotoxic, embryotoxic or teratogenic effects. In a chronic (2-year) continuous drinking water combined chronic toxicity-oncogenicity study using Fischer 344 rats, there was no evidence for non-oncogenic target organ toxicity. The only possible oncogenicity-related finding was an increase in the incidence of large granular cell lymphocytic leukemia in female, but not male, rats. The pattern of the response suggests that it does not represent direct chemical carcinogenic activity but, rather, a modifying influence on the expression of this spontaneous and commonly occurring neoplasm in the Fischer 344 rat.

**ON INGREDIENTS:**

| <u>Chemical Name</u> | <u>Oral LD<sub>50</sub></u><br><u>(rat)</u> | <u>Dermal LD<sub>50</sub></u><br><u>(rabbit)</u> | <u>Inhalation LC<sub>50</sub></u><br><u>(rat)</u> |
|----------------------|---|--|---|
| Glutaraldehyde       | 134 mg/kg                                   | 2560 mg/kg (25% soln)                            | 480 mg/m <sup>3</sup> /4H                         |



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**Section 12. ECOLOGICAL INFORMATION****ON PRODUCT:****Environmental data:**

This product is toxic to fish. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

Modified Test for Ready Biodegradation: 79.7% DOC

**ON INGREDIENTS:**

Chemical Name  
Glutaraldehyde (50% active solution)

Aquatic Toxicity Data

96 hr LC<sub>50</sub> (bluegill sunfish): 22 ppm  
96 hr LC<sub>50</sub> (rainbow trout): 24 ppm  
48 hr LC<sub>50</sub> (Daphnia): 12 ppm  
96 hr LC<sub>50</sub> (fathead minnow): 12 ppm  
96 hr LC<sub>50</sub> (sheepshead minnow): 64 ppm  
96 hr LC<sub>50</sub> (mysid shrimp): 14 ppm

**Section 13. DISPOSAL CONSIDERATIONS**

RCRA STATUS: Discarded product, as sold, would not be considered a RCRA Hazardous Waste.

DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**Section 14. TRANSPORT INFORMATION****DOT CLASSIFICATION:**

Class/Division: 8  
Proper Shipping Name: Corrosive liquid, acidic, organic, n.o.s. (contains Glutaraldehyde)  
Label: Corrosive  
Packing Group: II  
ID Number: UN 3265

**Section 15. REGULATORY INFORMATION**

OSHA Hazard Communication Status: Hazardous

TSCA: The ingredients of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.

MSDS Code: 0885-01-29-96  
Issue Date: 10/06/97

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Continued on Page 7

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CERCLA reportable quantity of EPA hazardous substances in product:

Chemical Name RQ
No ingredients of this product have CERCLA reportable quantities.

Product RQ: Not applicable (Notify EPA of product spills exceeding this amount.)

SARA TITLE III:

Section 302 Extremely Hazardous Substances:

Chemical Name CAS # RQ IPQ
There are no SARA 302 Extremely Hazardous Substances in this product.

Section 311 and 312 Health and Physical Hazards:

Immediate Delayed Fire Pressure Reactivity
[yes] [yes] [no] [no] [no]

Section 313 Toxic Chemicals:

Chemical Name CAS # % by Weight
There are no reportable SARA 313 Toxic Chemicals in this product.

Section 16. OTHER INFORMATION

HMIS RATINGS: Health = 3\* Flammability = 0 Reactivity = 0
Personal Protective Equipment = X (to be specified by user depending on use conditions)

\*There are potential chronic health effects to consider.

Hazard rating scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

MSDS REVISION SUMMARY: Supersedes MSDS issued on 09/25/97. The MSDS has been changed in Section 2.

While this information and recommendations set forth herein are believed to be accurate as of the date hereof, CALSON CORPORATION MAKES NO WARRANTY WITH RESPECT HERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

PREPARED BY: P.J. Maloney

**BETZDEARBORN MATERIAL  
SAFETY DATA SHEET**

EFFICIENCY DATE: 25-FEB-1997  
PRINTED DATE: 25-FEB-1997

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**1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME : BETZ 860**

**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)**

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**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

TRADE SECRET INGREDIENT(E195);TSRN 125438 - 5118P  
Irritant (eyes)

TRADE SECRET INGREDIENT(122);;TSRN 125438 - 5214P  
Potential irritant (eyes)

TRADE SECRET INGREDIENT(222);TSRN 125438 - 5238P  
Oxidizer; corrosive; pulmonary damage; dental  
erosion

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.

PRODUCT NAME : BETZ 860  
EFFECTIVE DATE: 25-FEB-1997

### 3) HAZARDS IDENTIFICATION

\*\*\*\*\*  
**EMERGENCY OVERVIEW**

#### WARNING

May cause slight irritation to the skin. Severe irritant to the eyes. Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.

DOT hazard: Corrosive to steel  
Emergency Response Guide #154  
Odor: Acid; Appearance: Yellow To Dark 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; May cause slight irritation to the skin.

##### ACUTE EYE EFFECTS:

Severe irritant 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 slight gastrointestinal irritation.

##### TARGET ORGANS:

Prolonged or repeated exposures may cause primary irritant dermatitis and/or toxicity to the lung.

##### MEDICAL CONDITIONS AGGRAVATED:

Not known.

##### SYMPTOMS OF EXPOSURE:

Inhalation may cause irritation of the respiratory tract. Skin contact may cause itching and/or redness.

PRODUCT NAME : BETZ 860  
EFFECTIVE DATE: 25-FEB-1997

---

#### 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.

---

#### 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 P-M(CC)

**MISCELLANEOUS:**

Corrosive to steel

UN3264;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.

PRODUCT NAME : BETZ 860  
EFFECTIVE DATE: 25-FEB-1997

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## 7) HANDLING AND STORAGE

### HANDLING:

Contains an oxidizer. Avoid all contact with reducing agents, oils, greases, organics and acids.

### 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

TRADE SECRET INGREDIENT(E195);TSRN 125438 - 5118P

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

TRADE SECRET INGREDIENT(122);;TSRN 125438 - 5214P

PEL (OSHA): NUISANCE DUST

TLV (ACGIH): 5 MG/M3

MISC: Note: manufacturer's recommended exposure limit: 10 mg/m3.

TRADE SECRET INGREDIENT(222);TSRN 125438 - 5238P

PEL (OSHA): 5 MG/M3(10MG/M3-STEL)

TLV (ACGIH): 5 MG/M3(10MG/M3-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.

An air-supplying respirator (positive pressure full facepiece) may be needed for this product.

#### SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

#### EYE PROTECTION:

splash proof chemical goggles

PRODUCT NAME : BETZ 860  
EFFECTIVE DATE: 25-FEB-1997

## 9) PHYSICAL AND CHEMICAL PROPERTIES

|                      |       |                       |        |
|----------------------|-------|-----------------------|--------|
| Specific Grav. (70F) | 1.098 | Vapor Pressure (mmHG) | ~ 18.0 |
| Freeze Point (F)     | 26.00 | Vapor Density (air=1) | < 1.00 |
| Viscosity (cps 70F)  | ND    | % Solubility (water)  | 100.0  |

|                            |                      |
|----------------------------|----------------------|
| Odor                       | Acid                 |
| Appearance                 | Yellow To Dark Brown |
| Physical State             | Liquid               |
| Flash Point (F)            | > 200 P-M(CC)        |
| pH As Is (approx.)         | 1.4                  |
| 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 organics or alkaline materials.

### DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

### BETZ INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"D"

## 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:   | >2,000 ppm/hr |
| NOTE - Estimated value |               |

## 12) ECOLOGICAL INFORMATION

### AQUATIC TOXICOLOGY

No Data Available.

### BIODEGRADATION

|                 |     |
|-----------------|-----|
| COD (mg/gm):    | 443 |
| TOC (mg/gm):    | 203 |
| BOD-5 (mg/gm):  | 381 |
| BOD-28 (mg/gm): | 505 |

PRODUCT NAME : BETZ 860  
EFFECTIVE DATE: 25-FEB-1997

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### 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: UN3264  
DOT EMERGENCY RESPONSE GUIDE #: 154

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### 15) REGULATORY INFORMATION

#### TSCA:

All components of this product are listed in the TSCA inventory.

#### CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

9,111 gallons due to (122);5,466 gallons due to (222);

#### SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

#### SARA SECTION 302 CHEMICALS:

| CAS# | CHEMICAL NAME                       |
|------|-------------------------------------|
|      | TRADE SECRET(222) -- INORGANIC ACID |

#### SARA SECTION 313 CHEMICALS:

| CAS# | CHEMICAL NAME                       | RANGE    |
|------|-------------------------------------|----------|
|      | TRADE SECRET(222) -- INORGANIC ACID | 2.0-5.0% |

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### CALIFORNIA REGULATORY INFORMATION

#### CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

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### MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds



PRODUCT NAME : BETZ 860  
EFFECTIVE DATE: 25-FEB-1997

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<br>DATE | REVISIONS TO SECTION: | SUPERCEDES  |
|--------------|-------------------|-----------------------|-------------|
|              | -----             | -----                 | -----       |
| MSDS status: | 22-AUG-1995       | REVISED FORMAT        | ** NEW **   |
|              | 28-SEP-1996       | 3, 5, 14              | 22-AUG-1995 |
|              | 25-FEB-1997       | 12                    | 28-SEP-1996 |

32/28

Coagulant Aid 35



P.O. Box 1346  
Pittsburgh, PA 15230-1346  
Phone-(412)494-8000

MATERIAL SAFETY DATA SHEET

Section 1. PRODUCT IDENTIFICATION

PRODUCT NAME: Coagulant Aid 35

CHEMICAL DESCRIPTION: Bentonite, a colloidal clay (aluminum silicate) that consists primarily of montmorillonite

PRODUCT CLASS: Water treatment

MSDS CODE: 0378-04-25-95

Section 2. INFORMATION ON INGREDIENTS

| <u>Chemical Name</u>                         | <u>CAS Number</u> | <u>% by Weight</u> | <u>OSHA PEL</u>           | <u>ACGIH TLV</u>          |
|--|-------------------|--------------------|---------------------------|---------------------------|
| Silica, crystalline, quartz, respirable dust | 14808-60-7        | <2                 | TWA 0.1 mg/m <sup>3</sup> | TWA 0.1 mg/m <sup>3</sup> |

Section 3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING!

May cause respiratory tract and eye irritation.  
Prolonged inhalation of product dust may cause lung injury or disease.  
Causes slippery surfaces when wet.

PRIMARY ROUTES OF ENTRY: Inhalation, eye contact

TARGET ORGANS: Lung, eye

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing chronic lung conditions such as, but not limited to, bronchitis, emphysema, and asthma.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: This product is expected to cause eye irritation due to mechanical action.

SKIN CONTACT: The product is not expected to cause skin irritation upon contact. No data is available to suggest that this product may produce an allergic skin reaction or be absorbed through the skin in harmful amounts.

MSDS Code: 0378-04-25-95  
Issue Date: 11/07/95

Page 1 of 5  
Continued on Page 2

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**Coagulant Aid 35**

**INGESTION:** This product would be expected to be practically non-toxic by ingestion.

**INHALATION:** Exposure to high dust concentrations may produce irritation to the nose, throat, and respiratory tract. Inhalation of large amounts of dust of this product may produce shortness of breath and reduced pulmonary function.

**SUBCHRONIC, CHRONIC:**

Inhalation of dusts of this product over a prolonged period of time may produce lung injury or disease like silicosis. Silicosis is a chronic disease characterized by the formation of scattered silica-containing nodules of scar tissue in the lungs. Silicosis usually begins with symptoms of coughing, breathing difficulty, wheezing, and repeated, non-specific chest illnesses. Impairment of pulmonary function may be progressive.

This product contains a small amount of free crystalline silica which upon prolonged inhalation has exhibited evidence of carcinogenicity.

**CARCINOGENICITY:**

**NTP:**

Respirable crystalline silica is a NTP anticipated carcinogen (6th Annual Report, 1991).

**IARC:**

Respirable crystalline silica is an IARC probable human carcinogen (Group 2A); human evidence-limited, animal evidence-sufficient.

**OSHA:**

No ingredients listed.

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**Section 4: FIRST AID MEASURES**

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**EYE CONTACT:** In case of contact, immediately flush eyes with plenty of water. Seek medical aid if irritation persists.

**SKIN CONTACT:** Not expected to require first aid measures.

**INGESTION:** Not an expected route of overexposure.

**INHALATION:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical aid.

---

**Section 5. FIRE-FIGHTING MEASURES**

---

**FLASH POINT:** Not applicable  
Product is noncombustible.

**LOWER FLAMMABLE LIMIT:** Not applicable      **UPPER FLAMMABLE LIMIT:** Not applicable

**AUTO-IGNITION TEMPERATURE:** Not applicable

**EXTINGUISHING MEDIA:** Use extinguishing media appropriate for the surrounding fire.

**FIRE-FIGHTING INSTRUCTIONS:** Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential.

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**Coagulant Aid 35**

**FIRE & EXPLOSION HAZARDS:** No unusual hazards.

**DECOMPOSITION PRODUCTS:** None

**NFPA RATINGS:** Health = 1 Flammability = 0 Reactivity = 0 Special Hazard = None

Hazard rating scale: 0-Minimal 1-Slight 2-Moderate 3-Serious 4-Severe

**Section 6. ACCIDENTAL RELEASE MEASURES**

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Wearing appropriate personal protective equipment, vacuum if possible to avoid generating airborne dust, and place into a suitable container. Avoid using water as the product will become slippery when wet.

**Section 7. HANDLING AND STORAGE**

**HANDLING:** Avoid breathing dust.  
Avoid contact with eyes.  
Use with adequate ventilation.  
Wash thoroughly after handling.  
Keep container closed when not in use.

**STORAGE:** No specific information.

**Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**PERSONAL PROTECTIVE EQUIPMENT:**

**EYE/FACE PROTECTION:** Chemical splash goggles

**SKIN PROTECTION:** No special requirement.

**RESPIRATORY PROTECTION:** If airborne concentrations exceed published exposure limits, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements (29 CFR 1910.134).

**ENGINEERING CONTROLS:** Use local and/or general exhaust ventilation to maintain airborne concentrations below exposure limits.

**WORK PRACTICES:** Ensure all equipment is properly grounded to prevent static electricity discharge.

**Section 9. PHYSICAL AND CHEMICAL PROPERTIES**

**BOILING POINT:** Not applicable

**SOLUBILITY IN WATER:** Negligible

**VAPOR PRESSURE:** Not applicable

**SPECIFIC GRAVITY:** 1.2 (1% aqueous suspension)

**VAPOR DENSITY (air=1):** Not applicable

**pH:** 8.5 - 10.5 (5% suspension)

MSDS Code: 0378-04-25-95  
Issue Date: 11/07/95

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Continued on Page 4

32-12-87

**Coagulant Aid 35**

**%VOLATILE BY WEIGHT:** Not applicable      **FREEZING POINT:** Not applicable

**APPEARANCE AND ODOR:** Pale gray to buff powder or granules, odorless.

**Section 10. STABILITY AND REACTIVITY**

**CHEMICAL STABILITY:** Stable      **HAZARDOUS POLYMERIZATION:** Will not occur

**CONDITIONS TO AVOID:** No specific information.

**INCOMPATIBILITY:** No significant incompatibilities known

**DECOMPOSITION PRODUCTS:** None

**Section 11. TOXICOLOGICAL INFORMATION**

**ON PRODUCT:**  
No information available on the formulated product.

**ON INGREDIENTS:**

| <u>Chemical Name</u>                         | <u>Oral LD<sub>50</sub><br/>(rat)</u> | <u>Dermal LD<sub>50</sub><br/>(rabbit)</u> | <u>Inhalation LC<sub>50</sub><br/>(rat)</u>               |
|--|---------------------------------------|--|---|
| Silica, crystalline, quartz, respirable dust | Not available                         | Not available                              | LC <sub>50</sub> (human):<br>300 ug/m <sup>3</sup> /10Y-1 |

**Section 12. ECOLOGICAL INFORMATION**

**ON PRODUCT:**  
No information available on the formulated product.

**Section 13. DISPOSAL CONSIDERATIONS**

**RCRA STATUS:** Discarded product; as sold, would not be considered a RCRA Hazardous Waste.

**DISPOSAL:** Dispose of in accordance with local, state and federal regulations.

**Section 14. TRANSPORT INFORMATION**

**DOT CLASSIFICATION:**

- Class/Division: Not restricted
- Proper Shipping Name: Not applicable
- Label: None
- Packing Group: Not applicable
- ID Number: Not applicable

MSDS Code: 0378-04-25-95  
Issue Date: 11/07/95

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Continued on Page 5

32-12-8

**Coagulant Aid 35**

**Section 15. REGULATORY INFORMATION**

OSHA Hazard Communication Status: **Hazardous**  
TSCA: The ingredients of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.  
CERCLA reportable quantity of EPA hazardous substances in product:

Chemical Name RQ  
No ingredients of this product have CERCLA reportable quantities.

Product RQ: **Not applicable** (Notify EPA of product spills exceeding this amount.)

**SARA TITLE III:**

**Section 302 Extremely Hazardous Substances:**

Chemical Name CAS # RQ TPO  
There are no SARA 302 Extremely Hazardous Substances in this product.

**Section 311 and 312 Health and Physical Hazards:**

|                    |                  |              |                  |                    |
|--------------------|------------------|--------------|------------------|--------------------|
| Immediate<br>[yes] | Delayed<br>[yes] | Fire<br>[no] | Pressure<br>[no] | Reactivity<br>[no] |
|--------------------|------------------|--------------|------------------|--------------------|

**Section 313 Toxic Chemicals:**

Chemical Name CAS # % by Weight  
There are no reportable SARA 313 Toxic Chemicals in this product.

**Section 16. OTHER INFORMATION**

HMIS RATINGS: Health = 1\* Flammability = 0 Reactivity = 0  
Personal Protective Equipment = X (to be specified by user depending on use conditions)

\*There are potential chronic health effects to consider.

Hazard rating scale: 0-Minimal 1-Slight 2-Moderate 3-Serious 4-Severe

MSDS REVISION SUMMARY: Supersedes MSDS issued on 10/28/92. The MSDS has been changed in Sections 3 and 8.

While this information and recommendations set forth herein are believed to be accurate as of the date hereof, CALGON CORPORATION MAKES NO WARRANTY WITH RESPECT HERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

PREPARED BY: P.J. Maloney

MSDS Code: 0378-04-25-95  
Issue Date: 11/07/95

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Last Page

**BETZDEARBORN MATERIAL  
SAFETY DATA SHEET**

EFFECTIVE DATE: 12-JUN-1998  
PRINTED DATE: 23-OCT-1998

32.69

**1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME : BETZ CLAM-TROL CT-1**

**PRODUCT APPLICATION AREA:**

**COMPANY ADDRESS:**

BetzDearborn Inc.  
4636 Somerton Road, Trevoise, 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   |
|------------|---|
| 107-21-1   | ETHYLENE GLYCOL<br>Liver, kidney and blood toxin; CNS depressant;<br>animal teratogen (at high oral doses)                  |
| 68424-85-1 | (C12-16)ALKYL DIMETHYL BENZYL AMMONIUM CHLORIDE<br>Corrosive (eyes and skin);toxic (by ingestion)                           |
| 67-63-0    | ISOPROPYL ALCOHOL (IPA)<br>Flammable liquid; chronic overexposure may cause<br>liver and kidney toxicity                    |
| 13590-97-1 | DODECYLGUANIDINE HYDROCHLORIDE (DGH)<br>Corrosive   |
| 64-17-5    | ETHYL ALCOHOL (ETHANOL)<br>Flammable liquid; irritant (eyes); potential liver<br>and kidney toxin; may cause CNS depression |
| 111-46-6   | ETHANOL, 2, 2'-OXYBIS-<br>Toxic (by ingestion); liver and kidney toxin; CNS<br>depressant                                   |

PRODUCT NAME : BETZ CLAM-TROL CT-1

EFFECTIVE DATE: 12-JUN-1998

**HAZARDOUS INGREDIENTS (continued):**

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.



PRODUCT NAME : BETZ CLAM-TROL CT-1  
EFFECTIVE DATE: 12-JUN-1998

### 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, flammable

Emergency Response Guide #29

Odor: Mild; Appearance: Colorless To Light 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:**

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 CNS depression, tissue necrosis, and/or toxicity to the liver, kidney, and reproductive system.

##### **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 : BETZ CLAM-TROL CT-1**  
**EFFECTIVE DATE: 12-JUN-1998**

---

#### **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:**

116F 47C SETA(CC)

**MISCELLANEOUS:**

Corrosive to skin, flammable  
UN2920;Emergency Response Guide #29

---

#### **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. Remove ignition sources. Flush area with water. 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 : BETZ CLAM-TROL CT-1  
EFFECTIVE DATE: 12-JUN-1998

---

## 7) HANDLING AND STORAGE

### HANDLING:

Combustible. Do not use around sparks or flames. Bond containers during filling or discharge when performed at temperatures at or above the product flash point.

### STORAGE:

Keep containers closed when not in use. Do not store at elevated temperatures. Keep away from flame or sparks.

---

## 8) EXPOSURE CONTROLS/PERSONAL PROTECTION

### EXPOSURE LIMITS

#### CHEMICAL NAME

##### ETHYLENE GLYCOL

PEL (OSHA): 50 PPM-C

TLV (ACGIH): 100 PPM-C

##### (C12-16)ALKYL DIMETHYL BENZYL AMMONIUM CHLORIDE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

##### ISOPROPYL ALCOHOL (IPA)

PEL (OSHA): 400 PPM(500PPM-STEL)

TLV (ACGIH): 400 PPM(500PPM-STEL)

##### DODECYLGUANIDINE HYDROCHLORIDE (DGH)

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

##### ETHYL ALCOHOL (ETHANOL)

PEL (OSHA): 1,000 PPM

TLV (ACGIH): 1,000 PPM

##### ETHANOL,2,2'-OXYBIS-

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

MISC: Note-AIHA WEEL of 50 ppm for aerosol and vapor has been established.

PRODUCT NAME : BETZ CLAM-TROL CT-1  
EFFECTIVE DATE: 12-JUN-1998

---

## 8) EXPOSURE CONTROLS/PERSONAL PROTECTION (continued)

### 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:

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)  | 1.022    | Vapor Pressure (mmHG)     | 23.0   |
| Freeze Point (F)           | < -30    | Vapor Density (air=1)     | > 1.00 |
| Freeze Point (C)           | < -34    |                           |        |
| Viscosity(cps 70F, 21C)    | 23       | % Solubility (water)      | 100.0  |
| Odor                       |          | Mild                      |        |
| Appearance                 |          | Colorless To Light Yellow |        |
| Physical State             |          | Liquid                    |        |
| Flash Point                | SETA(CC) | 116F 46C                  |        |
| pH As Is (approx.)         |          | 3.6                       |        |
| Evaporation Rate (Ether=1) |          | < 1.00                    |        |

NA = not applicable ND = not determined

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## 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"

PRODUCT NAME : BETZ CLAM-TROL CT-1  
EFFECTIVE DATE: 12-JUN-1998

## 11) TOXICOLOGICAL INFORMATION

|                               |              |
|-------------------------------|--------------|
| Oral LD50 RAT:                | 3,270 mg/kg  |
| Dermal LD50 RABBIT:           | >2,000 mg/kg |
| Skin Irritation Score RABBIT: | 5.13         |
| Eye Irritation Score RABBIT:  | 103          |

NOTE - Max unwashed (day 14); max washed value:101 (day 14)

## 12) ECOLOGICAL INFORMATION

### AQUATIC TOXICOLOGY

#### Rainbow Trout 96 Hour Flow-Thru Bioassay

LC50: 8.1 mg/L  
No Effect Level: 6.5 mg/L

#### Fathead Minnow 96 Hour Flow-Thru Bioassay

LC50: 2.9 mg/L  
No Effect Level: 2.1 mg/L

#### Daphnia magna 48 Hour Flow-Thru Bioassay

LC50: .2 mg/L  
No Effect Level: .135 mg/L

#### Ceriodaphnia 48 Hour Flow-Thru Bioassay

LC50: .14 mg/L  
No Effect Level: .05 mg/L

#### Mysid Shrimp 96 Hour Flow-Thru Bioassay

LC50: .34 mg/L  
No Effect Level: .1 mg/L

### BIODEGRADATION

|                 |                 |
|-----------------|-----------------|
| COD (mg/gm):    | 1155 Calculated |
| TOC (mg/gm):    | 278 Calculated  |
| BOD-5 (mg/gm):  | 24 Calculated   |
| BOD-28 (mg/gm): | 254 Calculated  |

PRODUCT NAME : BETZ CLAM-TROL CT-1  
EFFECTIVE DATE: 12-JUN-1998

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### 13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :  
D001 = Ignitable.

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.

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### 14) TRANSPORT INFORMATION

DOT HAZARD: Corrosive to skin, flammable  
UN / NA NUMBER: UN2920  
DOT EMERGENCY RESPONSE GUIDE #: 29

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### 15) REGULATORY INFORMATION

#### TSCA:

#### CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

2,059 gallons due to ETHYLENE GLYCOL;

#### FOOD AND DRUG ADMINISTRATION:

21 CFR 176.300 (slimicides for wet end use)

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).

#### SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic);Fire

#### SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

#### SARA SECTION 313 CHEMICALS:

| CAS#     | CHEMICAL NAME   | RANGE      |
|----------|-----------------|------------|
| 107-21-1 | ETHYLENE GLYCOL | 21.0-30.0% |

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### CALIFORNIA REGULATORY INFORMATION

#### CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

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### MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

PRODUCT NAME : BETZ CLAM-TROL CT-1  
EFFECTIVE DATE: 12-JUN-1998

16) OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

|                          |      |                                     |
|--------------------------|------|-------------------------------------|
| Health                   | 3    | Serious Hazard                      |
| Fire                     | 2    | Moderate 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<br>DATE | REVISIONS TO SECTION: | SUPERCEDES  |
|--------------|-------------------|-----------------------|-------------|
|              | -----             | -----                 | -----       |
| MSDS status: | 29-OCT-1997       |                       | ** NEW **   |
|              | 01-MAY-1998       | 8,15;EDIT:9           | 29-OCT-1997 |
|              | 15-MAY-1998       | 2                     | 01-MAY-1998 |
|              | 12-JUN-1998       | 2,8,15                | 15-MAY-1998 |

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1998

### SODIUM HYPOCHLORITE SOLUTION

Date Prepared September 19, 1998

1 - Chemical Product and Company Identification

**MANUFACTURER'S NAME:** MANLEY-REGAN CHEMICALS  
DIVISION OF E+E (US) INC.

**EMERGENCY TELEPHONE NUMBER:** 800-424-9300 (Chemtrec)  
24 hours a day, 7 days a week

**ADDRESS:** 532 EAST EMAUS STREET  
P.O. BOX 280  
MIDDLETOWN, PA 17057  
800-283-0326

**DATE OF REVISION:** September 19, 1998

2 - Composition/Information on Ingredients

**TRADE NAME:** SODIUM HYPOCHLORITE 15% CL/VOL

*Component:*  
Sodium Hypochlorite Solution

**CAS Number:** 7681-52-9

|                      |                    |                    |   |
|----------------------|--------------------|--------------------|---|
| <b>CONTAINS:</b>     | <b>CAS NUMBER:</b> | <b>PERCENTAGE:</b> | <b>PEL/TLV -SOURCE</b>  |
| Sodium Hydroxide     | 1310-73-2          | 0.8 to 2.4         | PEL 8hr 2mg/m(3) OSHA<br>TLV 8hr 2mg/m(3) Ceiling ACGIH                                     |
| Chlorine (Available) | 7782-50-5          | Approx. 10         | OSHA (PEL)<br>TWA - 0.5 ppm<br>STEL - 1 ppm<br>ACGIH (TLV)<br>TWA - 0.5 ppm<br>STEL - 1 ppm |
| Water                | 7732-18-5          | Approx. 89.0       |   |

\*\*\*\*\*

|  |   |
|--|---|
| <b>Synonyms/Common Names:</b>              | Chlorine Bleach, Soda Bleach, Liquid Chlorine |
| <b>Chemical Formula:</b>                   | NaOCl   |
| <b>DOT Proper Shipping Name:</b>           | Hypochlorite Solutions                        |
| <b>DOT Hazard Class:</b>                   | 8   |
| <b>DOT ID Number:</b>                      | UN1791  |
| <b>DOT Packing Group:</b>                  | III   |
| <b>DOT Hazardous Substance:</b>            | RQ 100# (Sodium Hypochlorite)                 |
| <b>DOT Marine Pollutant:</b>               | N/A   |
| <b>Additional Description Requirement:</b> | N/A   |



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3 - Physical Data

|                                |   |  |       |
|--------------------------------|---|--|-------|
| Boiling Point:                 | (@760 mm Hg)  | Decomposes above 110 Deg C (230 Deg F) |       |
| Freezing Point:                | Weight %  | Freezing Point Deg F                   |       |
|                                | 10  | 7                                      |       |
|                                | 12  | - 3                                    |       |
| Vapor Pressure:                | Temperature Deg F   | mm Hg                                  | PSIA  |
|                                | 48.2  | 3.7                                    | 0.071 |
|                                | 60.8  | 8.0                                    | 0.15  |
|                                | 68.0  | 12.1                                   | 0.23  |
|                                | 89.6  | 31.1                                   | 0.60  |
|                                | 118.4   | 100.00                                 | 1.93  |
| Specific Gravity:              | (H <sub>2</sub> O) = 1)   | Approximately 1.19                     |       |
| Solubility in H <sub>2</sub> O | (By Weight)   | 100%                                   |       |
| pH                             | 9 - 12  |  |       |
| Appearance/Odor:               | Colorless to light yellow-green liquid with chlorine like odor. |  |       |

4 - Emergency and First Aid Procedures

- EYES:** Immediately flush eyes with flowing water for at least 15 minutes. Washing eyes within one (1) minute is essential to achieve maximum effectiveness.  
**SEEK MEDICAL ATTENTION IMMEDIATELY.**
- SKIN:** Skin contact may cause severe irritation. Flush thoroughly with cool water under shower while removing contaminated clothing and shoes. Discard non-rubber shoes. Wash clothing before reuse. Continue to flush until medical attention arrives.  
**SEEK MEDICAL ATTENTION IMMEDIATELY.**
- INHALATION:** Remove to fresh air. If breathing is difficult, have a qualified person administer oxygen. If respiration stops, give mouth-to-mouth resuscitation.  
**GET IMMEDIATE MEDICAL ATTENTION.**
- INGESTION:** Never give anything by mouth to an unconscious person. If swallowed, **DO NOT INDUCE VOMITING.** Give large quantities of milk. If these are not available, give large quantities of water. If vomiting occurs spontaneously keep airway clear and give more milk or water. Avoid vomiting, lavage or acidic antidotes.  
**GET MEDICAL ATTENTION IMMEDIATELY.**

**NOTE TO PHYSICIAN:** Sodium Hypochlorite is an alkaline corrosive. For exposure by ingestion do not use emesis, lavage or acidic antidotes. Dilute immediately by giving milk, melted ice cream, beaten egg white, starch paste or antacids such as milk of magnesia, aluminum hydroxide gel or magnesium trisilicate gel. Avoid sodium bicarbonate because of carbon dioxide release. Sodium thiosulfate solution may prove beneficial by reducing unreacted material.

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5 - First Aid Measures and Effects of Overexposure

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- INHALATION:** Inhalation of hypochlorous acid fumes may cause severe respiratory tract irritation and pulmonary edema.
- SKIN:** Skin contact may cause severe irritation and burns.
- EYE CONTACT:** Eye contact may cause severe irritation, burns and/or corrosion.
- INGESTION:** Ingestion may cause pain and inflammation of the mouth and digestive system, burns and perforation of the esophagus or stomach, vomiting, circulatory collapse, confusion, delirium and coma.

**EFFECTS OF OVEREXPOSURE:**

- ACUTE:** Corrosive and strongly irritating to the eyes, skin, and respiratory tract. Inhalation of fumes may cause pulmonary edema. Ingestion may cause burns to the mouth and digestive tract and abdominal distress.
- CHRONIC:** No Data.

6 - Fire and Explosion Hazard Data

|                             |               |
|-----------------------------|---------------|
| FLASH POINT (test method):  | Non-Flammable |
| AUTOIGNITION TEMPERATURE:   | None          |
| FLAMMABILITY LIMITS IN AIR: | None          |
| LFL: N/A                    | UEL: N/A      |

**EXTINGUISHING MEDIA:** Use water spray, fog, foam, dry chemical, or carbon dioxide or agents suitable for materials in surrounding fire.

**SPECIAL FIRE FIGHTING PROCEDURES:** Avoid fumes from spilled or exposed liquid, dilute copiously, ventilate and be prepared to use respiratory protection if needed. Use self-contained breathing apparatus and full protective equipment. Acid contamination will produce very irritating fumes similar to chlorine.

**UNUSUAL FIRE AND EXPLOSION HAZARD:** Product decomposes when heated and may cause containers to rupture or explode. Vigorous reaction is possible with organic materials or oxidizing agents and may result in fire.

7 - Reactivity Data

**CONDITIONS CONTRIBUTING TO INSTABILITY:** Strong oxidizer, stability decreases with concentration, heat, light, decrease in pH and contamination by metals.

**INCOMPATIBILITY:** Avoid contamination with heavy metals, reducing agents, ether, ammonia, and acids.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Acid fumes.

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION:** Material is not known to polymerize.

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8- Special Protection

**VENTILATION REQUIREMENTS:** Provide good general room ventilation plus local exhaust at points of emission.

**SPECIFIC PERSONAL PROTECTIVE EQUIPMENT:**

**RESPIRATORY:** NIOSH/MSHA approved respirator, following manufacturer's recommendations, should be used as a precautionary measure where airborne contaminants may occur.

**EYE:** Wear chemical safety goggles plus full face shield to protect against splashing when appropriate.

**GLOVES:** Wear impervious gloves such as rubber, neoprene or vinyl.

**OTHER CLOTHING AND EQUIPMENT:** Wear impervious protective clothing including gloves, apron or rain suit and boots to avoid bodily contact. Eye wash facility and emergency shower should be in close proximity.

9- Handling and Storage

**HANDLING AND STORAGE PRECAUTIONS:** Do not store adjacent to chemicals that may react if spillage occurs. Comply with DOT regulations when shipped. If closed containers become heated, vent to release decomposition products (mainly oxygen under normal decomposition). Do not mix or contaminate with ammonia, hydrocarbons, acids, alcohol's or others.

**DO NOT REUSE CONTAINERS:** Product residues may remain in containers. All labeled precautions must be observed. Dispose of container in a manner meeting government regulations.

**PRODUCT DISPOSAL:** Product should be completely removed from containers. Material that cannot be used or chemically reprocessed should be disposed of in a manner meeting government regulations.

10- Environmental Procedures

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Do not allow spilled material to enter sewers or streams. Flush with water to dilute as much as possible and pump into polyethylene containers for disposal. Avoid heat and contamination with acid materials. Do not use combustible materials such as sawdust to absorb Sodium Hypochlorite Solution.

**WASTE DISPOSAL METHOD:** Reduce with agents such as bisulfites or ferrous salt solutions. Some heat will be produced. Keep on alkaline side and dilute with copious amount of water. Main end-product is salt water. Comply with all applicable governmental regulations.

11- Toxicological Information**TOXICOLOGY DATA:**

The toxicity and corrosivity of Sodium Hypochlorite is a function of concentration. Industrial grades of higher concentrations than household bleach are more toxic and corrosive.

|                          |             |
|--------------------------|-------------|
| Aquatic Toxicity Rating: | 96 hr. LC50 |
| Ceriodaphnia dubia:      | 1.23 ppm    |
| Pimephales promelas:     | 1.19 ppm    |

|  |              |           |
|--|--------------|-----------|
| Sodium Hypochlorite @ 12.5% (Rat, Oral LD50) | Test Result: | 5.0 g/kg  |
| Sodium Hypochlorite @ 5.25% (Rat, Oral LD50) | Test Result: | 13.0 g/kg |

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12- Additional Information

This blend does not contain any substances subject to the Threshold Planning Quantity (TPQ) requirements of Section 313 of the act.

**CONTAINER DISPOSAL:** Dispose in a licensed facility. Recommend crushing or other means to prevent unauthorized reuse.

**NSF LIMITS:** NSF Maximum Drinking Water Use Concentration, 100 mg/L as Sodium Hypochlorite. The finished drinking water should be monitored for disinfection by-products in accordance with state and U.S. E.P.A. regulations and guidelines. Levels of chlorite ion and chlorate ion should not exceed 10 ppb.

**USDA APPROVAL:** This product is acceptable as a sanitizer for all surfaces not always requiring a rinse in official establishments operating under the Federal meat, poultry, shell egg, and egg products inspection programs.

Section 311 of The Clean Water Act lists this product as a hazardous substance which, if discharged to water, may require immediate response to mitigate danger to public health and welfare. Spills of 100 pounds or more must be reported to the National Response Center at the following number: 800-424-8802

Material is contained on a composite list as required under 101 (14) of CERCLA.

Sodium Hypochlorite Solution is regulated by the USEPA under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) as a pesticide product.

\*\*\*\*\*

**DISCLAIMER:** The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer relabels this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container.

Manley-Regan Chemicals provides no warranties, either expressed or implied, and assumes no responsibility for the accuracy or completeness of the data contained herein.

The above information complies with the OSHA's hazard communication standard 29CFR1910.1200. The standard must be consulted for specific requirements.



