

FACT SHEET

The United States Environmental Protection Agency (EPA)
Plans To Reissue A
National Pollutant Discharge Elimination System (NPDES) Permit To:

The City of Cottonwood
P.O. Box 172
Cottonwood, Idaho 83522

Permit Number: ID-002184-9
Public Notice start date:
Public Notice expiration date:

EPA Proposes NPDES Permit Reissuance.

EPA proposes to reissue an NPDES permit to the City of Cottonwood. The draft permit places conditions on the discharge of pollutants from the City of Cottonwood's wastewater treatment plant to Cottonwood Creek. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a description of the current discharge and current sewage sludge (biosolids) practices
- a listing of proposed effluent limitations, schedules of compliance, and other conditions
- a map and description of the discharge location
- technical material supporting the conditions in the permit

The State of Idaho Proposes Certification.

EPA is requesting that the Idaho Department of Environmental Quality certify the NPDES permit for the City of Cottonwood, under section 401 of the Clean Water Act. The state provided preliminary comments on the draft permit, and these comments have been incorporated into the draft permit.

Public Comment.

Persons wishing to comment on, or request a Public Hearing for, the draft permit may do so in writing by the expiration date of the Public Notice. A request for a Public Hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All comments and requests for Public Hearings must be in writing and should be submitted to EPA as described in the Public Comments Section of the attached Public Notice.

After the Public Notice expires, and all comments have been considered, EPA's regional Director for the Office of Water will make a final decision regarding permit reissuance.

Persons wishing to comment on State Certification should submit written comments by the Public Notice expiration date to the Idaho Department of Environmental Quality (IDEQ) at State Office Building, 1118 F Street, Lewiston, Idaho. A copy of the comments should also be submitted to EPA.

If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, EPA will address the comments and issue the permit. The permit will become effective 30 days after the issuance date, unless the permit is appealed to the Environmental Appeals Board.

Documents are Available for Review.

The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday (See address below). Draft permits, Fact Sheets, and other information can also be found by visiting the Region 10 website at "www.epa.gov/r10earth/water.htm."

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-2108 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The Fact Sheet and draft permit are also available at:

EPA Idaho Operations Office
1435 North Orchard Street
Boise, Idaho 83706
(208) 378-5746

TABLE OF CONTENTS

I. APPLICANT 5

II. FACILITY INFORMATION 5

 A. Treatment Plant Description 5

 B. Background Information 5

III. RECEIVING WATER 6

 A. Outfall location/ Receiving Water 6

 B. Water Quality Standards 6

 C. Water Quality Limited Segment 7

IV. EFFLUENT LIMITATIONS 8

V. MONITORING REQUIREMENTS 9

VI. SLUDGE (BIOSOLIDS) REQUIREMENTS 10

VII. OTHER PERMIT CONDITIONS 11

 A. Quality Assurance Plan 11

 B. Additional Permit Provisions 11

 C. Reopener Clause 11

VIII. OTHER LEGAL REQUIREMENTS 11

 A. Endangered Species Act 11

 B. State Certification 12

 C. Permit Expiration 12

APPENDIX A 1

 Wastewater Treatment Plant Location 1

APPENDIX B 1

 Water Quality Standards 1

APPENDIX C 1

 Basis for Effluent Limitations 1

APPENDIX D 1

 Derivation of Water Quality Based
 Effluent Limitations for Total Residual Chlorine 1

APPENDIX E 1

 Endangered Species Act 1

APPENDIX F 1
IDEQ Preliminary Comments on the Draft Permit 1

I. APPLICANT

City of Cottonwood
NPDES Permit No.: ID-002184-9

Facility Mailing Address:
P.O. Box 172
Cottonwood, Idaho 83522

II. FACILITY INFORMATION

A. Treatment Plant Description

The City of Cottonwood owns, operates, and has maintenance responsibility for a facility which treats domestic sewage from local residents and commercial establishments. The system serves a population of approximately 1,000, and there are no significant industrial dischargers to the system. The facility has a design flow of 0.275 million gallons per day (mgd), an annual average daily flow rate of 0.48 mgd, and a peak average monthly flow of 1.46 mgd. The system provides secondary treatment, as well as disinfection by chlorination followed by dechlorination prior to discharging effluent to Cottonwood Creek.

Cottonwood's system consists of five facultative lagoons followed by chlorination and dechlorination. From November through April the system discharge is to Cottonwood Creek. From May through October, the effluent is applied to a city-owned hybrid poplar tree plantation. The land application site is covered by a state-issued land application permit. Biosolids accumulate and are treated anaerobically in the bottom of the lagoons. The city does not anticipate having to handle sludge during the next seven years.

