

# BMPs for Dewatering and Pumping Operations

2011 North Dakota Storm Water & Pollution Control Conference  
 April 5, 2011  
 Gladstone Inn & Suites, Jamestown ND  
 Dwayne Stenlund, MSc., CPESC  
 Resource Professionals Alliance



Permit No: NDG07-0000  
 Effective Date: April 01, 2010  
 Expiration Date: March 31, 2015

## Permit to Discharge

**AUTHORIZATION TO DISCHARGE UNDER THE  
 NORTH DAKOTA POLLUTANT DISCHARGE ELIMINATION SYSTEM**

In compliance with Chapter 33-16-01 of the North Dakota Department of Health rules as promulgated under Chapter 61-28 (North Dakota Water Pollution Control Act) of the North Dakota Century Code,

operations engaged in temporary discharge activities

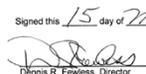
are authorized to discharge from locations throughout the state of North Dakota

to waters of the State

provided all the conditions of this permit are met.

This permit and the authorization to discharge shall expire at midnight, March 31, 2015.

Signed this 15 day of March, 2010.



Dennis R. Fewless, Director  
 Division of Water Quality

**TABLE OF CONTENTS**

DEFINITIONS.....	3
PERMIT SUBMITTALS SUMMARY.....	5
SPECIAL CONDITIONS.....	5
Daily Logs.....	5
COVERAGE UNDER THIS PERMIT.....	6
Applicability of General Permit.....	6
POLLUTION PREVENTION PLAN.....	7
Request for Discharge of Water Treatment Additives.....	8
I. LIMITATIONS AND MONITORING REQUIREMENTS.....	9
A. Discharge Authorization.....	9
B. Effluent Limitations and Monitoring.....	9
C. Notice of Termination (NOT).....	12
II. MONITORING, RECORDING, AND REPORTING REQUIREMENTS BP 2009.09.24.....	12
A. Representative Sampling (Routine and Non-Routine Discharges).....	12
B. Test Procedures.....	12
C. Recording of Results.....	12
D. Additional Monitoring.....	13
E. Reporting of Monitoring Results.....	13
F. Records Retention.....	13
III. COMPLIANCE RESPONSIBILITIES.....	13
A. Duty to Comply.....	13
B. Proper Operation and Maintenance.....	13
C. Planned Changes.....	13
D. Duty to Provide Information.....	13
E. Signatory Requirements.....	14
F. Twenty-four Hour Notice of Noncompliance Reporting.....	14
G. Bypass of Treatment Facilities.....	15
H. Upset Conditions.....	15
I. Duty to Mitigate.....	16
J. Removed Materials.....	16
K. Duty to Reapply.....	16

### PERMIT SUBMITTALS SUMMARY

Coverage Point	Submittal	Frequency	First Submittal Date
001, etc.	Discharge Monitoring Report	Quarterly	July 31, 2010

### SPECIAL CONDITIONS

**Daily Logs**

The permittee shall maintain a log relating to the authorized discharge(s). The following information shall be included in the summaries with appropriate discharge monitoring report forms:

- Flow information and dates discharged;
- sample results;
- records of visual observations;
- notations of any problems relating to treatment of the discharge; and
- name of receiving water.

### POLLUTION PREVENTION PLAN

Instead of monitoring for total suspended solids, the permittee may request to develop and implement a pollution prevention plan before beginning the temporary discharge activities. The plan must detail the best management practices the permittee will undertake to reduce or eliminate any discharge of pollutants. The following table lists some examples of best management practices to temporary discharge activities.

Best Management Practice	Description of Practice
Filter Berm	<ul style="list-style-type: none"> <li>A temporary ridge of gravel or crushed rock;</li> <li>Retains sediment on-site by retarding and filtering runoff while allowing water to be discharged from the site.</li> </ul>
Vegetative Buffer	<ul style="list-style-type: none"> <li>An area of growing vegetation between the discharge and the receiving waters;</li> <li>Filters runoff and minimizes erosion.</li> </ul>
Filter Fence	<ul style="list-style-type: none"> <li>A low fence made of filter cloth and fencing material;</li> <li>Filters runoff water before discharge.</li> </ul>
Sediment Pond	<ul style="list-style-type: none"> <li>Small ponding area either diked or excavated;</li> <li>Allows the sediment to settle out before discharge.</li> </ul>

### Request for Discharge of Water Treatment Additives

In the event a permittee proposes to discharge water additives, the permittee shall submit a request to discharge water additives to the department for review. Written notice from the department to discharge such additives at specified levels shall be obtained prior to discharge by the permittee. Additional monitoring and reporting may be required as a condition for the approval to discharge the additive.