# Material Safety Data Sheet

Page: 1 of 8  
Issue Date: 07/28/98  
Supersedes: 02/14/96

A company of Hoechst and Schering, Berlin

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## NUSYN-NOXFISH® FISH TOXICANT

### SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

AgrEvo Environmental Health  
95 Chestnut Ridge Road  
Montvale, NJ 07645

COMPANY CONTACT: *Regulatory Department*  
TELEPHONE NUMBER: (800)438-5837

EMERGENCY TELEPHONE NUMBER  
(800)471-0660

PRODUCT NAME: **NUSYN-NOXFISH® FISH TOXICANT**  
PRODUCT CODE: B467413  
CHEMICAL NAME: *Mixture; a.i.'s, rotenone and piperonyl butoxide*  
EPA REGISTRY NUMBER: 432-550  
MSDS IDENTIFICATION CODE/NUMBER: B467413

*Nusyn-Noxfish is a registered trademark of AgrEvo Environmental Health, Inc.*

**PRODUCT DESCRIPTION:** *Nusyn-Noxfish Fish Toxicant is a restricted use pesticide to be used in fisheries management for the eradication of fish from lakes, ponds, reservoirs and streams.*

### SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

| INGREDIENT NAME                                      | EXPOSURE LIMITS   | CONCENTRATION PERCENT BY WEIGHT |
|--|---|---------------------------------|
| Rotenone<br>CAS NUMBER: 83-79-4                      | ACGIH TLV-TWA 5 mg/m <sup>3</sup><br>OSHA PEL-TWA 5 mg/m <sup>3</sup> | = 2.5                           |
| Piperonyl Butoxide, technical<br>CAS NUMBER: 51-03-6 | None established  | = 2.5                           |
| Other associated resins                              | None established  | = 5                             |
| Other ingredients, including:                        |   | = 90                            |
| Aromatic petroleum solvent<br>CAS NUMBER: 64742-94-5 | 100 ppm (Manufacturer recommended)                                    | < 85                            |

### SECTION 3. HAZARDS IDENTIFICATION

\*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*

*A clear to brown liquid with a mild odor.*

- *Fatal if inhaled.*
- *May be fatal if swallowed.*
- *Harmful if absorbed through skin.*
- *Causes substantial but temporary eye injury.*
- *Causes skin irritation.*
- *Combustible mixture.*
- *This pesticide is extremely toxic to fish.*

\*\*\*\*\*

### POTENTIAL HEALTH EFFECTS

000217

## **NUSYN-NOXFISH® FISH TOXICANT**

### **SECTION 3. HAZARDS IDENTIFICATION - Continued**

#### **PRIMARY ROUTE(S) OF ENTRY**

*Inhalation, ingestion, skin and eye contact.*

#### **EYES**

*Causes substantial but temporary eye injury.*

#### **SKIN**

*Causes skin irritation.*

#### **INGESTION**

*May be fatal if swallowed.*

#### **INHALATION**

*Fatal if inhaled.*

### **SECTION 4. FIRST AID MEASURES**

#### **EYES**

*Hold eyelids open and flush with a steady, gentle stream of water for 15 minutes. Get medical attention.*

#### **SKIN**

*Wash with plenty of soap and water. Get medical attention.*

#### **INGESTION**

*Promptly drink a large quantity of milk, egg white, gelatin, solution or if these are not available, large quantities of water. Avoid alcohol. Do not induce vomiting. Call a physician or Poison Control Center.*

#### **INHALATION**

*Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. Get medical attention.*

#### **NOTE TO PHYSICIAN**

*This product is highly toxic when spray mist is inhaled, moderately toxic by the oral route and slightly toxic by the dermal route. This product causes substantial but reversible eye irritation. Initial treatment is removal of exposure by washing, emesis or lavage and is followed by symptomatic and supportive care.*

### **SECTION 5. FIRE FIGHTING MEASURES**

#### **FLAMMABLE PROPERTIES**

**FLASH POINT:** 115°F 46°C TCC

#### **FIRE AND EXPLOSION HAZARDS**

*Keep away from sources of ignition.*

#### **EXTINGUISHING MEDIA**

*Fog, foam, carbon dioxide or dry chemical.*

#### **FIRE FIGHTING INSTRUCTIONS**

*As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH approved (or equivalent) and full protective gear. Keep upwind. Isolate hazard area. Avoid inhalation of smoke and fumes. Use water or foam to reduce fumes. Do not touch spilled material. If possible, move containers from area. Extinguish only if flow can be stopped. Use flooding amounts of water as a fog. Cool containers with flooding amounts of water from as far a distance as possible. Avoid breathing vapors.*

#### **FLAMMABILITY CLASSIFICATION/RATING:**

## **NUSYN-NOXFISH<sup>®</sup> FISH TOXICANT**

### **SECTION 5. FIRE FIGHTING MEASURES - Continued**

*NFPA/OSHA Class: II  
NFPA Rating (Fire): 2*

### **SECTION 6. ACCIDENTAL RELEASE MEASURES**

**GENERAL AND DISPOSAL** *Use proper protective equipment to minimize personal exposure (see Section 8). Take all necessary action to prevent and to remedy the adverse effect of the spill. Ensure that the disposal is in compliance with all Federal, State/Provincial, and local regulations (See Section 13 for applicable RCRA Number). Refer to Section 15 for applicable Reportable Quantity (RQ) and other regulatory requirements.*

#### **LAND SPILL OR LEAK**

*Small Spills: Absorb liquid with an inert absorbent material such as granular clay, saw dust, or pet litter. Sweep up carefully while avoiding the formation of a dust cloud. Place in an approved chemical waste container for disposal. Rinse spill area with small amount of soapy water. Contain and absorb the rinsate with inert absorbents and place into the same disposal container. Area can be washed with water to remove the last trace residue. Do not allow water to contaminate water supplies or sewers.*

*Large Spills: Eliminate all ignition sources. Stop leak if you can do so without coming into contact with spilled material. Dike far ahead of liquid spill for later disposal. All equipment used to clean up spill should be grounded. Prevent entry into waterways, sewers, basements or confined areas. Inform appropriate authorities immediately if contamination occurs. Contact AgrEvo for further assistance if necessary.*

### **SECTION 7. HANDLING AND STORAGE**

#### **HANDLING PRECAUTIONS**

- *Do not breathe spray mist.*
- *Do not get in eyes, on skin or on clothing.*
- *Do not use near heat or open flame.*

#### **STORAGE PRECAUTIONS**

- *Do not store near heat or open flame.*
- *Do not contaminate water, food or feed by storage.*
- *Store only in original containers, in a dry place inaccessible to children and pets. Nusyn-Noxfish will not solidify nor show any separation at temperatures down to 40°F and is stable for a minimum of one year when stored in sealed drums at 70°F.*

#### **WORK/HYGIENIC PRACTICES**

- *Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco.*
- *Remove contaminated clothing and wash before reuse.*

### **SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

#### **MANUFACTURING, FORMULATION AND OTHER NON-AGRICULTURAL USES**

##### **ENGINEERING CONTROLS**

*Control airborne concentrations below the appropriate exposure guideline (see Section 2 for applicable OSHA/ACGIH Exposure Limits). Local exhaust ventilation may be necessary.*

##### **EYE/FACE PROTECTION**

*Wear safety glasses, splash goggles or face shield.*

## **NUSYN-NOXFISH<sup>®</sup> FISH TOXICANT**

### **SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION - Continued**

#### **SKIN PROTECTION**

*Wear chemical-resistant gloves (Neoprene, Nitrile, PVC) and other protective clothing to avoid skin contact.*

#### **RESPIRATORY PROTECTION**

*Ensure good ventilation. If not adequate, use a chemical cartridge-type respirator approved by the National Institute of Occupational Health and Safety.*

#### **GENERAL PROTECTION**

*Eye wash facility and safety shower should be available.*

### **SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

#### **APPEARANCE**

*Clear, brown liquid.*

#### **ODOR**

*Mild odor.*

#### **BASIC PHYSICAL PROPERTIES**

**PHYSICAL STATE:** *Liquid*

**pH:** *Not available*

**VAPOR PRESSURE:** *Not available*

**VAPOR DENSITY (AIR = 1):** *Not available*

**EVAPORATION RATE (BUTYL ACETATE = 1):** *Not available*

**SPECIFIC GRAVITY OR DENSITY (G/ML):** *Not available*

**PACKING (BULK) DENSITY (LB/GAL):** *8.25*

**BOILING POINT/RANGE:** *200°C*

**MELTING/FREEZING POINT RANGE:** *Not available*

**SOLUBILITY (IN WATER):** *Miscible*

**SOLUBILITY IN SOLVENTS/OIL (SPECIFIED):** *Not available*

**DUST EXPLOSION SEVERITY DATA:** *Not applicable*

**MINIMUM IGNITION ENERGY (MJ):** *Not available*

**MINIMUM EXPLOSION CONCENTRATION (MEC):** *Not available*

**LIMITED OXYGEN CONCENTRATION (LOC):** *Not available*

### **SECTION 10. STABILITY AND REACTIVITY**

**STABILITY:** *Stable*

#### **CONDITIONS TO AVOID (STABILITY)**

*None.*

#### **INCOMPATIBLE MATERIALS**

*Strong oxidizing and strong reducing agents.*

#### **HAZARDOUS DECOMPOSITION PRODUCTS**

*Carbon monoxide and carbon dioxide.*

#### **CONDITIONS TO AVOID (POLYMERIZATION)**

*Avoid excessive heat and ignition sources.*

**HAZARDOUS POLYMERIZATION:** *Will not occur.*



## **NUSYN-NOXFISH<sup>®</sup> FISH TOXICANT**

### **SECTION 11. TOXICOLOGICAL INFORMATION**

#### **ACUTE STUDIES**

*THE FOLLOWING DATA WERE DEVELOPED WITH: Nusyn-Noxfish Fish Toxicant.*

#### **EYE EFFECTS**

*(Rabbit) Moderately irritating*

#### **SKIN EFFECTS**

*Irritation (Rabbit): Moderately irritating  
Absorption (Rabbit): LD50 > 2020 mg/kg (slightly toxic)  
Sensitization (Guinea Pig): non-sensitizing*

#### **ACUTE ORAL EFFECTS**

*Oral LD50 (Rat, female): 147 mg/kg (moderately toxic)  
Oral LD50 (Rat, male): 704 mg/kg (slightly toxic)  
Oral LD50 (Rat, overall): 561 mg/kg (slightly toxic)*

#### **ACUTE INHALATION EFFECTS**

*4-Hour LC50 (Rat, female): .041 mg/l (highly toxic)  
4-Hour LC50 (Rat, male): .059 mg/l (moderately toxic)  
4-Hour LC50 (Rat, overall): .049 mg/l (highly toxic)*

*NOTE: The severity classifications listed above are those of AgrEvo, and, particularly for eye irritation, may not always coincide with EPA-mandated Precautionary Statements.*

*THE FOLLOWING DATA WERE DEVELOPED WITH: rotenone and piperonyl butoxide, the active ingredients*

#### **CHRONIC (CANCER INFORMATION)**

*Rotenone was not carcinogenic when tested in rats and mice.*

*A statistically significant increase in the number of benign liver tumors appeared in mice fed piperonyl butoxide technical at doses which far exceed any anticipated daily human intake. Independent and industry toxicological experts who have reviewed the data agree that the findings of the study do not indicate a health risk to human beings.*

**CARCINOGENICITY:** NTP: No IARC: No OSHA: No

#### **TERATOGENICITY (BIRTH DEFECTS)**

*Rotenone was not teratogenic or fetotoxic when tested in rats and mice.*

#### **REPRODUCTIVE EFFECTS**

*Rotenone had no adverse effects on reproduction when tested over two successive generations in rats.*

#### **MUTAGENICITY (GENETIC EFFECTS)**

*Rotenone was not mutagenic nor clastogenic when tested in the Ames Test, Yeast Test, Mouse Lymphoma Test, Mouse Micronucleus Test, Chromosome Aberration Test and the Mitotic Recombination Test in Yeast.*

### **SECTION 12. ECOLOGICAL INFORMATION**

**ENVIRONMENTAL PRECAUTIONS:** *This pesticide is extremely toxic to fish. Fish kills are expected at recommended rates. Consult your State Fish and Game Agency before applying this product to public waters to determine if a permit is needed for such an application. Do not contaminate untreated water when disposing of equipment washwaters.*

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## **NUSYN-NOXFISH<sup>®</sup> FISH TOXICANT**

### **SECTION 13. DISPOSAL CONSIDERATIONS**

*Do not contaminate water, food or feed by disposal.*

**Pesticide Disposal:** *Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to the label instructions contact your state pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.*

**Container Disposal:** *Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.*

#### **RCRA INFORMATION**

**RCRA HAZARDOUS WASTE INGREDIENTS:** *None*

### **SECTION 14. TRANSPORT INFORMATION**

**PROPER SHIPPING NAME:** *Pesticides, liquid, toxic, flammable, n.o.s. (Rotenone, petroleum distillate)*

**HAZARD CLASS:** *6.1, PG I*  
**SUBSIDIARY HAZARD CLASS:** *3*  
**DOT IDENTIFICATION NUMBER:** *UN2903*  
**DOT SHIPPING LABEL:** *Poison and/or Toxic*

**NOTE:** *For transport purposes (49 CFR Part 173.132), the calculated 1-Hour LC50 (Rat, overall) is: .196 mg/l*

### **SECTION 15. REGULATORY INFORMATION**

#### **U.S. FEDERAL REGULATORY INFORMATION**

**EPA Registration Number:** *432-550*  
**TSCA Inventory:** *registered pesticide, exempt from TSCA*

#### **SARA TITLE III NOTIFICATION AND INFORMATION**

**Section 302 (EHS) ingredients:** *None*  
**Section 304 (CERCLA & EHS) ingredients (RQ):** *None*  
**Section 313 ingredients:** *None*

#### **SARA TITLE III NOTIFICATIONS AND INFORMATION**

**SARA TITLE III - HAZARD CLASSES:** *Acute Health Hazard - "Yes"*  
*Chronic Health Hazard - "No"*  
*Fire Hazard - "Yes"*  
*Sudden Release of Pressure Hazard - "No"*  
*Reactivity Hazard - "No"*

#### **SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION**

*This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:*

| <u>CAS NUMBER</u> | <u>INGREDIENT NAME</u>        | <u>PERCENT BY WEIGHT</u> |
|-------------------|-------------------------------|--------------------------|
| 51-03-6           | Piperonyl Butoxide, technical | = 2.5                    |

*This information must be included on all MSDSs that are copied and distributed for this material.*

#### **REGULATED INGREDIENTS**

000222

**NUSYN-NOXFISH® FISH TOXICANT**

**SECTION 15. REGULATORY INFORMATION - Continued**

**REGULATED INGREDIENTS - Continued**

**INGREDIENT:** Rotenone  
**CAS NUMBER:** 83-79-4  
**PERCENT BY WEIGHT:** = 2.5  
Regulations: Illinois Toxic Substance  
Massachusetts Hazardous Substance  
New Jersey Special Health Hazardous Substance  
New Jersey Workplace Hazardous Substance  
Pennsylvania Workplace Hazardous Substance

**INGREDIENT:** Piperonyl Butoxide, technical  
**CAS NUMBER:** 51-03-6  
**PERCENT BY WEIGHT:** = 2.5  
Regulations: SARA Section 313 Toxic Chemical

**U.S. STATE REGULATORY INFORMATION**

**CALIFORNIA (Proposition 65):** This product does not contain any chemical which is known to the State of California to cause cancer or birth defects or other reproductive harm.

**CANADIAN REGULATORY INFORMATION**  
**CPC NUMBER:** None

**WHMIS Classification for Control Product Regulations (CPR):** Registered pesticide under US FIFRA regulations; exempt from CPR classification.

The MSDS contains all CPR required hazard-related information.

**WHMIS HAZARD RATING:** See HMIS rating (Section 16)

**SECTION 16. OTHER INFORMATION**

**HMIS HAZARD RATING - HEALTH:** 3 High  
- **FIRE:** 2 Moderate  
- **REACTIVITY:** 0 Negligible  
- **PROTECTION:** H

**NFPA HAZARD RATING - HEALTH:** 3 High  
- **FIRE:** 2 Moderate  
- **REACTIVITY:** 0 Negligible  
- **SPECIAL:**

**MSDS IDENTIFICATION CODE/NUMBER:** B467413

**PREPARED BY:** Regulatory                      **PHONE:** (800)438-5837  
**SUPERCEDES MSDS DATED:** 02/14/96

**DATE AND TIME OF PRINTING:** 07/28/98 11:23:44

**MSDS Revision Indicators:** Revisions made in Section 1 (added trademarks and product description), Section 2 (added Other ingredient statement), Section 3 (Emergency Overview), Section 5 (changed Flash Point and Fire Fighting Procedures and added Flammability Classification/Rating), Section 7 (changed text under each heading), Section 8 (changed text under each heading), Section 9 (Basic Physical Properties), Section 11 (changed the eye, skin irritation toxicity data, added to the acute oral and inhalation toxicity data, chronic toxicity data, added where the data was developed from and what animal was used in the study), Section 12 (Environmental Precautions), Section 13 (Disposal Considerations), Section 14 (changed DOT

**NUSYN-NOXFISH® FISH TOXICANT**

**SECTION 16. OTHER INFORMATION - Continued**

*Shipping Label and added 1-Hour LC50) Section 15 (added Regulatory Information) and Section 16 (added HMIS Protection Code and Disclaimer).*

**DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES**

*This information is provided in good faith but without express or implied warranty. Buyer assumes all responsibility for safety and use not in accordance with label instructions.*

# Material Safety Data Sheet

Emergency Phone: 317-580-8282  
General Phone: 1-317-580-8282

EPA Reg. Number: 67690-3  
Effective Date: August 25, 1994

SePRO Corporation • Carmel, IN

## SONAR\* SRP Herbicide 32.46

### 1. INGREDIENTS: (% w/w, unless otherwise noted)

1-Methyl-3-phenyl-5-(3-(trifluoromethyl)phenyl)-  
4(1H)-pyridinone (Fluridone)  
CAS# 059756-60-4.....5%  
Other Ingredients..... 95%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

### 2. PHYSICAL DATA:

**BOILING POINT:** Not applicable  
**VAP. PRESS:** Not applicable  
**VAP. DENSITY:** Not applicable  
**SOL. IN WATER:** Insoluble, but disintegrates in water  
**SP. GRAVITY:** Not applicable  
**APPEARANCE:** Dark gray to dark brown pellet  
**ODOR:** Faint musty odor  
**pH:** (aqueous 50/50) 3.5

### 3. FIRE AND EXPLOSION HAZARD DATA:

**FLASH POINT:** Not applicable  
**METHOD USED:** Not applicable  
**FLAMMABLE LIMITS:**  
LFL: Not applicable  
UFL: Not applicable  
**AUTO-IGNITION TEMPERATURE:** No ignition up to 1382°F, 750°C  
**EXTINGUISHING MEDIA:** Use water, CO<sub>2</sub> or dry chemicals.  
**FIRE AND EXPLOSION HAZARDS:** Will emit toxic vapors as it burns.  
**FIRE-FIGHTING EQUIPMENT:** Wear full protective clothing and use self-contained breathing apparatus.

### 4. REACTIVITY DATA:

**STABILITY: (CONDITIONS TO AVOID)** None known  
**INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)** None known

**HAZARDOUS DECOMPOSITION PRODUCTS:** Will emit toxic vapors as it burns.

**HAZARDOUS POLYMERIZATION:** Does not occur.

### 5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

**ENVIRONMENTAL DATA:** Follow use directions carefully so as to minimize adverse effects on nontarget organisms. IN ORDER TO AVOID IMPACT ON THREATENED OR ENDANGERED AQUATIC PLANT OR ANIMAL SPECIES, USERS MUST CONSULT THEIR STATE FISH AND GAME AGENCY OR THE U.S. FISH AND WILDLIFE SERVICE BEFORE MAKING APPLICATIONS. Do not contaminate water by cleaning of equipment or disposal of wastes. Trees and shrubs growing in water treated with SONAR may be injured. Do not apply in tidewater or brackish water. Do not apply in lakes, ponds, or other bodies of water where crayfish farming is performed.

**ACTION TO TAKE FOR SPILLS:** Contain and sweep up material of small spills and dispose as waste. Large spills report to CHEMTREC and SePRO Corporation for assistance. Prevent runoff.

**DISPOSAL METHOD:** Do not contaminate water, food or feed by storage or disposal. Wastes resulting from the use of this product may be disposed of at an approved waste disposal facility in accordance with applicable regulations.

### 6. HEALTH HAZARD DATA:

#### ACUTE EXPOSURE (SONAR SRP)

Eyes - Rabbit, irritant  
Skin - Rabbit, 2000 mg/kg, no deaths or toxicity, nonirritant  
Inhalation - This formulation is not considered to be an inhalation hazard due to pelleted nature of material  
Ingestion - Rat, 500 mg/kg, no deaths or toxicity  
Sensitization - This formulation was not tested.  
Fluridone technical is not a contact sensitizer in guinea pigs.

**CHRONIC EXPOSURE (Fluridone Technical)** The following effects were reported in chronic, teratogenic, and reproductive toxicity studies in laboratory animals where experimental dosage levels and durations of exposure were far in excess of those likely to occur in humans.

Chronic Toxicity - Decreased survival in lifetime feeding study. Increased liver enzyme activity, liver weight, liver cell size, and microscopic liver cell changes.

\*Trademark of SePRO Corporation

# Material Safety Data Sheet



Emergency Phone: 317-580-8282  
General Phone: 1-317-580-8282

EPA Reg. Number: 67690-3  
Effective Date: August 25, 1991

## SONAR\* SRP Herbicide

SePRO Corporation • Carmel, IN

Increased kidney weights, and microscopic kidney cell changes. Increased serum enzyme levels.

Teratology & Reproduction - Not teratogenic. Fetal deaths at maternally toxic doses. No effects on reproductive performance.

Mutagenicity - Not mutagenic in either bacterial or mammalian cells.

Carcinogenicity - Not listed as a carcinogen or potential carcinogen by IARC, NCI/NTP, OSHA, or ACGIH. Not considered to be carcinogenic in lifetime feeding studies.

**SIGNS AND SYMPTOMS OF EXPOSURE:** There are no reports of significant exposure to SONAR SRP. In two reports of children swimming in water treated with SONAR, no symptoms developed.

**PRIMARY ROUTES OF ENTRY:** Skin and inhalation.

### 7. FIRST AID:

**EYES:** Flush eyes with plenty of water and call a physician if irritation develops.

**SKIN:** Wash exposed areas with plenty of soap and water. Wash all contaminated clothing before reuse. Call a physician if irritation develops.

**INGESTION:** Do not induce vomiting. Call a physician or Poison Control Center. If available, administer activated charcoal (6-8 heaping teaspoonfuls) with a large quantity of water. Do not give anything by mouth to an unconscious person. Immediately transport to a medical care facility and see a physician.

**INHALATION:** If discomfort occurs, move individual to fresh air. If breathing difficulty occurs, get medical attention. If not breathing, provide cardiopulmonary resuscitation assistance and get medical attention immediately.

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:** No information available.

### 8. HANDLING PRECAUTIONS:

**EXPOSURE GUIDELINE(S):** PEL and TLV not established.

**VENTILATION:** Good general ventilation should be sufficient for most conditions.

**RESPIRATORY PROTECTION:** No respiratory protection should be needed when used in accordance with label instructions.

**SKIN PROTECTION:** No precautions other than normal work clothing should be needed.

**EYE PROTECTION:** Use safety glasses.

### 9. ADDITIONAL INFORMATION:

**SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Keep out of reach of children. Harmful if swallowed, absorbed through skin, or if inhaled. Avoid breathing of dust or contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Wash exposed clothing before reuse.

**NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 704)**  
(4=Extreme; 3=High; 2=Moderate; 1=Slight; 0=Insignificant)  
Health: 2      Flammability: 1      Reactivity: 0

**SHIPPING REQUIREMENTS DOT Hazard Class:**  
Not regulated.

**MSDS STATUS:** Revised 1/92, Section 8

### REGULATORY INFORMATION:

(Not meant to be all-inclusive—selected regulations represented).  
**NOTICE:** The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

**SARA HAZARD CATEGORY:** This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:  
An immediate health hazard

The Information Herein Is Given In Good Faith,  
But No Warranty, Express Or Implied, Is Made.  
Consult SePRO Corporation For Further Information.


**PRODUCT SAFETY  
DATA SHEET**
**SODIUM BISULFITE SOLUTION**
**GENERAL INFORMATION**

32.113

|  |  |  |   |                                 |  |
|--|--|--|---|---------------------------------|--|
| TRADE NAME (COMMON NAME)<br><b>SODIUM BISULFITE SOLUTION</b>   |  | <input checked="" type="checkbox"/> C.A.S. NO. | <input type="checkbox"/> ALLIED PRODUCT CODE =<br>7631-90-5 |                                 |  |
| CHEMICAL NAME AND/OR SYNONYM<br>Sodium bisulfite, aqueous solution   |  |  |   |                                 |  |
| FORMULA<br>38% NaHSO <sub>3</sub> in water   |  |  | MOLECULAR WEIGHT<br>104.06                                  |                                 |  |
| ADDRESS (No., STREET, CITY, STATE AND ZIP CODE)<br><b>ALLIED CORPORATION<br/>CHEMICAL SECTOR<br/>P.O. Box 1139R<br/>Morristown, N.J. 07960</b> |  |  |   |                                 |  |
| CONTACT<br>Director, Product Safety  |  | PHONE NUMBER<br>(201) 455-4157                 | LAST ISSUE DATE<br>June, 1980                               | CURRENT ISSUE DATE<br>May, 1985 |  |

**B. FIRST AID MEASURES**

|  |  |  |
|--|--|--|
| <p><b>Eyes:</b> Immediately flush with plenty of water, continuing for at least 15 minutes. Get medical attention.</p> <p><b>Skin:</b> Promptly flush with plenty of soap and water.</p> <p><b>Inhalation:</b> Promptly remove to fresh air.</p> <p><b>Ingestion:</b> If conscious, give plenty of water or milk. Induce vomiting by touching finger to back of throat. Get medical attention.</p> |  | EMERGENCY PHONE NUMBER<br>(201) 455-2000 |
|--|--|--|

**C. HAZARDS INFORMATION**
**HEALTH**

|  |   |
|--|---|
| INHALATION                                     | Inhalation of mist may irritate respiratory tract.  |
| INGESTION                                      | May irritate gastrointestinal tract. Very large doses cause violent colic, diarrhea, depression, and death. --Reference (b). May cause severe allergic reaction in some asthmatics. |
| SKIN   | Repeated or prolonged contact with product may cause irritation.  |
| EYES   | Solution contact will irritate the eyes. Long untreated exposures may cause burns.  |
| POSSIBLE CONCENTRATION: AIR<br>(SEE SECTION J) | BIOLOGICAL  |
| TLV: 5 mg/cu.m.                                | None  |
| UNUSUAL CHRONIC TOXICITY                       | None known  |

000227

**G. HAZARDS (Cont.)****FIRE AND EXPLOSION**

|   |    |   |    |   |
|---|----|---|----|---|
| FLASH POINT<br>Not flammable<br><input type="checkbox"/> OPEN CUP <input type="checkbox"/> CLOSED CUP | OC | AUTO IGNITION TEMPERATURE<br>Not applicable | OC | FLAMMABLE LIMITS IN AIR (% BY VOL.)<br>LOWER —    Not applicable    UPPER — |
| UNUSUAL FIRE AND EXPLOSION HAZARDS<br>See Hazardous Decomposition Products, Section G.                |    |   |    |   |

**D. PRECAUTIONS/PROCEDURES**

|  |                        |
|--|------------------------|
| FIRE EXTINGUISHING AGENTS RECOMMENDED<br>N.A.  |                        |
| FIRE EXTINGUISHING AGENTS TO AVOID<br>N.A.   |                        |
| SPECIAL FIRE FIGHTING PRECAUTIONS<br>Wear self-contained breathing apparatus approved by NIOSH.  |                        |
| VENTILATION<br>Sufficient to eliminate mists and reduce SO <sub>2</sub> levels below TLV. Packaging, unloading and open processing areas should be equipped with mechanical exhaust system.  |                        |
| NORMAL HANDLING<br>Avoid contact with skin, eyes, clothing. Avoid breathing mist and/or SO <sub>2</sub> vapors. Use normal personal hygiene and housekeeping. Keep away from acids or heat.  |                        |
| STORAGE<br>Cool, well-ventilated space away from acids and oxidizing agents.<br>(Releases sulfur dioxide gas slowly at ambient temperatures—see odor, Section F.)  |                        |
| SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT — SECTION E)<br>Dilute small spills cautiously with water. Neutralize residue with alkali such as soda ash, lime or limestone. Sulfur dioxide and carbon dioxide may be released during neutralization. |                        |
| SPECIAL PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS  | SIGNAL WORD — WARNING! |

**E. PERSONAL PROTECTIVE EQUIPMENT**

|   |
|---|
| RESPIRATORY PROTECTION<br>Where required, use a NIOSH-approved respirator for mist, and/or sulfur dioxide gas, as conditions indicate. Some exposures may require NIOSH-approved self-contained breathing apparatus or supplied-air respirator. |
| EYES AND FACE<br>Wear hard hat (or other head covering) and chemical safety goggles. Do not wear contact lenses.  |
| HANDS, ARMS, AND BODY<br>Wear impervious gloves and full work-clothing, including acid resistant apron, long-sleeved shirt and trousers.  |
| OTHER CLOTHING AND EQUIPMENT<br>Eye-wash facility.  |

000228



**F. PHYSICAL DATA**

|   |          |   |  |
|---|----------|---|--|
| MATERIAL IS (AT NORMAL CONDITIONS):<br><input checked="" type="checkbox"/> LIQUID <input type="checkbox"/> SOLID <input type="checkbox"/> GAS |          | APPEARANCE AND ODOR<br>Yellow liquid<br>Pungent sulfur dioxide gas odor |  |
| BOILING POINT   | 104 - °C | SPECIFIC GRAVITY (H <sub>2</sub> O = 1)                                 | VAPOR DENSITY (AIR = 1)  |
| MELTING POINT   | ND - °C  | 1.37  | N.A.   |
| SOLUBILITY IN WATER (% by Weight)   | 00%      | pH  | VAPOR PRESSURE (mm Hg at 20°C) <input checked="" type="checkbox"/> (PSIG) <input type="checkbox"/> |
|   |          | 4.3 - 4.5   | est. 32  |
| EVAPORATION RATE (Butyl Acetate = 1) <input checked="" type="checkbox"/> (Ether = 1) <input type="checkbox"/>                                 | < 1      | % VOLATILES BY VOLUME (At 20°C)   |  |
|   |          | N.A.  |  |

**G. REACTIVITY DATA**

|  |   |
|--|---|
| STABILITY<br><input type="checkbox"/> UNSTABLE <input checked="" type="checkbox"/> STABLE  | CONDITIONS TO AVOID<br>Temperatures at or near boiling (104°C) cause evolution of toxic and corrosive sulfur dioxide. (Sulfur dioxide also will evolve slowly at ambient temperatures.) |
| INCOMPATIBILITY (MATERIALS TO AVOID)<br><u>Oxidizers:</u> cause strong exothermic reaction.<br><u>Acids:</u> yield sulfur dioxide gas, which is toxic and corrosive.   |   |
| HAZARDOUS DECOMPOSITION PRODUCTS<br>Sulfur dioxide gas: see above comments.<br>Sulfur sulfide may be formed after dried solution residues are heated.<br>is an explosive hazard and strongly alkaline in contact with water. |   |
| HAZARDOUS POLYMERIZATION<br><input type="checkbox"/> MAY OCCUR <input checked="" type="checkbox"/> WILL NOT OCCUR  | CONDITIONS TO AVOID<br>N.A.   |

**H. HAZARDOUS INGREDIENTS (Mixtures Only)**

| MATERIAL OR COMPONENT / C.A.S. # | WT. % | HAZARD DATA (SEE SECT. J) |
|----------------------------------|-------|---------------------------|
| NOT APPLICABLE                   |       |                           |

000229

**I. ENVIRONMENTAL**

|   |  |   |                   |
|---|--|---|-------------------|
| DEGRADABILITY/AQUATIC TOXICITY  |  | OCTANOL/WATER PARTITION COEFFICIENT             |                   |
| Aquatic toxicity:<br>240 ppm/24, 48, & 96 hr/mosquito fish/TL <sub>m</sub> /fresh water - Reference (b)<br>(100% basis)   |  | NO  |                   |
| EPA HAZARDOUS SUBSTANCE?<br>(CLEAN WATER ACT SECT. 311) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO   |  | IF SO, REPORTABLE QUANTITY: 5000 # (100% Basis) | 40 CFR<br>116-117 |
| WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS)  |  |   |                   |
| Neutralize with alkali and flush to sewer with plenty of water if permitted by applicable disposal regulations. Good ventilation is required during neutralization because of the release of SO <sub>2</sub> gas. Oxidation to sodium sulfate solution is required prior to disposal. This may be done by adding a slight excess of dilute hydrogen peroxide carefully and with stirring. Neutralized or oxidized waste may have to be disposed of by an approved contractor. |  |   |                   |
| RCRA STATUS OF UNUSED MATERIAL IF DISCARDED.<br>Not a "hazardous waste".  |  | HAZARDOUS WASTE NUMBER: (IF APPLICABLE)         | 40 CFR<br>261     |

**J. REFERENCES**

|  |                                  |            |
|--|----------------------------------|------------|
| PERMISSIBLE CONCENTRATION REFERENCES   |                                  |            |
| (1) "Threshold Limit Values for Chemical Substances", ACGIH, 1984/85.  |                                  |            |
| REGULATORY STANDARDS   | D.O.T. CLASSIFICATION: Corrosive | 49 CFR 173 |
| DOT ID No.: NA 2693  |                                  |            |
| FDA regulations apply to food use and NF grades (21 CFR). Food use in meats or in food recognized as a source of vitamin B1 is prohibited (21 CFR 132.3766).                             |                                  |            |
| GENERAL  |                                  |            |
| (a) ACGIH, Documentation of the Threshold Limit Values, 4th Ed., 1981, Am. Conf. of Governmental Industrial Hygienists, Cincinnati 45202 - a review for this material with 4 references. |                                  |            |
| (b) Coast Guard CHRIS system form covering Sodium Bisulfite and Metabisulfite, "SBS", October, 1978.   |                                  |            |

**K. ADDITIONAL INFORMATION**

|      |  |
|------|--|
| None |  |
|------|--|

000230

PSDS FILE # 815

THIS PRODUCT SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION

ALLIED CORPORATION PROVIDES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, AND ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE DATA CONTAINED HEREIN.

**Towerbrom 960**



32.115

P.O. Box 1346  
Pittsburgh, PA 15230-1346  
Phone--(412)494-8000

**MATERIAL SAFETY DATA SHEET**

**Section 1. PRODUCT IDENTIFICATION**

PRODUCT NAME: Towerbrom 960

CHEMICAL DESCRIPTION: This product is a mixture of Sodium dichloro-s-triazinetrione and Sodium bromide. When dissolved in water, the mixture produces the disinfectant hypobromous acid.

PRODUCT CLASS: Microbiocide

MSDS CODE: 0B79-10-04-93

**Section 2. INFORMATION ON INGREDIENTS**

| <u>Chemical Name</u>             | <u>CAS Number</u> | <u>% by Weight</u> | <u>OSHA PEL</u>  | <u>ACGIH TLV</u>   |
|----------------------------------|-------------------|--------------------|------------------|--|
| Sodium dichloro-s-triazinetrione | 2893-78-9         | 89                 | None established | TWA 0.5 mg/m <sup>3</sup> ,<br>STEL 1.5 mg/m <sup>3</sup><br>(supplier recommendation) |
| Sodium bromide                   | 7647-15-6         | 7                  | None established | None established   |

Product ingredient, Sodium dichloro-s-triazinetrione, is also referred to as Sodium dichloroisocyanurate. Product contains 57% available chlorine. Product provides 128% available bromine with continued use in accordance with the directions for use.

**Section 3. HAZARDS IDENTIFICATION**

\*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*

**DANGER!**

May cause severe eye and skin damage.

May be harmful if swallowed.

May cause respiratory tract irritation.

**STRONG OXIDIZING AGENT. WILL BURN WITH THE EVOLUTION OF CHLORINE AND EQUALLY TOXIC GASES.**

Contact with water slowly liberates irritating and hazardous chlorine containing gases.

Decomposes at 460-480°F with release of harmful gases.

\*\*\*\*\*

PRIMARY ROUTES OF ENTRY: Eye and skin contact, inhalation, ingestion

## Towerbrom 960

**TARGET ORGANS:** Eye, skin, respiratory tract, gastrointestinal tract

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** No data available.

**POTENTIAL HEALTH EFFECTS:**

**EYE CONTACT:** This product may cause severe irritation and damage upon contact with the eye.

**SKIN CONTACT:** This product may be irritating and damaging to the skin upon contact. In dry form, the product is not appreciably irritating to dry skin. However, on contact with moisture, sodium dichloro-s-triazinetriene readily hydrolyzes to form hypochlorous acid which may cause tissue damage. This product is not expected to be absorbed through the skin in harmful amounts or to cause an allergic skin reaction.

**INGESTION:** Ingestion of this product may result in burning of mouth, throat and esophagus, abdominal distress and severe irritation, possible corrosion of the digestive tract. Prolonged ingestion of large amounts may cause adverse central nervous system effects including: headache, irritability, muscle incoordination and dizziness.

**INHALATION:** Inhalation of sodium dichloro-s-triazinetriene dust has been reported to produce nose, throat, and respiratory tract irritation and in some individuals bronchospasm may result. Chlorine gas from decomposition of the product has been reported to cause burning of the nose and mouth and irritation of the lining of the respiratory tract with coughing, a choking sensation, chest pain, vomiting, nausea, headache, dizziness and fainting. The onset of severe respiratory symptoms following exposure to chlorine, including pulmonary edema and pneumonitis, may be delayed.

**SUBCHRONIC, CHRONIC:**

Exposure to large amounts may cause damage to the liver and kidney. Due to sodium bromide content, prolonged ingestion of large amounts may cause adverse central nervous system effects.

**CARCINOGENICITY:**

**NTP:**

\*No ingredients listed in this section\*

**IARC:**

\*No ingredients listed in this section\*

**OSHA:**

\*No ingredients listed in this section\*

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### Section 4. FIRST AID MEASURES

---

**EYE CONTACT:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Seek medical aid immediately.

**SKIN CONTACT:** In case of contact, immediately brush off excess product and flush with plenty of soap and water. Remove contaminated clothing. Seek medical aid immediately. Wash clothing before reuse.

**INGESTION:** If swallowed, do NOT induce vomiting. Give large quantities of water. Seek medical aid immediately. Never give anything by mouth to an unconscious person.

**NOTE TO PHYSICIAN:** Probable mucosal damage may contraindicate the use of gastric lavage.

# Towerbrom 960

**ALATION:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical aid.

## Section 5. FIRE-FIGHTING MEASURES

**FLASH POINT:** Not applicable

This product is not, by definition, flammable or combustible, however, it is an oxidizing and chlorinating agent. If heated by an outside source to temperatures above 240°C (464°F), it will undergo vigorous self-sustaining decomposition with the evolution of heat and dense noxious gases. In addition, when in contact with another combustible material, this product will increase the burning rate of the combustible material. When ignited, it will burn with the evolution of noxious chlorine containing gases.

**LOWER FLAMMABLE LIMIT:** Not applicable

**UPPER FLAMMABLE LIMIT:** Not applicable

**AUTO-IGNITION TEMPERATURE:** Not available

**EXTINGUISHING MEDIA:** Use water spray to cool containers exposed to fire and massive quantities of water to dilute material involved in a fire or spilled from containers. Do not use ABC or other dry chemical fire extinguishers since there is the potential for a violent reaction.

**FIRE-FIGHTING INSTRUCTIONS:** Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential. Chlorine containing gases with traces of phosgene can be liberated at temperatures in excess of 400°F. Using a 10% solution of sodium carbonate, thoroughly decontaminate fire fighting equipment including all fire fighting wearing apparel after the incident.

**FIRE & EXPLOSION HAZARDS:** Nitrogen trichloride can be generated slowly by the reaction of small quantities of water with a high concentration of this product. Nitrogen trichloride can present an explosion hazard.

Immediately after a fire has been extinguished, check for wet or damp material. Any spilled material from burned or broken containers should be assumed to be contaminated. Neutralize to a non-oxidizing material for safe disposal. Do not attempt to re-close broken containers, even for movement to the disposal area. They should be left open to disperse any nitrogen trichloride that may form.

Bulging containers require extreme care. Contact the fire department.

**DECOMPOSITION PRODUCTS:** Chlorine (released in presence of moisture) and other chlorine containing compounds. Hypobromous acid, hypochlorous acid, and cyanuric acid (released when dissolved in water). Thermal decomposition or combustion may produce oxides of nitrogen, disodium oxide, bromine, and traces of phosgene.

**NFPA RATINGS:** Health = 3      Flammability = 1      Reactivity = 2      Special Hazard = Oxidizer

Hazard rating scale: 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

# Towerbrom 960

## Section 6. ACCIDENTAL RELEASE MEASURES

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Contain spilled material. Any spillage should be cleaned up as soon as possible. DO NOT add water to spilled material. Using clean, dedicated equipment, sweep and scoop all spilled material, contaminated soil, and other contaminated material and place into clean, dry containers for disposal. DO NOT use floor sweeping compounds to clean up spills. DO NOT close drums containing wet or damp material. They should be left open to disperse any nitrogen trichloride that may form. DO NOT transport wet or damp material. Keep product out of sewers, water sheds and water systems. DO NOT contaminate water, food, or feed by storage or disposal. Report any release of this product if it could cause harm to people or the environment, or if the State requires a more stringent reporting threshold. If this product spill gets into the ground or surface water or is involved in a fire, toxic gases are released; therefore, the spill should be reported.

## Section 7. HANDLING AND STORAGE

- HANDLING:** It is a violation of Federal law to use this product in a manner inconsistent with its labeling.  
Do not get in eyes, on skin or clothing.  
Avoid breathing dust or fume.  
Use with adequate ventilation.  
Wash thoroughly after handling. Keep container closed when not in use.  
Keep from contact with clothing and other combustible materials.  
Remove and wash contaminated clothing promptly.  
Never add water to product. Always add product to large quantities of water. Use clean, dry utensils. DO NOT add this product to any dispensing device containing remnants of any other product. Such use may cause a violent reaction leading to fire or explosion. Contamination with moisture, organic matter, or other chemicals may start a chemical reaction with generation of heat, liberation of hazardous gases, and possible fire and explosion.
- STORAGE:** Store in a cool, dry, well-ventilated place away from flammable liquids, combustible materials, and oxidizable materials.  
Store in original container and in a dry area where temperatures do not exceed 125°F (52°C) for 24 hours. Keep container tightly closed. DO NOT allow water to get into container and keep off wet floors. Do not contaminate water, food or feed by storage or disposal.

