Nebraska Department of Environmental Quality

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Fact Sheet

City of Lincoln - Ashland PWTP
Ashland, Nebraska
NPDES NE0111155 / PCS 57640-P

March 21, 2011

Contents of Fact Sheet

A. Proposed Action - Tentative Determination

On the basis of a preliminary staff review, the Nebraska Department of Environmental Quality has made a tentative determination to reissue with change the NPDES permit to the City of Lincoln-Ashland Potable Water Treatment Plant in Ashland, Nebraska for discharge of filter backwash water, cooling water pump motors, gear drives, and bearing packing for pumps, building area floor drains including air relief discharge, and pump station effluent analyzers to Salt Creek via an unnamed tributary.

B. Applicant and Facility Information

Applicant: City of Lincoln

Address: 2021 North 27th Street, Lincoln, NE 68503

Location of Facility: 401 Highway 6, Ashland, NE 68003

Legal Description: S½ NE¼, Section 1, Township 12 North, Range 9 East, Saunders County, Nebraska

SIC Code: 4941 - Water Supply

Other Information: The City of Lincoln-Ashland Potable Water Treatment Plant (PWTP) supplies drinking water for the City of Lincoln. The Ashland PWTP pumps ground water from 44 wells, one that is under the influence of surface water, and uses filtration for the removal of iron and manganese. The facility serves a population of approximately 240,000 in Lincoln. The facility essentially provides all the potable water for the City of Lincoln and consists of two treatment plants known as the West Plant and the East Plant.

The West Plant (**Outfall 001**) was constructed in 1934 with a production capacity of 60 MGD. The treatment process includes aeration (oxidation), chlorination, detention, rapid sand filtration, chloramination, and fluoridation. The backwash flow during each filter backwash cycle for filters 1-10 is 76,400 gal., and for filters 11-14 it is 147,200 gal. The reported average discharge flow is approximately 0.3557 MGD for the period from June 2003 through July 2009 with a maximum of 0.8303 MGD for the month of August 2006.

The East Plant (**Outfall 002**) was constructed and placed on line in October 1994 with a production capacity of 50 MGD. The treatment process includes ozonation (oxidation), dual media (sand/anthracite) filtration, chloramination, and fluoridation. A cationic polymer, Calgon Cat-Floc TL, along with chlorine is added to the raw water prior to filtration. The backwash flow during each filter backwash cycle is 211,800 gal. The reported average discharge flow is approximately 0.1554 MGD for the period from June 2003 through July 2009 with a maximum of 1.0545 MGD for the month of May 2006.

Outfall 003 constructed in 1976 discharges cooling water for a high pressure pump motor and gear drives, bearing packing water for high pressure pumps and wash water supply pumps, all building area floor drains including air relief valve discharges, and West Pump Station effluent analyzers. The average discharge flow is approximately 507 gallons per day.

Outfall 004 constructed in 1995 discharges storm water from on-site street storm sewers and roof drains. It also discharges from the 890,000-gallon W2 chlorine contact/detention basin for raw water that is drained once per year for inspection and cleaning at the West Plant. The average discharge flow varies except when the chlorine contact/detention basin is drained.

This activity does not have any categorically defined effluent guidelines.

C. City PWTP, Receiving Stream and Water Quality Criteria

Outfall 001, Outfall 002, Outfall 003, and Outfall 004

Receiving Stream for PWTP: Salt Creek via an unnamed tributary

Segment / Basin: LP2-10000 of the Lower Platte River Basin

Water Quality Usage Designations **

Salt Creek – Segment LP2-10000	*Unnamed Tributary*
Class A Warm Water Aquatic Life	Class B Warm Water Aquatic Life
Class B Agricultural Water Supply	Acute Criteria applies to this segment
Recreation	Aesthetics
Aesthetics	
Key Species: *Channel Catfish; Walleye*	

** Note: Basin, segment and use designations are set forth in Chapter 5 of NDEQ Title 117 - *Nebraska Surface Water Quality Standards*. The water quality criteria that apply to use designations are set forth in NDEQ Title 117, Chapter 4.

D. Description of Discharge and Potential Pollutants

1. Outfall 001 and Outfall 002

The City of Lincoln-Ashland PWTP, a publicly owned potable water treatment plant that filters ground water for removal of iron and manganese, consists of the following: production wells; aeration (West Plant); ozonation (East Plant); detention; polymer product addition (East Plant) to increase the efficiency of the treatment process; filtration basins; chlorine and anhydrous ammonia addition to produce chloramine; fluoride addition; potable water storage reservoirs; and distribution pumps. Solids removed during filtration are discharged through Outfall 001 (West Plant) and Outfall 002 (East Plant) to Salt Creek via an unnamed tributary. Outfall 002 is located approximately 300 feet upstream of Outfall 001, and Outfall 001 is located approximately 2,100 feet upstream from Salt Creek.

The solids that accumulate in the detention tank in the West Plant are discharged through Outfall 004 once a year when the tank is cleaned using raw well water.