A request to discharge water additives shall include all of the following water additive usage and discharge information:

- Material Safety Data Sheet (MSDS);
- the proposed water additive discharge concentration;
- the discharge frequency (i.e. number of hours per day and number of days per year);
- the monitoring point from which the product is to be discharged;
- the type of removal treatment, if any, that the water additive receives prior to discharge;
- product function (i.e. microbicide, flocculant, etc.);
- a 48-hour LC<sub>50</sub> or EC<sub>50</sub> for a North American freshwater planktonic crustacean (either *Ceriodaphnia* sp., *Daphnia* sp. Or *Simoscephalus* sp.); and
- the results of a toxicity test for one other North American freshwater aquatic species (other than a planktonic crustacean).

## Discharge Issues

- Clean storm water
- Treated drinking water
- Toxic/hazardous water

## Effluent discharge

Parameter	Effluent Limitations			Monitoring Requirements	
	Avg. Monthly Limit	Avg. Weekly Limit	Daily Maximum Limit	Sample Frequency	Sample Type
Total Suspended Solids (TSS)	*	*	100 mg/l	1/week	Grab
pH, SU	Shall remain between 7.0 to 9.0 for all Class I and IA waters, Shall remain between 6.0 to 9.0 for all Class II and III waters			1/week	Grab
Oil and Grease °	*	*	10 mg/l	1/week	Visual

## Effluent discharge

Parameter	Effluent Limitations			Monitoring Requirements	
	Avg. Monthly Limit	Avg. Weekly Limit	Daily Maximum Limit	Sample Frequency	Sample Type
Total Suspended Solids (TSS)	*	*	100 mg/l	1/week	Grab
pH, SU	Shall remain between 7.0 to 9.0 for all Class I and IA waters, Shall remain between 6.0 to 9.0 for all Class II and III waters			1/week	Grab
Benzene	For direct discharges, the concentration shall not exceed 5 µg/l.			*	Grab
Total BTEX °	For direct discharges, the concentration shall not exceed 100 µg/l.			*	Grab
Total Petroleum Hydrocarbons °	A limit of 1 mg/l shall apply to water classification for domestic water supply. Otherwise the limit shall be 10 mg/l.			*	Grab
Oil and Grease °	*	*	10 mg/l	1/week	Visual

## Dewatering Site Plan => Contractor

- All dewatering operations require an approved site plan.
- No Exceptions.
- Develop preapproved option plans for expected operations
- No matter what, it will rain, or you will hit something *with* water.
  - Be prepared for emergency dewatering.

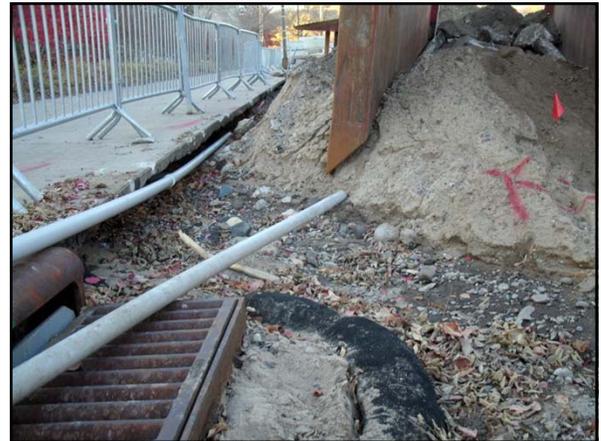


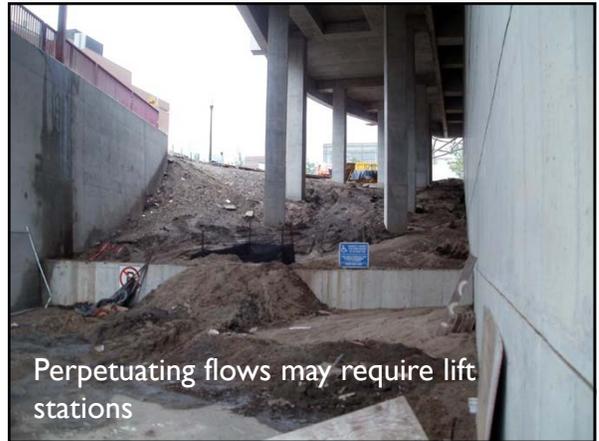
All water goes downhill. Know where.

