

Nebraska Department of Environmental Quality

Wastewater Section

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Fact Sheet

General NPDES Permit Authorizing Dewatering Discharges from Contaminated Sites within The City of Omaha, Nebraska

NPDES NEG673000

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A. Basis for General Permits

The NDEQ may issue a general permit in accordance with the conditions and requirements set forth in Chapter 25 of NDEQ Title 119 *Rules and Regulations pertaining to the Issuance of Permits Under the National Pollutant Discharge Elimination System*. General permits are written to cover one or more categories or subcategories of discharges within a geographic area. This area should correspond to existing geographic or political boundaries which includes City, County, or State political boundaries.

Where sources within a specific category or subcategory of dischargers are subject to water quality-based limits imposed pursuant to 40 CFR 122.44 adopted and incorporated by reference in NDEQ Title 119; the sources in that specific category or subcategory shall be subject to the same water quality-based effluent limitations.

The general permit must clearly identify the applicable conditions for each category or subcategory of dischargers and the general permit may exclude specified sources or areas from coverage.

B. Proposed Action - Tentative Determination

On the basis of a preliminary staff review, the Nebraska Department of Environmental Quality has made a tentative determination to issue a new NPDES General Permit, NEG673000, for the discharge of dewatering wastewater to the Missouri River from contaminated sites such as construction excavations, foundation sumps, or utility vaults within the City of Omaha, Nebraska.

This general permit was developed according to the requirements and conditions set forth in NDEQ Title 119 *Rules and Regulations Pertaining to the Issuance of Permits Under the National Pollutant Discharge Elimination System*.

C. Segment, Use Designations, and Impairments for the Missouri River

This permit authorizes dewatering discharges only to the Missouri River. Segment, basin, and use designations for the Missouri River are set forth in NDEQ Title 117 - *Nebraska Surface Water Quality Standards*. Impairments and pollutants of concern are from the NDEQ, *2010 Water Quality Integrated Report*.

Receiving Stream for General Permit NEG673000 Missouri River

Basin / Segment: MT1-10000 of the Missouri Tributaries River Basin.

Water Quality Usage Designations for the Missouri River (MT1-10000)

Aquatic life: Warmwater A

Agricultural Water Supply: Class A

Recreation

Drinking Water Supply

Industrial Water Supply

Aesthetics

Key Species Listed Below

Endangered Species: *Pallid Sturgeon, Sturgeon Chub*

Threatened Species: *Lake Sturgeon*

Recreational Species: *Paddlefish, Blue Catfish, Channel Catfish, Flathead Catfish*

Impairments and Parameters of Concern for the Missouri River (MT1-10000)

Impairments: Fish consumption advisory

Parameters of Concern: Cancer Risk and Hazard Index Compounds (PCBs and dieldrin)

D. Description of Discharge, Potential Pollutants, and Antidegradation

1. Description of Discharge and Potential Pollutants

The City of Omaha wastewater treatment service and collection system is a publicly owned utility (SIC Number 4952), which receives and treats domestic wastewater. The collection system in some sections of the City of Omaha is combined so that both sanitary wastewater and stormwater runoff share a common conveyance and outfall. A combined sewer system (CSS) is a collection system owned by a state or municipality which conveys domestic and industrial wastewater plus storm water through a single pipe system to a Publicly Owned Treatment Works (POTW). A combined sewer overflow (CSO) is the discharge from a CSS, during a wet weather event, at a point prior to the POTW. CSOs are point sources subject to NPDES permit requirements including technology based and water quality based requirements of the Clean Water Act (CWA). The combined sewer overflows in the City of Omaha is permitted under NPDES NE0133680 that sets forth a compliance schedule for reducing the magnitude, frequency, and quantity of CSO discharges by sewer separation, high rate treatment facilities, and a deep tunnel conveyance system. The major projects undertaken by the City as part of the approved Long Term Control Plan will involve a number of construction projects that will require dewatering.