The solids that accumulate in the ozonation contact basins in the East Plant are discharged through Outfall 002 once a year when the basins are cleaned using raw well water; the ozone diffuser heads are checked at this time.

The primary pollutants of concern for Outfall 001 and Outfall 002 are residual chlorine, oxidized iron, oxidized manganese, suspended solids, and pH.

2. Outfall 003

The discharge from Outfall 003 to Salt Creek via an unnamed tributary consists of cooling water for a high pressure pump motor, gear drives, and pump packing for high pressure pumps and wash water supply pumps; wastewater from all building area floor drains which includes air relief valve discharges; and wastewater from the West Pump Station effluent analyzers. The outfall is located between Outfall 001 and Outfall 002.

Source water for cooling is the potable water produced by the PWTP.

The primary pollutants of concern are residual chlorine, suspended solids, and pH.

3. Outfall 004

The discharge from Outfall 004 to Salt Creek via an unnamed tributary consists of storm water from building roof drains and street storm sewers and draining of the 890,000-gallon chlorine contact/detention basin once a year for cleaning and inspection over a 20-24 hour period. The outfall is located downstream of Outfall 001.

The primary pollutants of concern are residual chlorine, suspended solids, total dissolved solids, and pH.

E. Existing Permit Limits

Listed below is a summary of the existing permit monitoring requirements and limitations for the process wastewater discharged to Salt Creek via an unnamed tributary at Outfall 001.

Table FS-1: Existing Effluent Monitoring Requirements for Outfall 001

Parameters	Daily Minimum	Daily Average	Daily Maximum	Monitoring Frequency
pH (Standard Units)	6.0	--	9.0	Quarterly
Flow	--	Report	Report	Daily
Total Suspended Solids	--	Report	Report	Quarterly

F. Proposed Changes Between Draft Permit and Existing Permit

The highlights of the proposed changes between the draft permit and existing permit are summarized below. The basis for these changes is provided in this fact sheet. Also, see the draft permit for specific information on the permit changes.

1. Outfall 002 for the East Plant has been added to the permit.

2. Outfall 003 and Outfall 004 have been added to the permit.
3. Monitoring for Dissolved Iron for Outfall 001 and Outfall 002 is added to the permit.
4. Monitoring for Dissolved Manganese for Outfall 001 and Outfall 002 is added to the permit.

5. Monitoring and limitations for Total Residual Chlorine (TRC) for all outfalls are added to the permit along with a compliance schedule to meet final TRC limits.
6. Monitoring for Conductivity for Outfall 001 and Outfall 002 is added to the permit.
7. The pH daily minimum limitation for Outfall 001 is revised.

G. Discharge Limits and Monitoring Requirements Proposed in the Draft Permit and their Basis

1. Overview of Permit Requirements

The City of Lincoln-Ashland PWTP wastewater from the filtration of ground water for the removal of iron and manganese is discharged to Salt Creek via an unnamed tributary, and must comply with the requirements of the Clean Water Act and NDEQ Title 117 - *Nebraska Surface Water Quality Standards.*

The permit considers both Best Professional Judgment (BPJ) technology-based limitations and water quality-based permit limits. In this permit, technology-based limits were considered for Total Suspended Solids (TSS) and pH.

Water quality-based limitations for Total Residual Chlorine (TRC), Dissolved Iron, and Dissolved Manganese are included in the permit to protect the receiving stream from the discharge of toxic substances in toxic amounts.

2. Basis for Monitoring Frequencies

The monitoring frequencies specified in the draft permit are in accordance with NDEQ's permitting procedures.

3. 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 unnamed tributary and Salt Creek, the receiving water bodies for the discharge addressed by the permit, likely have habitat for aquatic life. The designated uses of the unnamed tributary and Salt Creek were considered during permit development. The limitations in the draft permit are protective of the Clean Water Act § 101(a)(2) goals, and will ensure the existing quality of water in the receiving streams is not lowered.

4. Outfall 001 and Outfall 002: Basis for Monitoring and Limitations

The backwash waters from the City of Lincoln-Ashland PWTP Outfall 001 (West Plant) and Outfall 002 (East Plant) are discharged to Salt Creek via an unnamed tributary. The treatment process should be operated and maintained to meet the requirements of the Clean Water Act.

There are two general approaches for developing technology-based effluent limitations: (1) applying EPA- promulgated effluent limitations developed under Section 304 of the Clean Water Act (CWA) to dischargers by category, or (2) on a case-by-case basis under Section 402(a)(1) of the CWA, to the extent that EPA-promulgated effluent limitations are inapplicable. See 40 CFR 125.3(c)(1)-(2).

EPA has not yet developed technology-based effluent limitations for the drinking water treatment point source category, so technology-based limits for permits issued to such sources must be developed on a case-by-case basis for each pollutant discharged, including suspended solids.