B. Background Information

The NPDES permit for the wastewater treatment plant expired on September 29, 1992. An application for renewal of the permit was received on July 17, 2000.

A review of the facility's Discharge Monitoring Reports¹ for the past five years indicates that the facility has generally been in compliance with its permit effluent limits for BOD and TSS. There have been numerous violations for BOD percent removal, and several violations for fecal coliform.

¹Discharge monitoring reports are forms used by the permittee to report the results of monitoring that is conducted to verify that they are adhering to the effluent limitations and conditions in their NPDES permit.

A map has been included in Appendix A which shows the location of the treatment plant and the discharge location.

III. RECEIVING WATER

A. Outfall location/ Receiving Water

The treated effluent from the City of Cottonwood's wastewater treatment facility is discharged from outfall 001 to Cottonwood Creek at approximately river mile (RM) 21. The current permit allows a direct discharge to Cottonwood Creek from November 1 through March 31. From May 1 through October 15, effluent is land applied after chlorination.

Cottonwood Creek is a second order tributary of the South Fork Clearwater River located in Idaho County, Idaho. It flows from an elevation of 5,730 feet at Cottonwood Butte, east across the Camas Prairie, to an elevation of 1,332 feet at its confluence with the South Fork of the Clearwater River, near Stites, Idaho. It flows roughly from west to east, and the main stem is about 30 miles long. A waterfall approximately 9 miles upstream from the mouth of Cottonwood Creek restricts fish passage upstream.

The Cottonwood Creek TMDL includes a flow analysis to provide reliable stream discharge data for pollutant loading calculations. There are no flow gages on the creek, and historic data are not considered reliable because stream discharges were not measured directly. Based on the work done for the TMDL, the following are the estimated daily monthly flows in upper Cottonwood Creek for the November through April period:

November	1.9 cfs
December	1.6 cfs
January	5.2 cfs
February	4.4 cfs
March	11.4 cfs
April	6.9 cfs

B. Water Quality Standards

A State's water quality standards are composed of use classifications, numeric and/or narrative water quality criteria, and an anti-degradation policy. The use classification system designates the beneficial uses (such as cold water biota, contact recreation, etc.) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary, by the State, to support the beneficial use classification of each water body. The anti-

degradation policy represents a three tiered approach to maintain and protect various levels of water quality and uses.

The Idaho *Water Quality Standards and Wastewater Treatment Requirements* (IDAPA 58.01.02.120.08) protects this segment of Cottonwood Creek for cold water biota, salmonid spawning, secondary contact recreation, and agricultural water.

The criteria that the State of Idaho has deemed necessary to protect the beneficial uses for this portion of Cottonwood Creek, and the State's anti-degradation policy are summarized in Appendix B.

C. Water Quality Limited Segment

A water quality limited segment is any waterbody, or definable portion of a water body, where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards. Cottonwood Creek has been listed as water quality limited for sediment, temperature, pathogens, nutrients, dissolved oxygen, ammonia, habitat alteration, and flow.

Section 303(d) of the Clean Water Act requires states to develop a plan, known as a Total Maximum Daily Load (TMDL) management plan, for water bodies determined to be water quality limited. The TMDL documents the amount of a pollutant a waterbody can assimilate without violating a state's water quality standards and allocates that load to known point sources and nonpoint sources. The Idaho Division of Environmental Quality (IDEQ) completed the *Cottonwood Creek Total Maximum Daily Load* and submitted it to EPA in May, 2000, and EPA approved the TMDL on June 6, 2000. The following summarizes the TMDL requirements as they apply to the City of Cottonwood's discharges:

1. The TMDL established a waste load allocation for TSS at the existing permit limit of 70 mg/l monthly average during the discharge period November 1 through April 30.
2. Temperature requirements do not apply to the city's discharge because the city does not discharge during the critical period.
3. The TMDL did not establish wasteload allocations for nutrients/dissolved oxygen because the city does not discharge during the critical period (May through October). The TMDL did not address flow or habitat modification.

4. The TMDL provides a wasteload allocation for fecal coliform at the existing permit limit from November 1 through April 30.
5. The TMDL requires a 5 percent reduction in total ammonia from the city during the November - April time period; however, sufficient data are not available to provide a specific wasteload allocation at this time. The draft permit includes monitoring for a term of three years beginning 90 days after the effective date of the permit. A reopener clause allows modification of the permit if the results of the monitoring program show a modification is necessary to comply with the state's water quality standards.

IV. EFFLUENT LIMITATIONS

In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either technology-based effluent limits or water quality-based effluent limits. A technology based effluent limit requires a minimum level of treatment for municipal point sources based on currently available treatment technologies. A water quality based effluent limit is designed to ensure that the water quality standards of a waterbody are being met and they may be more stringent than technology-based effluent limits. For more information on deriving technology-based effluent limits and water quality-based effluent limits see Appendix C.