Some of the construction sites are known to be contaminated with toxic substances that include heavy metals, volatile organics, semivolatile organics, and pesticides. Preliminary groundwater monitoring has been conducted by the City of Omaha at prospective construction sites that includes Nicholas Street, Heartland of America Park, Leavenworth Lift Station, OPPD site and others. Organic and inorganic pollutants as described above were detected in the $\mu\text{g/L}$ range or low mg/l in some of the sites which means that these pollutants will likely be present in dewatering wastewater during construction excavation. The intent of this permit is to limit the quantity of pollutants in the dewatering discharge from these sites to the Missouri River so that there is no discharge of toxics in toxic amounts.

2. Antidegradation Review

An antidegradation review was performed for purposes of developing the permit pursuant to 40 CFR 131.12. The results of the evaluation indicate that the Missouri River, the receiving water body of the discharge addressed by the permit, has habitat for aquatic life. The designated uses of the Missouri River were considered during permit development. The limitations in the draft permit are protective of the Clean Water Act § 101(a)(2) fishable/swimmable goals and will ensure the existing quality of water in the receiving stream is not lowered.

E. Eligibility – Part I of the Permit

a. Permit Coverage

Permit coverage for general permit NEG673000 is limited to dewatering sites, such as construction excavations, foundation sumps, or utility vaults within the city limits of the City of Omaha, Nebraska. Effluent discharge from dewatering sites covered under this permit is limited to the Missouri River. The intent of this permit is applicable only for dewatering contaminated sites which are sites that are known, or have a reasonable potential, to contain quantifiable amounts of hazardous or toxic substances above natural background.

This permit is not intended to address or authorize discharges of sanitary wastewater, industrial process wastewater, livestock wastes, industrial stormwater runoff, or any discharge regulated by an existing NPDES Permit. This permit is also not intended to address or authorize the discharge of dewatering wastewater to the City of Omaha wastewater treatment facilities.

b. Discharges Affecting Endangered or Threatened Species

This permit is not intended to address the impact of the proposed discharge to the critical habitat of endangered or threatened species. It is the permittee's responsibility to coordinate with state and federal agencies for any project with potential to affect the critical habitat of endangered or threatened species.

c. Discharges Affecting Historical Places or Archeological Sites

This permit is not intended to address the impact of the proposed discharge to historical places or archeological sites. It is the permittee's responsibility to coordinate with state and federal agencies for any project with potential to affect historical places or archeological sites.

F. Application and Approval (Part II)

a. Notice of Intent (DWO-NOI)

NDEQ Title 119, Chapter 25 requires that dischargers seeking coverage under a general permit shall submit to the NDEQ a written notice of intent to be covered by the general permit. The contents of the notice of intent shall be specified in the general permit and shall require the submission of information necessary for adequate program implementation, including at a minimum, the legal name and address of the owner or operator, the facility name and address, type of facility or discharges, and the receiving stream. Form DWO-NOI, which is an attachment to the permit, fulfills the requirements listed above.

Any facility wishing authorization to discharge under the terms and conditions of this general permit must submit a notice of intent using form DWO-NOI. The permit and form DWO-NOI specifies requirements for information that must be supplied by potential applicants before authorization can be considered by the NDEQ. A chemical analysis of a representative sample of the dewatering wastewater must also be completed for all the parameters listed in Part III of the permit and submitted with form DWO-NOI. Submission of information gathered during prior site investigations may be considered by NDEQ to meet this requirement. Also, the Owner or Operator may provide information to NDEQ that demonstrates the absence of certain parameters at the proposed dewatering site. The NDEQ may request additional information from the applicant when it is necessary to adequately review the DWO-NOI and evaluate the discharge request. Failure to properly complete form DWO-NOI may delay issuance of authorization to discharge.

b. Authorization to Discharge (DWO-AMR)

According to NDEQ Title 119, Chapter 25 general permits shall specify whether a discharger that has submitted a complete and timely notice of intent to be covered in accordance with the general permit and that is eligible for coverage under the permit, is authorized to discharge. Upon review of the notice of intent and the water testing results, the NDEQ will determine authorization or denial to dewater from the site specified in the NOI on form DWO-AMR.