To develop effluent limits on a case-by-case basis, the permitting authority (EPA, or a state agency that has been delegated the authority to administer the NPDES program) must identify "best practicable control technology presently available" (BPCT) and "best conventional pollutant control technology" (BCT) using the permitting authority's "best professional judgment" (BPJ). The factors the permitting authority must consider in any BPJ analysis are set by regulation. The permitting authority must consider:

a. 40 CFR 125.3(c)(2) to identify BPCT
   (i) The total cost of application of technology in relation to the effluent reduction benefits to be achieved from each application;
   (ii) The age of equipment and facilities involved;
   (iii) The process employed;

(iv) The engineering aspects of the application of various types of control techniques;

(v) Process changes; and

(vi) Non-water quality environment impact (including energy requirements).

b. 40 CFR 125.3(d)(1) to identify BCT, whether an effluent limitation based on BCT should be more stringent than BPCT requirements, and must consider the following factors in addition to those identified under 40 CFR 125.3(d)(1):

(i) The reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived; and

(ii) The comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources.

The basis for the permit monitoring requirements and limitations are specified below.

a. Basis for Flow Monitoring

Flow monitoring without limits is required in the draft permit. The flow can either be calculated or measured. NPDES permits do not regulate discharge flows, but flow may be inherently related to the mass of pollutants discharged and to the impact of the discharge pollutants on the receiving water body.

b. Basis for the pH Discharge Limits

The hydrogen ion concentration of the process wastewater discharge is expressed as pH. A pH range of 6.5 to 9.0 S.U. is included in the permit to ensure water quality protection for aquatic life in the receiving waters, according to the regulations set forth in NDEQ Title 117.

Most promulgated technology-based effluent guidelines set pH minimum limitations at 6.0 Standard Units. In this case, the water quality-based effluent limits are more stringent.

c. Basis for Conductivity Discharge Monitoring

The conductivity monitoring is included in the permit in accordance with NDEQ Title 117, Chapter 4. Monitoring requirements for conductivity are listed in the Permit in Table 1 for Outfall 001 and Table 3 for Outfall 002.

d. Basis for Total Residual Chlorine (TRC) Discharge Limits

Chlorine is added to the water after the aeration process in the West Plant; ammonia is then added to form chloramine for disinfection after the filtration process. In the East Plant, chlorine is added to the water after the ozonation process and again along with ammonia for disinfection after the filtration process.

Residual chlorine is a toxic pollutant that is detrimental to aquatic plant and animal life even at low concentrations. To protect the beneficial uses of the receiving stream, the NDEQ has placed an acute criterion of 19 µg/L and a chronic criterion of 11 µg/L in Title 117 - *Nebraska Surface Water Quality Standards*. To protect these in-stream criteria, limitations for TRC are included in the permit. TRC limitations are determined using the procedures for permit limit development from the *TSD*. The TRC wasteload allocations for the Lincoln-Ashland PWTP are included in Attachment 1 - *Permit Limit Calculations*. TRC is a measure of the combined available chlorine and the free available chlorine after the chlorine demand has been met. Monitoring and limitation requirements for TRC are listed in the Permit in Table 2 for Outfall 001 and Table 4 for Outfall 002. The TRC limits are water quality-based. A compliance schedule is included in Part III of the permit to give the City of Lincoln sufficient time to meet final TRC limits.

e. Basis for Total Suspended Solids (TSS) Discharge Monitoring

The Total Suspended Solids (TSS) monitoring is continued in the permit in accordance with NDEQ Title 117, Chapter 4. Monitoring requirements for TSS are listed in the Permit in Table 1 for Outfall 001 and Table 3 for Outfall 002.

It is the best professional judgment of the permit writer that TSS limits are not required for Outfalls 001 and 002, and only monitoring is required. While all the factors discussed above apply, the guiding considerations is the process employed [40 CFR 125.3(c)(2)(iv)]. The facility is treating groundwater and the only chemicals added besides chlorine, anhydrous ammonia, and fluoride are

small amounts of a polymer at the East Plant. Aeration, ozonation, and detention precipitate small amounts of minerals which are captured by sand and dual media filters.

The standard technology for capture of TSS is the use of settling ponds. In this case, the amounts of solids produced are so small that they can only be captured by filtration. Long term monitoring shows that the levels of solids in the filter backwash water are less that the limits that would be specified for settling ponds in various industrial applications. So, based on the process employed, limits are not necessary.

f. Basis for Iron Discharge Monitoring

The Dissolved Iron monitoring is included in the permit in accordance with NDEQ Title 117, Chapter 4, and the *TSD* - Technical Support Document For Water Quality-based Toxics Control (EPA/505/2-90-001), Chapter 3.2, and to provide data to ensure there is no in-stream excursion above the water quality standard. Monitoring requirements for dissolved iron are listed in the Permit in Table 1 for Outfall 001 and Table 3 for Outfall 002.