## Section 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### PERSONAL PROTECTIVE EQUIPMENT:

**EYE/FACE PROTECTION:** Chemical splash goggles and face shield

**SKIN PROTECTION:** Chemical resistant gloves and protective clothing

**RESPIRATORY PROTECTION:** If airborne concentrations exceed published exposure limits, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements (29 CFR 1910.134).

**ENGINEERING CONTROLS:** Use local and/or general exhaust ventilation to maintain airborne concentrations below exposure limits.

**WORK PRACTICES:** Eye wash station and safety shower should be accessible in the immediate area of use.

# Towerbrom 960

## Section 9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: Not applicable  
SOLUBILITY IN WATER: 10 g/100 g @ 25°C  
VAPOR PRESSURE: Not available  
SPECIFIC GRAVITY: Not applicable  
VAPOR DENSITY (air=1): Not available  
pH: 6.0 - 7.0 (1% solution @ 25°C)  
%VOLATILE BY WEIGHT: Nil  
FREEZING POINT: 240 - 250°C  
APPEARANCE AND ODOR: White crystalline granules with a slight bromine odor.

## Section 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable  
HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Overheating.

INCOMPATIBILITY: Avoid contact with water on concentrated material in the container. Also avoid contact with easily oxidizable organic material; ammonia, urea, or similar nitrogen containing compounds; inorganic reducing compounds; floor sweeping compounds; calcium hypochlorite; alkalis.

DECOMPOSITION PRODUCTS: Chlorine (released in presence of moisture) and other chlorine containing compounds. Hypobromous acid, hypochlorous acid, and cyanuric acid (released when dissolved in water). Thermal decomposition or combustion may produce oxides of nitrogen, disodium oxide, bromine, and traces of phosgene.

## Towerbrom 960

### Section 11. TOXICOLOGICAL INFORMATION

#### ON PRODUCT:

**Product Oral LD<sub>50</sub> (rat):** 1350 mg/kg (similar formulation)

**Product Dermal LD<sub>50</sub> (rabbit):** > 5000 mg/kg (similar formulation)

**Toxicological data on oral effects:** Following repeated exposure (8-weeks) to sodium dichloro-s-triazinetrione in their drinking water, rats demonstrated decreases in body weight gain, and drinking water consumption and changes in urine composition at dose levels of 4000 and 8000 ppm which produced some deaths. In a 90-day feeding study with rats, the two highest dose levels of 6000 and 12,000 ppm caused increases of the relative kidney and liver weights.

No birth defects were noted in rats given sodium dichloro-s-triazinetrione orally during the pregnancy, even at amounts which produced adverse effects on the mothers.

Toxic effects reported following ingestion of large single doses of bromide include stomach irritation, nausea, vomiting, and lethargy. Repeated ingestion of sodium bromide produces sedation and central nervous system (CNS) depression with possible effects such as headache, irritability, vertigo, memory loss, muscular incoordination, increased action of the reflexes, decreased appetite, hallucinations, acne-like rash, stupor and coma.

Following repeated exposures (4-12 weeks) to sodium bromide in their feed, signs of muscular incoordination and depressed grooming, changes in body weight and behavior, and endocrine (hormone) system effects were reported in laboratory animals. Reduced fertility and viability of offspring were noted in rats fed sodium bromide for three successive generations. These effects on the ability of rats to reproduce were reported to be reversible upon withdrawal of the bromide. Results of another study suggest that learning ability was reduced in offspring of rats given sodium bromide during pregnancy.

**Toxicological data on inhalation effects:** Signs of eye and nose irritation and changes in body weight, liver weight and blood cell composition were noted following repeated inhalation (4-weeks) of sodium dichloro-s-triazinetrione dust by rats.

### Section 12. ECOLOGICAL INFORMATION

#### ON PRODUCT:

##### **Aquatic toxicity data:**

48 hr LC<sub>50</sub> (mysid shrimp): 3.54 ppm

96 hr LC<sub>50</sub> (sheepshead minnow): 3.42 ppm

48 hr LC<sub>50</sub> (Daphnia magna): 2.5 ppm

48 hr LC<sub>50</sub> (fathead minnow): 0.7 ppm

##### **Environmental hazards:**

This product is toxic to fish. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.



# Towerbrom 960

## INGREDIENTS:

Chemical Name  
Sodium dichloroisocyanurate

Aquatic Toxicity Data  
96 hr LC<sub>50</sub> (rainbow trout): 0.37 ppm  
96 hr LC<sub>50</sub> (bluegill sunfish): 0.43 ppm

## Section 13. DISPOSAL CONSIDERATIONS

RCRA STATUS: Discarded product, as sold, would be considered a RCRA Hazardous Waste based on the characteristics of ignitability and reactivity. The EPA Hazardous Waste Numbers are D001 and D003.

DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

## Section 14. TRANSPORT INFORMATION

### DOT CLASSIFICATION:

Class/Division: 5.1  
Proper Shipping Name: Dichloroisocyanuric acid salts, mixture  
Label: Oxidizer  
Packing Group: II  
ID Number: UN 2465

## Section 15. REGULATORY INFORMATION

OSHA Hazard Communication Status: Hazardous

TSCA: Pesticides are exempted by TSCA (the Toxic Substances Control Act), under Section 3(2)(a)ii, from the provisions of the Act.

CERCLA reportable quantity of EPA hazardous substances in product:

Chemical Name RQ  
No ingredients of this product have CERCLA reportable quantities.

Product RQ: This product has not been assigned an RQ; however, releases may be reportable. (Notify EPA of product spills exceeding this amount.)

### SARA TITLE III:

#### Section 302 Extremely Hazardous Substances:

Chemical Name CAS # RQ TPQ  
There are no SARA 302 Extremely Hazardous Substances in this product.

#### Section 311 and 312 Health and Physical Hazards:

| Immediate<br>[yes] | Delayed<br>[yes] | Fire<br>[yes] | Pressure<br>[no] | Reactivity<br>[yes] |
|--------------------|------------------|---------------|------------------|---------------------|
|--------------------|------------------|---------------|------------------|---------------------|



**Material Safety Data Sheet**  
 Genium Publishing Corporation  
 1145 Catalyn Street  
 Schenectady, NY 12303-1836 USA  
 (518) 377-8855



No. 9  
**SULFURIC ACID, IDENT**  
**CONCENTRATED 725**  
 Revision C  
 Issued: October 1980  
 Revised: February 1986

32.57  
 10fa

**SECTION 1. MATERIAL IDENTIFICATION** 19

**MATERIAL NAME:** SULFURIC ACID, CONCENTRATED

**OTHER DESIGNATIONS:** Oil of Vitriol, Hydrogen Sulfate; H<sub>2</sub>SO<sub>4</sub>; CAS #7664-93-9

**MANUFACTURER/SUPPLIER:** Available from many suppliers, including:  
 Allied Corporation, PO Box 2064R, Morristown, NJ 07960; Telephone: 800 631-8050

HMIS  
 H: 3  
 F: 0  
 R: 2  
 PPE: \*  
 \* See Sect. 8

R 1  
 I 3  
 S 4  
 K 0



**SECTION 2. INGREDIENTS AND HAZARDS**

| Ingredients   | Concentration | Hazard Data  |
|---|---------------|--|
| Hydrogen Sulfate (H <sub>2</sub> SO <sub>4</sub> )  | 93-96         | 8-hr TWA: 1 mg/m <sup>3</sup>  |
| Water   | Balance*      | Human, Mist Inhalation,<br>TCLo: 3 mg/m <sup>3</sup> , 24 wk.<br>(Toxic Mouth Effects) |
| * Material is obtained by the reaction of SO <sub>3</sub> and water. Can contain low impurity levels, such as 0.02% max of iron as Fe. Properties vary with H <sub>2</sub> SO <sub>4</sub> content. |               | Rat. Oral.<br>LD <sub>50</sub> : 2140 mg/kg  |
| Current OSHA standard and ACGIH (1985-86) TLV. NIOSH has a 10-hr TWA, 40-hr. work week, of 1 mg/m <sup>3</sup> .  |               |  |

**SECTION 3. PHYSICAL DATA**

| Property                      | 93.19% H <sub>2</sub> SO <sub>4</sub>  | 98.33% H <sub>2</sub> SO <sub>4</sub> | 100% H <sub>2</sub> SO <sub>4</sub> |
|-------------------------------|--|---------------------------------------|-------------------------------------|
| Bolling Point, 1 atm, deg C   | ca 281   | ca 338                                | ca 330 (dc)                         |
| Specific Gravity (60/60 F)    | 1.8354   | 1.84                                  | 1.84                                |
| Volatiles, % @ 340°C          | ca 100   | ca 100                                | ca 100                              |
| Melting Point, deg C          | ca -34   | ca 3                                  | 10.4                                |
| Water Solubility              | Complete Miscible  |                                       |                                     |
| Vapor Pressure, mm Hg @ 100°F | <1 (93.19% H <sub>2</sub> SO <sub>4</sub> ); Deg. Baume ... 66 (93.19% H <sub>2</sub> SO <sub>4</sub> ) - Density of H <sub>2</sub> SO <sub>4</sub> is often reported in degrees Baume Be). Formula is Be=145 [(145/sp gr for liquids heavier than water]. |                                       |                                     |
| Appearance and odor           | Clear, colorless, hygroscopic, oily liquid with no odor. Mists greater than 1 mg/m <sup>3</sup> are easily recognizable. Those at 5 mg/m <sup>3</sup> are distinctly objectionable.  |                                       |                                     |

**SECTION 4. FIRE AND EXPLOSION DATA**

| Flash Point and Method   | Autoignition Temp. | Flammability Limits in Air | LOWER | UPPER |
|--|--------------------|----------------------------|-------|-------|
| None - Nonflammable  | NA                 | NA                         | NA    | NA    |
| Sulfuric acid is nonflammable; however, it is a strong oxidizing agent and may cause ignition by contact with combustible materials. Small fires may be smothered with suitable dry chemical. Cool exterior of storage tanks of H <sub>2</sub> SO <sub>4</sub> with water to avoid rupture if exposed to fire. <b>Do not add water or other liquid to the acid!</b> The acid, especially when diluted with water, can react with metals to liberate flammable hydrogen gas.<br>Sulfuric acid mists and vapors from a fire area are corrosive (see sect. 5).<br>Fire fighters must wear self-contained breathing equipment and fully protective clothing. |                    |                            |       |       |

**SECTION 5. REACTIVITY DATA**

Sulfuric acid is stable under normal conditions of use and storage. It does not undergo hazardous polymerization. It is a strong mineral acid reacting with bases and metals. The concentrated acid is also a dehydrating agent, picking up moisture readily from the air or other materials. Hydrogen gas may be generated within a H<sub>2</sub>SO<sub>4</sub> container. Vent drums cautiously.

This material reacts exothermically with water. (Acid should always be added slowly to water. Water added to acid can cause boiling and uncontrolled splashing of the acid.) Sulfur oxides can result from decomposition and from oxidizing reactions of sulfuric acid.

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No. 9 2/86 SULFURIC ACID, CONCENTRATED (Rev. C) IDENT 725 2072

**SECTION 6. HEALTH HAZARD INFORMATION TLV**

Concentrated sulfuric acid is a strong mineral acid, an oxidizing agent, and a dehydrating agent that is rapidly damaging to all human tissue with which it comes in contact. Ingestion may cause severe injury or death. Eye contact produces severe or permanent injury. Inhalation of mists can damage both the upper respiratory tract and the lungs. Sulfuric acid is not listed as a carcinogen by the NTP, IARC, or OSHA.

**FIRST AID: EYE CONTACT:** Immediately flush eyes (including under eyelids) with plenty of running water for at least 15 minutes. Speed in diluting and rinsing out acid with water is extremely important if permanent eye damage is to be avoided.

**SKIN CONTACT:** Immediately flush affected areas with water, removing contaminated clothing while under the safety shower. Continue washing with water and get medical attention.\*

**INHALATION:** Remove to fresh air. Restore breathing. Call a physician immediately. **INGESTION:** Dilute acid immediately with large amounts of milk or water, then give milk of magnesia to neutralize. Never give anything by mouth to an unconscious person. Do not induce vomiting; if it occurs spontaneously, continue to administer fluid. Obtain medical attention as soon as possible.\*

Maintain observation of patient for possible delayed onset of pulmonary edema.

\* GET MEDICAL HELP - In plant, paramedic, community.

**SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES**

Handle major spills by a predetermined plan. Contact supplier for assistance in this planning, in meeting local regulations, and for disposing of large amounts. Notify safety personnel. Provide optimum ventilation; vapors are extremely irritating. Stop leak if you can do so without risk.

Cleanup personnel need protection against inhalation or contact. Keep upwind. Contain spill. Minor leaks or spills can be diluted with much water and neutralized with soda ash or lime. If water is not available, cover contaminated area with sand, ashes, or gravel and neutralize cautiously with soda ash or lime.

**DISPOSAL:** Follow Federal, state, and local regulations. Runoff to sewer may create hydrogen gas, which is a fire or explosion hazard. EPA (CWA) RQ 1000 lbs. (40 CFR 117).

**SECTION 8. SPECIAL PROTECTION INFORMATION**

Provide general ventilation to meet current TLV requirements in the workplace. Where mists are up to 50 mg/m<sup>3</sup>, a high-efficiency particulate respirator with full facepiece is warranted; a type-C supplier-air respirator with full facepiece operated in pressure-demand mode is used to 100 mg/m<sup>3</sup>.

Avoid eye contact by use of chemical safety goggles or face shield where splashing may occur. Acid-resistant protective clothing, such as rubber gloves, aprons, boots, and suits, is recommended to avoid body contact.

Eyewash fountain and safety showers with deluge type of heads should be readily available where this material is handled or stored.

Contact lenses pose a special hazard; soft lenses may absorb and all lenses concentrate irritants. Comprehensive preplacement and annual medical examinations with emphasis on dental erosion, cardiopulmonary system, and mucous membrane irritation and cough are indicated.

**SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS**

Sulfuric acid in carboys or drums should be stored in clean, ventilated storage areas having acid-resistant floors with good drainage. Keep out of direct sunlight, do not store above 89.6°F (32°C). Storage facilities are to be separate from organic materials, metallic powders, chromates, chlorates, nitrates, carbides, oxidizables, etc. Soda ash, sand, or lime should be kept in general storage or work areas for emergency use. Protect containers against physical damage. Glass bottles need extra protection. Sulfuric acid is highly corrosive to most metals, especially below 77% H<sub>2</sub>SO<sub>4</sub>. Avoid breathing mist or vapors. Avoid contact with skin or eyes. Do not ingest. Do not add water to concentrated acid. Drums may contain hydrogen gas, so open cautiously. Use nonsparking tools free of oil, dirt, and grit and vapor-proof electrical fixtures.

DOT Classification: Corrosive Material ID No.: UN1830 Label: Corrosive

Data Source(s) Code: 1-12, 19, 20, 24, 26, 31, 37-39, 42, 82. CK

|  |  |
|--|--|
| <small>Judgements as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Chemtune Publishing Corp. extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.</small> | Approvals <i>J. J. Hancock, 6/86.</i>    |
|  | Indust. Hygiene/Safety <i>J. W. 6/86</i> |
|  | Medical Review <i>[Signature]</i>        |

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MATERIAL SAFETY DATA

BELLACIDE (R) 325

5915 -41 -3 -2

U.S./CANADA VERSION

EFFECTIVE: 06/28/95

PRINTED: 02/23/96

PRINTED FOR..... FMC CORPORATION

===== 1. CHEMICAL PRODUCT/COMPANY IDENTIFICATION =====

PRODUCT NAME..... BELLACIDE 325  
ALGICIDE

SYNONYMS..... 2-(TERT-BUTYLAMINO)-4-CHLORO-6-(ETHYLAMINO)-  
5-TRIAZINE; TERBUTHYLAZINE

INFORMATION PROVIDED BY... FMC CORPORATION  
PROCESS ADDITIVES DIVISION  
1735 MARKET STREET  
PHILADELPHIA, PA 19103  
(800) 545-6532

EMERGENCY PHONE NUMBERS

CHEMTREC..... (800) 424-9300  
MEDICAL..... (303) 595-9048 CALL COLLECT  
PLANT/OTHER..... (304) 755-6300 CALL COLLECT

===== 2. COMPOSITION/INFORMATION ON INGREDIENTS =====

CAS # AND COMPONENTS..... 2-(TERT-BUTYLAMINO)-4-CHLORO-6-(ETHYLAMINO)-  
5-TRIAZINE  
CAS#: 5915-41-3  
PERCENT: 4%  
WATER  
CAS#: 7732-18-5

===== 3. HAZARD IDENTIFICATION =====

EMERGENCY OVERVIEW..... PRODUCT IS STABLE UNDER NORMAL CONDITIONS OF  
USE. UNDER FIRE CONDITIONS TOXIC SULFUR  
OXIDES AND CHLORINE COMPOUNDS MAY BE RELEASED.  
HEALTH EFFECTS..... PRODUCT IS SLIGHTLY TOXIC BY INGESTION.

===== 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.  
INHALATION..... REMOVE TO FRESH AIR. IF BREATHING DIFFICULTY OR  
DISCOMFORT OCCURS AND PERSISTS. OBTAIN MEDICAL  
ATTENTION.  
INGESTION..... DRINK 1 OR 2 GLASSES OF WATER AND INDUCE  
VOMITING BY TOUCHING THE BACK OF THE THROAT  
WITH A FINGER OR BY GIVING SYRUP OF IPECAC.  
NEVER INDUCE VOMITING OR GIVE ANYTHING BY MOUTH  
TO AN UNCONSCIOUS PERSON. CONTACT A MEDICAL  
DOCTOR.

NOTES TO PHYSICIAN..... NOT AVAILABLE

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MATERIAL SAFETY DATA

BELLACIDE (R) 325



5915 -4! -3 -2

U.S./CANADA VERSION

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===== 5. FIRE FIGHTING MEASURES =====

|                             |   |
|-----------------------------|---|
| EXTINGUISHING MEDIA.....    | CARBON DIOXIDE, FOAM, DRY CHEMICAL, WATER SPRAY |
| SPECIAL FIREFIGHTING.....   | USE-SELF CONTAINED BREATHING APPARATUS.         |
| PROCEDURES                  |   |
| DEGREE OF FIRE AND.....     | DECOMPOSITION AND COMBUSTION PRODUCTS MAY BE    |
| EXPLOSION HAZARD            | TOXIC.  |
| HAZARDOUS DECOMPOSITION...: | THERMAL DECOMPOSITION AND BURNING MAY PRODUCE   |
| PRODUCTS                    | CARBON MONOXIDE, CARBON DIOXIDE, NITROGEN AND   |
|                             | SULFUR OXIDES, CHLORINE COMPOUNDS AND OTHER     |
|                             | TOXIC SPECIES.                                  |

===== 6. ACCIDENTAL RELEASE MEASURES =====

|                            |  |
|----------------------------|--|
| PROCEDURE FOR RELEASE..... | ISOLATE AREA. WEAR PRESCRIBED PROTECTIVE       |
| OR SPILL                   | CLOTHING AND EQUIPMENT. DIKE TO CONFINE SPILL. |
|                            | ABSORB WITH AN ABSORBENT OR SHOVEL WASTE INTO  |
|                            | AN APPROVED CONTAINER AND DISPOSE OF FOLLOWING |
|                            | THE METHOD OUTLINED UNDER THE "DISPOSAL        |
|                            | CONSIDERATIONS" SECTION. TO DECONTAMINATE SP   |
|                            | AREA, TOOLS AND EQUIPMENT WASH WITH WATER AND  |
|                            | ADD TO DRUMS OF WASTE ALREADY COLLECTED.       |

===== 7. HANDLING AND STORAGE =====

|                  |  |
|------------------|--|
| HANDLING.....    | AVOID DIRECT CONTACT WHEN HANDLING THIS PRODUCT. |
| VENTILATION..... | USE WITH GENERAL ROOM VENTILATION WHEN AIRBORNE  |
|                  | CONTAMINATION IS EXPECTED.                       |
| STORAGE.....     | KEEP CONTAINERS CLOSED WHEN NOT IN USE. PROTECT  |
|                  | FROM HEAT, FLAME AND PHYSICAL DAMAGE.            |

===== 8. EXPOSURE CONTROLS/PERSONAL PROTECTION =====

|                       |   |
|-----------------------|---|
| CONTROL MEASURES..... | UNDER NORMAL CONDITIONS OF USE EXPOSURE SHOULD  |
|                       | NOT BE A SIGNIFICANT CONCERN. UNDER UNUSUAL     |
|                       | CONDITIONS THE PERSONAL PROTECTIVE EQUIPMENT    |
|                       | INDICATED BELOW IS RECOMMENDED.                 |
| RECOMMENDED PERSONAL  |   |
| PROTECTIVE EQUIPMENT  |   |
| RESPIRATORY.....      | USE MSHA/NIOSH APPROVED ORGANIC RESPIRATORY     |
|                       | PROTECTION WHEN AIRBORNE VAPOR IS EXPECTED.     |
| EYES.....             | USE CHEMICAL TYPE GOGGLES OR FACE SHIELD.       |
| GLOVES.....           | USE IMPERVIUS GLOVES.                           |
| SPECIAL CLOTHING...:  | WEAR IMPERVIUS APRON AND GAUNTLETS WHEN         |
| AND EQUIPMENT         | SPLASHING IS EXPECTED DURING LIQUID TRANSFER.   |
| FOOTWEAR.....         | NORMAL WORKSHOES EXCEPT IN CONDITIONS OF SPILLS |
|                       | WHERE RUBBER OVERSHOES OR BOOTS WOULD BE        |
|                       | REQUIRED.                                       |

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MATERIAL SAFETY DATA

BELLACIDE (R) 325



5915 -41 -3 -2

U.S./CANADA VERSION

EFFECTIVE: 06/28/95

PRINTED: 02/23/96

9. PHYSICAL AND CHEMICAL PROPERTIES

MELTING/FREEZING POINT...: NOT AVAILABLE  
 BOILING POINT...: NOT AVAILABLE  
 VAPOR PRESSURE...: NOT AVAILABLE  
 VAPOR DENSITY (AIR=1)...: NOT APPLICABLE  
 ROOM TEMPERATURE...: WHITE TO BEIGE AQUEOUS DISPERSION  
 APPEARANCE AND STATE  
 ODOR...: SLIGHT CHALKY ODOR  
 SPECIFIC GRAVITY (H2O=1)...: 1.0  
 SOLUBILITY IN H2O % BY WT: NOT AVAILABLE  
 % VOLATILES...: NOT AVAILABLE  
 EVAPORATION RATE...: NOT AVAILABLE  
 (BUTYL ACETATE=1)  
 PH (AS IS)...: 7-9  
 PH (1% SOLUTION)...: NOT AVAILABLE  
 ODOR THRESHOLD...: NOT AVAILABLE  
 DENSITY (G/ML)...: NOT AVAILABLE  
 PARTITION COEFFICIENT...: NOT AVAILABLE  
 N-OCTANOL/WATER  
 FLASH POINT...: NOT APPLICABLE  
 AUTOIGNITION TEMPERATURE...: NOT AVAILABLE  
 FLAMMABLE LIMITS UPPER...: NOT APPLICABLE  
 (AIR) LOWER...: NOT APPLICABLE  
 EXPLOSIVE PROPERTIES...: NOT APPLICABLE  
 OXIDIZING PROPERTIES...: NOT APPLICABLE  
 SOLUBILITY...: NOT AVAILABLE  
 - FAT SOLUBILITY  
 (SOLVENT - OIL)

10. STABILITY AND REACTIVITY

STABILITY...: STABLE  
 HAZARDOUS POLYMERIZATION...: WILL NOT OCCUR  
 CONDITIONS TO AVOID...: AVOID STORAGE AT EXTREME TEMPERATURES.  
 MATERIALS TO AVOID...:  
 MAJOR CONTAMINANTS THAT...: NOT AVAILABLE  
 CONTRIBUTE TO INSTABILITY  
 INCOMPATIBILITY...: STRONG ACIDS AND ALKALIES  
 HAZARDOUS DECOMPOSITION...: THERMAL DECOMPOSITION AND BURNING MAY PRODUCE  
 PRODUCTS CARBON MONOXIDE, CARBON DIOXIDE, NITROGEN AND  
 SULFUR OXIDES, CHLORINE COMPOUNDS AND OTHER  
 TOXIC SPECIES.  
 SENSITIVITY TO MECH...: NONE  
 IMPACT  
 SENSITIVITY TO STATIC...: NONE  
 DISCHARGE

11. TOXICOLOGICAL INFORMATION

EYE CONTACT...: NON-IRRITANT (RABBIT)

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MATERIAL SAFETY DATA

BELLACIDE (R) 325



5915 -41 -3 -2

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SKIN CONTACT.....: NON-IRRITANT (RABBIT)  
 SKIN ABSORPTION.....: NON-SENSITIZER (GUINEA PIG)  
 INHALATION.....: LD50 > 4400 MG/KG (RABBIT)  
 INGESTION.....: NO DATA AVAILABLE  
 ACUTE EFFECTS FROM.....: LD50 = 1350 MG/KG (RAT)  
 OVEREXPOSURE.....: PRODUCT IS SLIGHTLY TOXIC BY INGESTION.  
 CHRONIC EFFECTS FROM.....: ANIMAL STUDIES INDICATED EFFECTS ON THE LIVER,  
 OVEREXPOSURE.....: TESTES, THYMUS AND STOMACH WHEN PRODUCT WAS  
 (EFFECTS CONSIDERED.....: APPLIED DERMALLY. LONG-TERM ANIMAL STUDIES WITH  
 INCLUDE:.....: THE ACTIVE INGREDIENT INDICATED TOXIC EFFECTS IN  
 SENSITIVITIES,.....: LYMPH NODES, THYMUS AND SPLEEN FOLLOWING ORAL  
 CARCINOGENICITY,.....: AND DERMAL EXPOSURE; A SMALL INCREASED  
 TERATOGENICITY,.....: INCIDENCE OF MAMMARY TUMORS WAS NOTED IN RATS.  
 MUTAGENICITY,.....: INHALATION OR INGESTION OF ETHYLENE GLYCOL MAY  
 SYNERGISTIC.....: RESULT IN CENTRAL NERVOUS SYSTEM DEPRESSION,  
 PRODUCTS, AND ANY.....: LIVER AND KIDNEY DAMAGE AND FETO TOXICITY AND  
 MEDICAL CONDITIONS.....: TERATOGENICITY.  
 GENERALLY RECOGNIZED.....:  
 AS BEING AGGRAVATED.....:  
 BY EXPOSURE.)

11. TOXICOLOGICAL INFORMATION

ENVIRONMENTAL FATE.....: SEWAGE BACTERIAL TOXICITY -  
 ENVIRONMENTAL EFFECTS.....: INHIBITORY CONCENTRATION ON RESPIRATION OF  
 AEROBIC WASTE WATER - IC20, IC50, IC80 > 100 PPM,  
 NO DATA AVAILABLE FOR THE PRODUCT. INFORMATION  
 BELOW IS FOR TERBUTHYLAZINE, THE MAJOR  
 INGREDIENT:  
 FISH TOXICITY -  
 BLUEGILL: 96 HR LC50 = 7.6 PPM  
 RAINBOW TROUT: 96 HR LC50 = 3.8 PPM  
 INVERTEBRATE TOXICITY -  
 DAPHNIA MAGNA: 48 HR EC50 = 39 PPM  
 AVIAN TOXICITY -  
 MALLARD DUCK: ORAL LD50 > 2510 MG/KG  
 BOBWHITE QUAIL: 8 DAY DIETARY LC50 > 5620 PPM  
 MALLARD DUCK: 8 DAY DIETARY LC50 > 3620 PPM

12. ECOLOGICAL INFORMATION

WASTE DISPOSAL METHOD.....: OPEN DUMPING OR BURNING OF THIS MATERIAL IS  
 PROHIBITED. AN ACCEPTABLE METHOD OF DISPOSAL IS  
 TO BURN IN AN INCINERATOR IN ACCORDANCE WITH ALL  
 LOCAL, STATE AND FEDERAL ENVIRONMENTAL LAWS,  
 RULES, STANDARDS AND REGULATIONS.  
 THE APPROPRIATE REGULATORY AGENCIES SHOULD BE  
 CONTACTED PRIOR TO DISPOSAL.

13. DISPOSAL CONSIDERATIONS

PAD

(CONTINUED) PAGE 04



JAN-09-1998 09:17 FROM

TO

216172542713 P.06



MATERIAL SAFETY DATA

BELLACIDE(R) 325

5915 -41 -3 -2

U.S./CANADA VERSION

EFFECTIVE: 06/28/95

PRINTED: 02/23/96

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===== 14. TRANSPORT INFORMATION =====
DOT PROPER SHIPPING NAME.: NOT REGULATED AS A HAZARDOUS MATERIAL BY U.S.
DOT 49 CFR 172.101.
IATA.....: NOT REGULATED
IMDG.....: NOT REGULATED
DOT CLASSIFICATION.....: NOT APPLICABLE
DOT LABELS!.....: NOT REQUIRED
DOT MARKING.....: NOT REQUIRED
DOT PLACARD.....: NOT REQUIRED
UN NUMBER.....: NOT APPLICABLE
HAZARDOUS SUBSTANCE/RO...: NOT APPLICABLE
49 STCC NUMBER.....: NOT AVAILABLE
PRECAUTIONS TO BE TAKEN.: KEEP CONTAINER TIGHTLY CLOSED. PROTECT AGAINST
IN TRANSPORTATION PHYSICAL DAMAGE.
OTHER SHIPPING.....: NONE
INFORMATION

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===== 15. REGULATORY INFORMATION =====
OSHA
EXPOSURE LIMITS
SUBSTANCE(S).....: NONE
OSHA PEL-TWA.....: NOT APPLICABLE
STEL.....: NOT APPLICABLE
CEILING.....: NOT APPLICABLE
SKIN DESIGNATION.: NOT APPLICABLE
ACGIH TLV-TWA.....: NOT APPLICABLE
STEL.....: NOT APPLICABLE
CEILING.....: NOT APPLICABLE
SKIN DESIGNATION.: NOT APPLICABLE
TARGET ORGAN EFFECTS....: LIVER, TESTES, THYMUS, STOMACH, SPLEEN
CARCINOGENIC POTENTIAL...: NO
REGULATED BY OSHA.....: NO
LISTED ON NTP REPORT...: NO
IARC GROUP 1, 2A, 2B...: NO
U.S. EPA REQUIREMENTS
RELEASE REPORTING
CERCLA (40 CFR 302)
LISTED SUBSTANCE(S)....: NONE
RQ.....: NOT APPLICABLE
CATEGORY.....: NOT APPLICABLE
RCRA WASTE NO.....: NOT APPLICABLE
UNLISTED SUBSTANCE(S)...: NONE
RQ.....: NOT APPLICABLE
CHARACTERISTIC...: NOT APPLICABLE
RCRA WASTE NO.....: NOT APPLICABLE
SARA TITLE III SEC 313
(40 CFR 372).....:
LISTED TOXIC CHEMICAL...: NONE
INVENTORY REPORTING

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PAD

(CONTINUED) PAGE 05

JAN-09-1998 09:18 FROM

TO

315172542713 P.87

MATERIAL SAFETY DATA

BELLACIDE(R) 325



5915 -41 -3 -2

U.S./CANADA VERSION

EFFECTIVE: 06/28/95

PRINTED: 02/23/96

|  |  |       |
|--|--|-------|
| =====                                      | 15. REGULATORY INFORMATION   | ===== |
| SARA TITLE III SEC 311/312<br>(40 CFR 370) |  |       |
| SUBSTANCE(S).....                          | NOT APPLICABLE   |       |
| HAZARD CATEGORY.....                       | DELAYED (CHRONIC) HEALTH HAZARD  |       |
| PLANNING THRESHOLD.....                    | NOT APPLICABLE   |       |
| EMERGENCY PLANNING                         |  |       |
| SARA TITLE III SEC 302-303<br>(40 CFR 355) |  |       |
| LISTED SUBSTANCE(S).....                   | NONE   |       |
| RQ.....                                    | NOT APPLICABLE   |       |
| PLANNING THRESHOLD.....                    | NOT APPLICABLE   |       |
| U.S. TSCA STATUS.....                      | YES (COMPONENTS)   |       |
| CANADA                                     |  |       |
| INGREDIENT DISCLOSURE LIST                 |  |       |
| SUBSTANCE(S).....                          | NOT EVALUATED FOR CANADA   |       |
| CONTROLLED PRODUCT.....                    | NOT EVALUATED FOR CANADA   |       |
| HAZARD SYMBOLS.....                        | NOT EVALUATED FOR CANADA   |       |
| CLASS & DIVISION.....                      | NOT EVALUATED FOR CANADA   |       |
| PRODUCT IDENTIFICATION NO:                 | NOT EVALUATED FOR CANADA   |       |
| DOMESTIC SUBSTANCE LIST.....               | NOT EVALUATED FOR CANADA   |       |
| CEPA PRIORITY LIST.....                    | NOT EVALUATED FOR CANADA   |       |
| CARCINOGENICITY                            |  |       |
| ACGIH APPENDIX A.....                      | NO   |       |
| A1 - CONFIRMED HUMAN.....                  | NO   |       |
| A1 - SUSPECTED HUMAN.....                  | NO   |       |
| IARC GROUP 1 OR 2.....                     | NO   |       |
| LABEL LANGUAGE (US/CANADA)                 | FOR UNITED STATES ONLY   |       |
| HEALTH.....                                | U.S.: CAUTION- HARMFUL IF SWALLOWED OR ABSORBED THROUGH THE SKIN. AVOID CONTACT WITH SKIN AND CLOTHING. WASH THOROUGHLY AFTER HANDLING. REMOVE AND WASH CONTAMINATED CLOTHING BEFORE REUSE.  |       |
| PHYSICAL.....                              | NOT APPLICABLE   |       |
| HANDLING AND STORAGE.....                  | KEEP OUT OF REACH OF CHILDREN. DO NOT CONTAMINATE WATER, FOOD OR FEED BY STORAGE AND DISPOSAL. PROTECT FROM FREEZING.  |       |
| FIRST AID.....                             | FIRST AID IN CASE OF CONTACT:<br>EYES: FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.<br>SKIN: FLUSH SKIN WITH PLENTY OF WATER OR WASH WITH MILD SOAP AND WATER.<br>INGESTION: IF CONSCIOUS, GIVE PLENTY OF WATER AND INDUCE VOMITING BY PLACING FINGER IN BACK OF THROAT. GET MEDICAL ATTENTION. |       |
| STATE REGULATIONS.....                     | NONE KNOWN   |       |

PAD

(CONTINUED) PAGE 06

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JAN-09-1998 09:18 FROM

TO 816172542713 P.08



MATERIAL SAFETY DATA

BELLACIDE (R) 325

5915 -41 -3 -2

U.S./CANADA VERSION

EFFECTIVE: 06/28/95

PRINTED: 02/23/96

PRODUCT USES.....

16. OTHER INFORMATION

ALGICIDE  
REGISTERED UNDER EPA NO. 279-3139

IMPORTANT: THIS MATERIAL IS NOT INTENDED FOR USE IN PRODUCTS FOR WHICH PROLONGED CONTACT WITH MUCOUS MEMBRANES OR ABRADED SKIN, OR IMPLANTATION WITHIN THE HUMAN BODY, IS SPECIFICALLY INTENDED, UNLESS THE FINISHED PRODUCT HAS BEEN TESTED IN ACCORDANCE WITH THE FOOD AND DRUG ADMINISTRATION AND/OR OTHER APPLICABLE SAFETY TESTING REQUIREMENTS. BECAUSE OF THE WIDE RANGE OF SUCH POTENTIAL USES, FMC CORPORATION IS NOT ABLE TO RECOMMEND THIS MATERIAL AS SAFE AND EFFECTIVE FOR SUCH USES AND ASSUMES NO LIABILITY FOR ANY SUCH USES.

NFPA 704

HEALTH..... 1  
FLAMMABILITY..... 1  
REACTIVITY..... 0  
SPECIAL HAZARD.....  
(DEGREE OF HAZARD  
0 = NO HAZARD  
4 = SEVERE HAZARD)

THE CONTENTS AND FORMAT OF THIS MSDS ARE IN ACCORDANCE WITH OSHA HAZARD COMMUNICATION AND CANADA'S WORKPLACE HAZARDOUS MATERIAL INFORMATION SYSTEM (WHMIS).



MATERIAL SAFETY DATA SHEET

BAYER CORPORATION
PRODUCT SAFETY & REGULATORY AFFAIRS
100 Bayer Road
Pittsburgh, PA 15205-9741

TRANSPORTATION EMERGENCY CALL CHEMTREC: 800-424-9300 INTERNATIONAL: 703-527-3887
NON-TRANSPORTATION BAYER EMERGENCY PHONE...: (412) 923-1800 BAYER INFORMATION PHONE.: (800) 662-2927

1. CHEMICAL PRODUCT IDENTIFICATION:

PRODUCT NAME.....: Bayhibit AM Inhibitor
PRODUCT CODE.....: V801
CHEMICAL FAMILY.....: Phosphonates
CHEMICAL NAME.....: 2-phosphono-1,2,4-butanetricarboxylic acid aqueous solution
SYNONYMS.....: PBTC
FORMULA.....: C7H11O9P in H2O

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME /CAS NUMBER EXPOSURE LIMITS CONCENTRATION (%)

\*\*\*\*\* HAZARDOUS INGREDIENTS \*\*\*\*\*

2-phosphono-1,2,4-butanetricarboxylic acid
37971-36-1 OSHA : Not Established
ACGIH: Not Established
Approx. 50 %

3. HAZARDS IDENTIFICATION:

\*\*\*\*\*
\* EMERGENCY OVERVIEW \*
\* CAUTION! Color: Colorless to yellowish; Form: Liquid; \*
\* Odor: Very slight odor; May cause eye irritation; Contact \*
\* with metals liberates flammable gas; Corrosive to steel, or \*
\* aluminum; Use cold water spray to cool fire-exposed \*
\* containers to minimize the risk of rupture; Irritating \*
\* gases/fumes may be given off during burning or thermal \*

Product Code: V801
Approval date: 11/18/1998

MSDS Page 1
Continued on next page

3. HAZARDS IDENTIFICATION (Continued)

\* decomposition. \*  
\*\*\*\*\*

POTENTIAL HEALTH EFFECTS:

ROUTE(S) OF ENTRY.....: Eye Contact; Skin Contact; Inhalation

HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE:

ACUTE EFFECTS OF EXPOSURE.....: On the basis of Animal Toxicity testing (see Section 11), we would expect this product to be moderately irritating to the eyes, with symptoms such as tearing, reddening and swelling. We would also expect this product to be non-irritating to the skin and to be essentially non-toxic by ingestion.

CHRONIC EFFECTS OF EXPOSURE...: Prolonged or repeated skin contact could result in skin irritation. Possible symptoms include itching, reddening, swelling, rash and scaling. Based on animal test results, no mutagenic or teratogenic effects are expected. Also, sub-chronic three (3) month animal feeding studies were conducted without any adverse effects.

CARCINOGENICITY.....: This product is not listed by NTP, IARC or regulated as a carcinogen by OSHA.

MEDICAL CONDITIONS

AGGRAVATED BY EXPOSURE.....: Persons with pre-existing eye conditions may be more susceptible to the effects of overexposure to this product.  
EXPOSURE LIMITS.....: Not established for this product.

4. FIRST AID MEASURES:

FIRST AID FOR EYES.....: Flush eyes with water for at least 15 minutes. Consult a physician if irritation persists.

FIRST AID FOR SKIN.....: Wash thoroughly with soap and water. Consult a physician if irritation develops.

FIRST AID FOR INHALATION: Remove to fresh air. Consult a physician if breathing is difficult.

FIRST AID FOR INGESTION.: Consult a physician.

5. FIRE FIGHTING MEASURES:

FLASH POINT.....: Greater than 212 F (100 C); DIN 51758.

AUTO-IGNITION TEMPERATURE.....: Greater than 932 F (500 C); DIN 51794.