The following summarizes the proposed effluent limitations that are in the draft permit for the period November 1 through April 30.

1. The pH range must be between 6.5 - 9.0 standard units.
2. For any month, the monthly average effluent concentration for BOD₅ and TSS must not exceed 35 percent of the monthly average influent concentration for BOD₅ and TSS.
3. There must be no discharge of floating solids or visible foam, or oil and grease other than trace amounts.
4. Table 1, below, presents the proposed average monthly, average weekly, and instantaneous maximum effluent limits for BOD₅, TSS, escherichia coli (E. coli) bacteria, fecal coliform bacteria, and residual chlorine for the November 1 through April 30 period.

TABLE 1: Monthly, Weekly and Daily Effluent Limitations				
Parameters	Average Monthly Limit	Average Weekly Limit	Daily Maximum Limit ¹	Instantaneous Maximum Limit ¹
BOD ₅	45 mg/L	65 mg/L		---
	77 lbs/day	116 lbs/day		
TSS	70 mg/L	105 mg/L		---
	160 lbs/day	240 lbs/day		
E. coli Bacteria	126 /100 ml	—	---	576 /100 ml
Fecal Coliform Bacteria	---	200 /100 ml	---	---
Residual Chlorine ²	12.2 µg/L	---	18.0µg/L	---
	0.1 lbs/day		0.2 lbs/day	
¹ Reporting is required within 24 hours of a maximum daily or instantaneous maximum daily violation. ² The effluent limits for total residual chlorine are not quantifiable using EPA-approved analytical methods. EPA will use 100 µg/L (the Minimum Level) as the compliance evaluation level for this parameter.				

Effluent from the wastewater treatment plant is land applied from May 1 through October 31. The city has an IDEQ-issued land application permit for this activity. No direct discharge to Cottonwood Creek is allowed during this time period.

V. MONITORING REQUIREMENTS

Section 308 of the Clean Water Act and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and ambient data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports to EPA.

Cottonwood is required to perform ambient monitor during the term of the permit because the limited data available during preparation of the TMDL indicated a potential to exceed water quality standards for ammonia. The data set needs to be augmented to aid in future permit development.

Table 2 presents the proposed effluent monitoring requirements, and table 3 presents the proposed ambient monitoring requirements.

TABLE 2: City of Cottonwood Waste Water Treatment Plant Monitoring Requirements			
Parameter	Sample Location	Sample Frequency	Sample Type
Stream Flow, cfs	Upstream	5/week (Monday - Friday)	Instantaneous
Flow, mgd	Effluent	5/week (Monday - Friday)	Instantaneous
BOD ₅ , mg/L	Influent and effluent	1/month	grab
TSS, mg/L	Influent and effluent	1/month	grab
pH, standard units	Effluent	5/week (Monday - Friday)	grab
Fecal Coliform Bacteria, colonies/100 ml	Effluent	5/week	grab
E. Coli Bacteria	Effluent	5/month ¹	grab
Residual Chlorine, µg/l	Effluent	5/week	grab
Total Ammonia as N, mg/L	Effluent	1/month	grab
Total Phosphorus	Effluent	1/month	grab
Temperature, °C	Effluent	1/month	grab
¹ Samples must be taken every three to five days over a thirty-day period.			

TABLE 3: City of Cottonwood Ambient Monitoring Requirements			
Parameter	Sample Location	Sample Frequency	Sample Type
Temperature, °C	upstream of outfall	2/month	grab
pH, standard units	upstream of outfall	2/month	grab
Total Ammonia, mg/L	upstream of outfall	2/month	grab
Note: Ambient monitoring shall start 90 days after the effective date of the permit and continue for 3 years.			

VI. SLUDGE (BIOSOLIDS) REQUIREMENTS

Currently, sludge from the treatment plant is stored at the bottom of the ponds. The permittee does

not anticipate having to remove the sludge from the bottom of the ponds during the term of this permit (five years).

EPA Region 10 recently decided to separate wastewater and sludge permitting. Under the Clean Water Act (CWA), EPA has the authority to issue separate sludge-only permits for the purposes of regulating biosolids. EPA will issue a sludge-only permit to this facility at a later date, as appropriate.

Until future issuance of a sludge-only permit, any sludge management and disposal activities at the facility continue to be subject to the national sewage sludge standards at 40 CFR Part 503 and any requirements of the State's biosolids program. The Part 503 regulations are self-implementing, meaning that permittees must comply with them whether or not a permit has been issued. Therefore, the CWA does not require the facility to have a permit prior to use or disposal of biosolids.