Salt Creek, Segment LP2-10000, was included on the NDEQ Section 303(d) list as having iron as an impairing use parameter in the *2004 Surface Water Quality Integrated Report.* The 2*008 Water Quality Integrated Report, Modified November 2008,* does not list iron as an impairment or a parameter of concern. Therefore, there appears to be no reasonable potential for the City of Lincoln-Ashland PWTP to cause an excursion of water quality criteria for iron.

g. Basis for Manganese Discharge Monitoring

The Dissolved Manganese monitoring is included in the permit in accordance with NDEQ Title 117, Chapter 4, and to provide data to ensure there is no in-stream excursion above the water quality standard. Monitoring requirements for dissolved manganese are listed in the Permit in Table 1 for Outfall 001 and Table 3 for Outfall 002.

Since Salt Creek, Segment LP2-10000, was not included on the NDEQ Section 303(d) list as having manganese as an impairing use parameter in the *2004 Surface Water Quality Integrated Report* nor as an impairment or a parameter of concern in the 2*008 Water Quality Integrated Report, Modified November 2008,* there appears to be no reasonable potential for the City of Lincoln-Ashland PWTP to cause an excursion of water quality criteria for manganese.

5. Outfall 003: Basis for Monitoring and Limitations

a. Basis for Flow Monitoring

Flow monitoring without limits is required in the draft permit. The flow can either be calculated or measured. NPDES permits do not regulate discharge flows, but flow may be inherently related to the mass of pollutants discharged and to the impact of the discharge pollutants on the receiving water body.

b. Basis for the pH Discharge Limits

The hydrogen ion concentration of the process wastewater discharge is expressed as pH. A pH range of 6.5 to 9.0 S.U. is included in the permit to ensure water quality protection for aquatic life in the receiving waters, according to the regulations set forth in NDEQ Title 117.

Most promulgated technology-based effluent guidelines set pH minimum limitations at 6.0 Standard Units. In this case, the water quality-based effluent limits are more stringent.

c. Basis for TSS Discharge Monitoring

The Total Suspended Solids (TSS) monitoring is included in the permit in accordance with NDEQ Title 117, Chapter 4. Monitoring requirements for TSS are listed in Table 5 in the Permit.

It is the best professional judgment of the permit writer that TSS limits are not required for Outfall 003, and only monitoring is required.

d. Basis for Total Residual Chlorine (TRC) Discharge Limits

Free chlorine is a toxic pollutant that is detrimental to aquatic plant and animal life even at low concentrations. To protect the beneficial uses of the receiving stream, the NDEQ has placed water quality-based limits of acute criterion of 19 µg/l and a chronic criterion of 11 µg/L in Title 117 - *Nebraska Surface Water Quality Standards*. To protect these in-stream criteria, limitations for TRC are included in the permit. Monitoring and limitation requirements for TRC are listed in Table 5 in the Permit. A compliance schedule is included in Part III of the permit to give the City of Lincoln sufficient time to meet final TRC limits.

6. Outfall 004: Basis for Monitoring and Limitations

a. Basis for Flow Monitoring

Flow monitoring without limits is required in the draft permit. The flow can either be calculated or measured. NPDES permits do not regulate discharge flows, but flow may be inherently related to the mass of pollutants discharged and to the impact of the discharge pollutants on the receiving water body.

b. Basis for the pH Discharge Limits

The hydrogen ion concentration of the process wastewater discharge is expressed as pH. A pH range of 6.5 to 9.0 S.U. is included in the permit to ensure water quality protection for aquatic life in the receiving waters, according to the regulations set forth in NDEQ Title 117.

Most promulgated technology-based effluent guidelines set pH minimum limitations at 6.0 Standard Units. In this case, the water quality-based effluent limits are more stringent.

c. Basis for TSS Discharge Monitoring

The Total Suspended Solids (TSS) monitoring is included in the permit in accordance with NDEQ Title 117, Chapter 4. Monitoring requirements for TSS are listed in Table 6 in the Permit.

It is the best professional judgment of the permit writer that TSS limits are not required for Outfall 004, and only monitoring is required.

d. Basis for TDS Discharge Monitoring

The Total Dissolved Solids (TDS) monitoring is included in the permit in accordance with NDEQ Title 117, Chapter 4. Monitoring requirements for TDS are listed in Table 6 in the Permit.

It is the best professional judgment of the permit writer that TDS limits are not required for Outfall 004, and only monitoring is required.

e. Basis for Total Residual Chlorine (TRC) Discharge Limits

Free chlorine is a toxic pollutant that is detrimental to aquatic plant and animal life even at low concentrations. To protect the beneficial uses of the receiving stream, the NDEQ has placed water quality-based limits of acute criterion of 19 µg/l and a chronic criterion of 11 µg/L in Title 117 - *Nebraska Surface Water Quality Standards*. To protect these in-stream criteria, limitations for TRC are included in the permit. Monitoring and limitation requirements for TRC are listed in Table 6 in the Permit. A compliance schedule is included in Part III of the permit to give the City of Lincoln sufficient time to meet final TRC limits.

f. Basis for Iron Discharge Monitoring

The Dissolved Iron monitoring is included in the permit in accordance with NDEQ Title 117, Chapter 4, and the *TSD* - Technical Support Document For Water Quality-based Toxics Control (EPA/505/2-90-001), Chapter 3.2, and to provide data to ensure there is no in-stream excursion above the water quality standard. Monitoring requirements for dissolved iron are listed in Table 6 in the Permit.