## Reminder

### D. DEWATERING AND BASIN DRAINING

1. **Dewatering** or basin draining (e.g., pumped discharges, trench/ditch cuts for drainage) related to the **construction activity** that may have turbid or sediment laden discharge water must be discharged to a temporary or permanent sedimentation basin on the project site whenever possible. Discharge from the temporary or permanent sedimentation basin must be visually checked to ensure adequate treatment is obtained in the basin and that nuisance conditions (see Minn. R. 7050.0210, subp. 2) will not result from the discharge. If the water cannot be discharged to a sedimentation basin prior to entering the **surface water**, it must be treated with the appropriate **BMPs**, such that the discharge does not adversely affect the receiving water or downstream landowners. The **Permittee(s)** must ensure that discharge points are adequately protected from erosion and scour. The discharge must be dispersed over natural rock riprap, sandbags, plastic sheeting, or other accepted **energy dissipation** measures. A adequate sedimentation control measures are required for discharge water that contains suspended solids.
2. All water from **dewatering** or basin draining activities must be discharged in a manner that does not cause nuisance conditions, erosion in receiving channels or on downlope properties, or inundation in **wetlands** causing significant adverse impact to the **wetland**.





- ### Dewatering Program
- Follow Permit Requirements
  - Remove toxins and hazardous substances
  - Remove pH and other non-visible contaminates
  - Remove visible non-sediment contaminates like concrete and drill slurries
  - Remove sediments to background levels
  - Prevent pickup of fuels and other work chemicals



## Example SWPPP Dewatering

2. Construction Dewatering

A. Dewatering is anticipated for utility trench and sub soil corrections. During dewatering activities, the sediment laden water shall not be directly discharged to City drainage systems. The allowable dewatering method involves pumping sediment-laden water to a sediment control structure before releasing the discharge. Acceptable sediment control structures include:

- Construct a temporary sediment trap for turbid water discharge.
- Use a portable sediment trap system.
- Apply natural based flocculent technology such as chitosan in sediment traps or a series of ditch checks to contain sediment.

B. A water appropriation permit will be required from the DNR for construction dewatering in excess of 10,000 gallons per day and shall include a site plan to treat the water.

C. The Contractor shall consult with CAR to locate known potential contaminated areas prior to commencing dewatering operations. The Contractor shall apply for and obtain NPDES contaminated discharge or MCES permits for necessary dewatering operations with the contaminated areas.



## Concerns

**METROPOLITAN COUNCIL ENVIRONMENTAL SERVICES**

A. Discharge Limitations

1. Local Pretreatment Standards:

Parameter	Standard (mg/L)
Cadmium (Cd)	1.0
Chromium - total (Cr)	6.0
Copper (Cu)	4.0
Cyanide - total (CN)	4.0
Lead (Pb)	1.0
Mercury (Hg)	0.002
Nickel (Ni)	6.0
Zinc (Zn)	6.0
pH - maximum (Std. Units)	11.0
pH - minimum (Std. Units)	5.0

Local pretreatment standards for metals and cyanide are the maximum for any 24 hour period. pH standards are continuous and apply at all times.

2. Additional Limitations:

The following limits apply to contaminated groundwater discharges:

Concentration of any one toxic organic parameter	3 mg/L
Combined total toxic organics parameter concentration	10 mg/L
Total hydrocarbons (for petroleum-related discharges)	100 mg/L