The Director, or delegate, will sign and date form DWO-AMR that will be submitted to the applicant with the Department's determination of status to discharge along with required monitoring if authorization is granted. Dewatering to the Missouri River from the site specified in the NOI is prohibited until the applicant receives authorization from the Department by means of form DWO-AMR.

c. Additional Notification

The NDEQ may request additional information from the applicant to determine the nature of the dewatering discharge and pollutants of concern so that the water quality of the receiving stream is not impaired.

d. Revocation of discharge Authorization

General permits may be issued, modified, revoked and reissued, or terminated in accordance with applicable requirements in NDEQ Title 119, Chapter 25.

e. Notification of Changes

Written notification must be provided to the Department for any changes to ownership, name change, or changes in the owner/operator, or authorized representative according to NDEQ 119.

f. Notification of Activities that Alter Water Quality of the Discharge

The requirement for permittee to notify the Department immediately of any activities or actions that may alter the water quality of dewatering discharges is included in the permit so that the monitoring requirements or authorization can be changed due to new information.

g. Notification of Dewatering Project Completion

Notification by the permittee of dewatering start-up dates and termination are included in the permit so that the Department can monitor the progress of the dewatering project.

G. Dewatering Effluent Limitations and Monitoring Requirements (Part III)

1. Overview of Permit Requirements

When developing effluent limits for a NPDES permit, the NDEQ considers limits based on both the technology available to treat the pollutants (technology based effluent limits) and limits that are protective of the designated uses of the receiving water (water quality based effluent limits). The intent of technology based effluent limitations are to require a minimum level of treatment for point sources based on currently available treatment technology. Water quality based effluent limits are developed by the State of Nebraska to protect the beneficial uses of the receiving waters. The water quality based effluent limits involve a site-specific evaluation of the effluent discharge and its effect on the receiving water. Permit limits are developed by a comprehensive assessment of both technology-based limits and water quality based limits.

a. Technology Standards

No categorical effluent guidelines have been promulgated by EPA for dewatering wastewater.

b. Water Quality Based Effluent Limits

Water quality monitoring and limitations are included in the permit to protect the Missouri River from the discharge of toxic substances in toxic amounts. In NDEQ Title 117, *Nebraska Surface Water Quality Standards*, the water quality criteria for pollutants of concern are determined as acute and chronic in-stream criteria. The NDEQ develops allocations (WLA) to protect these criteria. If there is a reasonable potential to cause an instream excursion of the water quality criteria for a parameter, then limitations are included in the NPDES permit. Permit limitations are established from the WLAs according to the procedures given in the *Technical Support Document for Water Quality-based Toxics Control (TSD)*.

2. Basis for Monitoring and Limitations

The dewatering sites addressed by this permit are contaminated or are believed to have a reasonable potential to be contaminated with toxic pollutants. Water quality limits have been derived by the NDEQ to protect the Missouri River from toxic amounts of pollutants in discharge of dewatering wastewater. The permit limit derivation used by the NDEQ accounts for effluent variability, receiving water dilution, protects against both acute and chronic impacts, accounts for compliance monitoring sampling frequency and protects the wasteload allocation and ultimately water quality standards. To accomplish these objectives, the NDEQ uses statistical permit limit derivation from two value, steady-state outputs for acute and chronic protection according to the procedures set forth in the TSD.

a. Parameter Groups

Monitoring and limitations have been included in the permit for sixteen parameter groups. The applicant is required to submit an analysis for all of these groups as part of the Notice of Intent. The sixteen groups were based on preliminary monitoring provided by the City of Omaha and are chosen to provide a comprehensive analysis of the wastewater for a variety of pollutants. The groups are generally organized according to analytical methodology so that the testing provides the maximum amount of information on the quality of the dewatering wastewater. Monitoring frequencies for the various parameter groups will be determined by the NDEQ upon review of the initial analytical data. In some cases, monitoring may not be required for some parameter groups if there is no reasonable potential to exceed water quality standards.