EXTINGUISHING MEDIA.....: Water; Foam; Carbon Dioxide

Product Code: V801  
Approval date: 11/18/1998

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Continued on next page

5. FIRE FIGHTING MEASURES (Continued)

SPECIAL FIRE FIGHTING PROCEDURES: Under fire conditions irritating and/or toxic gases and aerosols may be present. Firefighters should wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES:

SPILL OR LEAK PROCEDURES.....: Utilize recommended protective clothing and equipment. Spills should be taken up with a suitable absorbent and placed in containers. Spill area can be washed with water. Collect wash water for approved disposal. Bayhibit AM may be eliminated from sewage water via precipitation by flocculation with iron (III) or aluminum salt.

7. HANDLING AND STORAGE:

STORAGE TEMPERATURE (MIN/MAX): Ambient/122 F (50 C).

SHELF LIFE.....: At least two (2) years.

SPECIAL SENSITIVITY.....: None known.

HANDLING/STORAGE PRECAUTIONS: Do not store in unlined steel containers as Bayhibit AM solution will dissolve steel and other metals, causing the generation of hydrogen gas (flammable). Steel or metal containers must have a complete polyethylene liner on sides, top and bottom. Repack only into approved containers. Store away from alkalis, food and beverages. Handle as any moderately strong acid would be handled. Freezing of this product will not effect its quality. Keep away from food, drink and animal feeds.

8. PERSONAL PROTECTION:

EYE PROTECTION REQUIREMENTS.....: Chemical workers splash goggles.

SKIN PROTECTION REQUIREMENTS.....: Rubber, PVC, Nitrile gloves, aprons and other splash protection as appropriate for the conditions of use.

Employees should wash their hands and face before eating, drinking or using tobacco products.

VENTILATION REQUIREMENTS.....: Local exhaust ventilation at work area.

RESPIRATOR REQUIREMENTS.....: None required under normal conditions of use.

ADDITIONAL PROTECTIVE MEASURES.....: Safety showers and eyewash facilities should be available. Employees should be trained in the safe use and handling of hazardous chemicals.

Product Code: V801  
Approval date: 11/18/1998

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Continued on next page

9. PHYSICAL AND CHEMICAL PROPERTIES:

PHYSICAL FORM.....: Liquid  
COLOR.....: Colorless to yellowish  
ODOR.....: Very slight odor  
MOLECULAR WEIGHT.....: Approx. 270 for PBTC  
pH .....: (10 % solution) Approx. 1.1 @ 68 F (20 C)  
BOILING POINT.....: (Initial): 212 F (100 C)  
MELTING/FREEZING POINT....: Approx. 5 F (-15 C)  
VISCOSITY.....: (Dynamic): 15 to 25 mPas @ 68 F (20 C)  
SOLUBILITY IN WATER .....: Miscible  
SPECIFIC GRAVITY .....: 1.27 to 1.30 @ 68 F (20 C)  
BULK DENSITY.....: Not Established  
% VOLATILE BY VOLUME.....: 50 to 55 %  
VAPOR PRESSURE .....: 19.6 mbar @ 68 F (20 C);  
107 mbar @ 122 F (50 C)

10. STABILITY AND REACTIVITY:

STABILITY.....: Under normal conditions of use and storage, the product is stable.  
HAZARDOUS POLYMERIZATION...: Will not occur.  
INCOMPATIBILITIES.....: Steel, bases, sodium hypochlorite solution and strong alkalis (vigorous reaction which generates heat due to neutralization process). Bayhibit AM may be added safely to dilute alkali solutions under controlled conditions, i.e. adding slowly with constant mixing.  
INSTABILITY CONDITIONS.....: (see INCOMPATIBLE MATERIALS).  
DECOMPOSITION TEMPERATURE...: No decomposition below 212 F (100 C).  
DECOMPOSITION PRODUCTS.....: Thermal decomposition may emit phosphoric acid, carbon monoxide, carbon dioxide and other unidentified by-products.

11. TOXICOLOGICAL INFORMATION:

ACUTE TOXICITY

ORAL LD50.....: Greater than 6,500 mg/kg (Rat). (1)  
INHALATION LC50.....: Aerosol concentrations of up to 3,000 mg/m3 were tolerated without development of symptoms. (2)  
EYE EFFECTS.....: Moderately irritating to rabbit eyes. (1)  
SKIN EFFECTS.....: Non-irritating to rabbit skin (24 hrs.). (1)  
SUBCHRONIC TOXICITY...: Feeding experiment/test over a three month period: In tests, doses of up to 6,800 mg/kg were tolerated without any adverse effect. (2)

Product Code: V801  
Approval date: 11/18/1998

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Continued on next page

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### 11. TOXICOLOGICAL INFORMATION (Continued)

CHRONIC TOXICITY.....: Data not established for product.  
 MUTAGENICITY.....: Salmonella/microsome test (Ames test): No evidence of mutagenic effects. (2)  
 REPRODUCTION.....: Pregnant rats were administered doses of up to 1,000 mg/kg body weight; no evidence of possible embryotoxicity or teratogenicity were found. (2)

- (1) Tests at the Institute for Toxicology of Bayer AG.  
 (2) Tests performed with Bayhibit S (sodium salts): Data recalculated to correspond with Bayhibit AM.

### 12. ECOLOGICAL INFORMATION:

AQUATIC TOXICITY.....: ACUTE BACTERIA TOXICITY: No harmful effects to Escherichia coli at 105,000 mg/l, 24 hrs. and Pseudomonas fluorescens at 105,000 mg/l, 24 hrs. (3); DAPHNIA TOXICITY: No harmful effects to daphnia magna Strauss at 300 mg/l, 24 hrs. (3); FISH TOXICITY: Rainbow trout (Salmo gairdneri) LCo = 5,300 mg/l, 48 hrs. (3); OTHER AQUATIC TOXICITY: No harmful effect to Scenedesmus quadricauda (green algae) at 1,300 mg/l, 24 hrs. (3); BIOLOGICAL DEGRADATION: 17 % after 28 days (Zahn-Wellens Test) (3) NOTE: Based on experience to date, no interference to biological purification installations if product is used appropriately. (4)

- (3) Tests performed with neutralized solution - results recalculated for Bayhibit AM.  
 (4) Tests carried out in the biological laboratories of the Environmental Protection Department of Bayer AG.

### 13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD.....: May incinerate or dispose of in closed containers at suitable deposit site if in accordance with federal, state and local environmental control regulations. Empty packing materials should be disposed of at authorized incineration installations in accordance with applicable regulations.

### 14. TRANSPORTATION INFORMATION:

TECHNICAL SHIPPING NAME.....: 2-phosphono-1,2,4-butanetricarboxylic acid in water  
 FREIGHT CLASS BULK.....: Cleaning or Washing Compounds, NOI, Liquid  
 FREIGHT CLASS PACKAGE.....: Cleaning or Washing Compounds, NOI, Liquid

Product Code: V801  
 Approval date: 11/18/1998

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 Continued on next page



## 14. TRANSPORTATION INFORMATION (Continued)

PRODUCT LABEL.....: Bayhibit AM Inhibitor

## DOT (DOMESTIC SURFACE)

PROPER SHIPPING NAME.....: Corrosive Liquid, Acidic, Organic, N.O.S.  
 HAZARD CLASS OR DIVISION .....: 8  
 UN/NA NUMBER.....: UN3265  
 PACKING GROUP .....: III  
 DOT PRODUCT RQ lbs (kgs).....: None  
 HAZARD LABEL(s).....: Corrosive  
 HAZARD PLACARD(s).....: Corrosive

## IMO / IMDG CODE (OCEAN)

PROPER SHIPPING NAME.....: Corrosive Liquid, Acidic, Organic, N.O.S.  
 HAZARD CLASS DIVISION NUMBER....: 8  
 UN NUMBER.....: UN3265  
 PACKAGING GROUP.....: III  
 HAZARD LABEL(s).....: Corrosive  
 HAZARD PLACARD(s).....: Corrosive

## ICAO / IATA (AIR)

PROPER SHIPPING NAME.....: Corrosive Liquid, Acidic, Organic, N.O.S.  
 HAZARD CLASS DIVISION NUMBER....: 8  
 UN NUMBER.....: UN3265  
 SUBSIDIARY RISK.....: None  
 PACKING GROUP.....: III  
 HAZARD LABEL(s).....: Corrosive  
 RADIOACTIVE?.....: Non-Radioactive  
 PASSENGER AIR - MAX. QTY. ....: 5 L  
 PASSENGER PACKING INSTRUCTION...: 818  
 CARGO AIR - MAX. QTY. ....: 60 L  
 CARGO AIR PACKING INSTRUCTION...: 820

## 15. REGULATORY INFORMATION:

OSHA STATUS.....: This product is hazardous under the criteria of  
 the Federal OSHA Hazard Communication Standard 29  
 CFR 1910.1200.  
 TSCA STATUS.....: On TSCA Inventory  
 CERCLA REPORTABLE QUANTITY...: None.  
 SARA TITLE III:  
 SECTION 302 EXTREMELY  
 HAZARDOUS SUBSTANCES...: None.

Product Code: V801  
 Approval date: 11/18/1998

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 Continued on next page

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## 15. REGULATORY INFORMATION (Continued)

## SECTION 311/312

HAZARD CATEGORIES.....: Immediate Health Hazard

## SECTION 313

TOXIC CHEMICALS.....: None.

RCRA STATUS.....: When discarded in its purchased form, this product meets the criteria of corrosivity, and should be managed as a hazardous waste (EPA Hazardous Waste Number D002). (40 CFR 261.20-24)  
- pH is less than 2.

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.

| COMPONENT NAME<br>/CAS NUMBER                            | CONCENTRATION    | STATE CODE |
|--|------------------|------------|
| 2-phosphono-1,2,4-butanetricarboxylic acid<br>37971-36-1 | Approx. 50 %     | PA3, NJ4   |
| Water<br>7732-18-5                                       | Approx. 50 %     | PA3, NJ4   |
| Cadmium<br>7440-43-9                                     | < 0.02 ppm* (1)  | CA         |
| Lead<br>7439-92-1  | < 0.02 ppm* (1)  | CA         |
| Mercury<br>7439-97-6                                     | < 0.001 ppm* (1) | CA         |
| Nickel<br>7440-02-0                                      | 0.2 ppm*         | CA         |

CA = California Proposition 65

NJ4 = New Jersey Other - included in 5 predominant ingredients &gt; 1%

PA3 = Pennsylvania Non-hazardous present at 3% or greater.

## MASSACHUSETTS SUBSTANCE LIST (MSL)

Hazardous Substances and Extraordinarily Hazardous Substances on the MSL must be identified when present in products. To the best of our knowledge, this product contains no substances at a level which could require reporting under the statute.

\* Please note that these were random sample analyses and content may vary from batch to batch.

(1) Value indicated is the detection limit.

Product Code: V801  
Approval date: 11/18/1998

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Continued on next page

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16. OTHER INFORMATION:  
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HMIS RATINGS:                    Health    Flammability    Reactivity  
                                  1                    1                    0  
                                  0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

Bayer's method of hazard communication is comprised of Product Labels and Material Safety Data Sheets. HMIS ratings are provided by Bayer as a customer service.

REASON FOR ISSUE.....: Revise Emergency Overview Section  
PREPARED BY.....: Ann M. Colo  
APPROVED BY.....: J. M. Mostowy  
APPROVAL DATE.....: 11/18/1998  
SUPERSEDES DATE.....: 09/30/1996  
MSDS NUMBER.....: 01998

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This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Bayer Corporation. The data on this sheet relates only to the specific material designated herein. Bayer Corporation assumes no legal responsibility for use or reliance upon these data.  
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Product Code: V801  
Approval date: 11/18/1998

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Last page

**BETZDEARBORN MATERIAL  
SAFETY DATA SHEET**



**BetzDearborn**

EFFECTIVE DATE: 08-MAR-1999  
PRINTED DATE: 14-JUN-1999

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**1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME : DEPOSITROL PY5206**

**PRODUCT APPLICATION AREA: WATER-BASED CORROSION  
INHIBITOR/DEPOSIT CONTROL AGENT.**

**COMPANY ADDRESS:**

BetzDearborn Inc.  
4636 Somerton Road, Trevoise, Pa. 19053  
Information phone number: (215) - 355-3300

**EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)**

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**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:**

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 Pennsylvania thresholds for carcinogens.

PRODUCT NAME : DEPOSITROL PY5206  
EFFECTIVE DATE: 08-MAR-1999  
NON-HAZARDOUS INGREDIENTS:

CAS#

CHEMICAL NAME

7732-18-5

WATER  
TRADE SECRET (N320) TSRN: 125438 - 6148

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CONTINUED

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### 3) HAZARDS IDENTIFICATION

\*\*\*\*\*

#### EMERGENCY OVERVIEW

##### CAUTION

May cause slight irritation to the skin. May cause slight 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: Pale 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 slight 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.

---

#### **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. Protect from freezing. Do not store at elevated temperatures.

---

## 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 AND CHEMICAL PROPERTIES

|                            |         |                       |        |
|----------------------------|---------|-----------------------|--------|
| Specific Grav. (70F, 21C)  | 1.270   | Vapor Pressure (mmHG) | ~ 18.0 |
| Freeze Point (F)           | 27      | Vapor Density (air=1) | < 1.00 |
| Freeze Point (C)           | -3      |                       |        |
| Viscosity(cps 70F, 21C)    | 22      | % Solubility (water)  | 100.0  |
| Odor                       |         | Mild                  |        |
| Appearance                 |         | Pale Yellow           |        |
| Physical State             |         | Liquid                |        |
| Flash Point                | P-M(CC) | > 200F > 93C          |        |
| pH As Is (approx.)         |         | 13.1                  |        |
| Evaporation Rate (Ether=1) |         | < 1.00                |        |

NA = not applicable ND = not determined



PRODUCT NAME : DEPOSITROL PY5206  
EFFECTIVE DATE: 08-MAR-1999

## 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:   | 3,050 mg/kg     |
| 28 Day Oral RAT:   | 1,000 mg/kg/day |
| NOTE - No clear indications of treatment related toxicity (dose adjusted to 100% active) |                 |
| Dermal LD50 RABBIT:  | >1,000 mg/kg    |
| NOTE - Estimated value   |                 |
| Skin Irritation Score RABBIT:  | 0.3             |
| NOTE - DOT HM181: noncorrosive   |                 |
| Eye Irritation Score RABBIT:   | 3.3             |
| NOTE - Maximum score at 48 hrs; completely reversible by day 4                           |                 |
| Ames Mutagenicity MOUSE:   | NEGATIVE        |
| NOTE - In Vivo Bone Marrow Micronucleus Assay  |                 |

PRODUCT NAME : DEPOSITROL PY5206  
EFFECTIVE DATE: 08-MAR-1999

---

## 12) ECOLOGICAL INFORMATION

### AQUATIC TOXICOLOGY

Fathead Minnow 96 Hour Static Acute Bioassay

LC50: 1680 mg/L  
No Effect Level: 1350 mg/L

Daphnia magna 48 Hour Static Acute Bioassay

LC50: 1635 mg/L  
No Effect Level: 870 mg/L

Mysid Shrimp 48 Hour Static Renewal Bioassay

LC50: 9900 mg/L  
5% Mortality: 4000 mg/L

Sheepshead Minnow 96 Hour Static Renewal Bioassay

LC50: 28300 mg/L  
No Effect Level: 20000 mg/L

### BIODEGRADATION

COD (mg/gm): 130  
TOC (mg/gm): 70  
BOD-5 (mg/gm): 9  
BOD-28 (mg/gm): 9

---

## 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 : DEPOSITROL PY5206  
EFFECTIVE DATE: 08-MAR-1999

### 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                  | 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<br>DATE          | REVISIONS TO SECTION: | SUPERCEDES               |
|--------------|----------------------------|-----------------------|--------------------------|
| MSDS status: | 21-MAY-1997<br>08-MAR-1999 | 12                    | ** NEW **<br>21-MAY-1997 |

MSDS Number: S3362 --- Effective Date: 02/01/98

24 Hour Emergency Telephone: 908-859-  
CHEMTREC: 1-800-424-9300

# MSDS Material Safety Data Sheet

National Response In Canada  
CANUTEC: 613-996-6666

From: Mallinckrodt Baker, Inc.  
222 Red School Lane  
Phillipsburg, NJ 08865



Outside U.S. and Canada  
Chemtrec: 202-483-7616

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.

## SODIUM CHROMATE

MSDS Number: S3362 --- Effective Date: 02/01/98

### 1. Product Identification

Synonyms: Chromic acid, disodium salt, tetrahydrate; Sodium Chromate, Tetrahydrate  
CAS No.: 7775-11-3  
Molecular Weight: 234.03  
Chemical Formula: Na<sub>2</sub>CrO<sub>4</sub>·4H<sub>2</sub>O  
Product Codes:  
J.T. Baker: 3640  
Mallinckrodt: 7592

### 2. Composition/Information on Ingredients

| Ingredient      | CAS No    | Percent   | Hazardous |
|-----------------|-----------|-----------|-----------|
| Sodium Chromate | 7775-11-3 | 99 - 100% | Yes       |

### 3. Hazards Identification

Emergency Overview

000264

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MSDS Number: S3362 --- Effective Date: 02/01/98

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**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.

J.T. Baker SAF-T-DATA (tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Cancer Causing)

Flammability Rating: 0 - None

Reactivity Rating: 3 - Severe (Oxidizer)

Contact Rating: 3 - Severe (Corrosive)

Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

Storage Color Code: Yellow Stripe (Store Separately)

---

#### 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.

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## 4. First Aid Measures

000265

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MSDS Number: S3362 --- Effective Date: 02/01/98

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**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.

**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.

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## 7. Handling and Storage

000266

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MSDS Number: S3362 --- Effective Date: 02/01/98

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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 CrO<sub>3</sub> = 0.1 mg/m<sup>3</sup> (ceiling)

- ACGIH Threshold Limit Value (TLV):

For water-soluble Cr(VI) compounds, as Cr = 0.05 mg/m<sup>3</sup> (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, deliquescent crystals.

000267

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 MSDS Number: S5362 --- Effective Date: 02/01/98
 

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**Odor:**  
 Odorless.  
**Solubility:**  
 Completely soluble in water.  
**Density:**  
 No information found.  
**pH:**  
 Alkaline  
**% Volatiles by volume @ 21C (70F):**  
 0  
**Boiling Point:**  
 No information found.  
**Melting Point:**  
 792C (1458F)  
**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:**  
 Burning may produce chrome oxides.  
**Hazardous Polymerization:**  
 Will not occur.  
**Incompatibilities:**  
 Flammable and combustible material. Any combustible, organic or other readily oxidizable material (paper, wood, sulfur, aluminum or plastics).  
**Conditions to Avoid:**  
 Heat, incompatibles.

---

## 11. Toxicological Information

Investigated as a tumorigen, mutagen, reproductive effector.

----- \Cancer Lists\ -----  
 ----- NTP Carcinogen -----  
 Ingredient                      Known      Anticipated      IARC Category



MSDS Number: S3362 --- Effective Date: 02/01/98

-----  
Sodium Chromate (7775-11-3)

Yes

No

1

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## 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.

---

## 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

### International (Water, I.M.O.)

-----  
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID,  
N.O.S.(SODIUM CHROMATE)

Hazard Class: 9

UN/NA: UN3077

Packing Group: III

Information reported for product/size: 2.5KG

---

## 15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----  
Ingredient TSCA EC Japan Australia

MSDS Number: S3362 --- Effective Date: 02/01/98

-----  
 Sodium Chromate (7775-11-3) Yes Yes Yes Yes

-----\Chemical Inventory Status - Part 2\-----

| Ingredient                  | --Canada-- |     |      |       |
|-----------------------------|------------|-----|------|-------|
|                             | Korea      | DSL | NDSL | Phil. |
| Sodium Chromate (7775-11-3) | Yes        | Yes | No   | Yes   |

-----\Federal, State & International Regulations - Part 1\-----

| Ingredient                  | -SARA 302- |     | -SARA 313- |               |
|-----------------------------|------------|-----|------------|---------------|
|                             | RQ         | TPQ | List       | Chemical Catg |
| Sodium Chromate (7775-11-3) | No         | No  | No         | Chromium com  |

-----\Federal, State & International Regulations - Part 2\-----

| Ingredient                  | CERCLA | -RCRA- | -TSCA- |
|-----------------------------|--------|--------|--------|
|                             |        | 261.33 | 8(d)   |
| Sodium Chromate (7775-11-3) | 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 (Mixture / Solid)

**WARNING:**

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: No information found.

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: Reactivity: 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.

MSDS Number: S3362 --- Effective Date: 02/01/98

- 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, 6, 16.

**Disclaimer:**

\*\*\*\*\*

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\*\*\*\*\*

Prepared by: Strategic Services Division  
Phone Number: (314) 539-1600 (U.S.A.)

000271

C-10.384.

**SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT NAME: Coil-Rite™  
 PRODUCT CODES: 82612, 82614, 82618  
 CHEMICAL FAMILY: Inorganic/Organic  
 USE: Coil Cleaner  
 MANUFACTURE / SUPPLIER  
 RectorSeal  
 2601 Spenwick  
 Houston, Texas 77055 USA

EMERGENCY TELEPHONE NUMBERS:  
 Chemtree 24 hours: (800) 424-9300  
 RectorSeal: (713) 263-8001

NON EMERGENCY TELEPHONE NUMBERS:  
 Technical Service: (800) 231-3345

**SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS**

| HAZARDOUS COMPONENTS | CAS NO.  | APPROX | OSHA PEL | ACGIH TLV | OTHER LIMITS | HMIS | NFPA     |
|----------------------|----------|--------|----------|-----------|--------------|------|----------|
|                      |          | %      |          |           |              |      |          |
| Glycol Ether EB      | 111-78-2 | 1-5    | 25 ppm   | 25 ppm    | N/A          | N/D  | H2,F2,R0 |

**SECTION 3 HAZARDS IDENTIFICATION**

SUMMARY OF ACUTE HAZARDS: Irritation to eyes, nose, and throat; drowsiness, narcosis, tremors, and other CNS effects at high concentrations. Skin irritation, dermatitis, and defatting.

| ROUTE OF EXPOSURE | SIGNS AND SYMPTOMS  | PRIMARY ROUTE(S) |
|-------------------|---|------------------|
| INHALATION:       | Nasal and respiratory irritation, dizziness, narcosis, headache, nausea, CNS depression, and unconsciousness.       | Yes              |
| EYE CONTACT:      | Watering, blurred vision, inflammation, and irritation which can result in corneal injury.                          | Yes              |
| SKIN CONTACT:     | Irritation, dermatitis.   | Yes              |
| INGESTION:        | Nausea, vomiting; CNS depression; irritation of gastrointestinal tract, liver and peritoneal wall; lung congestion. | No               |

SUMMARY OF CHRONIC HAZARDS: Skin irritation, dermatitis, and defatting. Possible liver and kidney damage.  
 MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Individuals with pre-existing or chronic diseases of the eyes, skin, respiratory system, cardiovascular system, gastrointestinal system, liver, or kidneys may have increased susceptibility to excessive exposure.

**SECTION 4 FIRST AID MEASURES**

INHALATION: If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain emergency medical attention. Prompt action is essential.  
 EYE CONTACT: Immediately flush with large amounts of water for at least 15 minutes. Get prompt medical attention.  
 SKIN CONTACT: Wash with soap and water. Remove contaminated clothing.  
 INGESTION: Give large amounts of water, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

**SECTION 5 FIRE FIGHTING MEASURES**

FLASH POINT: None  
 EXTINGUISHING MEDIA: Use agents suitable for surrounding fires.  
 FLAMMABILITY LIMITS: LEL: N/D UEL: N/D  
 SPECIAL FIRE FIGHTING PROCEDURES: Wear self-contained full face piece breathing apparatus and full body protective clothing. Hazardous decomposition products possible (see Section 10). Evacuate area. Dike area as run-off may create additional environmental contamination.  
 UNUSUAL FIRE AND EXPLOSION HAZARDS: Material will not sustain combustion.

**SECTION 6 ACCIDENTAL RELEASE MEASURES**

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Use absorbent materials to prevent footing hazard and to contain. Ventilate area with natural or explosion-proof, forced air ventilation. Avoid flushing into sewers, drains, waterways, and soil. Wear protective clothing and respiratory protection during cleanup. Also, if product is subject to CERCLA reporting (see Section 15) notify the National Response Center.

**SECTION 7 STORAGE AND HANDLING**

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Keep container closed and upright when not in use. Do not store near heat, sparks, or open flames. If transferring this material to other containers, ground all containers to avoid static electricity buildup and discharge which may ignite flammable vapors.  
 OTHER PRECAUTIONS: Avoid prolonged or repeated contact with skin or clothing. Empty containers may contain residues and vapors; treat as if full and observe all products precautions. Do not reuse empty containers. KEEP OUT OF REACH OF CHILDREN.

**SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION**

**RESPIRATORY PROTECTION (SPECIFY TYPE):** In confined, poorly ventilated areas, use NIOSH/MSHA approved air purifying or supplied air respirators.

**VENTILATION - LOCAL EXHAUST:** Acceptable

Special: N/A

**MECHANICAL (GENERAL):** Preferable

OTHER: N/A

**PROTECTIVE GLOVES:** Wear non-permeable gloves.

**EYE PROTECTION:** Chemical splash goggles (ANSI Z-87.1 or equivalent)

**OTHER PROTECTIVE CLOTHING OR EQUIPMENT:** Coveralls recommended.

**WORK/HYGIENIC PRACTICES:** Where use can result in skin contact, wash exposed areas thoroughly before eating, drinking, smoking, or leaving work area. Launder contaminated clothing before reuse.

**SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES**

**BOILING POINT:** 212°F (100°C) @ 760mm Hg

**SPECIFIC GRAVITY (H<sub>2</sub>O = 1):** 0.99

**VAPOR PRESSURE (mm Hg):** 17 @ 68°F (20°C)

**MELTING POINT:** N/A

**VAPOR DENSITY (AIR = 1):** N/A

**EVAPORATION RATE (ETHYL ACETATE = 1):** < 1

**SOLUBILITY IN WATER:** Soluble

**APPEARANCE/ODOR:** Green Liquid

**SECTION 10 STABILITY AND REACTIVITY**

**STABILITY:** Stable

**CONDITIONS TO AVOID:** Heat, sparks, open flames, and strong oxidizers.

**INCOMPATIBILITY (MATERIALS TO AVOID):** Oxidizers, acids and bases.

**HAZARDOUS DECOMPOSITION PRODUCTS:** CO, CO<sub>2</sub>, and fragmented hydrocarbons.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**SECTION 11 TOXICOLOGY INFORMATION**

**CARCINOGENICITY:**

NTP: No

IARC MONOGRAPHS: No

OSHA REGULATED: No

**SUBSTANCE**

**CAS NO.**

**LD50**

**LC50**

Glycol Ether EB

111-76-2

Oral-Rat LD50:470 mg/kg

Inhalation-Rat TCLo:200 ppm/6H

**SECTION 12 ECOLOGICAL INFORMATION**

**FOOD CHAIN**

**CON POTENTIAL**

**WATERFOWL TOXICITY**

**BOD**

**AQUATIC TOXICITY**

Glycol Ether EB

None

N/A

26%

1000 ppm/24 hr/brine shrimp/TLm

**SECTION 13 DISPOSAL CONSIDERATIONS**

**WASTE DISPOSAL METHOD:** Dispose of absorbed materials and liquid waste in accordance with all local, state and federal regulations.

**SECTION 14 TRANSPORTATION INFORMATION**

**DOT:** Non-Regulated

**OCEAN (IMDG):** Non-Regulated

**AIR (IATA):** Non-Regulated

**WHMIS (CANADA):** Non-Regulated

**SECTION 15 REGULATORY INFORMATION**

**SUBSTANCE**

**SARA 313**

**TSCA INVENTORY**

**CERCLA RQ**

**RCRA CODE**

Glycol Ether EB

Yes

Yes

N/A

N/A

**SECTION 16 OTHER INFORMATION**

This document is prepared pursuant to the OSHA Hazardous Communication Standard (29 CFR 1910.1200). The information herein is given in good faith, but no warranty, express or implied is made. Consult RectorSeal for further information: (713) 283-8001.

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C-10,326

**ACTI-KLEAN**

## Material Safety Data Sheet

**SECTION I - COMPANY IDENTIFICATION****PRODUCT:** ACTI-KLEAN**CAT. NO.:** AK-1, AK-5, AK-55**MANUFACTURED BY:**  
Virginia KMP Corporation  
4100 Platinum Way  
Dallas, Texas 75237**TELEPHONE NUMBERS:**  
Office: 1-(214) 330-7731  
Emergency Only: 1-(800) 424-9300**SECTION II - HAZARDOUS INGREDIENTS****OSHA Hazardous Components (29 CFR 1910.1200)****EXPOSURE LIMITS: 8 HR. TWA**  
OSHA PEL ACGIH TLVEthylene glycol monobutyl ether (CAS# 111-76-2)  
Dodecylbenzene sulfonic acid (CAS# 27176-87-0)25 ppm (skin) 25 ppm (skin)  
NE NE**SECTION III - HAZARDS IDENTIFICATIONS****EMERGENCY OVERVIEW:** WARNING! Eye and skin irritant. Harmful if swallowed or inhaled.**POTENTIAL HEALTH EFFECTS:****INHALATION:** Inhalation of vapors in high concentration may cause headache, nausea, vomiting.  
**EYE CONTACT:** Irritation develops immediately on contact.  
**SKIN CONTACT:** Irritation develops on contact.  
**INGESTION:** Harmful if swallowed. May cause headache, nausea, vomiting.**CHRONIC Effects:** Not established.**NOTE:****CARCINOGENICITY:** LISTED IN NTP? No

IARC? No

OSHA Regulated? No

**SECTION IV - FIRST AID MEASURES****INHALATION:** Remove victim to fresh air and, if needed, immediately begin artificial respiration. Give oxygen if breathing is labored. Get emergency medical help. Contact a physician immediately.  
**EYE CONTACT:** Flush eyes with water for 15 minutes. Get medical attention if symptoms develop and persist.  
**SKIN CONTACT:** Flush with water or soap and water for 15 minutes or until all traces have been removed. Seek medical attention if symptoms develop and persist.  
**INGESTION:** Do not induce vomiting. Rinse mouth out with water. Get immediate medical attention.**SECTION V - FIRE FIGHTING MEASURES****FLASHPOINT (TEST METHOD):** Not flammable - aqueous solution:  
**FLAMMABLE LIMITS: NA** LOWER: NA UPPER: NA  
**AUTOIGNITION TEMPERATURE:** NE**GENERAL HAZARD:****FIRE FIGHTING INSTRUCTIONS:** Approach fire from upwind side. Avoid breathing smokes, fumes, mist, or vapors on the downwind side. Firefighters wear protective clothing and self contained breathing apparatus.**EXTINGUISHING MEDIA:** Dry powder, carbon dioxide (CO<sub>2</sub>), water fog or spray.**HAZARDOUS COMBUSTION PRODUCTS:** Acidic smoke, irritating and toxic fumes of SO<sub>2</sub>, H<sub>2</sub>S, PO<sub>x</sub>.**SECTION VI - ACCIDENTAL RELEASE MEASURES****LAND SPILL:** **SMALL SPILLS:** Flush to sewer with large amounts of water. 10 parts water to 1 part product.  
**LARGE SPILLS:** Pick up with absorbent media, place in non-leaking containers for proper disposal or reuse.  
**WATER SPILL:** Notify proper authorities.

Clean up leaks/spills immediately to prevent soil or water contamination.

**SECTION VII - HANDLING AND STORAGE****HANDLING:** Avoid contact with skin, eyes, and clothing. After handling this product, wash hands before eating, drinking, or smoking. If contact occurs, remove contaminated clothing. If needed, take first aid action shown in section IV. Launder contaminated clothing before reuse.**STORAGE:** Store away from food stuffs.

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## ACTI-KLEAN

## SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

**ENGINEERING CONTROLS:** Local exhaust ventilation.**PERSONAL PROTECTION:** Respiratory protection not normally needed under normal conditions of use. Use rubber or latex gloves, chemical goggles or full face shields. Use boots, aprons, drench showers, eye wash as needed for protection against spills and/or splashes.

## SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

**VAPOR PRESSURE:** ND  
**SPECIFIC GRAVITY (H<sub>2</sub>O=1):** 1.02  
**SOLUBILITY IN WATER:** Complete  
**pH:** 11-12  
**BOILING POINT:** 212 F  
**APPEARANCE & ODOR:** Green liquid.

**VAPOR DENSITY (Air=1):** ND  
**EVAPORATION RATE (BuAc=1):** <1  
**VOC (G/L):**  
**FREEZING POINT:** ND

## SECTION X - STABILITY AND REACTIVITY

**STABILITY:** Stable.**CONDITIONS TO AVOID:** High temperatures.**MATERIALS TO AVOID:** Oxidizers.**HAZARDOUS DECOMPOSITION PRODUCTS:** SO<sub>2</sub>, H<sub>2</sub>S, PO<sub>x</sub> and from combustion - smoke and toxic fumes.**HAZARDOUS POLYMERIZATION:** Will not occur.

## SECTION XI - TOXICOLOGICAL INFORMATION

Ethylene Glycolmonobutylether

|                                     |                              |
|-------------------------------------|------------------------------|
| <b>TDLo:</b> 600 mg/kg              | (oral - wmn)                 |
| <b>TCLo:</b> 195 ppm/8hr            | (inh - human) GIT            |
| <b>TCLo:</b> 100 ppm                | (inh - human) NOSE, EYE, CNS |
| <b>LD50:</b> 470 mg/kg              | (oral - rat)                 |
| <b>LC50:</b> 2900 mg/m <sup>3</sup> | (inh - rat)                  |
| <b>LD50:</b> 50-500 mg/kg           | (oral - mouse)               |

Dodecyl benzene sulfonic acid

## SECTION XII - ECOLOGICAL INFORMATION

Harmful to aquatic life in very low concentrations.

Ethylene Glycolmonobutylether  
Dodecyl benzene sulfonic acid1000 ppm / 24 hr / brine shrimp / TLM  
5 - 15 ppm / guppy / lethal conc

## SECTION XIII - DISPOSAL CONSIDERATIONS

Dispose as hazardous waste. Classification and documentation is required before disposal. Follow all local, state and federal regulations.

## SECTION XIV - TRANSPORTATION INFORMATION

**PROPER SHIPPING NAME:** Not regulated if container holds less than 1175 gallons.**HAZARD CLASS:** NA**IDENTIFICATION NUMBER:** NA**DOT Emergency Guide #:** NA**Reportable Quantity (RQ):** 1175 gallons (dodecyl benzene sulfonic acid).**International:** NA

## SECTION XV - REGULATORY INFORMATION

**TSCA (Toxic Substance Control Act):** Components of this product are listed on the TSCA Inventory.**CERCLA (Comprehensive Environmental Response, Compensation and Liability Act):**

Reportable quantity is 1175 gallons (dodecyl benzene sulfonic acid). Contact local authorities for other reporting requirements.

**SARA TITLE III (Superfund Amendments and Reauthorization Act):**

Section 313: Ethylene Glycol Monobutyl Ether (a glycol ether) &lt;10%

**CALIFORNIA PROPOSITION 65:** Not listed.

## SECTION XVI - OTHER INFORMATION

State Right-to-Know Programs: MA, NJ, PA

**NFPA Ratings**

Health: 1

Flammability: 0

Reactivity: 0

**Hazardous Equipment:** X See your supervisor

Prepared by: Virginia KMP Corporation

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Virginia KMP. The data on this sheet related only to specific material designated herein. Virginia KMP assumes no legal responsibility for use or reliance upon these data.

revised: 2/16/98

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J.D. # E-10-11  
Ident. 647  
10/2

**Material Safety Data Sheet**

May be used to comply with  
OSHA's Hazard Communication Standard,  
29 CFR 1910.1200. Standard must be  
consulted for specific requirements.

**U.S. Department of Labor**  
Occupational Safety and Health Administration  
(Non-Mandatory Form)  
Form Approved  
OMB No. 1218-0072

**IDENTITY (As Used on Label and List)**  
BY\*PAS 1500 SERIES

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

**Section I**

**Manufacturer's Name**  
BY\*PAS INTERNATIONAL CORPORATION

**Emergency Telephone Number**  
616-875-7234

**Address (Number, Street, City, State, and ZIP Code)**  
P.O. BOX 14

**Telephone Number for Information**  
616-875-7234

HUDSONVILLE, MI 49426

**Date Prepared**  
1-4-89

**Signature of Preparer (optional)**

**Section II -- Hazardous Ingredients/Identify Information**

**Hazardous Components (Specific Chemical Identity; Common Name(s))** OSHA PEL ACGIH TLV Other Limits Recommended % (optional)

Table with 5 columns: Hazardous Components, OSHA PEL, ACGIH TLV, Other Limits Recommended, % (optional). The table is mostly empty with a diagonal line drawn through it and the word "NONE" written across it.

**Section III -- Physical/Chemical Characteristics**

|                         |                          |        |   |       |
|-------------------------|--------------------------|--------|---|-------|
| Boiling Point           | 212-F                    | 98-C   | Specific Gravity (H <sub>2</sub> O = 1) | 1.080 |
| Vapor Pressure (mm Hg.) |                          | 100 C  | Melting Point                           | N/A   |
| Vapor Density (AIR = 1) |                          | UNDET. | Evaporation Rate (Butyl Acetate = 1)    | N/A   |
| Solubility in Water     | 100%                     |        |   |       |
| Appearance and Odor     | AQUA BLUE WITH MILD ODOR |        |   |       |

**Section IV -- Fire and Explosion Hazard Data**

|                                    |      |                  |     |     |
|------------------------------------|------|------------------|-----|-----|
| Flash Point (Method Used)          | NONE | Flammable Limits | LEL | UEL |
|                                    |      |                  | N/A | N/A |
| Extinguishing Media                | N/A  |                  |     |     |
| Special Fire Fighting Procedures   | N/A  |                  |     |     |
| Unusual Fire and Explosion Hazards | N/A  |                  |     |     |



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Section V -- Reactivity Data

|          |   |                     |                    |
|----------|---|---------------------|--------------------|
| Unstable |   | Conditions to Avoid | IRRITATING TO EYES |
| Stable   | X |                     | DRYING TO SKIN     |

Incompatibility (Materials to Avoid) STRONG ACIDS AND STRONG OXIDIZING AGENTS

Hazardous Decomposition or Byproducts NONE KNOWN

|                          |                |   |                     |     |
|--------------------------|----------------|---|---------------------|-----|
| Hazardous Polymerization | May Occur      |   | Conditions to Avoid | N/A |
|                          | Will Not Occur | X |                     |     |

Section VI -- Health Hazard Data

Route(s) of Entry: Inhalation? NO Skin? POSSIBLE Ingestion? UNLIKELY

Health Hazards (Acute and Chronic)

Carcinogenicity: NONE NTP? NO IARC Monographs? NO OSHA Regulated? NO

Signs and Symptoms of Exposure MAY CAUSE REDNESS OF SKIN FOR SENSITIVE INDIVIDUALS

Medical Conditions Generally Aggravated by Exposure NONE KNOWN

Emergency and First Aid Procedures ON SKIN, WASH THOROUGHLY WITH WATER, IN EYES, FLUSH WITH WATER  
IF SWALLOWED, DO NOT INDUCE VOMITING, GIVE LARGE AMOUNTS OF WATER, SEEK MEDICAL ATTENTION

Section VII -- Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled  
FLUSH THROUGH NORMAL SANITARY SEWER SYSTEM WITH LARGE AMOUNTS OF WATER

Waste Disposal Method SAME AS ABOVE, FOLLOW FEDERAL STATE AND LOCAL LAWS

Precautions to Be Taken in Handling and Storing KEEP FROM FREEZING  
STORE BETWEEN 35 AND 100 F

Other Precautions NONE

Section VIII -- Control Measures

Respiratory Protection (Specify Type) NOT REQUIRED WHEN USED AS DIRECTED

|             |                      |   |         |
|-------------|----------------------|---|---------|
| Ventilation | Local Exhaust        | X | Special |
|             | Mechanical (General) |   | Other   |

Protective Gloves RUBBER Eye Protection SAFETY GLASSES

Other Protective Clothing or Equipment NOT REQUIRED

Sanitation Practices NOT REQUIRED

O'NEILL INDUSTRIES INC TEL No.215-535-6007

Jun 6.94 9:40 No.005 P.02

E-10.35

MATERIAL SAFETY DATA SHEET

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ORGANIC ORANGE

SECTION I - IDENTIFICATION

COMPANY NAME..... O'Neill Industries, Inc.
5101 Comly St.
Phila., Pa. 19135
PHONE NUMBER..... (215) 333-5700
EMERGENCY PHONE NUMBER... 800-255-3924
EFFECTIVE DATE..... 4/1/89
REVISED DATE..... 3/31/94
CHEMICAL NAME..... Orange Distillate
TRADE NAME..... ORGANIC ORANGE

SECTION II - INGREDIENTS

Table with 4 columns: COMPONENTS, PERCENT, TLV (Units), PROD. CAS #. Rows include 1,8(9)-p-Methadiene and Nonylphenoxy-polyethoxyethanol.