Salt Creek, Segment LP2-10000, was included on the NDEQ Section 303(d) list as having iron as an impairing use parameter in the *2004 Surface Water Quality Integrated Report.* The 2*008 Water Quality Integrated Report, Modified November 2008,* does not list iron as an impairment or a parameter of concern. Therefore, there appears to be no reasonable potential for the City of Lincoln-Ashland PWTP to cause an excursion of water quality criteria for iron.

g. Basis for Manganese Discharge Monitoring

The Dissolved Manganese monitoring is included in the permit in accordance with NDEQ Title 117, Chapter 4, and to provide data to ensure there is no in-stream excursion above the water quality standard. Monitoring requirements for dissolved manganese are listed in Table 6 in the Permit.

Since Salt Creek, Segment LP2-10000, was not included on the NDEQ Section 303(d) list as having manganese as an impairing use parameter in the *2004 Surface Water Quality Integrated Report* nor as an impairment or a parameter of concern in the *2008 Water Quality Integrated Report, Modified November 2008,* there appears to be no reasonable potential for the City of Lincoln-Ashland PWTP to cause an excursion of water quality criteria for manganese.

H. Compliance Schedule

A compliance schedule to give a permittee sufficient time to achieve water quality standards may be included in a permit in accordance with the requirements set forth in NDEQ Title 119; *Rules and Regulations Pertaining to the Issuance of Permits Under the National Pollutant Discharge Elimination System*. A three-year compliance schedule is included in the permit to give the City of Lincoln sufficient time to design, construct, and operate a dechlorination treatment system to meet the final TRC requirements for Outfalls 001, 002, 003, and 004 for the Ashland PWTP set forth in the permit. The first year of the schedule requires that the City of Lincoln submit plans and specifications for an upgrade to the treatment system to meet final TRC limits. The second year of the schedule requires that the City of Lincoln commence construction of the upgrade followed by successful operation of the dechlorination system within three years after the effective date of the permit to meet final TRC limits for Outfalls 001, 002, 003, and 004.

I. Other Conditions and Requirements

1. 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.

2. Certified Operator Requirement

The requirement that the potable water treatment plant is to be operated and maintained by certified operators is in accordance with Nebraska Health and Human Services Title 179 - *Public Water Systems*.

3. Analytical Methods

The requirements to analyze wastewater samples using approved analytical methods are from 40 CFR, Part 136 and NDEQ Title 119.

4. Reporting of Detection Limit

The requirement to report less than the method detection limits on the Discharge Monitoring Report (DMR) instead of zero when an analyte is not detected is according to NDEQ permitting procedures.

5. Additional Monitoring

The condition under which the Department may require increases in monitoring frequencies and monitoring for additional parameters is in accordance with NDEQ Title 119.

6. Sludge Disposal

Sludge disposal requirements are in accordance with NDEQ Title 128.

7. Permit Modification and Reopening

The permit may be reopened and modified in accordance with NDEQ Title 119.

8. 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 NPDES Permit terms and conditions.

9. Best Management Practices

Discharge of treatment solids and backwash water to surface waters must meet water quality criteria as set forth in NDEQ Title 117. Discharges should be constant and equalized to the maximum extent practicable so that the solids or other pollutants are dispersed efficiently into surface waters.

J. 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* (Revised March 22, 2009);
2. NDEQ Title 119 - *Rules and Regulations Pertaining to the Issuance of Permits under the National Pollutant Discharge Elimination System* (Revised May 16, 2005);
3. Nebraska HHS Title 179 - *Public Water Systems;*
4. Technical Support Document for Water Quality-based Toxic Control (EPA 505/2-90-001 PB91-127415, March, 1991);
5. Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.) - Clean Water Act;
6. 40 CFR, Parts 122, 124, and 125, NPDES Regulations;
7. Wastewater Treatment Facility Inspection Report of August 24, 1994;
8. NDEQ letter dated December 24, 2002 indicating the Ashland facility met the requirements of the Nebraska Safe Drinking Water Act based on a routine Sanitary Survey conducted in August 2000 and the City of Lincoln's response to the survey comments on December 15, 2000;
9. Permit application received by the NDEQ on April 13, 1992 and June 15, 1992 (for signature);
10. Supplemental application form received by the NDEQ on April 9, 1999;
11. Amended permit application received by the NDEQ on February 19, 2008;
12. Wasteload allocation spreadsheet prepared by the NDEQ Planning Unit and the NDEQ Permits Unit;
13. DMR Data for the City of Lincoln-Ashland PWTP from the EPA Permit Compliance System; and
14. Information and additional data provided by the permittee.