VII. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop and submit a Quality Assurance Plan to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The permittee is required to complete a Quality Assurance Plan within 60 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Additional Permit Provisions

Sections II, III, and IV of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because they are regulations, they cannot be challenged in the context of an NPDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

C. Reopener Clause

If data or other information becomes available before the next scheduled permit reissuance which indicates more restrictive nutrient limits or monitoring are required to comply with state water quality standards, the permit may be reopened.

VIII. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service if their actions could adversely affect any threatened or endangered species. EPA has determined that issuance of this permit will not affect any of the endangered species in the vicinity of the discharge. See Appendix E for further details.

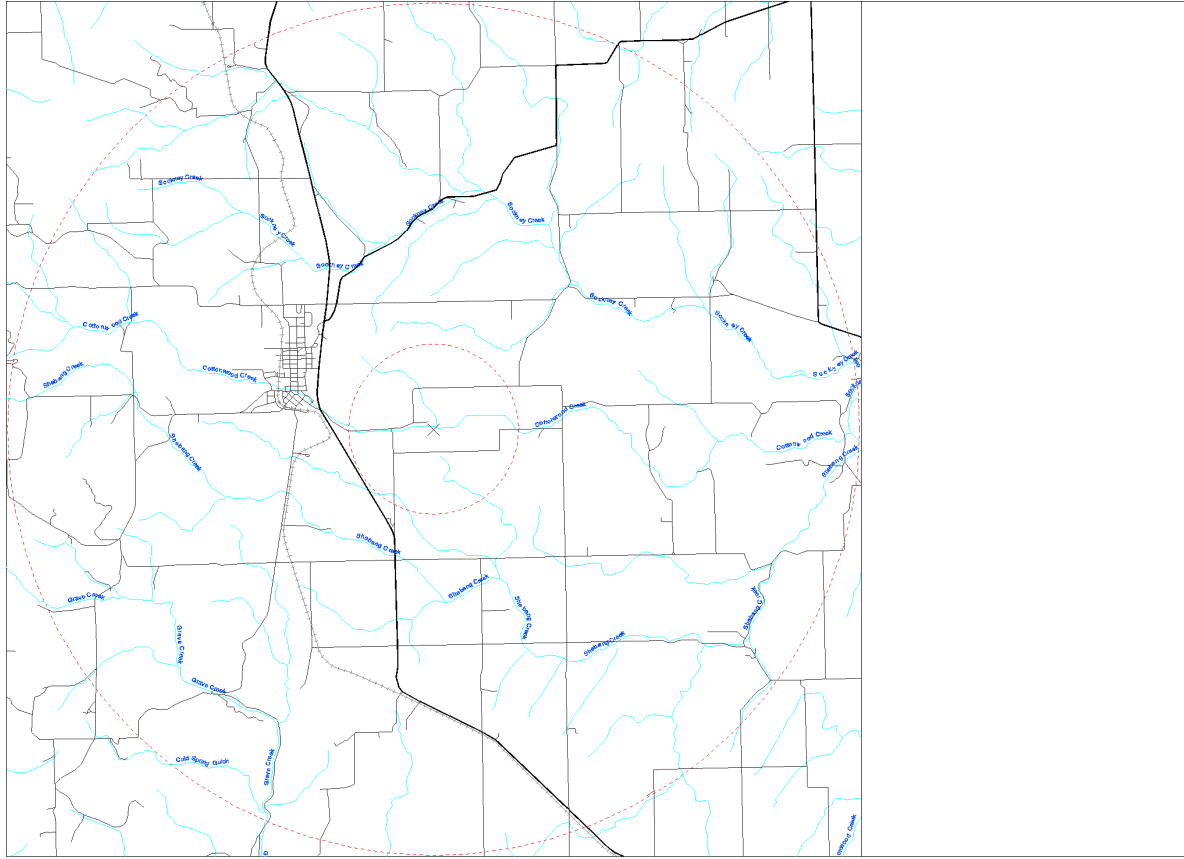
B. State Certification

Section 401 of the Clean Water Act requires EPA to seek state certification before issuing a final permit. As a result of the certification, the state may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with water quality standards.

C. Permit Expiration

This permit will expire five years from the effective date of the permit.