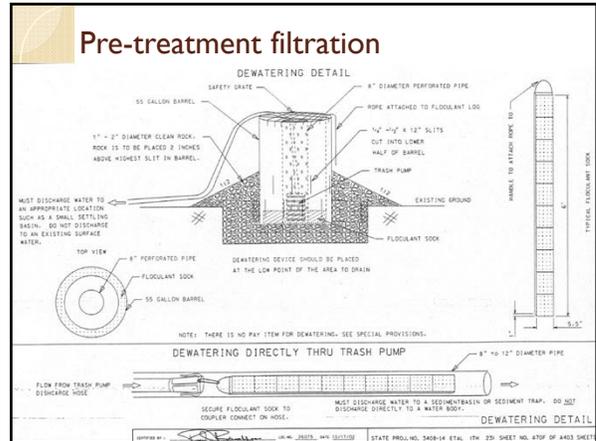
## Prohibited Discharges

**METROPOLITAN COUNCIL ENVIRONMENTAL SERVICES**

3. Prohibited Waste Discharges:

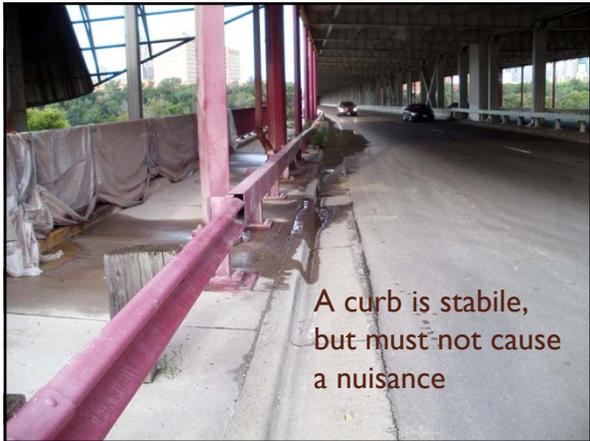
Prohibited Waste Discharges are specified in Waste Discharge Rule 406 and include, but are not limited to the following: (a) Flammable, explosive, and corrosive wastes, gasoline, fuel oil, lubricating oil, hydraulic oil, motor oil, or grease; (b) Wastes that are likely to obstruct the flow within public sewers: grease, fat or oil of animal or vegetable origin, solid wastes, garbage, guts, bones, ash, sand, rags, lime, metal, wood, plastic, glass, or yard wastes; (c) Wastes that are likely to cause interference, pass-through or operational problems: slug discharges, toxic chemicals, poisons, dyes, or inks; (d) Wastes that are likely to cause a public nuisance: noxious, malodorous, or foam producing substances; (e) Cooling water, runoff, and other unpolluted water; (f) Hazardous wastes, as defined by Minnesota Statutes; and (g) Wastes generated outside of the Metropolitan Area, unless prior approval is obtained from MCES.

- ### Dewater field Checklist for Site Plan Development.
- Pre-filter (if possible)
  - Provide a stable treatment flow path
  - Provide exit scour control
  - Provide secondary containment for potential leaks of chemicals used for pumping and flocculation
  - Provide method for visual or mechanical assessment of performance
  - Inspect final receiver of discharge





Provide a Stable flow path



A curb is stable, but must not cause a nuisance



Stable treatment path





Maintaining access



It also must be safe











### Impaired Waters Monitoring Protocols

#### How Dirty is Dirty?

- Any discharge causing a "nuisance condition."

**Rule of thumb\*:**

- A discharge within 25 NTUs of the receiving water will not cause a nuisance condition

Imaginary Hills Creek  
baseline water clarity

20

32

50

110

178

345

412

Nuisance  
Condition:  
(Violation)

\*Not a regulatory standard. State/local regulations may have stricter definition.



### Time to Settle

Settling Velocities Of Soil Particles In Still Water

Diameter of Particle (mm)	Order of Size	Settling Velocity (mm/sec)	Time Required to Settle One Meter (3.28 Ft)
10.0	Gravel	1.000	1.0 Seconds
1.0		100	9.8 Seconds
0.6	Coarse Sand	63	15 Seconds
0.3		32	30 seconds
0.15	Fine Sand	15	67.0 Seconds
0.015		0.35	47.6 Minutes
0.010	Silt	0.154	107.0 Minutes
0.003		0.0138	20.1 Hours
0.0015	Clay	0.0035	79 Hours
0.001		0.00154	180.0 Hours
0.0001		0.0000154	754.0 Days
0.00001	Colloidal Particles	0.000000154	207.0 Years

NOTE: Temperature 50°C; all particles assumed to have a specific gravity of 2.65.