K. Information Request

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

Sharon Brunke; NPDES Permits Unit

Telephone: 402-471-8830 or 402-471-4220. A TDD operator is available at 711.
Fax: 402-471-2909

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

Location Address:
Nebraska Department of Environmental Quality
The Atrium, 1200 N Street, Suite 400
Lincoln, NE 68509

L. Submission of Formal Comments or Requests for Hearing

The date on which the public notice 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 the 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, NE 68509-8922

Location Address:
Nebraska Department of Environmental Quality
The Atrium, 1200 N Street, Suite 400
Lincoln, NE 68509

Attachment 1 – *Permit Limit Calculations*

A. Total Residual Chlorine (TRC) Permit Limitation Calculations

1. Development of Permit Limits

The seasonal WLAs derived for the City of Lincoln-Ashland PWTP for TRC and the percent-mixing zone are presented in Table 1 below. (Also see Attachment 2 - *WLA Derivation Forms*)

Table 1: TRC WLAs

	Total Residual Chlorine (TRC) West Plant Salt Creek via Tributary (Outfall 001)		**Total Residual Chlorine (TRC) East Plant** Salt Creek via Tributary (Outfall 002)	
	WLA (mg/L)	**Percent Stream**	**WLA (mg/L)**	**Percent Stream**
Spring Acute (1Q10)	0.021	50.0	0.031	50.0
Spring Chronic (7Q10)	0.537	21.67	3.133	22.04
Summer Acute (1Q10)	0.020	50.0	0.025	50.0
Summer Chronic (7Q10)	0.250	21.64	0.996	22.39
Winter Acute (1Q10)	0.021	50.0	0.023	50.0
Winter Chronic (7Q10)	0.451	21.84	0.925	22.11

The permit limit concentrations are developed using a two-value steady state model as specified in the *TSD* – Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001).

Permit limitations must control all pollutants that are discharged at a level which will cause or have a reasonable potential to cause or contribute to an excursion above any state water quality standard. To develop the permit limitations from the WLA, the effluent data and long-term average from any treatment system may be described using standard descriptive statistics such as the mean and coefficient of variation. The long-term average (LTA) is defined as the average or mean of all the concentrations for the pollutant or pollutant parameter over time. The Coefficient of Variation (CV) is a standard statistical measure of the relative variability of a distribution or a set of data. The CV is the ratio of the standard deviation to the mean. Calculation of the LTAs is used in determining the permit limitations most protective of the WLA.

The water quality standards specify two different aquatic life exposure periods (Acute and Chronic). This requires the calculation of two sets of wasteload allocations and permit limitations. The acute and chronic LTAs are calculated using the 99th percentile of the effluent distribution. The methodology for calculating LTAs is set forth in the *TSD*, and is based on the default coefficient of variation of 0.6. Federal regulations require that seasonal variations be accounted for when developing the WLAs. Therefore, the point source WLAs will consider seasonal difference in the receiving stream water quantity and quality along with the seasonal effluent quantity and quality. The TRC WLAs for Outfall 001 and Outfall 002 are derived for a spring season (Mar. 1 - May 31), a summer season (June 1 - Oct. 31) and a winter season (Nov. 1 - Feb. 28[29]). The water-quality based effluent limitations are derived directly from whichever seasonal long-term average is the most protective, acute or chronic. The chronic LTA is calculated using a 4-day average since the City of Lincoln-Ashland PWTP will test for TRC monthly.

The Maximum Daily Limit (MDL) is calculated from each appropriate LTA using the 99th percentile of the effluent distribution, the long-term average, and the WLA. The Average Monthly Limit

(AML) is calculated from the appropriate LTA using the 95th percentile of the effluent distribution and is based on a sampling frequency of 4 samples per month.

The permit limits for Outfall 001 are chosen using the most protective long-term average, which is the acute for the spring, summer, and winter seasons.

Table 2: Summary of TRC Calculations – Outfall 001 (West Plant)

General Data				Water Quality Based Permit Limit Calculations for: Total Residual Chlorine (TRC)			
Facility Name:	Lincoln-Ashland PWTP				Spring	Summer	Winter
Permit Number:	NE0111155			Acute WLA	0.021	0.020	0.021
Date:	September 1, 2010			Chronic WLA	0.537	0.250	0.451
Permit Writer:	Gerald H. Memming			Acute LTA	0.0067	0.0066	0.0068
Receiving Stream:	Salt Creek via Unnamed Trib.			Chronic LTA	0.2832	0.1318	0.2377
Title 117 ID:	LP2-10000			***Concentration Based Permit Limits:***			
Aquatic Use:	WWA			***Average Monthly (mg/L)***	***0.0105***	***0.0102***	***0.0105***
Pollutant of Concern:	TRC			***Maximum Daily (mg/L)***	***0.0210***	***0.0204***	***0.0211***
Coefficient of Variation CV):	Spring	Summer	Winter	***Mass Based Permit Limits:***			
	0.6	0.6	0.6	***Average Monthly (kg/day)***	---	---	---
Samples/Month (N):	4			***Maximum Daily (kg/day)***	---	---	---
Chronic (N) day average:	4						