The general parameter group that includes flow rate, pH, total suspended solids, and petroleum oil is included for all facilities that are authorized to discharge with a weekly monitoring frequency. Monitoring for petroleum oil is required only when oil sheen is observed in a sample of the dewatering wastewater.

b. Calculation of the Acute and Chronic WLA

Before calculating a water quality based effluent limit, the wasteload allocation (WLA) for the point source discharger must first be determined. The WLA is the fraction of a total maximum daily load (TMDL) for the water body that is assigned to the point source. A steady state model is used by the NDEQ to determine the WLA at critical conditions of low flow in the receiving stream at the end of the mixing zone.

NDEQ title 117 sets forth both acute and chronic numeric criteria for most pollutants. A design upstream flow is determined for the acute aquatic life criteria at the 1Q10 (1-day low flow over a 10-year period) and chronic aquatic life criteria at the 7Q10 (7-day low flow over a 10-year period). The steady-state model used by the NDEQ entails the application of a mass balance equation that allows the determination of the mass of a pollutant at the end of pipe to the mass of pollutants downstream after mixing in the receiving stream.

The acute and chronic wasteload allocations (WLA) are calculated from the following formula;

$$WLA = \text{criterion} + [(\text{criterion} - \text{background}) \times ((Q_s \times M_z)/Q_e)]$$

where;

criterion is either the acute or chronic criterion for the pollutant of concern in NDEQ Title 117

background is the instream concentration for the pollutant of concern

Q_s is the stream design flows, 1Q10 for acute or 7Q10 for chronic

M_z is the instream percent mixing for either the acute or chronic criterion

Q_e is the effluent flow rate.

The following parameters were used in the calculation of the WLA for the discharge from dewatering sites in the City of Omaha to the Missouri River in permit NEG 673000.

$$1Q10 = 11997 \text{ cfs}$$

$$7Q10 = 12582 \text{ cfs}$$

$$M_z = 5.09 \% \text{ for acute}$$

$$M_z = 16.88 \% \text{ for chronic}$$

$$Q_e = 4.023 \text{ cfs, estimated for total daily flow rate for total of all dewatering sites.}$$

Background is assumed to be zero for pollutants of concern

c. Calculation of permit multipliers

The WLA determines the required effluent quality which defines the desired level of treatment plant performance or target long term average (LTA). The average (LTA) and coefficient of variation (CV) are calculated from the model effluent input used to show compliance with the water quality standards. The multipliers are calculated based on a default CV of 0.6. Finally, the maximum daily limit (MDL) and the average monthly limit (AML) are calculated from the required effluent LTA.

1) Calculation of an acute LTA from the WLA:

$$LTA_a = (WLA_a) e^{(0.5\alpha\alpha - z\alpha)}$$

where CV is the coefficient of variation and $\alpha^2 = \ln(CV^2 + 1)$ and

$z = 2.326$ for 99th percentile occurrence probability

Calculating $e^{(0.5\alpha\alpha - z\alpha)} = 0.321$ when the $CV = 0.6$ and $z = 2.326$

Therefore:

$$LTA_a = (WLA_a) (0.321)$$

2) Calculation of a chronic LTA from the WLA:

$$LTA_c = (WLA_c) e^{(0.5\alpha - z\alpha)}$$

where CV is the coefficient of variation of the 4 day average and $\alpha^2 = \ln\{(CV^2/30) + 1\}$ and

$z = 2.326$ for 99th percentile occurrence probability

Calculating $e^{(0.5\alpha - z\alpha)} = 0.527$ when the $CV = 0.6$ and $z = 2.326$