SECTION III - PHYSICAL DATA

BOILING Point(F)..... 175.5° C
SOLUBILITY IN H2O..... Emulsifiable
APPEARANCE/ODOR..... Clear colorless liquid, citrus odor
SPECIFIC GRAVITY (H2O=1). .85
PH.....

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT..... 115° F Closed Cup
EXTINGUISH MEDIA..... Use foam, dry chemical, or CO2
FOR FIRE..... Minimize breathing vapor or fumes. Cool fire exposed containers. Do not enter confined fire-spaces without proper protective clothing, including self contained air supply.
UNUSUAL FIRE HAZARD..... Burning liberates carbon monoxide, carbon dioxide and smoke.

SECTION V - HEALTH HAZARD DATA

OVER EXPOSURE EFFECTS.... Liquid may be irritating to eyes and skin. Vapor is irritating to throat and lungs.
FIRST AID PROCEDURES..... EYES; Immediately flush eyes with water for at least 15 minutes. Seek medical attention immediately. SKIN; Wash with water. If irritation develops or persists seek medical attention. INHALATION; Remove to fresh air. INGESTION; DO NOT INDUCE VOMITING. Give large quantities of water. Get medical attention immediately.

SECTION VI - REACTIVITY DATA

CHEMICAL STABILITY..... Stable

O'NEILL INDUSTRIES INC TEL No.215-535-6007

Jun 6,94 9:40 No.005.P.03

E-10.35

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MATERIAL SAFETY DATA SHEET

ORGANIC ORANGE

CONDITIONS TO AVOID..... Excessive heat and flames. Avoid strong oxidizing agents.

INCOMPATIBLE MATERIALS... Strong acids, strong oxidizers

DECOMPOSITION PRODUCTS... Carbon dioxide, carbon monoxide

HAZARDOUS POLYMERIZATION. Will not occur

POLYMERIZATION AVOID.....

SECTION VII - SPILL OR LEAK PROCEDURE

FOR SPILL ..... Absorb with inert material and dispose of in accordance with applicable regulations.

WASTE DISPOSAL METHOD.... Dispose of according to all local, state, and federal regulations.

SECTION VIII - SPECIAL PROTECTION

RESPIRATORY PROTECTION... None needed under normal conditions

VENTILATION..... Local

PROTECTIVE GLOVES..... Rubber

EYE PROTECTION..... Chemical goggles

OTHER PROTECTIVE

EQUIPMENT.....

HANDLING AND STORAGE..... STORE IN A COOL, DRY, WELL VENTILATED AREA.

KEEP CONTAINER CLOSED WHEN NOT IN USE.

KEEP AWAY FROM HEAT AND FLAMES.

USE WITH ADEQUATE VENTILATION.

KEEP OUT OF REACH OF CHILDREN.

WEAR SAFETY GOGGLES AND RUBBER GLOVES WHEN HANDLING THIS PRODUCT.

SECTION IX - SPECIAL PRECAUTIONS

DOT SHIPPING NAME..... Combustible liquid, n.o.s., NA 1993, PG III

DOT LABEL REQUIRED..... None required

REPORTABLE QUANTITY (RQ). N/A

NA NUMBER..... NA 1993

UN NUMBER..... N/A

COMMENTS The information contained herein is furnished without warranty of any kind. Employers should use this information only as a supplement to other information gathered by them to assure proper use of these materials and the safety and health of employees.

E-10.29

## MATERIAL SAFETY DATA SHEET

Penetone® Corporation, 74 Hudson Ave., Tenafly, NJ 07670.

CITRIKLEEN®

Page: 1 of 4  
Date Prepared: July 28, 1994  
MSDS No.: 1850-407S

### SECTION 1 PRODUCT IDENTIFICATION & EMERGENCY INFORMATION

PRODUCT NAME: CITRIKLEEN  
GENERAL USE: Cleaning, degreasing  
PRODUCT DESCRIPTION: Solvent emulsion  
GENERIC INGREDIENTS: Water, d'limonene, surfactants, coupling agents, alkanolamine.

EMERGENCY TELEPHONE NUMBERS: PENETONE 201-567-3000  
CHEMTREC 800-424-9300

### SECTION 2 HAZARDOUS INGREDIENT SECTION

This product is hazardous as defined in 29 CFR 1910.1200.

OSHA HAZARD: FLAMMABLE, CORROSIVE

#### OSHA HAZARDOUS INGREDIENTS

|                  | CAS#      | EXPOSURE LIMITS 8 hrs. TWA (ppm) |                 | Supplier |
|------------------|-----------|----------------------------------|-----------------|----------|
|                  |           | OSHA PEL                         | ACGIH TLV       |          |
| D'limonene       | 5989-27-5 | not established                  | not established | —        |
| Monoethanolamine | 141-43-5  | 3                                | 3               | —        |

### SECTION 3 HEALTH INFORMATION & PROTECTION

#### EMERGENCY OVERVIEW:

- Clear amber liquid with citrus odor.
- Flammable. Can be corrosive to eyes, skin, and respiratory tract.

#### POTENTIAL HEALTH EFFECTS:

##### EYE CONTACT:

May cause irritation or burns to eyes on prolonged contact. High vapor concentrations may be irritating.

##### SKIN CONTACT:

Frequent or prolonged contact may irritate or dry the skin, cause dermatitis or cause burns. Skin contact may aggravate an existing dermatitis condition.

##### INHALATION:

High vapor/aerosol concentrations are irritating or may cause burns to the respiratory tract, may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects.

##### INGESTION:

Small amounts of this liquid may be drawn into the lungs by either swallowing or vomiting. This may cause severe and delayed health effects such as inflammation of the lungs and infection of the bronchi. Ingestion may cause irritation of or burns to the digestive tract.

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**CHRONIC:**

Inflammation of mucous membranes and respiratory tract may occur upon prolonged breathing of mist. Ingestion of large amounts of d-limonene has caused kidney and liver damage in male rats but not in female rats or mice of both species. Ingestion of large amounts of monoethanolamine has caused kidney and liver damage in laboratory animals.

**FIRST AID MEASURES:****EYE CONTACT:**

Flush eyes with large amounts of water. See physician immediately.

**SKIN CONTACT:**

Flush skin with large amounts of water. Remove contaminated clothing and launder before reuse. If skin irritation develops or persists, consult physician.

**INHALATION:**

Remove person to fresh air. Administer oxygen or artificial respiration as needed. Call a physician immediately.

**INGESTION:**

If swallowed, give plenty of milk or water. DO NOT INDUCE VOMITING. Use a stomach pump. Call a physician immediately.

**WORKPLACE EXPOSURE CONTROLS:****PERSONAL PROTECTION:**

Safety glasses are recommended for all workplace conditions. Solvent resistant gloves should be used. Other protective gear, including splash proof goggles or face shield, rubber boots, apron, gauntlets, or rain gear should be worn depending on how the product is used.

**VENTILATION:**

None needed under normal use conditions. For enclosed areas, or where large amounts of the product are being used, the use of fans or other mechanical ventilation is recommended. An organic vapor mask should be used if the TLV is exceeded and a particle mask if the product is sprayed. DO NOT MIST THIS PRODUCT. Use coarse spray only.

---

**SECTION 4 FIRE & EXPLOSION HAZARDS**

---

**FLASH POINT:** 125°F PMCC, 165°F COC

**FLAMMABLE LIMITS:** not determined

**AUTOIGNITION TEMPERATURE:** not determined

**GENERAL HAZARD:**

Flammable liquid. Can form flammable mixtures at or above the flash point.  
Containers can rupture and explode under fire conditions due to pressure and vapor buildup.

**FIRE FIGHTING:**

Either allow fire to burn out under controlled conditions or extinguish with water, foam, or dry chemical.  
Cool exposed containers with water spray.

**HAZARDOUS COMBUSTION PRODUCTS:**

Smoke, fumes, and oxides of carbon, nitrogen, and sulfur.

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**SECTION 5 SPILL CONTROL MEASURES**

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**LAND SPILL:**

Eliminate sources of ignition. For small spills, use absorbent material such as towels or absorbent powders. Put all material into proper waste disposal container with lid tightly covered. Solvent soaked materials may spontaneously combust. For larger spills, dike spill, recover free liquid, and use absorbent material to dry area. Rinse area with water. Put all material into appropriate waste containers.

**WATER SPILL:**

Remove product from water surface by skimming or with suitable absorbents. This product contains surfactants which will cause it to disperse in water. Localized high concentrations of this product may cause fish kills, but no persistent or long term effects will result. Check with local environmental regulatory agencies for reporting requirements.

**SECTION 6 HANDLING & STORAGE**

**STORAGE TEMPERATURE, °F:** ambient. DO NOT STORE ABOVE 120 Deg. F. KEEP FROM FREEZING.

**GENERAL:** Keep away from heat sources, open flames, and other ignition sources. Do not store near strong oxidants.

**SECTION 7 TYPICAL PHYSICAL & CHEMICAL PROPERTIES****BOILING POINT, °F:**

About 212

**EVAPORATION RATE, Acetone = 1:**

equal to water

**SOLUBILITY IN WATER:**

emulsifies

**SPECIFIC GRAVITY at 75°F:**

0.98

**ODOR AND APPEARANCE:**

clear amber liquid with citrus odor

**VAPOR PRESSURE, mm Hg at 20°C:**

equal to water

**VAPOR DENSITY (Air = 1):**

equal to water

**WT% ORGANIC VOLATILES:**

about 30

**pH:**

10.2

**SECTION 8 REACTIVITY DATA****GENERAL:**

This product is stable and hazardous polymerization will not occur.

**INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:**

Strong oxidizing agents.

**SECTION 9 REGULATORY INFORMATION****DEPARTMENT OF TRANSPORTATION (DOT):****PROPER SHIPPING NAME:**

FLAMMABLE LIQUID, CORROSIVE, N.O.S.  
(contains dlimonene and ethanolamine)

**HAZARD CLASS: 3****IDENTIFICATION NUMBER: UN 2924****PACKING GROUP: III****LABEL: FLAMMABLE, CORROSIVE****FLASH POINT: 125°F TCC****pH: 10.2**

**TSCA:** The ingredients in this product are listed on the TSCA Inventory.

**CERCLA:**

This product contains no CERCLA reportable materials. Contact local authorities to determine if there may be other local reporting requirements.

**RCRA HAZARD CLASS:**D001 Ignitable hazardous waste  
D002 Corrosive hazardous waste**SARA TITLE III:****311/312 HAZARD CATEGORIES:**

Acute health, Chronic health, Fire

**313 REPORTABLE INGREDIENTS:**

Diethylene glycol monobutyl ether CAS# 112-34-5 &lt;5 wt%

**NEW JERSEY RIGHT-TO-KNOW INFORMATION:**

This product contains water (CAS# 7732-18-5), d-limonene (CAS# 5989-27-5), monoethanolammonium dodecylbenzene sulfonate (CAS# 26836-07-7), nonylphenol ethoxylate (CAS# 9016-45-9), diethylene glycol monobutyl ether (CAS# 112-34-5), and monoethanolamine (CAS# 141-43-5).

**CALIFORNIA PROPOSITION 65 INFORMATION:**

This product does not contain any chemicals recognized by the state of California to cause cancer and/or birth defects or reproductive harm.

**SCAQMD INFORMATION:**Is there a photochemically reactive material present? Yes  
What is the % by volume of photochemically reactive material? about 30  
What is the VOC content? 310 g/l  
What is the vapor pressure of VOC's? 0.14 mm Hg @ 20°C**SECTION 10 NOTES****HAZARD RATING SYSTEMS:**

|              | HMIS | NFPA | KEY          |
|--------------|------|------|--------------|
| HEALTH       | 1    | 1    | 4 = Severe   |
| FLAMMABILITY | 2    | 2    | 3 = Serious  |
| REACTIVITY   | 0    | 0    | 2 = Moderate |
|              |      |      | 1 = Slight   |
|              |      |      | 0 = Minimal  |

**REVISION SUMMARY:**

Change in Section 6,

**SUPERSEDES ISSUE DATE:**

September 28, 1993

FOR ADDITIONAL PRODUCT INFORMATION, CONTACT YOUR SALES ENGINEER  
FOR ADDITIONAL HEALTH/SAFETY INFORMATION, CALL 201-567-3000

THE INFORMATION PRESENTED HEREIN HAS BEEN COMPILED FROM SOURCES CONSIDERED TO BE DEPENDABLE AND ACCURATE TO THE BEST OF PENETONE'S KNOWLEDGE. THE INFORMATION RELATES TO THIS SPECIFIC MATERIAL. IT MAY NOT BE VALID FOR THIS MATERIAL IF USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY ONESELF AS TO THE SUITABILITY AND COMPLETENESS OF THIS INFORMATION FOR HIS OWN PARTICULAR USE.

# MATERIAL SAFETY DATA SHEET 1 of 2

(Essentially Similar to Form OSHA-20)

 ✓ J.D. & E-10.8  
 Ident. 644

## SECTION I

|                     |   |              |                     |
|---------------------|---|--------------|---------------------|
| PRODUCT NAME        | MSA CLEANER-SANITIZER II  |              |                     |
| MANUFACTURER        | Mine Safety Appliances Company<br>600 Penn Center Boulevard<br>Pittsburgh, PA 15235 | FORMULA CODE | 8599-03             |
|                     |   | COMPLETED BY | L. P. Dewosky       |
| EMERGENCY PHONE NO. | 412-273-5500  | TITLE        | Mgr. Product Safety |
|                     |   | DATE         | 3-17-81             |

## SECTION II - INGREDIENTS

|  | CAS NUMBER  | WEIGHT, % |
|--|-------------|-----------|
| <b>ACTIVE INGREDIENTS:</b>   |             | 54.7      |
| SODIUM CARBONATE   | 497-19-8    | 42.2      |
| TRISODIUM PHOSPHATE  | 7601-54-9   | 10.0      |
| ALKYL (C14, 50%; C12, 40%; C16, 10%)<br>DIMETHYL BENZYL AMMONIUM CHLORIDES | 139-08-2    | 2.5       |
| <b>INERT INGREDIENTS:</b>  |             | 45.3      |
| SODIUM TRIPOLYPHOSPHATE  | 7758-29-4   |           |
| SODIUM BICARBONATE   | 144-55-8    |           |
| WATER  | 7732-18-5   |           |
| ISOMERIC LINEAR ALCOHOLS (C11-C15)<br>POLYETHOXY ETHANOLS                  | 68131-40-8* |           |
| ETHANOL  | 64-17-5     |           |
| ISOBORNYL ACETATE  | 125-12-2    |           |

## SECTION III - PHYSICAL DATA

|                         |                                 |                                       |            |
|-------------------------|---------------------------------|---------------------------------------|------------|
| BOILING POINT (° F.)    | NA                              | SPECIFIC GRAVITY (H <sub>2</sub> O=1) | 0.8        |
| VAPOR PRESSURE (mm Hg.) | NA                              | %VOLATILE BY VOLUME                   | NA         |
| VAPOR DENSITY (AIR=1)   | NA                              | EVAPORATION RATE (_____ = 1)          | NA         |
| SOLUBILITY IN WATER     | 20%                             | pH 1% AQUEOUS SOLUTION                | 9.5 - 10.5 |
| APPEARANCE AND ODOR     | FRAGRANT BLEND OF WHITE POWDERS |                                       |            |

## SECTION IV - FIRE AND EXPLOSION DATA

|                                    |  |                  |        |        |
|------------------------------------|--|------------------|--------|--------|
| FLASH POINT (Method used)          | NO FLASH TO 240 F  | FLAMMABLE LIMITS | Lo: NA | Hi: NA |
| EXTINGUISHING MEDIA                | WATER SPRAY (FOG), FOAM, DRY CHEMICAL, CARBON DIOXIDE          |                  |        |        |
| SPECIAL FIRE FIGHTING PROCEDURES   | BLANKET FIRE WITH EXTINGUISHING MEDIUM                         |                  |        |        |
| UNUSUAL FIRE AND EXPLOSION HAZARDS | PRODUCT IS NONREACTIVE AND DOES NOT READILY SUPPORT COMBUSTION |                  |        |        |

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## SECTION V - HEALTH HAZARD DATA

2073  
Ident 644

SKIN CONTACT WITH POWDER MAY CAUSE BURNS. FLUSH AFFECTED AREA WITH CLEAN WATER.

EYE CONTACT WITH POWDER MAY CAUSE CORNEAL BURNS. AVOID RUBBING EYES BECAUSE WATER INSOLUBLE PARTICLES MAY SCRATCH CORNEA. IMMEDIATELY FLUSH EYES WITH CLEAN WATER WHILE HOLDING EYELIDS APART. CONTINUE FLUSHING FOR AT LEAST 15 MINUTES OR UNTIL IRRITATION SUBSIDES. CONSULT PHYSICIAN AS SOON AS POSSIBLE.

INHALATION OF A LARGE ENOUGH QUANTITY TO POSE A SIGNIFICANT HEALTH HAZARD IS IMPROBABLE.

INGESTION OF POWDER IS HARMFUL OR FATAL. SHOULD INGESTION OCCUR, DRINK MILK, RAW EGG WHITE, OR GELATIN SOLUTION, OR LARGE QUANTITIES OF WATER. AVOID ALCOHOL. CONSULT PHYSICIAN AS SOON AS POSSIBLE.

## SECTION VI - REACTIVITY DATA

|                                      |   |   |                     |      |
|--------------------------------------|---|---|---------------------|------|
| STABILITY                            | UNSTABLE  |   | CONDITIONS TO AVOID | NONE |
|                                      | STABLE  | X |                     |      |
| HAZARDOUS POLYMERIZATION             | MAY OCCUR   |   | CONDITIONS TO AVOID | NONE |
|                                      | WILL NOT OCCUR  | X |                     |      |
| HAZARDOUS DECOMPOSITION PRODUCTS     | UNDETERMINED  |   |                     |      |
| INCOMPATIBILITY (MATERIALS TO AVOID) | OXIDIZING AGENTS<br>SOAP AND ANIONIC SURFACTANTS DEACTIVATE GERMICIDE |   |                     |      |

## SECTION VII - SPILL OR LEAK PROCEDURES

|   |  |
|---|--|
| STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED | SWEEP UP   |
| WASTE DISPOSAL METHOD                                     | REMOVE TO SANITARY LANDFILL AWAY FROM WATER SUPPLIES<br>DESTROY EMPTY CONTAINERS |

## SECTION VIII - SPECIAL PROTECTION INFORMATION

|                                |              |
|--------------------------------|--------------|
| SPECIAL RESPIRATORY PROTECTION | NOT REQUIRED |
| SPECIAL SKIN PROTECTION        | NOT REQUIRED |
| SPECIAL EYE PROTECTION         | NOT REQUIRED |

## SECTION IX - SPECIAL PRECAUTIONS

|                              |  |
|------------------------------|--|
| SPECIAL HANDLING PRECAUTIONS | NOT REQUIRED   |
| SPECIAL STORAGE PRECAUTIONS  | NOT REQUIRED. MINIMUM SHELF LIFE 6 MONTHS. FOR MAXIMUM SHELF LIFE AVOID HIGH HUMIDITY AND STORE IN A CLEAN, DRY PLACE. |
| OTHER SPECIAL                | NOT REQUIRED   |

000285

32.68

**MATERIAL SAFETY DATA SHEET****1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT NAME: INTRACID RHODAMINE WT LIQUID  
 PRODUCT CODE: A34517L100  
 CHEMICAL FAMILY: Xanthene dye

PREPARER: Health & Safety Department  
 DATE PRINTED: 10/19/1999  
 REVISION DATE: 09/20/1999

**SUPPLIED BY:**

Crompton & Knowles Colors Inc.  
 P. O. Box 341  
 Reading, PA 19603  
 Phone: 610-582-8765

24 Hr. Emergency Phone:

CHEMTREC 1-800-424-9300

**CANUTEC:**

613-996-6666.

For chemical emergencies in Canada, call CANUTEC at 1-

**2. COMPOSITION/INFORMATION ON INGREDIENTS**HAZARDOUS COMPONENTS

| Component                    | Percent | ACGIH TLV: | ACGIH Short Term Exposure Limit (STEL) value: | OSHA PEL: | OSHA Short Term Exposure Limit (STEL) value: | NJ Trade Secret Registration Number: |
|------------------------------|---------|------------|---|-----------|--|--------------------------------------|
| Trimellitic acid<br>528-44-9 | 3       | N.E.       | N.E.  | N.E.      | N.E.   | 18881400-                            |

NON-HAZARDOUS COMPONENTS

| Component                    | Percent  | ACGIH TLV: | ACGIH Short Term Exposure Limit (STEL) value: | OSHA PEL: | OSHA Short Term Exposure Limit (STEL) value: | NJ Trade Secret Registration Number: |
|------------------------------|----------|------------|---|-----------|--|--------------------------------------|
| Sodium chloride<br>7647-14-5 | 7        | N.E.       | N.E.  | N.E.      | N.E.   | 18881400-                            |
| Trade Secret : Dye compound  | 10 to 20 | N.E.       | N.E.  | N.E.      | N.E.   | 5646<br>5647                         |

**PRODUCT:**

A34517L100 INTRACID RHODAMINE WT LIQUID

|                    |    |      |      |      |      |  |
|--------------------|----|------|------|------|------|--|
| Water<br>7732-18-5 | 70 | N.E. | N.E. | N.E. | N.E. |  |
|--------------------|----|------|------|------|------|--|

**3. HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW:** Warning: Causes eye irritation. May cause skin irritation.

**EFFECTS FROM ACUTE EXPOSURE:**

**EYE CONTACT:** Irritating to the eyes

**SKIN CONTACT:** May be irritating to the skin.

**INHALATION:** None known.

**INGESTION:** None known

**CHRONIC OVEREXPOSURE EFFECTS:**

Not known.

**CARCINOGENICITY:** NTP - No, IARC - No, OSHA Regulated - No

**PRINCIPLE ROUTES OF EXPOSURE:** None known.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Not known.

**4. FIRST AID MEASURES**

**EYES:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

**SKIN:** In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention.

**INHALATION:** If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get medical attention.

**INGESTION:** If swallowed, induce vomiting immediately by giving two glasses of water and sticking fingers down throat; never give anything to an unconscious person. Get medical attention.

**5. FIRE FIGHTING MEASURES**

**PRODUCT:**

A34517L100 INTRACID RHODAMINE WT LIQUID

FLASH POINT: N.A.

METHOD: N.A.

IGNITION TEMP: N.D.

FLAMMABLE LIMITS IN AIR - LOWER (%): N.A.

FLAMMABLE LIMITS IN AIR - UPPER (%): N.A.

EXTINGUISHING MEDIA: Carbon Dioxide, Dry Chemical, Water Fog

FIRE FIGHTING PROCEDURES: Cool exposed containers with water spray after extinguishing fire.

UNUSUAL HAZARDS: None known.

ADDITIONAL FIRE AND EXPLOSION DATA: As in any fire, wear self-contained breathing apparatus and full protective equipment.

**6. ACCIDENTAL RELEASE MEASURES**

**ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Wear appropriate safety equipment. Contain and clean up spill immediately. Prevent from entering floor drains. Sweep powders carefully minimizing dusting. Shovel all spill materials into disposal drums and follow disposal instructions. Scrub spill area with detergent and flush with copious amounts of water.

**7. HANDLING AND STORAGE**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Keep container closed when not in use.

**OTHER STORAGE AND HANDLING DATA:** In accord with good industrial practice, handle with care and avoid personal contact.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**EXPOSURE CONTROLS:** Local exhaust ventilation may be necessary to control air contaminants during the use of this product.

**RESPIRATORY PROTECTION:** If exposure to dust, mist, and/or vapors is likely, a NIOSH approved respirator with a protection factor of 10 is recommended. See MSDS section 2 for information on the hazardous ingredients.

**PROTECTIVE GLOVES:** Wear chemical resistant rubber gloves and long sleeved clothing.

**EYES:** Wear safety glasses or goggles to protect against exposure.

**CLOTHING:** Wear overalls, apron, or other protective clothing, to minimize skin contact.

**OTHER PERSONAL PROTECTION DATA:** None known.

**HYGIENIC PRACTICES:** Avoid contact with eyes and skin. Avoid inhalation of dusts and vapors. Wash thoroughly after handling. Keep containers closed when not in use.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**PHYSICAL STATE:** LIQUID

**COLOR:** RED

**ODOR:** NONE

**SOLUBILITY IN WATER (20°C):** MISCIBLE

**PRODUCT:**

A34517L100 INTRACID RHODAMINE WT LIQUID

SPECIFIC GRAVITY: ..... 1.13  
DENSITY @ 25°C: ..... N.D.  
PH: ..... 10.5 @ 1.0%  
MELTING POINT: ..... N.D.  
BOILING POINT: ..... N.A.  
FREEZING POINT: ..... N.D.  
VAPOR DENSITY (AIR=1): ... IS HEAVIER THAN AIR  
EVAP. RATE (BUTYL ACETATE=1): ..... SLOWER THAN BUTYL ACETATE  
VOC CONTENT (%): ..... N.D.  
VAPOR PRESSURE (mm/Hg @ 20°C): ..... N.D.

**10. STABILITY AND REACTIVITY**

STABILITY DATA: STABLE  
POLYMERIZATION: Will not occur  
HAZARDOUS DECOMPOSITION PRODUCTS: Burning will produce oxides of carbon, nitrogen and/or sulfur.  
INCOMPATIBILITY (MATERIALS TO AVOID): None known.  
CONDITIONS/HAZARDS TO AVOID: None known.

**11. TOXICOLOGICAL INFORMATION**

ACUTE ORAL LD50 (mg/kg): ..... No Data  
ACUTE DERMAL LD50 (mg/kg): ..... No Information  
ACUTE INHALATION LC50 (mg/L): ... No Data  
IRRITATION TO (skin, eyes, respiratory):.. None.  
ADDITIONAL TOXICOLOGY INFORMATION: .....None known.

**12. ECOTOXICOLOGICAL INFORMATION**

ECOTOXICOLOGICAL INFORMATION: No data is available at this time.

**13. DISPOSAL CONSIDERATIONS**

DISPOSAL OF WASTE METHOD: Bury or incinerate according to federal, state, and local regulations.  
CONTAINER DISPOSAL: Containers should be triple rinsed, according to federal regulations and/or good waste management practice.

**14. TRANSPORT INFORMATION**

DOT Proper Shipping Name: ..... Not DOT Regulated  
DOT Technical Name: ..... N.A.  
DOT Primary Hazard Class: ..... N.A.

**PRODUCT:**

A34517L100 INTRACID RHODAMINE WT LIQUID

DOT Secondary Hazard Class: ... N.A.

UN/NA NUMBER: ..... N.A.

DOT PACKING GROUP: ... N.A.

DOT EMERGENCY RESPONSE INFORMATION: ..... Keep unnecessary people away. Isolate area and deny entry. Stay upwind. Keep out of low areas. Call CHEMTREC at 1-800-424-9300 for emergency assistance.

..... For chemical emergencies in Canada, call CANUTEC at 1-613-996-6666.

**15. REGULATORY INFORMATION**

SARA SECTION 302: None Found

SARA (311, 312) HAZARD CLASS:  
IMMEDIATE HEALTH HAZARD

SARA (313) CHEMICALS: THIS PRODUCT DOES NOT CONTAIN A TOXIC CHEMICAL FOR ROUTINE ANNUAL 'TOXIC CHEMICAL RELEASE REPORTING' UNDER SECTION 313 (40 CFR 372)

AMOUNT OF SARA (313) REPORTABLE CHEMICAL (%): No SARA (313) Reportable Chemicals.

METAL CONTENT: This product is not a metallized dye.

TSCA INVENTORY STATUS: All components of this product are included on the TSCA Section 8 Inventory.

CALIFORNIA PROPOSITION 65 CHEMICALS: None

TSCA SECTION 12(B) EXPORT REGULATIONS: This product is not subject to TSCA 12(b) Export Regulations.

GERMAN AMINES/EUROPEAN UNION AMINES: This product does not contain any compounds that would be prohibited under the current German/European Union regulations regarding cleavable amine compounds.

**16. OTHER INFORMATION**

HAZARD RATING SYSTEMS

HMIS: FLAMMABILITY 1 , REACTIVITY 0 , HEALTH 2

ADDITIONAL INFORMATION:  
NONE

**PRODUCT:**

A34517L100 INTRACID RHODAMINE WT LIQUID

**REASON FOR UPDATE:**

Product review.

**DISCLAIMER:**

Crompton & Knowles warrants that this product conforms to the chemical description on the label and is reasonably fit for the specific purposes referred to in its directions for use, subject to inherent risks referred to in the Material Safety Data Sheet for this product. Crompton & Knowles makes no other express or implied warranty. In no case shall Crompton & Knowles be liable for consequential, special, or indirect damages resulting from the use or handling of this product.

**\*\*\* END OF MSDS \*\*\***

SPARTAN CHEMICAL CO., INC.  
MATERIAL SAFETY DATA SHEET

J.D.# C-10.16  
Ident 522  
1 of 2

SECTION I  
PRODUCT IDENTIFICATION

PRODUCT NAME OR NUMBER (as it appears on label)  
SD-20 (BULK)

MANUFACTURER'S NAME  
Spartan Chemical Co., Inc.

EMERGENCY TELEPHONE NO.  
(419) 531-5551

ADDRESS (NUMBER, STREET, CITY, STATE AND ZIP CODE)  
110 N. Westwood Ave., Toledo, OH 43607

MANUFACTURER'S D-U-N-S NO.  
00-503-6728

SECTION II  
HAZARDOUS INGREDIENTS

| CAS REGISTRY NO. | %W | CHEMICAL NAME(S) | - Table Z-1-A -          |                           |                              | CARCINOGEN |
|------------------|----|------------------|--------------------------|---------------------------|------------------------------|------------|
|                  |    |                  | TWA<br>mg/M <sup>3</sup> | STEL<br>mg/M <sup>3</sup> | Ceiling<br>mg/M <sup>3</sup> |            |

NO HAZARDOUS INGREDIENTS AT 1% OR GREATER CONCENTRATION

SECTION III  
PHYSICAL DATA

|   |  |   |
|---|--|---|
| BOILING POINT<br>212 OF ___ °C                        | SPECIFIC GRAVITY (H <sub>2</sub> O = 1)<br>1.074 | PERCENT SOLID BY WEIGHT (%)<br>15-17            |
| VAPOR PRESSURE - 18<br>0.75 OF ___ °C X mm Hg ___ psi | EVAPORATION RATE (but. ace. = 1)<br><1           |   |
| VAPOR DENSITY (AIR = 1)<br>Unknown                    | APPEARANCE AND ODOR<br>Blue, citrus odor         | IS MATERIAL: (LIQUID) SOLID<br>GAS PASTE POWDER |
| SOLUBILITY IN WATER<br>Complete                       |  |   |
| pH<br>Concentrate 11.0-11.5                           |  |   |

SECTION IV  
FIRE AND EXPLOSION HAZARD DATA

FLASH POINT - None      METHOD USED - ASTM - D92      FLAMMABLE LIMITS - n/a

EXTINGUISHING MEDIA  
n/a

SPECIAL FIRE FIGHTING PROCEDURES  
n/a

UNUSUAL FIRE AND EXPLOSION HAZARDS  
n/a

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## SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE - CONDITIONS TO AVOID      THRESHOLD LIMIT VALUE - Not established  
Avoid eye contact; may cause eye irritation.PRIMARY ROUTES OF ENTRY    INHALATION     SKIN CONTACT     OTHER (SPECIFY)

CONDITIONS AGGRAVATED BY USE

Unknown

EMERGENCY AND FIRST AID PROCEDURES - In case of contact immediately flush eyes with plenty of water for at least 15 minutes; call a physician. Flush skin with water. Wash clothing before reuse. If swallowed, give large quantities of water or fruit juice. Call a physician immediately.

## SECTION VI - REACTIVITY DATA

STABILITY: UNSTABLE   
                  STABLE 

INCOMPATIBILITY (MATERIALS TO AVOID)

None

HAZARDOUS DECOMPOSITION PRODUCTS

None

HAZARDOUS            MAY OCCUR POLYMERIZATION: WILL NOT OCCUR 

## SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Flush with water to sanitary sewer system.

WASTE DISPOSAL METHOD

Same as above.

## SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)

Nothing special

VENTILATION - Good general ventilation should be sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

PROTECTIVE GLOVES (SPECIFY TYPE)

If desired

EYE PROTECTION (SPECIFY TYPE)

If desired

OTHER PROTECTIVE EQUIPMENT

n/a

## SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Nothing special

OTHER PRECAUTIONS

Nothing special

Spartan Chemical Co., Inc.  
SD-20 (BULK)  
Ref: 29 CFR 1910:1200 (OSHA)NAME            Thomas J. Mitchell  
TITLE           Director of Research  
DATE            June 1, 1990  
SUPERCEDES    September 20, 1985©SCC6/90 Copyrighted: Spartan Chemical Co., Inc. - For Use Only  
By Authorized Spartan Distributors.

000293

**SynTech Products Corporation**  
**520 E. Woodruff Avenue**  
**Toledo, Ohio 43624**  
**(419) 241-1215**

**Material Safety Data Sheet**  
 24 Hour - Call INFOTRAC  
 1-800-535-5053  
 HMIS Rating H-1 F-0 R-0

*E-10.4*

### Section I - Product Identification

**Product Name:** Touch It Up® De-Contaminant\*  
**Effective Date:** 6-99  
 \* Do NOT use this product as a skin de-contaminant

### Section II - Hazardous Ingredients

| Chemical Name                    | CAS#             | WT%   | PEL     | TLV             | CARCIG |
|----------------------------------|------------------|-------|---------|-----------------|--------|
| 2 Butoxy Ethanol                 | 111-76-2         | 1% +  | 50ppm   | 50 Skin contact | No     |
| Other ingredients - Trade Secret |                  |       |         |                 |        |
| Propane/Butane                   | 74-98-6/106-97-8 | 6-10% | 1000ppm | 1000ppm         | No     |

\*All constituents are listed on the TSCA inventory.

### Section III - Physical Data

**Bolling Range:** N.D.  
**Vapor Pressure (psig) in Can @ 75°F:** 65  
**Solubility in Water of Concentrate:** Complete  
**Specific Gravity of Concentrate:** 1.036  
**% Volatile:** 7.49  
**Flash Point of Spray:** None to 150°F, Tag Open Cup  
**Appearance and Odor of Spray:** White foam, perfume odor  
**pH:** 11-12

### Section IV - Fire and Explosion Hazard Data

**Flammability as per CPSC Flame Extension Test:** Non-Flammable  
**Flammable Limits:** LEL: N/A UEL: N/A  
**Extinguishing Media:** Foam, dry chemical, carbon dioxide.  
**Special Fire Fighting Procedures:** Keep containers cool. Use equipment to protect personnel against rupturing, or venting containers.  
**Fire and Explosion Hazards:** Above 120°F, containers may vent, rupture, or burst.

### Section V - Reactivity Data

**Chemical Stability:** Stable  
**Conditions to Avoid:** Do not expose to temperatures above 120°F.  
**Incompatibility (Materials to Avoid):** Strong oxidizers, acids or bases, selected amines.  
**Hazardous Decomposition Products:** Thermal decomposition may produce carbon monoxide and/or carbon dioxide.  
**Hazardous Polymerization:** Will NOT occur

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## Section VI - Health Hazard Data

### Effects of Overexposure

**Eyes:** Minor irritation  
**Skin:** No evidence of adverse effect from available information  
**Ingestion:** Can cause gastrointestinal irritation, vomiting, and diarrhea.  
**Inhalation:** Product exists as foam. Inhalation of the foam could cause asphyxiation.

### Emergency and First Aid Procedures\*

**\*Caution!** Do NOT use this product as a skin de-contaminant  
**Eyes:** Flush with water for at least 15 minutes.  
**Skin:** Wash exposed area with water and soap.  
**Ingestion:** Do not induce vomiting. Get medical attention.  
**Inhalation:** Treat for asphyxiation.

## Section VII - Spill or Leak Procedures

### Steps to be taken in case container is punctured and material is released:

Clean up area by mopping or with absorbent materials and place in closed containers for disposal. Consult federal, state, or local disposal authorities for approved disposal procedures.

### Waste Disposal Method:

When used properly aerosol products do not generate hazardous waste. Empty de-pressurized containers can not be reused and should be wrapped and put in trash collection. Cans which are pressurized or contain liquid must be disposed of in a permitted waste management facility. Consult federal, state, and local disposal authorities for approved procedures.

## Section VIII - Special Protection Information

### Specific Personal Protective Equipment

**Respiratory Protection:** Under normal conditions no respiratory protection is required.  
**Ventilation:** Normal ventilation adequate.  
**Protective Gloves:** None required, protective gloves may be worn.  
**Eye Protection:** None required, chemical splash goggles may be worn.

## Section IX - Special Precautions

**Keep from freezing**

**Keep away from children**

**Special precautionary statement:** Please read and follow the directions on the product label. They are your best guide to using this product in the most effective way, and give the necessary safety precautions to protect your health.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition. We make no warranties, express or implied, and assume no liability in connection with any use of the information.

Prepared by J. Rose  
MSDS -Touch It Up®

Signature \_\_\_\_\_

000295

JUL 28 '95 10:11AM HARRISBURG PAPER CO

P.4/6

NAMICO, Inc.  
4601 Flat Rock Road  
P.O. Box 4684  
Philadelphia, PA 19127  
215-482-9182

30692 Tracy Road  
Walbridge, OH 43465  
419-666-8610

MATERIAL SAFETY DATA SHEET

601 NAMI-LO NON-PHOSPHATE

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1095

Section I - IDENTIFICATION

NAMICO Proprietary Name: 601 NAMI-LO NON-PHOSPHATE  
Chemical Name: NA  
DOT Proper Shipping Name: Compound, Cleaning, Solid  
DOT Hazard I.D. No:  
DOT Hazard Description:  
DOT Hazard Label Required:  
Date of Issue: JUN 21 91  
Supersedes MSDS dated: MAR 22 90  
Prepared by: George Sas

| HMIS RATINGS |   |
|--------------|---|
| Health       | 2 |
| Flammability | 0 |
| Reactivity   | 0 |

4 = Severe hazard  
3 = Serious hazard  
2 = Moderate hazard  
1 = Slight hazard  
0 = Minimal hazard

Section II - INGREDIENT INFORMATION

| Chemical/Common Name | CAS No.    | Weight % | ACGIH TLV (mg/m3) | OSHA PEL (mg/m3) |
|----------------------|------------|----------|-------------------|------------------|
| Sodium carbonate     | 497-19-8   | 10-50    | NE                | NE               |
| Na-A-Zeolite         | 68989-22-0 | 10-50    | NE                | NE               |
| Sodium carbonate     | 497-19-8   | 10-50    | NE                | NE               |
| Sodium metasilicate  | 6834-92-0  | 10-50    | NE                | NE               |
| Sodium chloride      | 7647-14-5  | 10-50    | NE                | NE               |

\*These materials are subject to the reporting requirements under the Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III, Section 313 and 40 CFR Part 372.