APPENDIX A
Wastewater Treatment Plant Location



APPENDIX B
Water Quality Standards

(A) Water Quality Criteria

For the City of Cottonwood discharge, the following water quality criteria are necessary for the protection of the beneficial uses of Cottonwood Creek:

1. IDAPA 58.01.02.200.02 - Surface waters of the State shall be free from toxic substances in concentrations that impair designated beneficial uses. These substances do not include suspended sediment produces as a result of nonpoint source activities.
2. IDAPA 58.01.02.200.05 - Surface waters of the State shall be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses.
3. IDAPA 58.01.02.200.06 - Excess Nutrient. Surface waters of the State shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses.
4. IDAPA 58.01.02.200.08 - Sediment. Sediment shall not exceed quantities specified in section 250, or , in the absence of specific sediment criteria, quantities which impair designated beneficial uses. Determinations of impairment shall be based on water quality monitoring and surveillance and the information utilized as described in Subsection 350.02.b.
5. IDAPA 58.01.02.250.01.a. - Hydrogen ion concentration (pH) values within the range of 6.5 to 9.5 standard units.
6. IDAPA 58.01.02.250.01.c. - Total chlorine residual: (i) One-hour average concentration not to exceed 19 µg/L; and (ii) four-day average concentration not to exceed 11 µg/L.
7. IDAPA 58.01.02.250.02. - Cold Water: Waters designated for cold water aquatic life are to exhibit the following characteristics:
 - a. Dissolved oxygen concentrations shall exceed 6 mg/L at all times.
 - b. Water temperature of 22°C or less with a maximum daily average of no greater than 19°C .
 - c. The one hour average concentration of un-ionized ammonia (as N) is not to exceed (0.43/A/B/2) mg/L, where:

A = 0.7 if the water temperature (T) is $\geq 25^{\circ}\text{C}$, or
A = $10^{(0.03(20-T))}$ if T < 25°C , and

B = 1 if the pH is ≥ 8.0 , or
B = $(1 + 10^{(7.4-\text{pH})}) \div 1.25$ if pH is < 8.0

- d. The four day average concentration of un-ionized ammonia (as N) is not to exceed $(0.66A/B/C)$ mg/L, where:

A = 1.0 if T is $\geq 20^{\circ}\text{C}$, or
A = $10^{(0.03(20-T))}$ if T < 20°C , and

B = 1 if the pH is ≥ 8.0 , or
B = $(1 + 10^{(7.4-\text{pH})}) \div 1.25$ if pH is < 8.0

C = 13.5 if pH is ≥ 7.7 , or
C = $20(10^{(7.7-\text{pH})}) \div (1 + 10^{(7.4-\text{pH})})$ if the pH is < 7.7

- e. IDAPA 58.01.02.250.02.e. - Salmonid spawning: waters designated for salmonid spawning are to exhibit the following characteristics during the spawning and incubation period for the particular species inhabiting those waters:

Intergravel Dissolved Oxygen: One-day minimum of not less than 5.0 mg/l.
Seven-day average mean of not less than 6.0 mg/l.

Water-Column Dissolved Oxygen: One-day minimum of not less than 6.0 mg/l or 90 percent of saturation, whichever is greater.

Water temperatures of 13 degrees C or less with a maximum daily average no greater than 9 degrees C.

Ammonia: Not to exceed the un-ionized ammonia criteria defined at IDAPA 58.01.02.250.02.c.i and ii.

- f. IDAPA 58.01.02.251.02. - Waters designated for secondary contact recreation are not to contain E. coli bacteria significant to the public health in concentrations exceeding:
1. A single sample of five hundred and seventy-six (576) E. coli organisms per one hundred (100) ml; or
 2. A geometric mean of one hundred and twenty six (126) E. coli organisms per one hundred (100) ml based on a minimum of five samples taken, every three to five days, over a thirty day period.

(B) Anti-Degradation Policy

The State of Idaho has adopted an anti-degradation policy as part of their water quality standards. The anti-degradation policy represents a three tiered approach to maintain and protect various levels of water quality and uses. The three tiers of protection are as follows:

- Tier 1 - Protects existing uses and the level of water quality necessary to protect those uses.
- Tier 2 - Protects the level of water quality necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water in waters that are currently of higher quality than required to support these uses. Before water quality in Tier 2 waters can be lowered, there must be an anti-degradation review consisting of: (1) a finding that it is necessary to accommodate important economic or social development in the area where the waters are located (2) full satisfaction of all intergovernmental coordination and public participation provisions; and (3) assurance that the highest statutory and regulatory requirements for point sources and best management practices for nonpoint sources are achieved. Furthermore, water quality may not be lowered to less than the level necessary to fully protect the “fishable/swimmable” uses and other existing uses.
- Tier 3 - Protects the quality of outstanding national resources, such as waters of national and State parks and wildlife refuges and waters of exceptional recreational or ecological significance. There may be no new or increased discharges to these waters and no new or increased discharges to tributaries of these waters that would result in lower water quality.