Data from WLA Worksheet – Outfall 001			
	Spring	Summer	Winter
Effluent Flow in cfs:	0.4762	0.6563	0.45263
1q10 Stream Flow in cfs:	0.10	0.10	0.10
7q10 Stream Flow in cfs:	105	66	83
30q5 Stream Flow in cfs:	1.7	86	110
% 1q10 used for mixing:	50.0	50.0	50.0
% 7q10 used for mixing:	21.67	21.64	21.84
% 30q5 used for mixing:	---	---	---
Acute WLA:	0.021	0.020	0.021
Chronic WLA:	0.537	0.250	0.451

The permit limits for Outfall 002 are chosen using the most protective long-term average, which is the acute for the spring, summer, and winter seasons.

Table 3: Summary of TRC Calculations – Outfall 002 (East Plant)

General Data				Water Quality Based Permit Limit Calculations for: Total Residual Chlorine (TRC)			
Facility Name:	Lincoln-Ashland PWTP				Spring	Summer	Winter
Permit Number:	NE0111155			Acute WLA	0.031	0.025	0.023
Date:	September 1, 2010			Chronic WLA	3.133	0.996	0.925
Permit Writer:	Gerald H. Memming			Acute LTA	0.0098	0.0079	0.0075
Receiving Stream:	Salt Creek via Unnamed Trib.			Chronic LTA	1.6524	0.5253	0.4879
Title 117 ID:	LP2-10000			***Concentration Based Permit Limits:***			
Aquatic Use:	WWA			***Average Monthly (mg/L)***	***0.0153***	***0.0123***	***0.0116***
Pollutant of Concern:	TRC			***Maximum Daily (mg/L)***	***0.0306***	***0.0247***	***0.0233***
Coefficient of Variation CV):	Spring	Summer	Winter	***Mass Based Permit Limits:***			
	0.6	0.6	0.6	***Average Monthly (kg/day)***	---	---	---
Samples/Month (N):	4			***Maximum Daily (kg/day)***	---	---	---
Chronic (N) day average:	4						

Data from WLA Worksheet – Outfall 002			
	Spring	Summer	Winter
Effluent Flow in cfs:	0.0527	0.1067	0.1428
1q10 Stream Flow in cfs:	0.10	0.10	0.10
7q10 Stream Flow in cfs:	105	66	83
30q5 Stream Flow in cfs:	1.7	86	110
% 1q10 used for mixing:	50.0	50.0	50.0
% 7q10 used for mixing:	22.04	22.39	22.11
% 30q5 used for mixing:	---	---	---
Acute WLA:	0.031	0.025	0.023
Chronic WLA:	3.133	0.996	0.925

2. Calculation of TRC Multipliers

The TRC multipliers are calculated based on a default CV of 0.6.

a) Calculation of an acute LTA from the WLA:

$$\mathbf{LTA_a = (WLA_a)\ e^{(0.5\,\sigma\,\sigma\,-\,z\,\sigma)}}$$

where σ is the standard deviation and $\sigma^2 = \ln(CV^2 + 1)$ and z = 2.326 for 99th percentile occurrence probability

Calculating $e^{(0.5\,\sigma\,\sigma\,-\,z\,\sigma)} = 0.3211$ when the CV = 0.6 and z = 2.326

Therefore: $\mathbf{LTA_a = (WLA_a)\ (0.3211)}$

b) Calculation of a chronic LTA from the WLA:

$$\mathbf{LTA_c = (WLA_c)\ e^{(0.5\,\sigma\,\sigma\,-\,z\,\sigma)}}$$

where σ is the standard deviation of the 4 day averaged value data set and $\sigma^2 = \ln\{(CV^2/30) + 1\}$ and z = 2.326 for 99th percentile occurrence probability

Calculating $e^{(0.5\,\sigma\,\sigma\,-\,z\,\sigma)} = 0.5274$ when the CV = 0.6 and z = 2.326

Therefore: $\mathbf{LTA_c = (WLA_c)\ (0.5274)}$

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

$$\mathbf{MDL = (LTA)\ e^{(z\,\sigma\,-\,0.5\,\sigma\,\sigma)}}$$

where σ is the standard deviation and $\sigma^2 = \ln(CV^2 + 1)$ and z = 2.326 for 99th percentile occurrence probability

Calculating $e^{(z\,\sigma\,-\,0.5\,\sigma\,\sigma)} = 3.1145$, when the CV = 0.6 and z = 2.326

Therefore: **MDL = (LTA) (3.1145)**

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

$$\mathbf{AML = (LTA)\ e^{(z\,\sigma\,-\,0.5\,\sigma\,\sigma)}}$$

where σ is the standard deviation of a 30 day averaged data set and $\sigma^2 = \ln\{(CV^2/n) + 1\}$ and z = 1.645 for 95th percentile occurrence probability