Therefore:

$$LTA_c = (WLA_c) (0.527)$$

3) Calculation of the Maximum Discharge Limit (MDL) from an acute or chronic LTA:

$$MDL = (LTA) e^{(z\alpha - 0.5\alpha\alpha)}$$

where CV is the coefficient of variation and $\alpha^2 = \ln(CV^2 + 1)$ and

$z = 2.326$ for 99th percentile occurrence probability

Calculating $e^{(z\alpha - 0.5\alpha\alpha)} = 3.11$, when the $CV = 0.6$ and $z = 2.326$

Therefore:

$$MDL = (LTA) (3.11)$$

4) Calculation of the Average Monthly Limit (AML) from an acute or chronic LTA:

$$AML = (LTA) e^{(z\alpha - 0.5\alpha\alpha)}$$

where CV is the coefficient of variation of a 4 day average data set and $\alpha^2 = \ln\{(CV^2/n) + 1\}$ and

$z = 1.645$ for 95th percentile occurrence probability

Calculating: $e^{(z\alpha - 0.5\alpha\alpha)} = 1.55$ when $n = 4$, $CV = 0.6$ and $z = 1.645$ for the 95th percentile

Therefore:

$$AML_4 = (LTA) (1.55)$$

d. Calculation of permit limits

Water quality based effluent limits are derived from the WLAs to protect the beneficial uses of the receiving stream and to assure that there is no discharge of toxics in toxic amounts. The NDEQ uses the EPA recommended permit limit derivation procedure set forth in the TSD for two-value, steady-state outputs for both acute and chronic protection. A treatment performance level based on a long term average and coefficient of variation, if available, that will allow the effluent to meet the WLA requirement is calculated. The long term average wasteload that will satisfy both the acute and chronic WLAs is determined. The monthly average and maximum permit limits are calculated using the more stringent long term average. The monthly average is included in the permit as the limit, instead of the maximum, to provide an additional level of protection for the receiving stream.

The calculation of the permit limits in NEG673000 is according to the procedures set forth above. The acute and chronic criteria for some of the pollutants of concern are obtained from NDEQ Title 117, Chapter 4, 003 *General Criteria for Aquatic Life*. For some pollutants of concern both an acute and chronic criteria is listed in Title 117 however for other parameters only chronic criterion is listed in Title 117 which is used to calculate permit limits. If no criterion is listed in Title 117, then reporting requirements are included in the permit without limits. Numerical standards in NDEQ Title 117 Chapter 4 004, *Water Supply* were also used in the calculation when no specific aquatic life standards were available.

An example of the calculation procedure is presented below for the pesticide alachlor.

1) Calculation of the Wasteload Allocation (WLA) for alachlor (see part b above)

$$76 \mu\text{g/L} = \text{chronic criterion from NDEQ Title 117}$$

$$760 \mu\text{g/L} = \text{acute criterion from NDEQ Title 117}$$

$$\text{WLA} = \text{criterion} + [(\text{criterion} - \text{background}) \times ((Q_s \times M_2)/Q_e)]$$

For acute and chronic WLA;

$$\text{WLA}_c = 76 + (76)(12582)(.168)/4.02 = 40194 \mu\text{g/L} = 40.19 \text{ mg/L}$$

$$\text{WLA}_a = 760 + (760)(11997)(0.0509)/4.02 = 116,192 \mu\text{g/L} = 116.19 \text{ mg/L}$$

2) Calculation of Permit Limit for alachlor (see part c above)

$$\text{LTA}_c = 40.19 \times 0.527 = 21.19 \text{ mg/L}$$

$$\text{LTA}_a = 116.19 \times 0.321 = 37.27 \text{ mg/L}$$

The chronic long term average is more stringent and is used to calculate the permit limits.

$$\text{Maximum daily limit} = 21.19 \times 3.11 = 66.02 \text{ mg/L}$$

$$\text{Average monthly limit} = 21.19 \times 1.55 = 32.91 \text{ mg/L}$$

A coefficient of variability (CV) of 0.6 for the effluent concentration is assumed according to EPA procedures for the determination of the permit limits above. The steady-state analyses assume that the effluent is constant and, therefore, the WLA value will never be exceeded. However, for contaminated sites the effluent variability of a pollutant may not be constant due to changes in dewatering site hydrology during the dewatering process. In fact, pollutant concentrations may increase over time due to changes in plume dynamics or other unforeseen factors. Therefore, to provide an additional level of protection for the receiving stream, the monthly average concentration is included in the permit as the limit not to be exceeded.