Section III - PHYSICAL DATA

Boiling Point (F) NA Specific Gravity (Water=1) NA  
Vapor Pressure (mm Hg) NA % Volatile by Volume NA  
Vapor Density (Air=1) NA Evaporation Rate (Water=1) NA  
Solubility in Water Complete pH NA  
Appearance & Odor White free-flowing powder

Section IV - FIRE & EXPLOSION HAZARD DATA

Flash Point(F) NA Method Used NA  
LEL (Lower Explosion Limit) NA  
UEL (Upper Explosion Limit) NA  
Extinguishing Media NA  
Special Procedures NA  
Unusual Fire and Explosion Hazards NA

-continued on additional page(s)-

JUL 28 '95 10:11AM HARRISBURG PAPER CO

P.5/6

NAMICO, Inc.  
4501 Flat Rock Road  
P.O. Box 4684  
Philadelphia, PA 19127

30092 Tracy Road  
Walbridge, OH 43465  
419-666-8610

MATERIAL SAFETY DATA SHEET

601 NAMI-LO NON-PHOSPHATE  
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Section V - HEALTH HAZARD DATA

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|                         |  |
|-------------------------|--|
| Threshold Limit Value   | NA   |
| Routes of Exposure      | Eye or skin contact, ingestion.  |
| Effects of Overexposure | Contact with eyes or skin can cause severe irritation.                       |
| Carcinogenicity         | This product is not considered to be a carcinogen by the NTP, IARC, or OSHA. |

EMERGENCY FIRST AID PROCEDURES

|            |  |
|------------|--|
| Eyes       | Thoroughly irrigate at once with running water for at least 15 minutes. Get immediate medical attention.   |
| Skin       | Flush with plenty of water.  |
| Ingestion  | Have victim drink large quantities of water or milk to dilute the product. DO NOT INDUCE VOMITING. Get IMMEDIATE medical attention. NOTE: Never give anything by mouth to an unconscious or convulsing victim. |
| Inhalation | NA   |
| Other      | NA   |

Section VI - REACTIVITY DATA

|                                  |                |
|----------------------------------|----------------|
| Stability                        | Stable         |
| Conditions to Avoid              | None known     |
| Incompatible Materials           | None known     |
| Hazardous Decomposition Products | None known     |
| Hazardous Polymerization         | Will not occur |
| Conditions to Avoid              | None known     |

-continued on additional page(s)-

JUL 28 '95 10:11AM HARRISBURG PAPER CO

P.6/6

NAMICO, Inc.  
4601 Flat Rock Road  
P.O. Box 4684  
Philadelphia, PA 19127

30592 Tracy Road  
Walbridge, OH 43465  
419-666-8610

MATERIAL SAFETY DATA SHEET

601 NAMI-LO NON-PHOSPHATE  
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Section VIII - SPILL OR LEAK PROCEDURES

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Steps to be taken in case material is released or spilled

Sweep up. Rinse spill area well with water.

Waste Disposal Method

DISPOSER MUST COMPLY WITH ALL FEDERAL, STATE, AND LOCAL DISPOSAL AND DISCHARGE LAWS.

Section VIII - SPECIAL PROTECTION INFORMATION

Respiratory Protection

None required

Ventilation

Adequate

Gloves

Rubber or neoprene

Eye Protection

Safety goggles

Other Protective Equipment

None required

Section IX - SPECIAL PRECAUTIONS

Precautions in Handling and Storage

Store in a tightly closed container.

Other Precautions

KEEP OUT OF REACH OF CHILDREN.

NA = Not Applicable, NE = Not Established, ND = Not Determined for this product  
The information herein is given in good faith and is compiled from Material Safety Data Sheets furnished by our suppliers. No warranty, express or implied, is made or intended. Any use of this information must be determined by the user to be in accordance with applicable Federal, State, and local laws and regulations.

**BETZDEARBORN MATERIAL  
SAFETY DATA SHEET**



**BetzDearborn**

EFFECTIVE DATE: 22-AUG-1995  
PRINTED DATE: 19-OCT-1999

32.90

**1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME : POWERLINE INHIBITOR- PPL10**

**PRODUCT APPLICATION AREA: WATER-BASED CORROSION INHIBITOR.**

**COMPANY ADDRESS:**

BetzDearborn

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: ORS (when container > RQ)  
Emergency Response Guide #31  
Odor: Mild; Appearance: Light 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:

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:

Causes irritation of the skin, eyes, and/or respiratory system.



#### 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.

---

#### 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)

**CELLANEOUS:**

ORS (when container > RQ)  
NA3082; Emergency Response Guide #31

---

#### 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. Do not freeze. If frozen, thaw and mix completely prior to use.

## 8) EXPOSURE CONTROLS/PERSONAL PROTECTION

### CHEMICAL NAME      EXPOSURE LIMITS

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:

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)  | 1.107   | Vapor Pressure (mmHG) | ~ 18.0 |
| Freeze Point (F)           | 19      | Vapor Density (air=1) | < 1.00 |
| Freeze Point (C)           | -7      |                       |        |
| Viscosity(cps 70F, 21C)    | 8       | % Solubility (water)  | 100.0  |
| Odor                       |         | Mild                  |        |
| Appearance                 |         | 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.

### BETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

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## 11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:

570 mg/kg

NOTE - Estimated value

Dermal LD50 RABBIT:

>5,000 mg/kg

NOTE - Estimated value

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## 12) ECOLOGICAL INFORMATION

### AQUATIC TOXICOLOGY:

No Data Available.

### BIODEGRADATION

COD (mg/gm): 42 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.

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## 14) TRANSPORT INFORMATION

DOT HAZARD:

ORS (when container > RQ)

UN / NA NUMBER:

NA3082

DOT EMERGENCY RESPONSE GUIDE #: 31

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### 15) REGULATORY INFORMATION

**TSCA:**

All components of this product are listed in the TSCA inventory.

**CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):**

72 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 | 11.0-15.0% |

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### CALIFORNIA REGULATORY INFORMATION

**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:**

No regulated constituent present at OSHA thresholds

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### MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

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### 16) OTHER INFORMATION

**NFPA/HMIS**

**CODE TRANSLATION**

|                          |      |                   |
|--------------------------|------|-------------------|
| Health                   | 2    | Moderate 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 **  |

## MATERIAL SAFETY DATA SHEET

COBRATEC® TT-50S

PRODUCT CODE: X18WT7440

Page 1 of 7

August 16, 1999

32.87

## SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER:

ADDRESS:

EMERGENCY TELEPHONE:

FOR TRANSPORTATION EMERGENCY:

CHEMICAL NAME AND SYNONYMS:

TRADE NAMES AND SYNONYMS:

CHEMICAL FAMILY:

FORMULA:

PMC SPECIALTIES GROUP, INC.

501 Murray Road

Cincinnati, OH 45217

(513) 242-3300 (USA)

(800) 424-9300 (USA)

Sodium Tolyltriazole, 50% Water  
Solution

COBRATEC® TT-50S

Triazole

C<sub>7</sub>H<sub>8</sub>N<sub>3</sub>Na

## SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

| <u>Material</u>      | <u>CAS No.</u> | <u>Wt. %</u> |
|----------------------|----------------|--------------|
| Sodium Tolyltriazole | 64665-57-2     | 49.5-51.0    |
| Water                | 7732-18-5      | 48.5-50.0    |
| Sodium Hydroxide     | 1310-73-2      | <0.5         |

Please request a copy of Technical  
Bulletin #: COR4333 for additional  
information.

081699

000305

**MATERIAL SAFETY DATA SHEET**

**COBRATEC® TT-50S**

**PRODUCT CODE: X18W17440**

*Page 2 of 7*

*August 16, 1999*

**SECTION 3 HAZARDS IDENTIFICATION**

**POTENTIAL HEALTH EFFECTS:**

**ROUTES OF ENTRY**

Eye contact, skin contact/absorption, ingestion and inhalation.

**(ACUTE)**

**EYES**

Material is corrosive. Contact with the eyes may severely damage delicate eye tissue.

**SKIN**

Material is corrosive. Prolonged contact can be destructive to tissue.

**INGESTION**

Material is corrosive. Harmful if swallowed.

**INHALATION**

Material is corrosive. Harmful if inhaled.

**CHRONIC EFFECTS/CARCINOGENICITY**

**CARCINOGENICITY:** None of the components in this material are listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.

## MATERIAL SAFETY DATA SHEET

COBRATEC® TT-50S  
PRODUCT CODE: X18WT7440  
Page 3 of 7  
August 16, 1999

**SECTION 4 FIRST AID MEASURES****IF INHALED**

If affected, remove from exposure. Restore breathing. Keep warm and quiet. Get medical attention.

**IF ON SKIN**

Wash affected area thoroughly with soap and water. Remove contaminated clothing, jewelry, etc. Get medical attention.

**IF IN EYES**

Flush eyes with large amounts of water for 15 minutes. Get medical attention.

**IF SWALLOWED**

Never give anything by mouth to an unconscious person. **DO NOT INDUCE VOMITING.** Give large amounts of water. Get medical attention.

**SECTION 5 FIRE FIGHTING MEASURES**

|                           |                |
|---------------------------|----------------|
| FLASH POINT:              | Not Applicable |
| AUTOIGNITION TEMPERATURE: | Not Applicable |
| FLAMMABLE LIMITS IN AIR:  | Not Applicable |
| EXTINGUISHING MEDIA:      | Not Applicable |

**SPECIAL FIRE FIGHTING PROCEDURES:** Full protective equipment including self-contained breathing apparatus should be used. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Get medical attention. Water may be used to cool and protect closed containers exposed to extreme heat.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.

000307

## MATERIAL SAFETY DATA SHEET

COBRATEC® TT-50S

PRODUCT CODE: X18WT7440

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August 16, 1999

**SECTION 6 ACCIDENTAL RELEASE MEASURES**

Use proper personal protective equipment. Isolate and secure the area and follow the appropriate emergency guidelines. Collect the material with inert absorbent and place in a covered waste disposal container.

**SECTION 7 HANDLING AND STORAGE****STORAGE INFORMATION**

**CORROSIVE MATERIAL** Avoid contact with skin, eyes and clothing. **DO NOT TAKE INTERNALLY.** Clean up spills immediately.

Keep containers tightly closed when not in use. Store only in containers which are resistant to caustic solutions.

**SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION**

**NFPA BASED RATINGS:** Health: 3, Flammability: 0, Reactivity: 0

**HMIS RATINGS:** Health: 3, Flammability: 0, Reactivity: 0, PPE: F

**WHMIS CLASSIFICATION:** D-2-(B),E

**RESPIRATORY PROTECTION:** If personal exposure cannot be controlled below applicable exposure limits by ventilation, wear respiratory devices approved by NIOSH/MSHA for protection against mists and vapors.

**VENTILATION:** Local exhaust is recommended.

**PROTECTIVE GLOVES:** Rubber, vinyl or other impervious material if skin contact can not be avoided.

**EYE PROTECTION:** Use safety glasses with unperforated side shields, or full face shield when danger of splashing is great.

**OTHER PROTECTIVE EQUIPMENT:** Rubber apron or similar protective clothing to prevent contact with skin or clothes.

**EXPOSURE GUIDELINES**

Sodium Hydroxide TWA = 2 mg/m<sup>3</sup>

000308



## MATERIAL SAFETY DATA SHEET

COBRATEC® TT-50S  
PRODUCT CODE: X18WT7440Page 5 of 7  
August 16, 1999**SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES**

|                                       |   |
|---------------------------------------|---|
| BOILING POINT:                        | 100°C   |
| FREEZING POINT:                       | -8°C  |
| SPECIFIC GRAVITY:                     | 1.19 @ 24°C   |
| BULK DENSITY:                         | Not Applicable  |
| VAPOR PRESSURE AT 20° C:              | 0.04 mm Hg  |
| VAPOR DENSITY (air=1):                | Not Applicable  |
| SOLUBILITY IN WATER % BY WT at 20° C: | Miscible in all proportions                                     |
| % VOLATILES BY VOLUME:                | 50% as water  |
| EVAPORATION RATE:                     | Not Applicable  |
| APPEARANCE AND ODOR:                  | Clear yellow to amber solution,<br>characteristic odor, pH=13.5 |

**SECTION 10 STABILITY AND REACTIVITY**

STABILITY: Stable

INCOMPATIBILITY: Strong Oxidizing Agents, Strong Acids.

HAZARDOUS DECOMPOSITION PRODUCTS: BY FIRE: Carbon Dioxide, Carbon Monoxide, Nitrogen oxides, HCN possible in reducing atmospheres.

HAZARDOUS POLYMERIZATION: Will not occur.

**SECTION 11 TOXICOLOGICAL INFORMATION**Oral LD<sub>50</sub> (rat)

920 mg/kg (Male)

640 mg/kg (Female)

Eye and Skin Irritant

Can cause severe irritation

## MATERIAL SAFETY DATA SHEET

COBRATEC® TT-50S

PRODUCT CODE: X18WT7440

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August 16, 1999

**SECTION 12 ECOLOGICAL INFORMATION**

|   |            |
|---|------------|
| Bluegill Sunfish (96 hr. LC <sub>50</sub> ) | 191.2 mg/l |
| Daphnia Magna (48 hr. LC <sub>50</sub> )    | 245.7 mg/l |
| Rainbow Trout (96 hr. LC <sub>50</sub> )    | 23.7 mg/l  |

**SECTION 13 DISPOSAL CONSIDERATIONS**

**WASTE DISPOSAL METHOD:** Dispose of in accordance with federal, state and local disposal regulations.

**SECTION 14 TRANSPORT INFORMATION**

|                       |   |
|-----------------------|---|
| D.O.T. SHIPPING NAME: | Caustic Alkali Liquids, n.o.s. (Sodium Hydroxide) |
| D.O.T. HAZARD CLASS:  | 8   |
| U.N. NUMBER:          | UN1719  |
| PACKAGING GROUP:      | PGII  |
| PRODUCT RQ (LBS):     | 1,000 lbs as Sodium Hydroxide                     |
| D.O.T. LABEL:         | Corrosive   |
| D.O.T. PLACARD:       | Corrosive   |

**SECTION 15 REGULATORY INFORMATION****U.S. FEDERAL REGULATIONS:**

Sodium Tolyltriazole (CAS No. 64665-57-2) is contained on the following chemical lists:

1. TSCA Inventory List

## MATERIAL SAFETY DATA SHEET

COBRATEC® TT-50S

PRODUCT CODE: X18WT7440

Page 7 of 7

August 16, 1999

**SECTION 15 REGULATORY INFORMATION (CONT.)**

Sodium Hydroxide (CAS No. 1310-73-2) is contained on the following chemical lists:

1. Clean Water Act Section 311 Hazardous Substances (ref.: Suspect Chemicals Sourcebook 1997)
2. CERCLA Hazardous Substances (ref.: Suspect Chemicals Sourcebook 1997)
3. OSHA Air Contaminants (ref.: Suspect Chemicals Sourcebook 1997)
4. American Council of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value Chemicals (ref.: Suspect Chemicals Sourcebook 1997)
5. OSHA Table Z-1-A [revoked] (ref.: Suspect Chemicals Sourcebook 1997)
6. DOT Hazardous Materials (ref.: Suspect Chemicals Sourcebook 1997)
7. DOT Hazardous Substances Other Than Radionuclides; and Radionuclides (ref.: Suspect Chemicals Sourcebook 1997)
8. Massachusetts Substance List (ref.: Suspect Chemicals Sourcebook 1997)
9. New Jersey Right To Know Hazardous Substance List (ref.: Suspect Chemicals Sourcebook 1997)  
NJIS = Special Health Hazard (ref.: Suspect Chemicals Sourcebook 1997)
10. Pennsylvania Hazardous Substance List (ref.: Suspect Chemicals Sourcebook 1997)  
PAIE = Environmental Hazard

**INTERNATIONAL REGULATIONS:**

SodiumTolyltriazole (CAS No. 64665-57-2) is contained on the following chemical lists:

1. Canadian Domestic Substance List

Sodium Hydroxide (CAS No. 1310-73-2) is contained on the following chemical lists:

1. Canadian Workplace Hazardous Materials Information System (WHMIS)  
CN1 = Ingredient must be disclosed at concentration of 1% (ref.: Suspect Chemicals Sourcebook 1997)
2. Canadian Domestic Substance List

**SECTION 16 OTHER INFORMATION**

REASON FOR ISSUE: New format and verification of information.  
MSDS NUMBER: X18WT7440  
PREPARED: August 16, 1999  
SUPERSEDES: March 3, 1998

The information contained herein is based on the data available to us and is believed to be correct as of the date prepared; however, PMC SPECIALTIES GROUP, INC. makes no warranty, expressed or implied, regarding the accuracy of these data or the results to be obtained from the use thereof

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**BRIGHT DYES™ MATERIAL SAFETY DATA SHEET  
 FLT YELLOW/GREEN™ LIQUID CONCENTRATE  
 PAGE 1 OF 3**

**MSDS PREPARATION INFORMATION**

PREPARED BY: T. P. MULDOON  
 (937) 773-0600  
 DATE PREPARED: 1/1/99

**PRODUCT INFORMATION**

MAUNFACTURED BY: KINGSCOTE CHEMICALS  
 9676 NORTH LOONEY RD.  
 PIQUA, OHIO 45356

CHEMICAL NAME ..... NOT APPLICABLE  
 CHEMICAL FORMULA ..... NOT APPLICABLE  
 CHEMICAL FAMILY ..... AQUEOUS DYE PRODUCR

**HAZARDOUS INGREDIENTS**

NONE PER 29 CFR 1910.1200

**PHYSICAL DATA**

PHYSICAL STATE ..... LIQUID  
 ODOR AND APPEARANCE ..... YELLOW/GREEN, WITH NO APPARENT ODOR  
 SPECIFIC GRAVITY ..... APPROXIMATELY *BT 1.05*  
 VAPOR DENSITY (mm Hg @ 25 ° C) ..... ~23.75 *Typo*  
 VAPOR DENSITY (AIR =1) ..... ~0.6 *JAF 11/2/99*  
 EVAPORATION RATE (Butyl Acetate = 1) ..... ~1.8  
 BOILING POINT ..... 100 degrees C (212 degrees F)  
 FREEZING POINT ..... 0 degrees C (32 degrees F)  
 pH ..... 3.0 OR ABOVE  
 SOLUBILITY IN WATER ..... HIGHLY SOLUBLE

**FIRE HAZARD**

CONDITION OF FLAMMABILITY ..... NON-FLAMABLE  
 MEANS OF EXTINCTION ..... WATER FOG, CARBON DIOXIDE, OR DRY CHEMICAL  
 FLASH POINT AND METHOD ..... NOT APPLICABLE  
 UPPER FLAMABLE LIMIT ..... NOT APPLICABLE  
 LOWER FLAMABLE LIMIT ..... NOT APPLICABLE  
 AUTO-IGNITION TEMPERATURE ..... NOT APPLICABLE  
 HAZARDOUS COMBUSTION PRODUCTS ..... NOT APPLICABLE  
 UNUSUAL FIRE HAZARD ..... NOT APPLICABLE

**BRIGHT DYES™ MATERIAL SAFETY DATA SHEET  
FLT YELLOW/GREEN™ LIQUID CONCENTRATE  
PAGE 2 OF 3**

**EXPLOSION HAZARD**

SENSITIVITY TO STATIC DISCHARGE ..... NOT APPLICABLE  
SENSITIVITY TO MECHANICAL IMPACT ..... NOT APPLICABLE

**REACTIVITY DATA**

PRODUCT STABILITY ..... STABLE  
PRODUCT INCOMPATIBILITY ..... NONE KNOWN  
CONDITIONS OF REACTIVITY ..... NOT APPLICABLE  
HAZARDOUS DECOMPOSITION PRODUCTS ..... NONE KNOWN

**TOXICOLOGICAL PROPERTIES**

**SYMPTOMS OF OVER EXPOSURE FOR EACH POTENTIAL ROUTE OF ENTRY:**

ABSORPTION, ACUTE ..... NO HARMFUL EFFECTS EXPECTED.  
INHALATION, CHRONIC ..... NO HARMFUL EFFECTS EXPECTED.  
SKIN CONTACT ..... WILL TEMPORARILY GIVE SKIN A YELLOW/GREEN COLOR.  
EYE CONTACT ..... NO HARMFUL EFFECTS EXPECTED.  
INGESTION ..... URINE MAY BE A YELLOW/GREEN COLOR UNTIL THE DYE  
HAS BEEN WASHED THROUGH THE SYSTEM.  
EFFECTS OF ACUTE EXPOSURE ..... NO HARMFUL EFFECTS EXPECTED  
EFFECTS OF CHRONIC EXPOSURE ..... NO HARMFUL EFFECTS EXPECTED  
THRESHOLD OF LIMIT VALUE ..... NOT APPLICABLE  
CARCINOGENICITY ..... NOT LISTED AS A KNOWN OR SUSPECTED CARCINOGEN BY  
IARC, NTP OR OSHA.  
TERATOGENICITY ..... NONE KNOWN  
TOXICOLOGY SYNERGISTIC PRODUCTS ..... NONE KNOWN

**PREVENTATIVE MEASURES**

**PERSONAL PROTECTIVE EQUIPMENT**

GLOVES ..... RUBBER  
RESPIRATORY ..... USE NIOSH APPROVED DUST MASK IF DUSTY CONDITIONS  
EXIST.  
CLOTHING ..... PROTECTIVE CLOTHING SHOULD BE WORN WHERE  
CONTACT IS UNAVOIDABLE.  
OTHER ..... HAVE ACCESS TO EMERGENCY EYEWASH.

**BRIGHT DYES™ MATERIAL SAFETY DATA SHEET**  
**FLT YELLOW/GREEN™ LIQUID CONCENTRATE**  
**PAGE 3 OF 3**

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**PREVENTATIVE MEASURES (CONT.)**

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|  |   |
|--|---|
| ENGINEERING CONTROLS .....               | NOT NECESSARY UNDER NORMAL CONDITIONS, USE LOCAL VENTILATION IF DUSTY CONDITIONS EXIST.   |
| SPILL OR LEAK RESPONSE .....             | CLEAN UP SPILLS IMMEDIATELY, PREVENT FROM ENTERING DRAIN. USE ABSORBANTS AND PLACE ALL SPILL MATERIALS IN WASTE DISPOSAL CONTAINER. FLUSH AFFECTED AREA WITH WATER. |
| WASTE DISPOSAL .....                     | INCINERATE OR REMOVE TO A SUITABLE SOLID WASTE DISPOSAL SITE, DISPOSE OF ALL WASTES IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.                        |
| HANDELING PROCEDURES AND EQUIPMENT ..... | NO SPECIAL REQUIREMENTS.  |
| STORAGE REQUIREMENTS .....               | STORE AT ROOM TEMPERATURE BUT ABOVE THE FREEZING POINT OF WATER.  |
| SHIPPING INFORMATION .....               | KEEP FROM FREEZING  |

---

**FIRST AID MEASURES**

---

**FIRST AID EMERGENCY PROCEDURES**

|                    |   |
|--------------------|---|
| EYE CONTACT .....  | FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.  |
| SKIN CONTACT ..... | WASH SKIN THOROUGHLY WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS.   |
| INHALATION .....   | IF DUST IS INHALED, MOVE TO FRESH AIR. IF BREATHING IS DIFFICULT GIVE OXYGEN AND GET IMMEDIATE MEDICAL ATTENTION.   |
| INGESTION .....    | DRINK PLENTY OF WATER AND INDUCE VOMITING. GET MEDICAL ATTENTION IF LARGE QUANTITIES WERE INGESTED OR IF NAUSEA OCCURS. NEVER GIVE FLUIDS OR INDUCE VOMITING IF THE PERSON IS UNCONSCIOUS OR HAS CONVULSIONS. |

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**SPECIAL NOTICE**

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ALL INFORMATION, RECOMMENDATIONS AND SUGGESTIONS APPEARING HEREIN CONCERNING THIS PRODUCT ARE BASED UPON DATA OBTAINED FROM MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES; HOWEVER, KINGSCOTE CHEMICALS MAKES NO WARRANTY, REPRESENTATION OR GUARANTEE AS TO THE ACCURACY, SUFFICIENCY OR COMPLETENESS OF THE MATERIAL SET FORTH HEREIN. IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE SAFETY, TOXICITY AND SUITABILITY OF HIS OWN USE, HANDLING, AND DISPOSAL OF THE PRODUCT. ADDITIONAL PRODUCT LITERATURE MAY BE AVAILABLE UPON REQUEST. SINCE ACTUAL USE BY OTHERS IS BEYOND OUR CONTROL, NO WARRANTY, EXPRESS OR IMPLIED, IS MADE BY KINGSCOTE CHEMICALS AS TO THE EFFECTS OF SUCH USE, THE RESULTS TO BE OBTAINED OR THE SAFETY AND TOXICITY OF THE PRODUCT, NOR DOES KINGSCOTE CHEMICALS ASSUME ANY LIABILITY ARISING OUT OF USE BY OTHERS OF THE PRODUCT REFERRED TO HEREIN. THE DATA IN THE MSDS RELATES ONLY TO SPECIFIC MATERIAL DESIGNATED HEREIN AND DOES NOT RELATE TO USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY PROCESS.

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**END OF MATERIAL SAFETY DATA SHEET**

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000314

**MATERIAL SAFETY DATA SHEET****Clarifloc® C-9490 Polymer**

One Gatehall Drive  
 Parsippany, New Jersey 07054  
 Phone Number: (201) 292-2900

32,109

**EMERGENCY CONTACTS: CHEMTREC (800) 424-9300**

Date Issued January 25, 1995 Supersedes MSDS Dated July 15, 1991

HMIS Health 1 Fire 2 Reactivity 0

NFPA Health 1 Fire 2 Reactivity 0

**I. Identification and Physical Data**

Product Name C-9490 Polymer

Product Class Cationic Polyacrylamide

DOT Hazard Class Combustible Liquid for bulk shipments only; see Sec. XIV

ID Number NA 1993

Shipping Name Combustible Liquid, n.o.s., NA 1993, PG III, (Contains Petroleum Distillate)

Vapor Pressure at 20° C Not determined

Vapor Density Heavier than air

Volatile Org. Compounds Not determined

% Volatile By Volume 50 - 70%

Boiling Range 100° C and above

Specific Gravity 1.0 (approximately)

Solubility In Water ~10% (forms gel)

Evaporation Rate Not determined

Melting Point Not applicable

Appearance and Odor White liquid emulsion with slight organic odor

**II. Hazardous Ingredients**

| Chemical Name                           | CAS Number | TWA TLV | OSHA PEL | STEL TLV |
|---|------------|---------|----------|----------|
| Light Hydrotreated Petroleum Distillate | 64742-47-8 | **      | —        | —        |
| Ethoxylated Nonylphenol, Branched       | 68412-54-4 | —       | —        | —        |

--- Not Established

\*\* TWA TLV for similar materials is about 100 ppm.

**III. Fire and Explosion Data**

LEL 0.9% (estimate)

Flashpoint &gt; 65 °C (Setflash Closed Cup)

**Extinguishing Media**

Use carbon dioxide or dry chemical for small fires and fog or foam for large fires.

**Unusual Fire and Explosion Hazards**

When exposed to extreme heat, closed containers may rupture due to buildup of pressure and release ignitable vapors. Water can cause extremely slippery floor surfaces.

**Special Fire Fighting Procedures**

Wear self-contained breathing apparatus and complete personal protective equipment when entering confined areas where there is potential for exposure to vapors or combustion products.

To the best of our knowledge, the information contained herein is accurate. However no liability whatsoever is assumed for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

**IV. Reactivity Data**      **Stable** yes      **Hazardous Polymerization?** no

**Conditions To Avoid**

Avoid open flames, hot surfaces or other ignition sources.

**Materials To Avoid**

Strong oxidizing agents

**Hazardous Decomposition Products**

Normally stable. Combustion products may include ammonia and oxides of carbon and nitrogen.

---

**V. Health Hazard Data****Effects of Overexposure****Ingestion**

Contains materials that may be slightly toxic. May cause irritation of gastrointestinal tract. Contains materials that, if aspirated into the lungs during ingestion or vomiting, may cause pulmonary injury and possibly death.

**Inhalation**

Breathing vapors or mists may irritate respiratory system and cause breathing difficulties. Effects on the central nervous system may include headaches, weakness, dizziness and drowsiness.

**Skin Absorption**

Product contains trace amounts of acrylamide. Prolonged exposure to liquid or dried product may cause numbness, tingling or weakness of extremities.

**Skin Contact**

Contains materials that may cause moderate skin irritation. Prolonged exposure may cause drying or defatting and cracking of the skin.

**Eye Contact**

Product contains materials which can cause severe eye irritation. Permanent damage is possible if contact is prolonged.

**Chronic Effects**

Breathing vapors or mist may aggravate pre-existing symptoms of asthma or other lung disorders. Repeated exposure to trace amounts of acrylamide in liquid or dried product may cause development of neurotoxicological effects.

**Emergency and First Aid Procedures****Eye Contact**

Immediately flush with water for 15 minutes or longer. Lift upper and lower eye lids to ensure removal of chemical. Get medical attention.

**Skin Contact**

Wash skin with soap and water. Remove and launder contaminated clothing before reuse. Get medical attention if irritation persists.

**Ingestion**

DO NOT INDUCE VOMITING. If victim is conscious and alert, give 2 - 3 glasses of water to drink. GET IMMEDIATE MEDICAL ATTENTION.

**Inhalation**

Move subject to fresh air. Administer artificial respiration if required. Get medical assistance.



## VI. Spill Or Leak Procedures

### Steps to Be Taken In Case Material is Released or Spilled

Ventilate area and remove ignition sources. Dike spill and collect for disposal or reuse. Absorb residues with inert material and collect for disposal. Flush area with water. Prevent polymer and washings from entering surface waters. Wet polymer may cause very slippery conditions.

### Waste Disposal Method

Incinerate or place in chemical landfill in accordance with federal, state and local regulations. The material, as sold, is not a hazardous waste under current RCRA regulations.

## VII. Special Protection Information

### Respiratory Protection

If misting conditions exist, wear NIOSH approved mist respirator.

### Ventilation

Natural or general ventilation is adequate for normal conditions.

Local ventilation is recommended to control exposure from operations that can generate aerosols, mists or vapors.

### Protective Gloves

Neoprene, polyvinyl, butyl rubber or nitrile rubber gloves are recommended.

### Eye Protection

Chemical splash goggles.

### Other Protective Equipment

For operations where contact can occur, coveralls, apron and rubber foot coverings are recommended. A safety shower and eye wash facility should be available.

## VIII. Special Precautions

Spills of product or solutions may cause slippery floor surfaces. Store at temperatures between 0 and 40°C. Keep container closed when not in use.

## IX. State R-T-K Information

| Chemical Name                           | CAS Number | Comment |
|---|------------|---------|
| Light Hydrotreated Petroleum Distillate | 64742-47-8 |         |
| Ethoxylated Nonylphenol, Branched       | 69412-54-4 |         |
| Cationic Polyacrylamide                 | 69418-26-4 |         |
| Nonionic Surfactant                     | 1338-43-8  |         |
| Water                                   | 7732-18-5  |         |
| Acrylamide                              | 79-06-1    | < 0.1 % |

---

**X. SARA Title III Section 313 Information**

Not Applicable

---

**XI. RCRA Information**

Not regulated as a hazardous waste.

Disposal Code None

---

**XII. CERCLA Information**

Not Applicable

---

**XIII. California Proposition 65 Information**

Product contains detectable amounts of acrylamide (CAS# 79-06-1) which is known to the State of California to be a carcinogen.

---

**XIV. Other Information**

All components of this product are listed in the TSCA inventory.

Acrylamide is described as reasonably anticipated to be a carcinogen by the National Toxicology Program (NTP) and as a probable carcinogen by the International Agency for Research on Cancer (IARC).

The D.O.T. defines Combustible Liquid as a hazard class only for bulk packagings, i.e. when a single packaging has a minimum capacity greater than 450 L (119 gallons).



# MATERIAL SAFETY DATA

PRODUCT  
**NALCO 9905 FLOCCULANT**

32.81

Emergency Telephone Number  
Medical (800) 462-5378 (24 hours) (800) I-M-ALERT

-----  
**SECTION 01 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**  
-----

TRADE NAME: NALCO 9905 FLOCCULANT  
DESCRIPTION: Cationic polyacrylamide

NEPA 704M/HMIS RATING: 1/1 HEALTH 1/1 FLAMMABILITY 0/0 REACTIVITY 0  
OTHER  
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

-----  
**SECTION 02 COMPOSITION AND INFORMATION ON INGREDIENTS**  
-----

Our hazard evaluation of the ingredient(s) under OSHA's Hazard Communication Rule, 29 CFR 1910.1200 has found none of the ingredient(s) hazardous.

-----  
**SECTION 03 HAZARD IDENTIFICATION**  
-----

**EMERGENCY OVERVIEW:**  
**CAUTION!** May cause irritation to skin and eyes. Avoid contact with eyes. Avoid prolonged or repeated contact with skin; Avoid breathing dust. Do not take internally.

**PRIMARY ROUTE(S) OF EXPOSURE:** Eye, Skin, Inhalation

**EYE CONTACT:** May cause irritation with prolonged contact.  
**SKIN CONTACT:** May cause irritation with prolonged contact.  
**INHALATION:** May cause slight irritation to the respiratory tract and lungs.

**SYMPTOMS OF EXPOSURE:** A review of available data does not identify any symptoms from exposure.

**AGGRAVATION OF EXISTING CONDITIONS:** A review of available data does not identify any worsening of existing conditions.

-----  
**SECTION 04 FIRST AID INFORMATION**  
-----

**EYES:** Flush with water for 15 minutes. Call a physician.  
**SKIN:** Wash thoroughly with soap and rinse with water. Call a physician.  
**INGESTION:** Induce vomiting. Give water. Call a physician.  
**INHALATION:** Remove to fresh air. Treat symptoms.

**NOTE TO PHYSICIAN:** No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be



# MATERIAL SAFETY DATA

|   |
|---|
| PRODUCT<br><br><b>NALCO 9906 FLOCCULANT</b> |
|---|

Emergency Telephone Number  
 Medical (800) 462-5378 (24 hours) (800) I-M-ALERT

used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

-----  
**SECTION 05 FIRE FIGHTING MEASURES**  
-----

FLASH POINT: Not applicable

EXTINGUISHING MEDIA: Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARD: May evolve NOx under fire conditions.

-----  
**SECTION 06 ACCIDENTAL RELEASE MEASURES**  
-----

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (800) I-M-ALERT or (800) 462-5378.

**SPILL CONTROL AND RECOVERY:**

Solid spills: Sweep or vacuum up and reclaim into recovery or salvage drums for disposal. Wear the protective equipment specified in Section 10. Refer to CERCLA in Section 15.

NOTE: Solutions of product are extremely slippery.

-----  
**SECTION 07 HANDLING AND STORAGE**  
-----

Storage : Keep container closed when not in use.

-----  
**SECTION 08 EXPOSURE CONTROLS AND PERSONAL PROTECTION**  
-----

RESPIRATORY PROTECTION: Respiratory protection not normally needed. If significant dusting occurs, wear a NIOSH approved or equivalent dust respirator.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a positive pressure, self-contained breathing apparatus is recommended.

VENTILATION: If significant dusting occurs, local exhaust ventilation is recommended.

PROTECTIVE EQUIPMENT: No special precautions. Avoid eye and skin



## MATERIAL SAFETY DATA

PRODUCT

**NALCO 9906 FLOCCULANT**

Emergency Telephone Number

Medical (800) 462-5378 (24 hours)

(800) I-M-ALERT

contact, and inhalation of dust.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

**HUMAN EXPOSURE CHARACTERIZATION:** Based on Nalco's recommended product application and our recommended personal protective equipment, the potential human exposure is: MODERATE.

### SECTION 09 PHYSICAL AND CHEMICAL PROPERTIES

|                      |                          |                         |
|----------------------|--------------------------|-------------------------|
| COLOR: White         | FORM: Powder             | ODOR: Slight ammoniacal |
| BULK DENSITY:        | 45.3 lbs/ft <sup>3</sup> |                         |
| SOLUBILITY IN WATER: | Completely               |                         |
| pH (at 1%) =         | 3 - 4                    | ASTM E-70               |
| FLASH POINT:         | Not applicable           |                         |

**NOTE:** These physical properties are typical values for this product.

### SECTION 10 STABILITY AND REACTIVITY

**INCOMPATIBILITY:** Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.

**THERMAL DECOMPOSITION PRODUCTS:** In the event of combustion CO, CO<sub>2</sub>, NO<sub>x</sub> may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

### SECTION 11 TOXICOLOGICAL INFORMATION

**TOXICITY STUDIES:** Toxicity studies have been conducted on this product. The results are shown below.

**ACUTE ORAL TOXICITY (ALBINO RATS):** LD<sub>50</sub> = Greater than 2 g/kg

**HUMAN HAZARD CHARACTERIZATION:** Based on our hazard characterization, the potential human hazard is: LOW

### SECTION 12 ECOLOGICAL INFORMATION

**BIOCHEMICAL OXYGEN DEMAND (5-day BOD):** 5,000 mg/L

PAGE 3 OF 7



# MATERIAL SAFETY DATA

|  |
|--|
| <p>PRODUCT</p> <p><b>NALCO 9906 FLOCCULANT</b></p> |
|--|

Emergency Telephone Number  
 Medical (800) 462-5378 (24 hours) (800) I-M-ALERT

CHEMICAL OXYGEN DEMAND (COD): 225,000 mg/L

If released into the environment, see CERCLA in Section 15.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION: Based on our Hazard Characterization, the potential environmental hazard is: HIGH. Based on Nalco's recommended product application and the product's characteristics, the potential environmental exposure is: LOW.

-----  
**SECTION 13 DISPOSAL CONSIDERATIONS**  
-----

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous solid waste, it can be disposed of in an industrial waste landfill in accordance with local, state, and federal regulations.

-----  
**SECTION 14 TRANSPORTATION INFORMATION**  
-----

PROPER SHIPPING NAME/HAZARD CLASS MAY VARY BY PACKAGING, PROPERTIES, AND MODE OF TRANSPORTATION. TYPICAL PROPER SHIPPING NAMES FOR THIS PRODUCT ARE:

ALL TRANSPORTATION MODES : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

-----  
**SECTION 15 REGULATORY INFORMATION**  
-----

The following regulations apply to this product.

**FEDERAL REGULATIONS:**

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:  
Based on our hazard evaluation, none of the ingredients in this product are hazardous.

CERCLA/SUPERFUND, 40 CFR 117, 302:  
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986

**MATERIAL SAFETY DATA****PRODUCT****NALCO 9905 FLOCCULANT**

Emergency Telephone Number  
Medical (800) 462-5378 (24 hours) (800) I-M-ALERT

(TITLE III) - SECTIONS 302, 311, 312 AND 313:

**SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):**

This product does not contain ingredients listed in Appendix A and B as an Extremely Hazardous Substance.

**SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):**  
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

**SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):**

This product does not contain ingredients (at a level of 1% or greater) on the List of Toxic Chemicals.

**TOXIC SUBSTANCES CONTROL ACT (TSCA):**

The chemical ingredients in this product are on the 8(b) Inventory List (40 CFR 710).

**RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:**  
Consult Section 13 for RCRA classification.

**FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15**  
(formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):  
None of the ingredients are specifically listed.

**CLEAN AIR ACT, Sec. 111 (40 CFR 60), Sec. 112 (40 CFR 61, 1990 Amendments),**  
Sec. 611 (40 CFR 82, CLASS I and II Ozone depleting  
substances):

This product does not contain ingredients covered by the Clean Air Act.

**STATE REGULATIONS:**

**CALIFORNIA PROPOSITION 65:**

This product does not contain any chemicals which require warning under California Proposition 65.

**MICHIGAN CRITICAL MATERIALS:**

This product does not contain ingredients listed on the Michigan Critical Materials Register.

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**MATERIAL SAFETY DATA****PRODUCT****NALCO 9905 FLOCCULANT**

Emergency Telephone Number  
 Medical (800) 462-5378 (24 hours) (800) I-M-ALERT

**STATE RIGHT TO KNOW LAWS:**

This product does not contain ingredients listed by State Right To Know Laws.

**INTERNATIONAL REGULATIONS:**

This is not a WHMIS controlled product under The House of Commons of Canada Bill C-70.

**SECTION 16 OTHER INFORMATION**

None

**SECTION 17 RISK CHARACTERIZATION**

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

- \* The human risk is: LOW.
- \* The environmental risk is: LOW.