Calculating: $e^{(z\,\sigma\,-\,0.5\,\sigma\,\sigma)} = 1.5524$ when n = 4, CV = 0.6 and z = 1.645 for the 95th percentile

Therefore: $\mathbf{AML_{30} = (LTA)\ (1.5524)}$

Attachment 2 – *WLA Derivation Forms*

A. TRC Derivation Forms

1. Derivation for West Plant

Facility Name-	City of Lincoln-Ashland PWTP, West Plant			9/1/2010				
Permit Number-	NE0111155		Pollutant:	TRC				
Multipliers					WLA =	WQS*(stream flow + discharge flow) - (background concentration * stream flow)		
3.1145	MDL					discharge flow		
1.5524	AML				LTAa =	WLA acute * LTAa multiplier		
0.3211	LTAa				LTAc =	WLA chronic * LTAc multiplier		
0.5274	LTAc				AML mg/L =	the smaller LTA (LTAa or LTAc) * AML multiplier		
monitoring samples	0				DML mg/L =	the smaller LTA (LTAa or LTAc) * DML multiplier		
CV	0.6				AML lbs/day =	AML mg/L * discharge flow * 8.34		
Design flow MGD=					DML lbs/day =	DML mg/L * discharge flow * 8.34		
n Used	4							

					Concentration limits		Mass limits	
	Acute WLA	Chronic WLA	LTAa	LTAc	AML mg/L	MDL mg/L	AML #/d	DML #/d
Spring (March-May)	0.021	0.537	0.0067	0.2832	0.0105	0.0210		
Summer (June-October)	0.020	0.250	0.0066	0.1318	0.0102	0.0204		
Winter (Nov-Febr)	0.021	0.451	0.0068	0.2377	0.0105	0.0211		

Input data for Limits calculator

Seasons in Permit Limits	Spring	Summer	Winter
Months in Season	March-May	June-October	Nov-Febr
Stream Flow (cfs) Acute	0.10	0.10	0.10
Stream Flow (cfs) Chronic	105.00	66.00	83.00
Effluent Discharge (MGD)	0.30775	0.4242	0.29255
Background concentration (mg/L) Acute	0.00	0.00	0.00
Background concentration (mg/L) Chronic	0.00	0.00	0.00
Stream pH	8.00	8.00	8.00
Stream Temperature ^{0}C	15.00	22.00	6.00
% mixing (0-1) Acute	0.50	0.50	0.50
% mixing (0-1) Chronic	0.2167	0.2164	0.2184
WQS Acute*	0.019	0.019	0.019
WQS Chronic*	0.011	0.011	0.011
	n	n	n
Salmonid Present? (y/n)	n	n	n
Early Life Stages Present? (y/n)	y	y	n

2. Derivation for East Plant

Facility Name-	City of Lincoln-Ashland PWTP, East Plant			9/1/2010				
Permit Number-	NE0111155		Pollutant:	TRC				
Multipliers					WLA =	WQS*(stream flow + discharge flow) - (background concentration * stream flow)		
3.1145	MDL					discharge flow		
1.5524	AML				LTAa =	WLA acute * LTAa multiplier		
0.3211	LTAa				LTAc =	WLA chronic * LTAc multiplier		
0.5274	LTAc				AML mg/L =	the smaller LTA (LTAa or LTAc) * AML multiplier		
monitoring samples	0				DML mg/L =	the smaller LTA (LTAa or LTAc) * DML multiplier		
CV	0.6				AML lbs/day =	AML mg/L * discharge flow * 8.34		
Design flow MGD=					DML lbs/day =	DML mg/L * discharge flow * 8.34		
n Used	4							

					Concentration limits		Mass limits	
	Acute WLA	Chronic WLA	LTAa	LTAc	AML mg/L	MDL mg/L	AML #/d	DML #/d
Spring (March-May)	0.031	3.133	0.0098	1.6524	0.0153	0.0306		
Summer (June-October)	0.025	0.996	0.0079	0.5253	0.0123	0.0247		
Winter (Nov-Febr)	0.023	0.925	0.0075	0.4879	0.0116	0.0233		

Input data for Limits calculator

Seasons in Permit Limits	Spring	Summer	Winter
Months in Season	March-May	June-October	Nov-Febr
Stream Flow (cfs) Acute	0.10	0.10	0.10
Stream Flow (cfs) Chronic	105.00	66.00	83.00
Effluent Discharge (MGD)	0.0527	0.1067	0.1428
Background concentration (mg/L) Acute	0.00	0.00	0.00
Background concentration (mg/L) Chronic	0.00	0.00	0.00
Stream pH	8.00	8.00	8.00
Stream Temperature ^{0}C	15.00	22.00	6.00
% mixing (0-1) Acute	0.50	0.50	0.50
% mixing (0-1) Chronic	0.2204	0.2239	0.2211
WQS Acute*	0.019	0.019	0.019
WQS Chronic*	0.011	0.011	0.011
	n	n	n
Salmonid Present? (y/n)	n	n	n
Early Life Stages Present? (y/n)	y	y	n