A maximum limit of 32.9 mg/L is included in the permit for alachlor

3. Other Conditions and Requirements (Part IV of the Permit)

a. Narrative Limits

The narrative limits on toxicity, noxious odors, objectionable materials, and undesirable aquatic life is in accordance with the water quality criteria set forth in NDEQ Title 117.

b. Immediate Reporting Requirements

Immediate reporting requirements are included in the permit so that the NDEQ can determine if dewatering discharge should be prohibited due to adverse environmental impacts.

c. Adjustment to Monitoring Requirements

The NDEQ may adjust the monitoring requirements set forth in form DWO-AMR based on monitoring data or other environmental factors so that the beneficial uses of the Missouri River are not degraded.

d. Implementation of Erosion Control and Energy Dissipation Measures.

Best management practices are required to protect the discharge site for erosion, channelization, or scouring from the discharge of wastewater.

e. Modification of Permit Attachments

The option to revise permit attachments is according to NDEQ permitting procedures. These attachments can be modified without public hearing since the attachments are not a component of the permit.

f. Noncompliance Reporting

Noncompliance reporting requirements are included in the permit so that verbal and written reports to the NDEQ are submitted as soon as reasonably possible.

H. Supporting Documentation

The following documents and regulations were used in the preparation of the draft permit:

1. NDEQ Title 117, *Nebraska Surface Water Quality Standards*, March 22, 2009.
2. NDEQ Title 118, *Ground Water Quality Standards and Use Classifications*, March 27, 2006.
3. NDEQ Title 119, *Rules and Regulations Pertaining to the Issuance of Permits under the National Pollutant Discharge Elimination System*, May 16, 2005.
4. NDEQ Title 197, *Rules and Regulations for the Certification of Wastewater Treatment Facility Operators in Nebraska*, January 24, 1993.
5. NDEQ, *2010 Surface Water Quality Integrated Report*.
6. Technical Support Document for Water Quality-based Toxic Control (EPA 505/2-90-001 PB91-127415, March, 1991).
7. 40 CFR, Part 122, 124, and 125, NPDES Regulations.
8. NDEQ facility file data for the city of Omaha CSO Permit; NPDES NE0133680.

I. Information Requests

Inquiries concerning the draft permit, its basis or the public comment process may be directed to:

Sharon Brunke Tel. 402/471-8830 or 402/471-4220 Fax: 402/471-2909

A TDD operator is available at 711

Copies of the application and other supporting material used in the development of the permit are available for review and copying at the Department's office between 8:00 a.m. and 5:00 p.m. on weekdays.

Office Location: The Atrium, 1200 N Street, Suite 400; Lincoln, NE

Mail Address: NPDES Permits Unit, Nebraska Department of Environmental Quality, PO Box 98922;
Lincoln, Nebraska 68509-8922

J. Submission of Formal Comments or Requests for Hearing

The date on which the public comment period ends is specified in the public notice. During the public notice period, the public may submit formal comments or objections, and/or petition the Department to hold a public hearing concerning the issuance of the draft permit. All such requests need to: be submitted in written form, state the nature of the issues to be raised, and present arguments and factual grounds to support them. The Department shall consider all written comments, objections and/or hearing petitions, received during public comment period, in making a final decision regarding permit issuance.

Formal comments, objections and/or hearing requests need to be submitted to:

Sharon Brunke; NPDES Permits Unit

Mailing Address: Nebraska Department of Environmental Quality
P.O. Box 98922
Lincoln, Nebraska 68509-8922

Location Address: Nebraska Department of Environmental Quality
The Atrium, 1200 N Street, Suite 400
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