Any use inconsistent with Nalco's recommendations may affect our risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

**SECTION 18 REFERENCES**

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda,





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NALCO

**MATERIAL SAFETY DATA**

PRODUCT

**NALCO 9906 FLOCCULANT**

Emergency Telephone Number  
Medical (800) 462-5378 (24 hours) (800) I-M-ALERT

Maryland (CD-ROM version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (CD-ROM version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, Ohio (CD-ROM version), Micromedex, Inc., Englewood, CO.

Shepard's Catalog of Teratogenic Agents (CD-ROM version), Micromedex, Inc., Englewood, CO.

Suspect Chemicals Sourcebook (a guide to industrial chemicals covered under major regulatory and advisory programs), Roytech Publications (a Division of Ariel Corporation), Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, Washington (CD-ROM version), Micromedex, Inc., Englewood, CO.

PREPARED BY: William S. Utley, PhD., DABT, Manager, Product Safety  
DATE CHANGED: 08/13/1998 DATE PRINTED: 03/28/1999

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T.D. # 16.20

Ident. 1698

1 of 4

**MATERIAL SAFETY  
DATA SHEET**
**BASF Corporation Chemicals Division**  
 100 Cherry Hill Road, Parsippany, New Jersey 07054, (201) 316-3000

**BASF**
**PRODUCT NUMBER: 581770 241-7 Antifreeze Formulation**

| SECTION I                                 |                  | Registered Trademark |
|---|------------------|----------------------|
| TRADE NAME: 241-7 Antifreeze Formulation  |                  |                      |
| CHEMICAL NAME: Ethylene Glycol--Inhibited |                  |                      |
| SYNONYMS: Permanent Antifreeze            | FORMULA: Mixture |                      |
| CHEMICAL FAMILY: Glycols                  | MOL. WGT.: N/A   |                      |

| SECTION II - INGREDIENTS          |          |     |                     |
|-----------------------------------|----------|-----|---------------------|
| COMPONENT                         | CAS NO.  | %   | PEL/TLV - SOURCE    |
| 241-7 Antifreeze Formulation      |          | 100 | Not established     |
| Contains:                         |          |     |                     |
| Ethylene Glycol                   | 107-21-1 | ~95 | 50 ppm Ceiling OSHA |
| Proprietary additives             |          | < 5 | Not established     |
| SARA Title III Sect. 313: Listed. |          |     |                     |

| SECTION III - PHYSICAL DATA                  |                                |
|--|--------------------------------|
| BOILING/MELTING POINT @760 mm Hg: 330°F/ N/A | pH: 10.0-11.0                  |
| VAPOR PRESSURE mm Hg @20 C: 18               |                                |
| SPECIFIC GRAVITY OR BULK DENSITY: 1.123      |                                |
| SOLUBILITY IN WATER: Complete                |                                |
| APPEARANCE: Clear, Dyed Liquid               | ODOR: Glycol INTENSITY: Slight |

| SECTION IV - FIRE AND EXPLOSION HAZARD DATA |   |
|---|---|
| FLASH POINT (TEST METHOD): 282°F C.O.C.     | AUTOIGNITION TEMP: 775°F  |
| FLAMMABILITY LIMITS IN AIR (% BY VOL)       | LOWER: N/A UPPER: N/A   |
| EXTINGUISHING MEDIUM                        | Use water fog, alcohol foam, CO2 or dry chemical extinguishing media. NFPA: 1/1/0   |
| SPECIAL FIREFIGHTING PROCEDURES             | Firefighters should be equipped with self-contained breathing apparatus and turnout gear. Avoid breathing vapors of heated or burning antifreeze. |
| UNUSUAL FIRE AND EXPLOSION HAZARDS          | Vapors from heated (above flash point) product may travel to a source of ignition and flash back.   |

**EMERGENCY TELEPHONE NUMBER**

CHEMTREC 800-424-9300

201-316-3000

THIS SHEET IS AVAILABLE ONLY THROUGH THE CHEMICAL SAFETY HAZARD INVESTIGATION CENTER

000326

Ident. 1698  
2 of 4

PRODUCT NUMBER: 581770 241-7 Antifreeze Formulation

**SECTION V - HEALTH DATA****TOXICOLOGICAL TEST DATA:**

241-7 Antifreeze Formulation  
Ethylene Glycol  
Rat, Oral LD50  
Human, Reported Lethal Dose  
Silicates  
Borates

**RESULT:**

5.8 g/kg.  
100 C.C.  
Eye and skin irritant  
Moderately toxic by  
ingestion

**EFFECTS OF OVEREXPOSURE:**

Contact with this product causes eye and skin irritation.  
Inhalation of vapors or mists may be irritating to the respiratory tract.  
Ingestion of about 100 ml. of ethylene glycol may result in acute poisoning, which is characterized by severe abdominal disturbances, central nervous system depression and possible respiratory or renal failure.  
Prolonged inhalation of the vapors may cause unconsciousness and increased lymphocyte counts.  
Chronic overexposure may lead to liver degeneration and severe renal damage.  
Animal studies indicate that ethylene glycol may be embryotoxic and teratogenic by the oral and inhalation routes.

**FIRST AID PROCEDURES:**

Eyes-Immediately wash eyes with running water for 15 minutes.  
If irritation develops, consult a physician.  
Skin-Wash affected areas with soap and water. Remove and launder contaminated clothing before reuse. If irritation develops, consult a physician.  
Ingestion-If swallowed, dilute with water and immediately induce vomiting. Never give fluids or induce vomiting if the victim is unconscious or having convulsions. Get immediate medical attention.  
Inhalation-Move to fresh air. Aid in breathing, if necessary, and get immediate medical attention.

**SECTION VI - REACTIVITY DATA****STABILITY:** Stable.**CONDITIONS TO AVOID:** N/A**CHEMICAL INCOMPATIBILITY:** N/A.**HAZARDOUS DECOMPOSITION PRODUCTS:** N/A**HAZARDOUS POLYMERIZATION:** Does not occur**CONDITIONS TO AVOID:** N/A**CORROSIVE TO METAL:** No**OXIDIZER:** No**SECTION VII - SPECIAL PROTECTION****RESPIRATORY PROTECTION:**

If vapors or mists are generated, wear a NIOSH/MSHA approved organic vapor/mist respirator.

**EYE PROTECTION:** If splashing can occur, use chemical goggles or full face shield.**PROTECTIVE CLOTHING:** Use rubber gloves, apron and shoes. Remove contaminated clothing immediately and wash before reuse.**VENTILATION:** Local exhaust to control vapors or mists.**OTHER:** N/A

Ident. 1698  
3 of 4

PRODUCT NUMBER: 581770 241-7 Antifreeze Formulation

**SECTION VIII - ENVIRONMENTAL DATA****ENVIRONMENTAL TOXICITY DATA:**

Aquatic toxicity rating: TLM96 1000-100 ppm.

**SPILL AND LEAK PROCEDURES:**

Spills should be contained, solidified, and placed in suitable containers for disposal. This material is not regulated under RCRA or CERCLA ("Superfund"). Clean up quickly as spills are a slipping hazard.

HAZARDOUS SUBSTANCE SUPERFUND: No RQ (lbs):

**WASTE DISPOSAL METHOD:**

Incinerate or bury in a licensed facility. Do not discharge into waterways. Discharge to sewer systems with prior approvals is acceptable.

HAZARDOUS WASTE 40CFR261: No HAZARDOUS WASTE NUMBER:

**CONTAINER DISPOSAL:**

Dispose of in licensed facility. Recommend crushing or other means to prevent unauthorized reuse.

**SECTION IX - SHIPPING DATA****D.O.T. PROPER SHIPPING NAME (49CFR172.101-102)**

None

**HAZARDOUS SUBSTANCE (49CFR CERCLA LIST)**

No

REPORTABLE QUANTITY (RQ) None

**D.O.T. HAZARD CLASSIFICATION (CFR172.101-102)**PRIMARY  
NoneSECONDARY  
N/A**D.O.T. LABELS REQUIRED (49CFR172.101-102)**

None

**D.O.T. PLACARDS REQUIRED (CFR172.504)**

None

**POISON CONSTITUENT (49CFR172.203(K))**  
N/A**BILL OF LADING DESCRIPTION**Antifreeze Preparations, Proprietary  
(Ethylene Glycol Base)

CC NO. 332

UN/NA CODE None

DATE PREPARED: 2 / 5 / 86

UPDATED: 2 / 24 / 89

WHILE BASF CORPORATION BELIEVES THE DATA SET FORTH HEREIN ARE ACCURATE AS OF THE DATE HEREOF, BASF CORPORATION MAKES NO WARRANTY WITH RESPECT THERETO AND EXPRESSLY DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. SUCH DATA ARE OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION.

000328

Ident. 1698  
H of 4

PRODUCT NUMBER: 581770 241-7 Antifreeze Formulation

**SECTION X - PRODUCT LABEL**

## 241-7 Antifreeze Formulation

**WARNING:**

CONTAINS ETHYLENE GLYCOL (CAS No.: 107-21-1).  
CONTACT MAY CAUSE TEMPORARY EYE AND SKIN IRRITATION.  
INGESTION MAY RESULT IN ACUTE POISONING, CHARACTERIZED BY SEVERE ABDOMINAL  
DISTURBANCES, CENTRAL NERVOUS SYSTEM DEPRESSION AND POSSIBLE RESPIRATORY OR  
RENAL FAILURE. PROLONGED INHALATION OF VAPORS MAY RESULT IN IRRITATION OR  
UNCONSCIOUSNESS. CHRONIC OVEREXPOSURE MAY LEAD TO LIVER AND KIDNEY DAMAGE.  
ETHYLENE GLYCOL WAS TERATOGENIC IN LABORATORY ANIMAL STUDIES.

**FIRST AID:**

**Eyes**-Immediately wash eyes with running water for 15 minutes.

If irritation develops, consult a physician.

**Skin**-Wash affected areas with soap and water. Remove and launder  
contaminated clothing before reuse. If irritation develops,  
consult a physician.

**Ingestion**-If swallowed, dilute with water and immediately induce  
vomiting. Never give fluids or induce vomiting if the victim  
is unconscious or having convulsions. Get immediate medical  
attention.

**Inhalation**-Move to fresh air. Aid in breathing, if necessary,  
and get immediate medical attention.

**HANDLING AND STORAGE:** Keep containers closed. In case of spill, clean up  
quickly as product is slippery. Wash away small amounts with cool water.  
Absorb large amounts with absorbent material or dike and pump into drums for  
proper disposal. Incinerate or bury in an approved landfill under guidance  
of local EPA. Prevent run-off onto public land or into waterways.

**IN CASE OF FIRE:** Use water fog, alcohol foam, CO2 or dry chemical  
extinguishing media. Firefighters should be equipped with self-contained  
breathing apparatus and turnout gear. Vapors from heated product can travel  
to source of ignition and flash back. Moderate explosion hazard when exposed  
to flame.

**EMPTY CONTAINERS:** All labeled precautions must be observed when handling,  
storing and transporting empty containers due to product residues. Do not  
reuse this container unless it is professionally cleaned and reconditioned.

**DISPOSAL:** Spill material, unused contents and empty containers must be  
disposed of in accordance with local, state and federal regulations. Refer  
to our Material Safety Data Sheet for specific disposal instructions.

**IN CASE OF CHEMICAL EMERGENCY:** Call CHEMTREC day or night for assistance and  
information concerning spilled material, fire, exposure and other chemical  
accidents. 800-424-9300.

**ATTENTION:** This product is sold solely for use by industrial institutions.

Refer to our Technical Bulletin and Material Safety Data Sheet regarding  
safety, usage, applications, hazards, procedures and disposal of this product.  
Consult your supervisor for additional information.

CAS No.: 107-21-1.

Made in U.S.A.

Industrial and Performance Chemicals  
0289

000329

Pg 1064  
(98)

# MATERIAL SAFETY DATA SHEET

32.129

Manufacturer: ProChem Inc. Phone: (815)398-1788  
 826 Roosevelt Rd.  
 Rockford, IL 61109 Fax: (815)398-1810

\*\*\*\*\*

## IDENTIFICATION

\*\*\*\*\*

Product Name: Iron (III) Oxalate Revision Date: 1/9/96  
 Formula:  $Fe_2(C_2O_4)_3 \cdot 6H_2O$   
 Chemical Nature: Salt  
 % Activity: 100

\*\*\*\*\*

## PHYSICAL DATA

\*\*\*\*\*

Boiling Point: Not Applicable  
 Melting Point: Decomposes @ 100°C  
 Specific Gravity: No Data  
 Vapor Pressure at 20°C: No Data  
 Vapor Density (Air=1): No Data  
 Solubility in H<sub>2</sub>O: Soluble in hot water  
 Percent Volatiles by Weight: Not Applicable  
 Ionic Nature: Yes  
 Appearance and Odor: Light green Powder, Odorless

\*\*\*\*\*

## HAZARDOUS INGREDIENTS

\*\*\*\*\*

| Material                              | %   | TLV/PEL         |
|---------------------------------------|-----|-----------------|
| Iron (III) Oxalate<br>CAS# 19459-07-9 | 100 | Not Established |

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\*\*\*\*\*

**FIRE AND EXPLOSION HAZARD DATA**

\*\*\*\*\*

|   |                 |
|---|-----------------|
| Flash Point:                                | Not Established |
| Autoignition Temperature:                   | No Data         |
| Flammable Limits in Air, % by Volume: Lower | No Data         |
| Upper                                       | No Data         |

Extinguishing Media: Use water, carbon dioxide, dry chemical extinguishing agents, dry sand, or dry ground dolomite.

Special Fire Fighting Procedures: Wear NIOS H/MSHA approved self-contained breathing apparatus, flame and chemical resistant clothing; hats, boots, and gloves. If without risk remove material from fire area.

Unusual Fire and Explosion Hazards: Combustible when exposed to prolonged heat or flame. Heating to decomposition emits toxic fumes.

\*\*\*\*\*

**HEALTH HAZARD DATA**

\*\*\*\*\*

Threshold Limit Value: Not Established

Effects of Overexposure: Corrosive via inhalation and ingestion, has a caustic effect on the mouth, esophagus, and stomach. May cause sever damage to kidneys. An irritant to skin, eyes, and mucous membranes.

Emergency and First Aid Procedures: Remove from exposure. Eyes: Flush with copious amounts of water for at least 15 minutes. Skin: Remove any contaminated clothing. Flood skin with large volumes of water for 15 minutes. Ingestion/inhalation: Seek prompt, competent medical attention.

\*\*\*\*\*

**REACTIVITY DATA**

\*\*\*\*\*

Stability: Stable

Conditions to Avoid: Heating to decomposition

Incompatibility: Furfuryl alcohol, silver, sodium chlorite, sodium hypochlorite

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**Hazardous Decomposition Products:** When heated to decomposition, emits toxic fumes.

**Hazardous Polymerization:** Will not occur

**Conditions to Avoid:** Not Applicable

\*\*\*\*\*

**SPILL OR LEAK PROCEDURES**

\*\*\*\*\*

**Steps to be taken if material is Spilled or Released:** Wearing full protective clothing and respiratory protection, eliminate all sources of ignition. Cover spill with dry sand or dry vermiculite, mix well and carefully transfer to a well-marked container. Close container tightly. Submit or retain for disposal.

**Waste Disposal Method:** Consult state, local, and federal regulations for proper disposal.

\*\*\*\*\*

**SPECIAL PROTECTION INFORMATION**

\*\*\*\*\*

**Respiratory Protection:** NIOSH/MSHA approved high efficiency particulate respirator for ordinary use and self-contained breathing apparatus for emergency use.

**Ventilation- Local exhaust:** Fume hood

**Mechanical:** Not adequate

**Special:** Not required

**Other:** Not required

**Protective Gloves:** Rubber

**Eye Protection:** Full face shield and chemical safety goggles

**Other Protective Equipment:** Lab coat and apron, flame and chemical resistant coveralls, eyewash capable of sustained flushing, safety drench shower and hygienic facilities for washing.



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TRANSPORTATION INFORMATION-U.S. D.D.T.

\*\*\*\*\*

Per 49CFR 172.101

Proper Shipping Name: Not regulated

Hazard Classification: None

UN #: None

D

\*\*\*\*\*

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

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**BetzDearborn**

32-130

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**BETZDEARBORN MATERIAL SAFETY DATA SHEET**

EFFECTIVE DATE: 20-APR-1998  
PRINTED DATE: 29-APR-1998

**1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME : POLYFLOC CP1160**

**PRODUCT APPLICATION AREA: FLOCCULANT.**

**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:**

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 Pennsylvania thresholds for carcinogens.

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PRODUCT NAME : POLYFLOC CP1160  
EFFECTIVE DATE: 20-APR-1998  
NON-HAZARDOUS INGREDIENTS:

| CAS#       | CHEMICAL NAME   |
|------------|---|
| 7732-18-5  | WATER   |
| 69418-26-4 | ETHANAMINIUM,N,N,N-TRIMETHYL-2-[(1-OXO-2-PROPENYL)OXY] - CHLORIDE, POLYMER WITH 2-PROPENAMIDE |

32.130

'98'

PRODUCT NAME : POLYFLOC CP1160  
EFFECTIVE DATE: 20-APR-1998

3) HAZARDS IDENTIFICATION

\*\*\*\*\*

EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. Potential eye irritant due to mechanical action only. 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, 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:

Potential eye irritant due to mechanical action only.

ACUTE RESPIRATORY EFFECTS:

Dusts may cause irritation to the 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.

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PRODUCT NAME : POLYFLOC CP1.160  
EFFECTIVE DATE: 20-APR-1998

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#### 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.

---

#### 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)

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#### 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.

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#### 7) HANDLING AND STORAGE

**HANDLING:**

Normal chemical handling.

**STORAGE:**

Keep containers closed when not in use. Keep dry.

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PRODUCT NAME : POLYFLOC CP1160  
EFFECTIVE DATE: 20-APR-1998

## 8) EXPOSURE CONTROLS/PERSONAL PROTECTION

### EXPOSURE LIMITS

This product is not hazardous as defined by OSHA regulations.

#### ENGINEERING CONTROLS:

Adequate ventilation to maintain dust concentrations below the exposure limit of 10 mg/m<sup>3</sup>(PEL/TLV) for nuisance dusts.

#### 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:

airtight chemical goggles

## 9) PHYSICAL AND CHEMICAL PROPERTIES

|                        |               |                       |        |
|------------------------|---------------|-----------------------|--------|
| Density                | 43.200 lb/cu. | Vapor Pressure (mmHG) | < 0.1  |
| Freeze Point (F)       | NA            | Vapor Density (air-1) | < 1.00 |
| Freeze Point (C)       | NA            |                       |        |
| Viscosity(cps 70F,21C) | NA            | % Solubility (water)  | ~ 2.0  |

|                            |                      |
|----------------------------|----------------------|
| Odor                       | None                 |
| Appearance                 | White                |
| Physical State             | Powder               |
| Flash Point                | P-M(CC) > 200F > 93C |
| pH 0.5% Sol. (approx.)     | 4.2                  |
| Evaporation Rate (Ether-1) | < 1.00               |

NA = not applicable ND = not determined

32.130

PRODUCT NAME : POLYFLOC CP1160  
EFFECTIVE DATE: 20-APR-1998

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## 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.

### BETZ INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"A"

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## 11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT: >5,000 mg/kg  
Carcinogenicity DOG: NEGATIVE  
NOTE - One year dog study had no adverse effects.  
Carcinogenicity RAT: NEGATIVE  
NOTE - Two year rat study had no adverse effects.  
Dermal LD50 RABBIT: >2,000 mg/kg  
NOTE - Non-toxic even at high dose levels  
Eye Irritation Score RABBIT:  
NOTE - Mechanical irritation  
Skin Sensitization G.PIG: NEGATIVE

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## 12) ECOLOGICAL INFORMATION

### AQUATIC TOXICOLOGY

#### Fathead Minnow 96 Hour Static Renewal Bioassay

LC50: 5.9 mg/L  
No Effect Level: 2.3 mg/L

#### Daphnia magna 48 Hour Static Renewal Bioassay

LC50: 158 mg/L  
No Effect Level: 15 mg/L

### BIODEGRADATION

COD (mg/gm): 1100  
TOC (mg/gm): 369  
BOD-5 (mg/gm): 122  
BOD-28 (mg/gm): 165

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PRODUCT NAME : POLYFLOC CP1160  
EFFECTIVE DATE: 20-APR-1998

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### 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

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### CALIFORNIA REGULATORY INFORMATION

#### CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

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### MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds



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48'

PRODUCT NAME : POLYFLOC CP1160  
EFFECTIVE DATE: 20-APR-1998

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: | 11-FEB-1998    |                       | ** NEW **   |
|              | 20-APR-1998    | ;EDIT:9               | 11-FEB-1998 |

**BetzDearborn****BETZDEARBORN MATERIAL  
SAFETY DATA SHEET**EFFECTIVE DATE: 16-MAR-1998  
PRINTED DATE: 29-APR-1998

32.131

**1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT NAME : POLYFLOC AP1100

PRODUCT APPLICATION AREA: FLOCCULANT.

**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:**

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 Pennsylvania thresholds for carcinogens.

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PRODUCT NAME : POLYFLOC AP1100

EFFECTIVE DATE: 16-MAR-1998

NON-HAZARDOUS INGREDIENTS:

CAS#

CHEMICAL NAME

7732-18-5  
25085-02-3

WATER  
ACRYLAMIDE/SODIUM ACRYLATE COPOLYMER

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CONTINUED

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PRODUCT NAME : POLYFLOC AP1100  
EFFECTIVE DATE: 16-MAR-1998

**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.

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PRODUCT NAME : POLYFLOC AP1100  
EFFECTIVE DATE: 16-MAR-1998

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#### 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.

---

#### 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.

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PRODUCT NAME : POLYFLOC AP1100  
EFFECTIVE DATE: 16-MAR-1998

## 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

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PRODUCT NAME : POLYFLOC AP1100  
EFFECTIVE DATE: 16-MAR-1998

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.

BETZ 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

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CONTINUED

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PRODUCT NAME : POLYFLOC AP1100  
EFFECTIVE DATE: 16-MAR-1998

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## 12) ECOLOGICAL INFORMATION

### AQUATIC 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



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'98'

PRODUCT NAME : POLYFLOC AP1100  
EFFECTIVE DATE: 16-MAR-1998

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.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: 16-MAR-1998 |                       | ** NEW **  |

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From : WARREN DIST.

PHONE No. : 4022895306

Apr. 25 1995 7:40AM P01

1995

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|                  |            |         |      |            |   |
|------------------|------------|---------|------|------------|---|
| Post-It Fax Note | 7671       | Date    | 4/24 | # of pages | 3 |
| To               | BAIG PEACE |         | From | JASUK      |   |
| Co. Adpt.        |            | Co.     |      |            |   |
| PHONE #          |            | Phone # |      |            |   |
| FAX #            |            | Fax #   |      |            |   |

727 South 13th Street  
Omaha, Nebraska 68102

800-432-9306  
FAX 402-341-8654

### MATERIAL SAFETY DATA SHEET.

**IDENTITY (As used on label and list):**  
**SIERRA ANTIFREEZE-COOLANT**

**PRODUCT CODE: SI01AF6P**

**NFPA Hazard Identification**

|               |              |
|---------------|--------------|
|               | 0 - Least    |
| Health: 0     | 1 - Slight   |
| Fire: 1       | 2 - Moderate |
| Reactivity: 0 | 3 - High     |
|               | 4 - Extreme  |

**SKIN CONTACT:** No significant adverse effects are expected under anticipated conditions of normal use. Repeated, prolonged exposure may cause slight flaking, tenderness, and softening of skin.

**INHALATION:** No significant adverse effects are expected under anticipated conditions of normal use. If effects do occur, refer to FIRST AID section.

**INGESTION:** No significant adverse effects are expected under anticipated conditions of normal use. Excessive ingestion may cause central nervous system effects.

**Section I - General Information**

Safe Brands Corporation  
2849 River Road  
Council Bluffs, IA 51501  
Emergency (402) 341-9397  
Information (800) 432-9306  
Chemtrec (800) 424-9300  
Revised: 08-18-94

**SIGNS AND SYMPTOMS OF OVEREXPOSURE:**  
as above

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:** Material and/or its emissions may aggravate preexisting eye disease.

**OTHER HEALTH INFORMATION:** none

**Section II - Composition/Information on Ingredients**

| COMPONENT NAME     | %   | CAS       |
|--------------------|-----|-----------|
| PEL MIST PEL VAPOR |     |           |
| Sodium Nitrate     | < 1 | 7631-09-4 |
| none established   |     |           |
| Sodium Silicate    | < 1 | 1344-02-8 |
| none established   |     |           |

**NON-HAZARDOUS INGREDIENTS > 1 %**

|                       |    |         |
|-----------------------|----|---------|
| Propylene Glycol      | 94 | 57-55-6 |
| none established      |    |         |
| Water                 | 3  |         |
| Proprietary additives | 3  |         |

(Does not contain IARC, NTP, OSHA and ACGIH listed carcinogens greater than 0.1%)

**Section III - Hazards Identification**

**EYE CONTACT:** May cause minor eye irritation.

**Section IV - First Aid Procedures**

**EYE CONTACT:** Immediately rinse with clean water for 20-30 minutes. Retract eyelids often. Obtain medical attention if pain, blinking, tears or redness persist.

**SKIN CONTACT:** Product is not expected to present a significant skin hazard under anticipated conditions of normal use.

**INHALATION:** If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain emergency medical attention. Prompt action is essential.

**INGESTION:** If large quantity is swallowed, give a pint of lukewarm water if victim is completely conscious and alert. If large quantities are consumed, induce vomiting. Obtain emergency medical attention.

From : WARREN DIST.

PHONE No. : 4022895306

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2584

CARCINOGENICITY: n/a

**Section V - Fire and Explosion Hazard Data**

Flash Point (deg F): 211

Flammable or Explosive Limits (approximate % by volume in air) LEL: 2.4 UEL: 17.4

EXTINGUISHING MEDIA: carbon dioxide, dry chemical, alcohol type foam, water spray, water fog

**SPECIAL FIRE FIGHTING PROCEDURES:** Wear positive pressure, self contained breathing apparatus and other protective apparatus as warranted. Fight fire from distance or protected location - heat may build up pressure and rupture closed containers. Liquid may form slippery film. Use water spray or fog for cooling, solid stream may spread fire as burning liquid will float on water. Avoid frothing/steam explosion. Notify authorities if liquid enters sewers/public waters.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Heat from fire can generate flammable vapor. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Vapors may be heavier than air and travel long distances along ground before igniting and flashing back. Fine sprays and mists may be combustible at temperatures below normal flash point.

**Section VI - Accidental Release Measures**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Prevent flow to sewers and public waters as it may contaminate said water. Restrict water usage to prevent slip/fall hazard. Soak up small spills with inert solids. Dike and recover large land spills. Notify appropriate authorities if product enters any waterway.

**Section VII - Handling and Storage**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Store in tightly closed and properly vented containers, away from heat, sparks, open flame, and strong oxidizing agents.

**Section VIII - Exposure Controls/Personal Protection**

**RESPIRATORY PROTECTION:** No special respiratory protection equipment is recommended

under normal conditions of anticipated use with adequate ventilation.

**VENTILATION:** Adequate general ventilation is required, local exhaust is recommended if possible.

**PROTECTIVE GLOVES:** not required

**EYE PROTECTION:** Chemical splash goggles or full face shield must be worn when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapor. Contact lenses should not be worn.

**OTHER PROTECTIVE EQUIPMENT:** none

**WORK PRACTICES/ENGINEERING CONTROLS:** Keep containers closed when not in use.

**PERSONAL HYGIENE:** If product handling results in skin contact, wash hands and other exposed areas with mild soap and water before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing and wash thoroughly before reuse.

**Section IX - Physical/Chemical Characteristics**

Boiling Point (deg F): 365

Specific Gravity (H<sub>2</sub>O=1): 1.04

Vapor Pressure (mm Hg): &lt;0.1

Melting Point (deg F): -76

Vapor Density (Air=1): 2.6

Solubility in Water : complete

Evaporation Rate (n-butyl Acetate=1): slight

**APPEARANCE AND ODOR:** dark green, slightly viscous almost odorless liquid

**Section X - Reactivity Data**

**STABILITY:** stable

**CONDITIONS TO AVOID:** heat, sparks, open flame

**INCOMPATIBILITY (MATERIALS TO AVOID):** strong alkalis, strong oxidizing agents  
**HAZARDOUS DECOMPOSITION OR BYPRODUCTS:** carbon monoxide and other toxic vapors

**HAZARDOUS POLYMERIZATION:** not expected to occur

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PHONE No. : 4022895306

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CONDITIONS TO AVOID: n/a

**Section XI - Toxicological Information**

See Section IV

**Section XII - Ecological Information**

No chemicals in this product are subject to the reporting requirements of CERCLA.

**Section XIII - Disposal Considerations**

WASTE DISPOSAL METHOD: Landfill solids at permitted sites using registered transporters. Burn concentrated liquids, avoiding flameouts, and assuring emissions comply with applicable regulations. Dilute aqueous waste may biodegrade, but avoid overloading plant biomass and assuring effluent complies with applicable regulations.

**Section XIV - Transport Information**

This product is not regulated by DOT

**Section XV - Regulatory Information**

WHMIS classification for product: n/a

This product has been classified in accordance with the hazard criteria of the CFR and the MSDS contains all the information required by the CFR.

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in the data sheet which we received from sources outside our company and we believe that information to be correct, but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either expressed or implied.





WESTERN CHEMICAL INTERNATIONAL, INC.  
2939 N. 67TH PLACE, SCOTTSDALE, AZ 85251 (602) 990-9487

B-10.27

|               |   |
|---------------|---|
| HAZARD RATING |   |
| HEALTH        | 1 |
| FLAMMABILITY  | 1 |
| REACTIVITY    | 0 |
| SPECIAL       | 0 |

MAY BE USED TO COMPLY WITH DEHA'S HAZARD COMMUNICATION STANDARD (1982) 29 CFR 1910.1200. STANDARD MUST BE CONSULTED FOR SPECIFIC REQUIREMENTS

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COMPOUND, CLEANING LIQUID/COMBUS. LIQ. NA 1270 P.O.T. CLASSIFICATION:

I - IDENTIFICATION

|                                 |                                |
|---------------------------------|--------------------------------|
| PRODUCT NAME "EPA 2000" WCI-140 | EMERGENCY PHONE (602) 990-9487 |
| PREPARER M. Michaels            | DATE PREPARED 8/18/92          |

NONE OF THE INGREDIENTS IN THIS FORMULATION ARE FOUND ON ANY LISTS OF HAZARDOUS, CARCINOGENIC OR BANNED CHEMICAL AGENTS OR MATERIALS GENERATED BY THEM. AGENCIES INVESTIGATED INCLUDE THE E.P.A., F.D.A., NATIONAL CANCER INSTITUTE, NATIONAL SCIENCE FOUNDATION, O.S.H.A. (FEDERAL AND CALIFORNIA), THE CONSUMER PRODUCT SAFETY COMMISSION, D.O.T. (SAFETY INSTITUTE AND SPECIAL PROGRAMS ADMINISTRATION), AND THE NATIONAL TOXICOLOGY PROGRAM. THE FORMULATION IS A TRADE SECRET AND COMPLIES WITH 29CFR XVII-1910.1200, SECTION(i). "TRADE SECRETS."

II - HAZARDOUS INGREDIENTS

| PRINCIPLE COMPONENT(S) (CHEMICAL NAMES)  | CAS#       | TLV  | PEL  |
|--|------------|------|------|
| ALIPHATIC HYDROCARBONS C10-C14   | 64742-47-8 | 200  | 200  |
| PARAFFINIC HYDROCARBONS  | 64742-88-8 | 200  | 200  |
| D-LIMONENE   | 5989-27-5  | None | None |
| "EPA 2000" formula is a trade secret and complies with 29 CFR 1910.1200, Section (i) Trade Secrets. VOC (Volatile Organic Compounds) is within Air Quality Emission Standards (California-All Districts). No ingredients listed under Cal. State Drinking & Toxic Chemical Enforcement Act (1986). OSHA Hazard Class 29 CFR 1910.1200 - NON HAZARDOUS LIQUID; RCRA Hazardous Waste Class 40 CFR 261.2 - NON HAZARDOUS WASTE; TCLP Waste Class 40 CFR 261.4 - NON HAZARDOUS WASTE |            |      |      |

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III - PHYSICAL DATA

|                              |           |   |  |
|------------------------------|-----------|---|--|
| BOILING POINT (°F)           | 320-290°F | SPECIFIC GRAVITY (H <sub>2</sub> O = 1) | 0.810  |
| VAPOR PRESSURE (psig)/mm Hg. | @25°C 1   | PH                                      | N/D  |
| VAPOR DENSITY (Air = 1)      | 3         | EVAPORATION RATE                        | Butyl Acetate=1 <1                             |
| SOLUBILITY IN WATER          | Insoluble | APPEARANCE AND ODOR                     | Non viscous liquid, clear color, pleasant odor |

IV - FIRE AND EXPLOSION HAZARD DATA

|                                    |  |                  |                     |
|------------------------------------|--|------------------|---------------------|
| FLASH POINT                        | 154°F (open cup)<br>143°F (TCC/Pensky-Martens)                                   | FLAMMABLE LIMITS | Lower N/A Upper N/A |
| EXTINGUISHING MEDIA                | CO <sub>2</sub> , Dry Powder, Foam   |                  |                     |
| SPECIAL FIRE FIGHTING PROCEDURES   | Class B Procedures   |                  |                     |
| UNUSUAL FIRE AND EXPLOSION HAZARDS | Keep away from sparks and open flames. Do not use welding torch on or near drum. |                  |                     |

V - REACTIVITY DATA

|                                       |                  |                     |   |
|---------------------------------------|------------------|---------------------|---|
| CHEMICAL STABILITY                    | UNSTABLE         | CONDITIONS TO AVOID | Open flames, welding arcs, or other high temperature sources. |
|                                       | STABLE           |                     |   |
| INCOMPATIBILITY (Materials to avoid)  | Oxidizing agents |                     |   |
| HAZARDOUS DECOMPOSITION OR BYPRODUCTS | None Known       |                     |   |
| HAZARDOUS POLYMERIZATION              | MAY OCCUR        | CONDITIONS TO AVOID | None Known  |
|                                       | WILL NOT OCCUR   |                     |   |

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| VI - HEALTH HAZARD DATA   |          |                  |          |
|---|----------|------------------|----------|
| ROUTE(S) OF ENTRY: INHALATION?  | Unlikely | SKIN?            | Possible |
|   |          | INGESTION?       | Unlikely |
| HEALTH HAZARDS (ACUTE AND CHRONIC)<br>Product has low vapor pressure and should not present a hazard under normal working conditions.   |          |                  |          |
| SIGNS AND SYMPTOMS OF EXPOSURE<br>Product considered safe under normal usage. Over exposure, however, may result in the following: INHALATION: Dizziness; SKIN/EYES: Irritation; INGESTION: Gastro-intestinal irritation.                               |          |                  |          |
| CARCINOGENICITY.  | NTP? No  | IARC MONOGRAPHS? | No       |
|   |          | OSHA REGULATED?  | No       |
| MEDICAL CONDITIONS<br>GENERALLY AGGRAVATED BY EXPOSURE<br>None Known  |          |                  |          |
| EMERGENCY AND FIRST AID PROCEDURES<br>INHALATION: Remove to fresh air; SKIN: Wash with soap and water; EYES: Flush with water for 15 minutes. If irritation persists, seek medical attention. INGESTION: Do not induce vomiting, get medical attention. |          |                  |          |

| VII - PRECAUTIONS FOR SAFE HANDLING AND USE  |  |
|--|--|
| STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED. Allow small spills to evaporate. Larger spills should be collected and disposed of properly in accordance with regulations.   |  |
| WASTE DISPOSAL METHOD: EPA 2000 has a high BTU value. Waste product can, therefore, be mixed with normal waste oil for burning as industrial fuel. It can also be recycled or reclaimed. |  |
| PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:<br>Store in cool, dry area away from heat. Keep container tightly closed when product is not being used.                                |  |

| VIII - CONTROL MEASURES   |                      |                |                        |
|---|----------------------|----------------|------------------------|
| RESPIRATORY PROTECTION (SPECIFY TYPE) Not required if TLV kept below PPM                        |                      |                |                        |
| VENTILATION   | LOCAL EXHAUST        | Adequate       | SPECIAL None           |
|   | MECHANICAL (GENERAL) | Adequate       | OTHER None             |
| PROTECTIVE GLOVES   | Nitrile /PVC         | EYE PROTECTION | Goggles/Safety Glasses |
| OTHER PROTECTIVE CLOTHING OR EQUIPMENT None required  |                      |                |                        |
| WORK/HYGIENIC PRACTICES Keep eye wash in vicinity. Wash with soap & water before handling food. |                      |                |                        |

NOTICE: WE BELIEVE THAT THE INFORMATION CONTAINED ON THIS MATERIAL SAFETY DATA SHEET IS ACCURATE. THE SUGGESTED PROCEDURES ARE BASED ON EXPERIENCE AS OF THE DATE OF PUBLICATION. THEY ARE NOT NECESSARILY ALL INCLUSIVE NOR FULLY ADEQUATE IN EVERY CIRCUMSTANCE. ALSO, THE SUGGESTIONS SHOULD NOT BE CONFUSED WITH NOR FOLLOWED IN VIOLATION OF APPLICABLE LAWS, REGULATIONS, RULES OR INSURANCE REQUIREMENTS. NO WARRANTY (EXPRESS OR IMPLIED) OF MERCHANTABILITY, FITNESS OR OTHERWISE IS MADE.

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**SAVOGRAN**

P.O. Box 130, Norwood, Mass. 02062

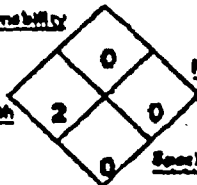
Emergency Telephone: (617) 762-5400

## DATA FOR HAZARDS INFORMATION LABEL

## Hazard Code

4 = Extreme  
3 = High  
2 = Moderate  
1 = Slight  
0 = Insignificant

## Flammability



## Reactivity

## Health

## Special

## MATERIAL SAFETY DATA SHEET

Page 1 of 2

TRADE NAME: SAVOGRAN TBP with trisodium phosphate EFFECTIVE DATE: March, 1991  
 CHEMICAL NAME: Mixture C.A.S. No.: Not Applicable Class: DETERGENT  
 DOT SHIPPING NAME AND LABELING: Cleaning Compound - Not regulated under 5000 pounds

## SECTION 2

## HAZARDOUS INGREDIENTS

|   | C.A.S. No. | Ht. X | Exposure Guidelines |
|---|------------|-------|---------------------|
| Sodium Phosphate, Tribasic, crystalline | 10101-89-0 | >80   | Not established     |
| Sodium Sesquicarbonate, crystalline     | 533-96-0   | <20   | Not established     |

Average elemental phosphorous content 7.3% in the form of phosphates. Equivalent of 17 grams per cup of powder.

## SECTION 3

## PHYSICAL DATA

|                                      |                                      |
|--------------------------------------|--------------------------------------|
| Boiling Point: > 500°C               | X Volatile: NA                       |
| Melting Point: NA                    | Evaporation Rate: NA                 |
| Vapor Pressure: NA                   | Solubility in water: Moderate        |
| Specific Gravity: NA                 | pH (1% in H <sub>2</sub> O): 11 - 12 |
| Density: 60 - 75 lbs/ft <sup>3</sup> | Appearance: White crystalline solid  |

## SECTION 4

## FIRE AND EXPLOSION DATA

**FLASH POINT:** Not applicable  
**FLAMMABLE LIMITS:** Not applicable  
**EXTINGUISHING MEDIA:** Nonflammable  
**HAZARDOUS DECOMPOSITION PRODUCTS:** May form toxic materials: carbon dioxide, carbon monoxide, etc. when heated to high temperature.  
**SPECIAL FIREFIGHTING PROCEDURES:** Solutions in water are moderately to strong alkaline. Wear full protective clothing.  
**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Not applicable

## SECTION 5

## HEALTH HAZARD DATA

**THRESHOLD LIMIT VALUE:** See Section 2  
**EFFECTS OF EXPOSURE - Routes of Entry - ACUTE (immediate)**  
**Eyes:** Can cause severe irritation and burning and transient injury to cornea.  
**Skin:** Irritating, may cause chemical burns and dermatitis.  
**Inhalation:** Inhalation of dust can cause nasal and respiratory irritation.  
**Swallowing:** May cause irritation and chemical burns to the gastrointestinal tract.  
**EFFECTS OF EXPOSURE - CHRONIC (delayed):** None known  
 Carcinogenicity: NTP? No IARC MONOGRAPHS? No OSHA REGULATED? No  
**FIRST AID:**

**Eyes:** Flush eyes with plenty of running water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of all tissue. Get medical attention promptly.  
**Skin:** Remove contaminated clothing and wash skin thoroughly with water. If irritation occurs get medical attention promptly. Thoroughly wash contaminated clothing before reuse.  
**Inhalation:** If illness occurs, remove patient to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, start artificial respiration. Get medical attention promptly.  
**Swallowing:** Never give anything by mouth to an unconscious person. If swallowed DO NOT INDUCE VOMITING. Give large quantities of water (if available give several glasses of milk). If vomiting occurs spontaneously keep airway clear and give more water. Get medical attention promptly. If symptoms indicate, apply treatment as appropriate for corrosive alkali substance.