Cottonwood Creek is a tier 1 waterbody, therefore, water quality should be such that it results in no mortality and no significant growth or reproductive impairment of resident species. An NPDES permit cannot be issued that would result in the water quality criteria being violated. The draft permit contains effluent limits which ensures that the existing beneficial uses for Cottonwood Creek will be maintained.

APPENDIX C Basis for Effluent Limitations

The Clean Water Act (CWA) requires Publicly Owned Treatment Works (POTW) to meet performance-based requirements (also known as technology based effluent limits) based on available wastewater treatment technology. EPA may find, by analyzing the effect of an effluent discharge on the receiving water, that technology based effluent limits are not sufficiently stringent to meet water quality standards. In such cases, EPA is required to develop more stringent water quality-based effluent limits which are designed to ensure that water quality standards are met.

Furthermore, technology based effluent limits don't always limit every parameter that is in an effluent. For example, technology based effluent limits for POTWs only limit five-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), and pH. Yet effluent from a POTW may contain other pollutants such as chlorine, ammonia, or metals depending on the type of treatment system used and the service area of the POTW (i.e., industrial facilities as well as residential areas that discharge into the POTW). In these cases, where technology based effluent limits do not exist for a particular pollutant, EPA must determine if the pollutants will cause or contribute to a violation of the water quality standards for the water body. If they do, EPA is required to develop water quality-based effluent limits designed to ensure that water quality standards are met.

The proposed effluent limits reflect whichever limits (technology-based or water quality-based) are more stringent. The following explains in more detail the derivation of technology based effluent limits and water quality based effluent limits. Part A discusses technology based effluent limits, Part B discusses water quality based effluent limits, and Part C compares the technology based effluent limits with the water quality based effluent limits, and shows the effluent limits that are proposed in the draft permit.

A. Technology-based Effluent Limitations

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," that all POTWs were required to meet by July 1, 1977. EPA developed "secondary treatment" regulations which are specified in the 40 CFR 133. These technology-based effluent limits apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of five-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), and pH.

The definition of secondary treatment includes special considerations regarding waste stabilization. The regulations allow alternative limits for facilities, such as Cottonwood, using waste stabilization ponds. Those alternative limits are called "treatment equivalent to secondary treatment."

The regulation also includes a provision for an Alternative State Requirement [40 CFR 133.105(d)]. This allows the state the flexibility to set permit limits above the maximum levels for “treatment equivalent to secondary treatment.” For waste stabilization ponds, the Idaho *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 58.01.02.420.02.b. has established average monthly limits for BOD₅ and TSS.

The technology-based effluent limits applicable to the city of Cottonwood are as follows:

1. BOD₅

Average Monthly Limit	45 mg/L
Average Weekly Limit	65 mg/L
Percent Removal	65 %

2. TSS

Average Monthly Limit	70 mg/L
Average Weekly Limit	105 mg/L
Percent Removal	65 %

Although not specified in the Idaho water quality standards, a weekly average effluent limitation for BOD₅ and TSS has been established in accordance with 40 CFR 122.45()(2). The average weekly limit is approximately 1.5 times the value of the monthly average limitation.

3. Federal regulations at 40 CFR 122.45(f) require BOD₅ and TSS limitations to be expressed as mass based limits. The existing BOD₅ loadings are based on an estimated design population of 1100 and an accepted average waste generation of 0.2 pounds/capita/day which result in monthly and weekly average mass based BOD₅ limits of 77 and 116 lbs/day. These values are the basis for the WLA in the TMDL and are, therefore, retained in the draft permit. The existing permit did not include mass limits for TSS. The loading calculation for TSS is as follows: concentration X design flow X 8.34. The facility design flow is 0.275 mgd; therefore, the TSS loadings are as follows:

$$\begin{aligned} \text{TSS monthly average load} &= 70 \text{ mg/l} \times 0.275 \text{ mgd} \times 8.34 = 160 \text{ lbs/day} \\ \text{TSS weekly average load} &= 105 \text{ mg/l} \times 0.275 \text{ mgd} \times 8.34 = 240 \text{ lbs/day} \end{aligned}$$

Federal regulations include a percent removal requirement for TSS and are, therefore, more restrictive than state requirements and must be included in the permit.

4. The technology-based chlorine effluent limitation of 0.5 mg/L is derived from standard operating practices. The Water Pollution Control Federation’s

Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/L limit on a monthly average basis. Additionally, NPDES regulations require effluent limits for POTWs to be expressed as average weekly limits (AWLs) as well as average monthly limits (AMLs) unless impracticable. The AWL is expressed as 1.5 times the AML, or in this case 0.75 mg/L. Finally, federal regulations require limitations to be expressed as mass-based limits using the design flow of the facility.