## EPA Method 180.1

- 3.2.1
- EPA method 180.1, "Determination of Turbidity by Nephelometry", is found in the Agency's publication, *Methods for Chemical Analysis of Water and Wastes*. The method is based upon a comparison of the intensity of light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension. The higher the intensity of scattered light, the higher the turbidity. Readings, in NTUs, are made in a nephelometer designed according to specifications laid out in the method.
- A primary standard suspension is used to calibrate the instrument. A secondary standard suspension is used as a daily calibration check and is monitored periodically for deterioration using one of the primary standards. See Appendix B for EPA Method 180.1.



## Chemical Treatment Options

- MSDS Required for any chemical used
- Natural base
  - Chitosan
  - Chitosan and pretreatment
  - Calgon
  - Corn starch
  - Cellulose
- Synthetic base
  - Poly acrylamide (PAM)

# MSDS

Updated 04/23/2010

Date: 3/9/2007  
Revision: 01

---

**Applied Polymer Systems, Inc.**

**Material Safety Data Sheet**

1. IDENTIFICATION OF THE HAZARDOUS MATERIAL AND THE COMPANY

Product Name: **AP-100 100-100**

Supplier: **Applied Polymer Systems, Inc.**

2. COMPOSITION/CONCENTRATION OF THE HAZARDOUS MATERIAL

3. HAZARD IDENTIFICATION

4. FIRST AID MEASURES

5. FIRE FIGHTING MEASURES

6. ACCIDENT AND EMERGENCY RESPONSE

7. HANDLING AND STORAGE

**Material Safety Data Sheet**

**StyromClear - Liquid-Floc 1%**

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

CAS NO.	COMPONENT	%	CLASS
56187	Acrylic Acid	1	100
	Other components are non-hazardous	99	100

SECTION 3: HAZARDS IDENTIFICATION

SECTION 4: SAFETY



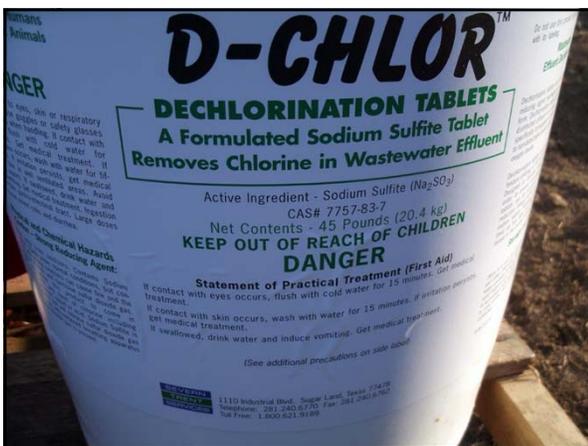


### Emergency Planning

- Using site amenities
  - Undisturbed areas
  - Sandy grade
  - Adjacent landowner
- City sanitary utility







**RESOURCE GUIDE**  
**INTEGRA chemical** Dechlorination Made Easy

**LPD-250**  
**CHLORINE LEVELS**  
 0-10 ppm  
**FLUSH RATE**  
 200-1,250 gpm  
**SETUP TIME**  
 1-3 minutes

**Equipment Options**

- Vita-D-Chlor Screen
- Pilot Kit
- Hitch Mount
- Extension Hose

**Benefits/Features**

- Available in a variety of chemical sizes with capacities up to 1000 lbs.
- Light weight design allows for quick and easy transport.
- Light weight design construction.
- Available in 1000 lbs.
- Small, compact design.

**Procedure (Treatment up to 1000 lbs.)**

1. Load the chemical into the container.
2. Connect the chemical to the water line.
3. Turn on the water flow.
4. Add additional chemical as needed.
5. Test chlorine level.
6. Add additional chemical as needed.
7. Test chlorine level.
8. Add additional chemical as needed.
9. Test chlorine level.
10. Add additional chemical as needed.
11. Test chlorine level.
12. Add additional chemical as needed.
13. Test chlorine level.
14. Add additional chemical as needed.
15. Test chlorine level.
16. Add additional chemical as needed.
17. Test chlorine level.
18. Add additional chemical as needed.
19. Test chlorine level.
20. Add additional chemical as needed.

**Bazooka**

**CHLORINE LEVELS**  
 0-10 ppm  
**FLUSH RATE**  
 200-1,250 gpm  
**SETUP TIME**  
 1-3 minutes

**LPD-250A**  
 1000 lbs. capacity  
 200-1,250 gpm