000355

Quality Products Since 1876  
**SAVOGRAN**   
 P.O. BOX 130 NORWOOD MASS. 02062  
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MSDS SAVOGRAN TBP

## SECTION 6

## REACTIVITY DATA

**STABILITY:** Stable**HAZARDOUS POLYMERIZATION:** Will not occur.**INCOMPATIBILITY (materials to avoid):** Solutions in water are highly alkaline and may produce hydrogen gas when in contact with aluminum. Will react with acids to form carbon dioxide. Material is hygroscopic and tends to cake.**CONDITIONS TO AVOID:** See "SECTION 4 - UNUSUAL FIRE AND EXPLOSION HAZARDS."

## SECTION 7

## SPILL OR LEAK PROCEDURES

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Review "SECTION 4 - UNUSUAL FIRE AND EXPLOSION HAZARDS."**SMALL SPILLS:** Sweep up material and transfer to containers. Thoroughly sweep area to clean up residue. Remaining residue may be washed away with water.**LARGE SPILLS:** Same as for small spills.**DISPOSAL OF WASTE:** Small quantities may be deposited in general trash and residue flushed down drain with water. Large spills - Deposit containers in posted toxic substances land-fill in accordance with local, state and federal regulations. Tris (phosphorus) phosphate has a reportable quantity (RQ) of 5000 lbs.

## SECTION 8

## SPECIAL PROTECTION INFORMATION

**VENTILATION:** Use local exhaust to control dust formation**RESPIRATORY PROTECTION:** Wear NIOSH/MSHA approved dust respirator, if dust is formed**GLOVES:** Industrial quality cotton lined neoprene gloves with close fitting wristlets.**EYE PROTECTION:** Chemical goggles or safety glasses with side shield.**OTHER PROTECTIVE EQUIPMENT:** No special protective clothing needed; however, wear long sleeved shirts with long pants to protect skin against splashes and spills.

## SECTION 9

## SPECIAL PRECAUTIONS

**EMPTIED CONTAINERS:** Empty containers may be incinerated or discarded with general trash. Large containers should be completely emptied before disposal. Because empty containers may contain residues which are hazardous, all precautions given on this sheet should be observed.**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Store in dry place. Moisture can cause caking. Keep away from acids of all types. Water solutions can be corrosive to aluminum and generate hydrogen.**NOTE:** Judgement of potential hazards of this mixture is based on information available about individual components listed under SECTION 2 - HAZARDOUS INGREDIENTS. Direct testing of mixture has not been one.

Information given herein is believed to be accurate and is given in good faith; however, no warranty either expressed or implied is made. It is strongly suggested that users confirm in advance of need that the information is current and applicable to their situations.

**Note:** The sale or use of cleaners containing Phosphates is prohibited in some states and localities.

000356



**OxyChem®**32.59  
IDENT 727**MATERIAL SAFETY DATA SHEET** 1099

MSDS NUMBER : M5389  
 MSDS DATE : 04-09-90  
 PRODUCT NAME : 50% CAUSTIC SODA SOLUTION

24 HOUR EMERGENCY PHONE: (716) 278-7021

**I. PRODUCT IDENTIFICATION****HMIS HAZARD RATINGS**

HEALTH HAZARD 3 FIRE HAZARD 0 REACTIVITY 2  
 Based on the National Paint & Coatings Association HMIS rating system.

**SARA/TITLE III HAZARD CATEGORIES (See Section X)**

Immediate (ACUTE) Health: YES Reactive Hazard: YES  
 Delayed (Chronic) Health: NO Sudden Release of Pressure: NO  
 Fire Hazard: NO

MANUFACTURER'S: Occidental Chemical Corporation Telephone  
 NAME AND : Customer Service, Occidental Tower, (1-800-752-5151)  
 ADDRESS : P O Box 809050, Dallas, Texas 75380

CHEMICAL NAME: Sodium Hydroxide CAS NUMBER: 1310-73-2

SYNONYMS/Common Names: Sodium Hydroxide; NaOH

CHEMICAL FORMULA: NaOH

DOT PROPER SHIPPING NAME: Sodium Hydroxide, Liquid

DOT HAZARD CLASS: Corrosive Material

DOT I.D. NUMBER: UN1824

DOT HAZARDOUS SUBSTANCE: RQ 1000#

**II. HEALTH HAZARD INFORMATION****EMERGENCY AND FIRST AID PROCEDURES****EYES:**

OBJECT IS TO FLUSH MATERIAL OUT IMMEDIATELY THEN SEEK MEDICAL ATTENTION. IMMEDIATELY flush eyes with large amounts of water for at least 15 minutes forcibly holding lids apart to ensure flushing of entire surface. Washing eyes within several seconds is essential to achieve maximum effectiveness. SEEK MEDICAL ATTENTION IMMEDIATELY.

CAS : Chemical Abstract Service Number      NA : No relevant information found or not available  
 PEL : OSHA Permissible Exposure Limit      CSAP : Corporate Exposure Limit  
 TLY : ACGIH Threshold Limit Value, Current      NA : Not applicable  
 IMPORTANT! The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY, OR GUARANTEE, EXPRESS OR IMPLIED IS MADE REGARDING PERFORMANCE, STABILITY, OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling and storage. Other factors may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as a recommendation to infringe any existing patents or violate any Federal, State or local laws.

000357

OCCIDENTAL CHEMICAL  
MSDS NUMBER: M5389  
PRODUCT NAME: 50% CAUSTIC SODA SOLUTION

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04-09-90

Ident

## II. HEALTH HAZARD INFORMATION (Continued)

### SKIN:

IMMEDIATELY wash with plenty of water for at least 15 minutes. Remove contaminated clothing and footwear. Wash clothing before reuse and discard footwear which cannot be decontaminated. SEEK MEDICAL ATTENTION IMMEDIATELY.

### INHALATION:

Remove to fresh air; if breathing is difficult have trained person administer oxygen. If respiration stops, give mouth-to-mouth resuscitation. GET MEDICAL ATTENTION.

### INGESTION:

NEVER give anything by mouth to an unconscious person. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. If available, give several glasses of milk. If vomiting occurs spontaneously, keep airway clear. SEEK MEDICAL ATTENTION IMMEDIATELY.

### ROUTES OF EXPOSURE

#### INHALATION:

Airborne concentrations of dust, mist, or spray of this product may cause damage to the upper respiratory tract and lung tissue proper which could produce chemical pneumonia, depending upon severity of exposure.

#### SKIN:

This product is destructive to tissue contacted and produces severe burns. A latent period may exist between exposure and sense of irritation.

#### EYE CONTACT:

This product is destructive to eye tissues on contact. Will cause severe burns that result in damage to the eyes and even blindness.

#### INGESTION:

This product, if swallowed, can cause severe burns and complete tissue perforation of mucous membranes of the mouth, throat, esophagus, and stomach.

### EFFECTS OF OVEREXPOSURE

#### ACUTE:

Corrosive to all body tissues with which it comes in contact. The effect of local dermal exposure may consist of multiple areas of superficial destruction of the skin or of primary irritant dermatitis. Similarly, inhalation of dust, spray, or mist may result in varying degrees of irritation or damage to the respiratory tract tissues and an increased susceptibility to respiratory illness. These effects occur only when the TLV is exceeded.

#### CHRONIC:

No known chronic effects.

#### TOXICOLOGY DATA:

Caustic soda is a corrosive material.  
Acute Oral LD50 = 140-340 mg/kg (rat)  
Acute Dermal LD50 = 1350 mg/kg (rabbit)

#### Human Dermal Exposure

Regardless of concentrations, the severity of damage and extent of its irreversibility increases with length of contact time. Prolonged contact with even dilute sodium hydroxide solution can cause a high degree of tissue destruction. The latent period, following skin contact during which no sensation of irritation occurs, varies from several hours for 0.4 - 4% solution to 3 minutes with 25 - 50% solution.

000358

OCCIDENTAL CHEMICAL  
 MSDS NUMBER: M5389  
 PRODUCT NAME: 50% CAUSTIC SODA SOLUTION

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Ident 727

### III. IMPORTANT COMPONENTS

#### CAS NUMBER / NAME

1310732 Sodium hydroxide (NaOH)

#### EXPOSURE LIMITS

PEL=2 mg/m3, Ceiling  
 TLV=2 mg/m3, Ceiling

#### PERCENTAGE

VOL ND  
 WT 48.50-51

#### COMMON NAMES:

CAUSTIC SODA

Listed On(List Legend Below):

13 18 21

7647145 Sodium chloride (NaCl)

#### EXPOSURE LIMITS

PEL=None established  
 TLV=None established

#### PERCENTAGE

VOL ND  
 WT 0.80-1.30

#### COMMON NAMES:

SALT

Listed On(List Legend Below):

23

7732185 Water

#### EXPOSURE LIMITS

PEL=Not Established  
 TLV=Not Established

#### PERCENTAGE

VOL ND  
 WT 49-51.50

#### COMMON NAMES:

Listed On(List Legend Below):

19 23

#### See Section II

All components of this product that are required to be on the TSCA Inventory are listed on the inventory.

Not listed as carcinogen - IARC, NTP, OSHA

#### LIST LEGEND

13 PA ENVIRONMENTAL HAZ SUBSTANCE  
 19 PA REQUIREMENT- 3% OR GREATER  
 23 NJ REQUIREMENT- 1% OR GREATER

18 NY HAZARDOUS SUBSTANCES  
 21 NJ SPECIAL HEALTH HAZ SUB

### IV. FIRE AND EXPLOSION DATA

FLASH POINT: NA

AUTOIGNITION TEMPERATURE: Nonflammable

FLAMMABLE LIMITS IN AIR, % BY VOLUME- UPPER: NA  
 LOWER: NA

#### EXTINGUISHING MEDIA:

This product is not combustible. Water spray, foam, carbon dioxide or dry chemical may be used where this product is stored.

#### SPECIAL FIRE FIGHTING PROCEDURES:

Wear full protective clothing. Avoid direct contact of this product with water as this can cause a violent exothermic reaction.

#### UNUSUAL FIRE AND EXPLOSION HAZARD:

None. See Reactivity (Section VII).

000359

OCCIDENTAL CHEMICAL  
MSDS NUMBER: M5389  
PRODUCT NAME: 50% CAUSTIC SODA SOLUTION

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04-09-90

IDENT

## V. SPECIAL PROTECTION

### VENTILATION REQUIREMENTS:

Special ventilation is not required under normal use. Use local exhaust ventilation where dust, mist, or spray may be generated. NOTE: Where carbon monoxide or other reaction products may be generated, special ventilation may be required.

### SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

#### RESPIRATORY:

Respiratory protection is not required under normal use. Use NIOSH/MSHA approved respirators where dust, mist, or spray may be generated.

#### EYE:

Wear chemical safety goggles plus full face shield to protect against splashing.

#### GLOVES:

Chemical resistant gloves should be worn. Gloves may be decontaminated by washing with mild soap and water. Natural and butyl rubber have been suggested.

#### OTHER CLOTHING AND EQUIPMENT:

Impervious protective clothing and chemically resistant safety shoes should be worn to minimize contact. Wash contaminated clothing with soap and water and dry before reuse. Showers and eyewash facilities should be accessible.

### MONITORING EXPOSURE

#### BIOLOGICAL:

NA

#### PERSONAL/AREA:

Use NIOSH Analytical Method No. 7401.

## VI. PHYSICAL DATA

BOILING POINT @ 760 mm Hg: 143°C (289°F)

FREEZING POINT: 12.1°C (54°F)

VAPOR PRESSURE: 13 mm Hg @ 60°C

SPECIFIC GRAVITY (H<sub>2</sub>O=1): 1.54 @ 15.6°C

SOLUBILITY IN H<sub>2</sub>O % BY WT: Completely soluble

VAPOR DENSITY (Air=1): NA

APPEARANCE AND ODOR: Clear liquid with no distinct odor.

pH: 7.5% solution has pH 14.0

DENSITY: 12.8 lb/gal

OCCIDENTAL CHEMICAL  
MSDS NUMBER: M5389  
PRODUCT NAME: 50% CAUSTIC SODA SOLUTION

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## VII. REACTIVITY DATA

### CONDITIONS CONTRIBUTING TO INSTABILITY:

Under normal conditions, this product is stable.

### INCOMPATIBILITY:

See Handling and Storage (Section VIII). Avoid direct contact with water. This product may be added slowly to water or acids with dilution and agitation to avoid a violent exothermic reaction. When handling this product, avoid contact with aluminum, tin, zinc, and alloys containing these metals. Do not mix with strong acids without dilution and agitation to prevent violent or explosive reaction. Avoid contact with leather, wool, acids, organic halogen compounds and organic nitro compounds.

### HAZARDOUS DECOMPOSITION PRODUCTS:

None known.

### CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION:

Material is not known to polymerize.

## VIII. HANDLING AND STORAGE

### HANDLING AND STORAGE PRECAUTIONS:

Do not get into eyes, on skin, on clothing.

Avoid breathing dust, mists, or spray.

Do not take internally.

Use with adequate ventilation and employ respiratory protection when exposure to dust, mist or spray is possible.

When handling, wear chemical splash goggles, face shield, rubber gloves and protective clothing.

Wash thoroughly after handling or contact - exposure can cause burns which are not immediately painful or visible.

Keep container closed.

Product can react violently with water, acids, and other substances - read Special Mixing and Handling Instructions below carefully before using.

Product is corrosive to tin, aluminum, zinc and alloys containing these metals, and will react violently with these metals in powder form.

Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and can cause death. Follow appropriate tank entry procedures (ANSI Z117.1-1977).

### SPECIAL MIXING AND HANDLING INSTRUCTIONS

Product can react violently with water. Considerable heat is generated when product is mixed with water. Therefore, when making solutions always carefully follow these steps:

ALWAYS wear ALL protective clothing described above. NEVER add water to product. ALWAYS add product - with constant stirring - slowly to surface of lukewarm (80-100°F) water, to assure product is being completely dissolved as it is added.

If product is added too rapidly, or without stirring, and becomes concentrated at bottom of mixing vessel, excessive heat may be generated, resulting in DANGEROUS boiling and spattering, and a possible IMMEDIATE AND VIOLENT ERUPTION of highly caustic solution.

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OCCIDENTAL CHEMICAL  
MSDS NUMBER: M5389  
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IDENTIFIED

## VIII. HANDLING AND STORAGE (Continued)

### SPECIAL MIXING AND HANDLING INSTRUCTIONS (Continued)

NOTE: Never add more product than can be absorbed by solution while maintaining temperature below 200°F (@ sea level) to prevent boiling and spattering.

Product can react EXPLOSIVELY with acids, aldehydes, and many other organic chemicals - when mixing product with solutions containing such chemicals, follow all of above mixing instructions, and add product very gradually, while stirring constantly.

ALWAYS empty and clean containers of all residues before adding product, to avoid possible EXPLOSIVE reaction between product and unknown residue.

Returnable containers should be shipped in accordance with supplier's recommendations. Return shipments should comply with all federal, state, and DOT regulations. All residual caustic soda should be removed from containers prior to disposal.

## IX. ENVIRONMENTAL PROCEDURES

### STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Leaks should be stopped. Spills should be contained, and cleaned up immediately. Spills should be removed by using a vacuum truck. Neutralize remaining traces of material with any dilute inorganic acid such as hydrochloric, sulfuric, nitric, phosphoric, and acetic acid. The spill area should then be flushed with water followed by liberal covering of sodium bicarbonate. All clean-up material should be removed and placed in approved containers, labeled and stored in a safe place await proper treatment or disposal. Spills on areas other than pavement, e.g., dirt or sand, may be handled by removing affected soils and placing in approved containers. Persons performing clean-up work should wear adequate personal protective equipment and clothing. Spills or releases should be reported, if required, to the appropriate local, state and federal regulatory agencies.

CAUTION: Caustic soda may react violently with acids and water.

### WASTE DISPOSAL METHOD:

The materials resulting from clean-up operations may be hazardous wastes and, therefore, subject to specific regulations. Package, store, transport, and dispose of all clean-up materials and any contaminated equipment in accordance with all applicable federal, state, and local health and environmental regulations. Shipments of waste materials may be subject to manifesting requirements per applicable regulations. Appropriate disposal will depend on the nature of each waste material and should be performed by competent and properly permitted contractors. Ensure that all responsible federal, state, and local agencies receive proper notification of spill and disposal methods.

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## X. ADDITIONAL INFORMATION

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OSHA Standard 29CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, material safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Material Safety Data Sheet available to your employees.

To aid our customers in complying with regulatory requirements, SARA Title III hazard categories for this product are indicated in Section I. If the word "YES" appears next to any category, this product may be reportable by you under the requirements of 40 CFR Part 370. Please consult those regulations for details.

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## XI. PREPARATION INFORMATION

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For additional Non-Emergency health, safety, or environmental information telephone (716) 286-3081, or write to:  
Occidental Chemical Corporation  
Product Stewardship Department  
Suite 400  
360 Rainbow Boulevard South  
Niagara Falls, NY 14302

For Emergencies: 24 HOUR EMERGENCY PHONE: (716) 278-7021

This MSDS replaces MSDS Number M5389 dated 07-14-89.

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OCCIDENTAL CHEMICAL  
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Ident 7

## WARNING LABEL INFORMATION

**SIGNAL WORD: DANGER!**

### STATEMENT OF HAZARDS:

CAUSES SEVERE BURNS TO SKIN, EYES AND MUCOUS MEMBRANES.  
CONTACT WITH EYES CAN CAUSE PERMANENT EYE DAMAGE.  
INHALATION OF DUST, MIST, OR SPRAY CAN CAUSE SEVERE LUNG DAMAGE.  
CAN REACT VIOLENTLY WITH WATER, ACIDS, AND OTHER SUBSTANCES.

### PRECAUTIONARY STATEMENTS:

Do not get into eyes, on skin, on clothing.  
Avoid breathing dust, mist, or spray.  
Do not take internally.  
Use with adequate ventilation and employ respiratory protection when exposure to dust, mist, or spray is possible.  
When handling, wear chemical splash goggles, face shield, rubber gloves and protective clothing.  
Wash thoroughly after handling or contact - exposure can cause burns which are not immediately painful or visible.  
Keep container closed.  
Product can react violently with water, acids, and other substances - read Handling and Storage instructions carefully before using.  
Product is corrosive to tin, aluminum, zinc, and alloys containing these metals, and will react violently with these metals in powder form.  
Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and can cause death. Follow appropriate tank entry procedures (ANSI Z117.1-1977).

### FIRST AID: IN CASE OF CONTACT:

#### FOR EYES:

OBJECT IS TO FLUSH MATERIAL OUT IMMEDIATELY THEN SEEK MEDICAL ATTENTION. IMMEDIATELY flush eyes with large amounts of water at least 15 minutes forcibly holding lids apart to ensure flushing of entire surface. Washing eyes within several seconds is essential to achieve maximum effectiveness. SEEK MEDICAL ATTENTION IMMEDIATELY.

#### FOR SKIN:

IMMEDIATELY wash with plenty of water for at least 15 minutes. Remove contaminated clothing and footwear. Wash clothing before reuse and discard footwear which cannot be decontaminated. SEEK MEDICAL ATTENTION IMMEDIATELY.

#### IF INHALED:

Remove to fresh air. If breathing is difficult, have trained person administer oxygen. If respiration stops, give mouth-to-mouth resuscitation. GET MEDICAL ATTENTION.

#### IF SWALLOWED:

NEVER give anything by mouth to an unconscious person. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. If available, give several glasses of milk. If vomiting occurs spontaneously, keep airway clear. SEEK MEDICAL ATTENTION IMMEDIATELY.

### IN CASE OF: SPILL OR LEAK:

Leaks should be stopped. Spills, after containment, should be shoveled up or removed by vacuum truck (if liquid) to chemical waste area. Neutralize residue with dilute acid, flush spill area with water followed by liberal covering of sodium bicarbonate. Dispose of wash water and spill by-products according to federal, state, and local regulations.

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OCCIDENTAL CHEMICAL  
 MSDS NUMBER: M5389  
 PRODUCT NAME: 50% CAUSTIC SODA SOLUTION

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### WARNING LABEL INFORMATION (Continued)

#### HANDLING AND STORAGE:

Considerable heat is generated when product is mixed with water. Therefore, when making solutions always carefully follow these steps:

ALWAYS wear ALL prescribed protective clothing. NEVER add water to product. ALWAYS add product - with constant stirring - slowly to surface of lukewarm (80-100°F) water, to assure product is being completely dissolved as it is added.

If product is added too rapidly, or without stirring, and becomes concentrated at bottom of mixing vessel, excessive heat may be generated, resulting in DANGEROUS boiling and spattering, and a possible IMMEDIATE AND VIOLENT ERUPTION of highly caustic solution.

NOTE: Never add more product than can be absorbed by solution while maintaining temperature below 200°F (@ sea level) to prevent boiling and spattering.

Product can react EXPLOSIVELY with acids, aldehydes, and many other organic chemicals - when mixing product with solutions containing such chemicals, follow all of above mixing instructions, and add product very gradually, while stirring constantly.

ALWAYS empty and clean containers of all residues before adding product, to avoid possible EXPLOSIVE reaction between product and unknown residue.

Returnable containers should be shipped in accordance with supplier's recommendations. Return shipments should comply with all federal, state, and DOT regulations. All residual caustic soda should be removed from containers prior to disposal.

#### DISPOSAL:

The materials resulting from clean-up operations may be hazardous wastes and, therefore, subject to specific regulations. Package, store, transport, and dispose of all clean-up materials and any contaminated equipment in accordance with all applicable federal, state, and local health environmental regulations. Shipments of waste materials may be subject to manifesting requirements per applicable regulations. Appropriate disposal will depend on the nature of each waste material and should be performed by competent and properly permitted contractors. Ensure that all responsible federal, state, and local agencies receive proper notification of disposal.

#### INFORMATION REQUIRED BY FEDERAL, STATE OR LOCAL REGULATIONS:

This product contains:

|          |                           |
|----------|---------------------------|
| CAS#     | NAME                      |
| .1310732 | Sodium hydroxide (Na(OH)) |
| 7647145  | Sodium chloride (NaCl)    |
| 7732185  | Water                     |

HMIS RATING SYSTEM: HEALTH 3 FLAMMABILITY 0 REACTIVITY 2

FOR INDUSTRIAL USE ONLY

LABEL 040M5389

000365

**SECTION C - (continued) N/A**

**IV. (Continued)**

**2.3 Information and Analysis of Effluent Quality for Other Potentially Toxic Pollutants Known or Expected to be Present in the Discharge**

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

| Outfall | Chemical Substance or Compound | Reason for Presence in Discharge | Average Effluent Concentration (µg/l) | Analytical Detection Level (µg/l) |
|---------|--------------------------------|----------------------------------|---------------------------------------|-----------------------------------|
|         |                                |                                  |                                       |                                   |

000366

**SECTION C - (continued)**

**(Continued)**

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

a. GC/MS "Five Peaks" pollutants (see instructions)

Outfall Number N/A

| Group Number (3-7) | Chemical Substance or Compound Name | Analytical Detection Limit (µg/l) | Average Effluent Concentration (µg/l) | Maximum Effluent Concentration (µg/l) | No. Samples Positive / No. Analyzed |
|--------------------|-------------------------------------|-----------------------------------|---------------------------------------|---------------------------------------|-------------------------------------|
|                    |                                     |                                   |                                       |                                       | /                                   |
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|                    |                                     |                                   |                                       |                                       | /                                   |
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|                    |                                     |                                   |                                       |                                       | /                                   |

Use additional sheets for additional pollutants, and for each Outfall reported.

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.

SECTION C - (continued)

IV. (Continued)

4. b. Other Chemicals

Outfall Number N/A

| Substance | Reason for Presence in Discharge | Average Concentration (µg/l) | Indicate if Presence is Known (K) or Suspected (S) |
|-----------|----------------------------------|------------------------------|--|
|           |                                  |                              |  |
|           |                                  |                              |  |
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|           |                                  |                              |  |
|           |                                  |                              |  |

Provide additional sheets if necessary

SEC **C** - (continued) N/A

**V. HAZARDOUS SUBSTANCE SPILL REPORTING REQUIREMENT EXEMPTION (Optional)**  
 (See Instructions)

| 1. Name of Table 4 Substance | Outfall | Amount Per Outfall |           |          | 2. Origin and Source | 3. Treatment Provided |   |   |
|------------------------------|---------|--------------------|-----------|----------|----------------------|-----------------------|---|---|
|                              |         | Quantity lb/24 hrs | Frequency | Duration |                      | a                     | b | c |
|                              |         |                    |           |          |                      |                       |   |   |
|                              |         |                    |           |          |                      |                       |   |   |
|                              |         |                    |           |          |                      |                       |   |   |
|                              |         |                    |           |          |                      |                       |   |   |
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|                              |         |                    |           |          |                      |                       |   |   |
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000369

**SECTION C - (continued)**

**VI. ANTICIPATED ENVIRONMENTAL PROTECTION IMPROVEMENTS OR RELATED CHANGES**

A. Are you now required by any federal, state or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

YES (complete the following table)       NO (go to B)

| 1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC. | 2. AFFECTED OUTFALLS |                        | 3. BRIEF DESCRIPTION OF PROJECT | 4. FINAL COMPLIANCE DATE |              |
|---|----------------------|------------------------|---------------------------------|--------------------------|--------------|
|   | a. No                | b. Source of Discharge |                                 | a. Required              | b. Projected |
|   |                      |                        |                                 |                          |              |

B. OPTIONAL: You may attach additional sheets describing any additional environmental pollution control programs (or other production projects) which may affect your discharges which you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction.      N/A

MARK "X" IF DESCRIPTION OF ADDITIONAL PROGRAMS IS ATTACHED

**VII. BIOLOGICAL TOXICITY TEST DATA**

Do you know or have reason to believe that any acute or chronic or biological toxicity tests were made in the last three (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 which you have available on the purpose and nature of such testing, and the test results.

All dischargers are encouraged to perform biological toxicity testing. The Department may require biomonitoring testing be conducted after your application is received. The Department may be contacted for protocols.

**SECTION D - Stormwater Discharges Associated with Industrial Activity**

**I. Outfall Location**

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

| A. Outfall Number<br>(List) | B. Latitude |  | C. Longitude |  |  | D. Receiving Water<br>(Name) |
|-----------------------------|-------------|--|--------------|--|--|------------------------------|
| N/A                         |             |  |              |  |  |                              |
|                             |             |  |              |  |  |                              |
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**II. Improvements**

A. Are you now required by any federal, state, or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders and grant or loan conditions.  Yes  No

| 1. Identification of Conditions, Agreements, Etc. | 2. Affected Outfalls |                     | 3. Brief Description of Project | 4. Final Compliance Date |          |
|---|----------------------|---------------------|---------------------------------|--------------------------|----------|
|   | number               | source of discharge |                                 | a. req.                  | b. proj. |
| N/A   |                      |                     |                                 |                          |          |
|   |                      |                     |                                 |                          |          |
|   |                      |                     |                                 |                          |          |
|   |                      |                     |                                 |                          |          |
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|   |                      |                     |                                 |                          |          |
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B. You may attach additional sheets describing any additional water pollution (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction.

**III. Site Drainage Map**

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) depicting the facility including: each of its intake and discharge structures; the drainage area of each stormwater outfall; paved areas and buildings within the drainage area of each stormwater outfall, each known past or present areas used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in stormwater runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal units (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; springs, and other surface water bodies which receive stormwater discharges from the facility.

**SECTION D (Continued)**

**IV. Narrative Description of Pollutant Sources**

A. For each outfall, provide an estimate of the area (include units) of impervious services (including paved areas and building roofs) drained to the outfall, and an estimate of the total surface area drained by the outfall.

| Outfall Number | Area of Impervious Surface (provide units) | Total Area Drained (provide units) | Outfall Number | Area of Impervious Surface (provide units) | Total Area Drained (provide units) |
|----------------|--|------------------------------------|----------------|--|------------------------------------|
| N/A            |  |                                    |                |  |                                    |
|                |  |                                    |                |  |                                    |
|                |  |                                    |                |  |                                    |

B. Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored or disposed in a manner to allow exposure to stormwater; method of treatment, storage, or disposal; past and present materials management practices employed, in the last three years, to minimize contact by these materials with stormwater runoff; materials loading and access areas; and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied.

N/A

C. For each outfall, provide the location and a description of existing structural and nonstructural 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 | Treatment | List Codes from Table 1 (EPA Table No. 2 F1) |
|----------------|-----------|--|
| N/A            |           |  |
|                |           |  |
|                |           |  |

**V. Nonstormwater Discharges**

A. I certify under penalty of law that the outfall(s) covered by this application have been tested or evaluated for the presence of nonstormwater discharges and that all nonstormwater discharges from these outfall(s) are identified in Section C of this application for this outfall.

| Name and Official title (type or print) | Signature | Date Signed |
|---|-----------|-------------|
| N/A                                     |           |             |

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.

N/A

**VI. Significant Leaks or Spills**

Provide existing information regarding the history of significant spills of toxic or hazardous pollutants at the facility in the last three years, including the approximate date and location of the spill or leak, and the type and amount of material released.

N/A



SECTION D (Continued)

**PART VII-E - Additional Stormwater Information Submission**

Use this page to list any toxic pollutants as required in Part VII-E of Section D, or to provide explanation of why sampling couldn't be performed.

N/A

**SECTION D (Continued)**

**VII. Discharge Information**

A, B, C, & D: See Instructions before proceeding. Complete one set of tables for each outfall. Annotate the outfall number in the space provided.

E. List any substance(s) or a component of a substance(s) listed in Table 5 which you currently use or manufacture as an intermediate or final product or byproduct. If none, indicate so.

N/A

**VIII. Biological Toxicity Testing Data**

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

- Yes (list all such pollutants below and explain the purpose and nature of such testing.)  No (go to Section IX)

N/A



**SECTION D (Continued) N/A**

**Part C - List each pollutant shown in Tables 5, 6, and 7 (EPA Table Nos. 2F-2, 2F-3, and 2F-4 respectively) that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each pollutant.**

| Pollutant and CAS Number (if available) | Maximum Values (include units)            |   | Average Values (include units)            |   | Number of Storm Events Sampled | Sources of Pollutants |
|---|---|---|---|---|--------------------------------|-----------------------|
|   | Grab Sample Taken During First 30 Minutes | Grab Sample Taken During First 30 Minutes | Grab Sample Taken During First 30 Minutes | Grab Sample Taken During First 30 Minutes |                                |                       |
|   |   |   |   |   |                                |                       |
|   |   |   |   |   |                                |                       |
|   |   |   |   |   |                                |                       |
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**Part D - Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.**

| 1. Date of Storm Event | 2. Duration of Storm (in minutes) | 3. Total Rainfall During Storm Event (in inches) | 4. Number of Hours Between Beginning of Storm Measured and End of Previous Measurable Rain Event | 5. Maximum Flow Rate During Rain Event (gallons per minute or specify units) | 6. Total Flow From Rain Event (gallons or specify units) | 7. Season Sample was Taken | 8. Form of Precipitation (rainfall, snowmelt) |
|------------------------|-----------------------------------|--|--|--|--|----------------------------|---|
| N/A                    |                                   |  |  |  |  |                            |   |
|                        |                                   |  |  |  |  |                            |   |
|                        |                                   |  |  |  |  |                            |   |
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|                        |                                   |  |  |  |  |                            |   |
|                        |                                   |  |  |  |  |                            |   |

**9. Provide a description of the method of flow measurement or estimate.**

N/A

## SECTION E - MISCELLANEOUS INFORMATION SUBMISSION

## I. CONTRACTED ANALYTICAL ASSISTANCE

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

Yes, their name(s), address(es) and list(s) of the analyses performed are given below:

No

Name Analytical Laboratory Services, Inc.

Types of Analyses Performed: Group

Address 34 Dogwood Lane

1, 2, 3, 4, 5, 7

Middletown, PA 17057

Phone (717) 944 - 5541

Attn: Sue Baer

Name Teledyne Brown Eng.. (Isotopes)

Types of Analyses Performed: Group

Address 50 Van Buren Avenue

8

P.O. Box 1235

Westwood, NJ 07675-1235

Phone (201) 664 - 7070

Attn: Al Hogan

Name PPL, Inc.

Types of Analyses Performed: 9C, 10C, 11C, 12C

Address Susquehanna Steam Electric Station

P.O. Box 467

Berwick, PA 18603

Phone (570) 542 - 3995

Attn: Sandra Lewis

(cont.)

SECTION E - MISCELLANEOUS INFORMATION SUBMISSION

I. CONTRACTED ANALYTICAL ASSISTANCE

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

Yes, their name(s), address(es) and list(s) of the analyses performed are given below:

No

Name Benchmark Analytics

Types of Analyses Performed: 8C; 15C  
(on some of the samples)

Address 4777 Saucon Creek Road  
Center Valley, PA 18034-9004

Phone (610) 974 - 8100

Name Ecology III

Types of Analyses Performed: 9C, 10C, 11C,  
12C

Address RR 1, Box 1795  
Berwick, PA 18603

Phone (570) 542 - 2191

Attn: Terry Soya

Name Kirby Memorial Health Center

Types of Analyses Performed: 14C (all)

Address 71 N. Franklin Street  
Wilkes-Barre, PA 18701-1391

Phone (570) 823 - 5450

Attn: Danielle Cappellini

## SECTION E - MISCELLANEOUS INFORMATION SUBMISSION (continued)

N/A

## II. OTHER INFORMATION

1. For New Dischargers Only: Check if Not Applicable

- a. Have there been any technical evaluations performed concerning your anticipated wastewater treatment or control facilities (including engineering reports or pilot plant studies)? Check the appropriate box below.

 Yes No

- b. If yes, briefly describe such evaluations and the resulting reports which have been prepared.

- c. Provide the name and location of any existing plant(s) which, to the best of your knowledge, resembles your planned operation with respect to items produced, production processes, wastewater constituents or wastewater treatment.

\_\_\_\_\_  
Name\_\_\_\_\_  
Location2. For All Dischargers: (Optional)

If necessary, use attached sheets to expand upon responses to any of the above Questions, or to call attention to any other information you feel should be considered in establishing permit limitations for the proposed or existing facility.





SECTION F - CERTIFICATION AND SIGNATURE OF APPLICANT

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.

Robert F. Saunders

VP-Nuclear Site Operations

Print Name and Title of Person Signing

Sworn and subscribed to before me this

2 day of December, 19 99

(570) 542-3256

Telephone Number of Person Signing

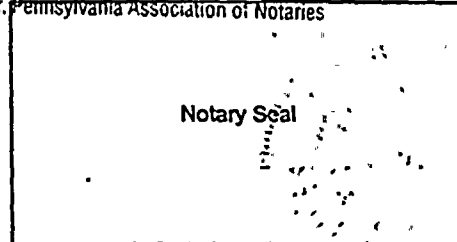
Sandra K Lines

Notary Public

Robert F Saunders

Signature of Applicant

Notarial Seal  
Sandra K. Lines, Notary Public  
Salem Twp., Luzerne County  
My Commission Expires Sept. 24, 2001  
Member, Pennsylvania Association of Notaries



12-2-99

Date Application Signed

Please note below the name, address and telephone number of the individual that should be contacted in the event additional information is required: (If same as Item I.C., in Section A, please state).

Name Jerome S. Fields

Address: PPL, Inc. (GENA93)

2 N. 9th Street, Allentown PA 18101-1179

Telephone: (610) 774-7889



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL RESOURCES  
PERMIT APPLICATION - GENERAL INFORMATION

**APPLICANT'S ✓ CHECKLIST**

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 (X)<br>if Included |
|--|--------------------------|
| General Information form attached (4000-PM-DF00001) (0130-PM-DPC0001)                      | X.                       |
| Three (3) copies of application package submitted  | X                        |
| Original copy of application notarized   | X                        |
| Additional copy for ECHD, ACHD, and DRBC   |                          |
| Application Fee \$500.00   | X                        |
| Proper evidence of Act 14 municipality, county notification                                | X                        |
| Proof of local newspaper public notice (for new and substantially changed discharges only) |                          |

**SECTION A - APPLICANT IDENTIFIER**

| Requirement  | Check (X)<br>if Included |
|--|--------------------------|
| <b>SECTION B - GENERAL INFORMATION</b>   |                          |
| 1. SIC Codes   | X                        |
| 2. General Description and Nature of Business  | X                        |
| 3. Past and Current NPDES and WQM Part II Permits  |                          |
| 4. Topographic Map   | X                        |
| 5. Outfall Location (submit copy of Topo Map with discharge location)                              | X                        |
| 6. Preparedness, Prevention, and Contingency (PPC) Plans See note page 2                           |                          |
| 7. Line Drawing  | X                        |
| 8. Site Plan and Stormwater Runoff for outfalls discharging BOTH stormwater and process wastewater | X                        |
| 9. New Source Determination  |                          |

**SECTION C - DATA REQUIREMENTS FOR PROCESS, NCCW, AND SANITARY WASTEWATER DISCHARGES**

| Requirement  | Check (X) if Included |
|--|-----------------------|
| I. OUTFALLS AND ASSOCIATED WASTEWATER TREATMENT TECHNOLOGIES   | X                     |
| II. SOURCES OF WASTEWATER CONTRIBUTING TO OUTFALLS   |                       |
| 1. Process Wastewater  | X                     |
| 2. Other Wastewater  | X                     |
| 3. Total Process, Miscellaneous, NCCW and Sanitary Wastewater  |                       |
| 4. Process Wastewater Combined with Stormwater   |                       |
| III. REQUIRED AND OPTIONAL ANALYSES  |                       |
| 1. Optional Site-Specific Toxics Data  |                       |
| 2. Summary of Required Analyses Worksheet  |                       |
| 3. Analyses Results  | X                     |
| IV. INFORMATION ON OTHER POTENTIALLY TOXIC POLLUTANTS KNOWN OR EXPECTED TO BE PRESENT IN THE DISCHARGE |                       |
| 1. Chemical Additives  | X                     |
| 2,3 Other Potentially Toxic Pollutants   |                       |
| 4a. GC/MS Five Peaks Pollutants  |                       |
| 4b. Other Chemicals  |                       |
| V. HAZARDOUS SUBSTANCE SPILL REPORTING REQUIREMENT EXEMPTION   |                       |
| VI. ANTICIPATED ENVIRONMENTAL PROTECTION IMPROVEMENTS  |                       |
| VII. BIOLOGICAL TOXICITY TEST DATA   |                       |

**SECTION D - "STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY"**

| Requirement   | Check (X) if Included |
|---|-----------------------|
| I. IF REQUIRED TO COMPLETE THIS SECTION, ALL PARTS ARE COMPLETE |                       |

**SECTION E - MISC. INFORMATION SUBMISSION (To be Completed by All Applicants)**

| Requirement                         | Check (X) if Included |
|-------------------------------------|-----------------------|
| I. CONTRACTED ANALYTICAL ASSISTANCE | X                     |
| II. OTHER INFORMATION               |                       |

**SECTION F - CERTIFICATION AND SIGNATURES OF APPLICATION (To Be Completed by All Applicants)**

| Requirement                                    | Check (X) if Included |
|--|-----------------------|
| Robert F. Saunders, VP-Nuclear Site Operations | X                     |