5. pH: The pH range must be between 6.0 - 9.0 standard units.
6. Fecal Coliform Bacteria: In addition to the above, the *Idaho Water Quality Standards and Wastewater Treatment Requirements* (IDAPA 58.01.02.420.02.b) require that fecal coliform concentrations in treated effluent not exceed a geometric mean of 200 colonies/100ml based on no more than one week's data and a minimum of five samples.

B. Water Quality-Based Effluent Limits

1. Statutory Basis for Water Quality-Based Limits

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards by July 1, 1977. Discharges to state waters must also comply with limitations imposed by the state as part of its certification of NPDES permits under section 401 of the CWA.

The NPDES regulation (40 CFR 122.44(d)(1)) implementing section 301 (b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.

The regulations require that this evaluation be made using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation.

2. Procedure for Deriving Water Quality-Based Effluent Limits

The first step in developing a water quality based permit limit is to develop a wasteload allocation for the pollutant. A wasteload allocation is the concentration

(or loading) of a pollutant that the permittee may discharge without causing or contributing to an exceedance of water quality standards in the receiving water. Wasteload allocations are determined in one of the following ways:

- (a) **TMDL-Based Wasteload Allocation:** Where the receiving water quality does not meet water quality standards, the wasteload allocation is generally based on a TMDL developed by the State. A TMDL is a determination of the amount of a pollutant from point, non-point, and natural background sources, including a margin of safety, that may be discharged to a water body without causing the water body to exceed the criterion for that pollutant. Any loading above this capacity risks violating water quality standards.

Section 303(d) of the CWA requires states to develop TMDLs for water bodies that will not meet water quality standards after the imposition of technology-based effluent limitations to ensure that these waters will come into compliance with water quality standards. The first step in establishing a TMDL is to determine the assimilative capacity of the waterbody (the loading of pollutant that a water body can assimilate without exceeding water quality standards). The next step is to divide the assimilative capacity into allocations for non-point sources (load allocations), point sources (wasteload allocations), natural background loadings, and a margin of safety to account for any uncertainties. Permit limitations are then developed for point sources that are consistent with the wasteload allocation for the point source.

The State has completed a TMDL for Cottonwood Creek which provides the City of Cottonwood with a wasteload allocation for BOD₅, TSS, and ammonia.

- (b) **Mixing-Zone Based Waste Load Allocation:** When the state authorizes a mixing zone for the discharge, the wasteload allocation is calculated by using a simple mass balance equation. The equation takes into account the available dilution provided by the mixing zone, and the background concentrations of the pollutant.
- (c) **Criterion as the Wasteload Allocation:** In some cases a mixing zone is not authorized, either because the receiving water already exceeds the criteria, the receiving water flow is too low to provide dilution, or the state does not authorize one. In such cases, the criterion becomes the wasteload allocation. Establishing the criterion as the wasteload allocation ensures that the permittee will not contribute to an exceedance of the criteria.

Once the wasteload allocation has been developed, the EPA applies the statistical

permit limit derivation approach (if appropriate) described in Chapter 5 of the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001, March 1991, hereafter referred to as the TSD) to obtain monthly average, and weekly average or daily maximum permit limits. This approach takes into account effluent variability, sampling frequency, and water quality standards.

3. Specific Water Quality-Based Effluent Limits

(a) Toxic Substances

The Idaho state water quality standards require surface waters of the state to be free from toxic substances in concentration that impair designated uses. There are no significant industrial discharges to the facility, and concentrations of priority pollutants from cities without a significant industrial component are low. Therefore, it is not anticipated that toxicity will be a problem in the effluent, and a water quality based effluent limit has not been proposed.

(b) Floating, Suspended or Submerged Matter/Oil and Grease

The Idaho state water quality standards require surface waters of the state to be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions that may impair designated beneficial uses. Therefore, a narrative condition is proposed for the draft permit that states there must be no discharge of floating solids or visible foam in other than trace amounts.

(c) Excess Nutrients

The Idaho state water quality standards require surface waters of the state be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses. Cottonwood Creek has been listed as water quality limited for nutrients. The TMDL evaluated nutrients for the May-to-October growing season. Since the city does not discharge during this period, no wasteload allocation was given to the city for phosphorus.

(d) Sediment/Total Suspended Solids (TSS)

Cottonwood Creek is listed as water quality limited for sediment. The TMDL provides a TSS wasteload allocation that is the same as the existing permit limit. Federal regulations at 40 CFR 122.44(d)(vii)(B) require EPA to incorporate effluent limits based on WLA from the state's TMDL into NPDES permits. Therefore, the following effluent limits have been

proposed, based on the TMDL: an average monthly limit of 70 mg/L and an average weekly limit of 105 mg/L for TSS. Mass limits based on the design flow of 0.275 mgd are also included in the draft permit in accordance with 40 CFR 122.45(f).

(e) pH

The Idaho state water quality standards require surface waters of the state to have a pH value within the range of 6.5 - 9.5 standard units. It is anticipated that a mixing zone will not be authorized for the water quality based criterion for pH, therefore, this criterion must be met before the effluent is discharged to the receiving water. The technology based effluent limits for pH are 6.0 - 9.0 standard units, and also must be met before the effluent is discharged to the receiving water. To ensure that both water quality based requirements and technology based requirements are met the draft permit incorporates the lower range of the water quality standards (6.5 standard units) and the upper range of the technology based limits (9.0 standard units).

(f) Dissolved Oxygen (D.O.)

Cottonwood Creek is listed as water quality limited for dissolved oxygen (D.O.), and the state water quality standards require the level of D.O. to exceed 6 mg/L at all times for water bodies that are protected for aquatic life use. The Cottonwood Creek TMDL found that low D.O. was not a problem during the months when the city discharges (November through April); therefore, a water quality based effluent limit has not been proposed for this parameter.

(g) Temperature

The state water quality standards require ambient water temperatures of thirteen three degrees C or less with a maximum daily average of no greater than nine degrees C for salmonid spawning. They require a maximum daily average of no greater than twenty-two degrees C or less with a maximum daily average no greater than nineteen degrees C for cold water biota.

A water quality based temperature limit has not been proposed in the draft permit for the Cottonwood wastewater treatment plant because it is not a source of thermal loading during the time period when violations occur in Cottonwood Creek.

(h) Ammonia

The Idaho Water Quality Standards contain water quality criteria to protect aquatic life against short term and long term adverse impacts from ammonia. The TMDL for ammonia involves comparing instream total ammonia concentrations to Idaho water quality criteria for cold water biota. The salmonid spawning criteria for ammonia are the same as those for cold water biota. The criteria are based on the toxic effects of ammonia to aquatic life and are pH and temperature dependent.

The existing, although limited, ammonia data show that ammonia problems exist in Upper Cottonwood Creek sub-watershed during the winter season because of higher flows. Ammonia concentrations in this watershed increase in November and gradually decrease in March. For the Cottonwood Creek TMDL, the wasteload allocation for the city's wastewater treatment plant during the critical time period (May through September) is 0 lbs/day because the city does not discharge during this time period.

Limited historic data (November 1997 through May of 1998 - Table 5.1 in the Cottonwood TMDL) shows there is a potential for water quality violations for ammonia in upper Cottonwood Creek. The TMDL requires a 5 percent load reduction in total ammonia based on the historic discharges. The draft permit includes a monthly monitoring requirement for ammonia to aid in future permit development.

(i) Escherichia Coli (E. Coli) Bacteria

According to the Idaho Water Quality Standards, waters designated for secondary contact recreation, such as Cottonwood Creek, are not to contain E. coli bacteria significant to the public health in concentrations exceeding:

- a. A single sample of five hundred and seventy-six E. coli organisms per one hundred ml; or
- b. A geometric mean of one hundred and twenty six E. coli organisms per one hundred ml based on a minimum of five samples taken, every three to five days, over a thirty day period.

It is anticipated that a mixing zone will not be authorized for bacteria, therefore, the criteria must be met before the effluent is discharged to the receiving water. The proposed water quality based effluent limits in the permit include an instantaneous maximum limit of 576 organisms/100 ml, and an average monthly limit of 126 organisms/100 ml.

(j) Total Residual Chlorine

The acute and chronic water quality criteria for total residual chlorine (TRC) are 19 µg/L and 11 µg/L, respectively (IDAPA 16.01.02.250.01.c.i and ii). Because there are no other sources of chlorine in the vicinity of the discharge and chlorine dissipates rapidly in water, the concentration upstream of Outfall 001 is assumed to be zero. Idaho Water Quality Standards provide that a mixing zone cannot exceed 25 percent of the stream volume. Typically, EPA uses the 7Q10 and 1Q10 flows to calculate a mixing zone. However, Cottonwood Creek is intermittent at the discharge point; i.e., the 7Q10 and 1Q10 flows are zero. Therefore, no mixing zone is allowed, and the water-quality based limits would be 18.0µg/l (monthly average) and 12.2 µg/L (daily maximum). See Appendix D for more information on the residual chlorine limits derivation. The existing permit did not include limits nor monitoring requirements for residual chlorine. The facility upgrade in 1993 included dechlorination facilities.