

FACT SHEET

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

The City of Meridian
Wastewater Treatment Plant
33 East Idaho Avenue
Meridian, Idaho 83642

Permit Number: ID-002019-2
Public Notice date:

EPA Proposes NPDES Permit Reissuance.

EPA proposes to reissue an NPDES permit to the City of Meridian Wastewater Treatment Plant. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to Five Mile Creek and/or the Boise River. 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 past and proposed effluent limitations, schedules of compliance, and other conditions
- a map and description of the discharge location
- detailed technical material supporting the conditions in the permit

The State of Idaho Proposes Certification.

EPA is requesting that the Idaho Division of Environmental Quality certify the NPDES permit for the City of Meridian Wastewater Treatment Plant, 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 Division of Environmental Quality (IDEQ) at 1445 North Orchard, Boise, Idaho 83706-2239, a copy of the comments should also be sent 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 a request for an evidentiary hearing is submitted within 30 days.

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/offices/water/npdes.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

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I. APPLICANT

City of Meridian Wastewater Treatment Plant
NPDES Permit No.: ID-002019-2

Facility Mailing Address:
33 East Idaho Avenue
Meridian, Idaho 83642

II. FACILITY INFORMATION

A. Treatment Plant Description

The City of Meridian is located in southwestern Idaho, approximately eight miles west of the City of Boise in Ada County. The City owns, operates, and has maintenance responsibility for a facility which treats domestic sewage from local residents and commercial establishments. The current design flow of the facility is 4.0 million gallons per day (mgd) and is expected to increase to 7.0 mgd by the year 2005.

Treatment of wastewater consists of screening, primary clarification, fixed film biological tower, two activated sludge aeration basins, three secondary clarifiers, three rapid sand filters, one reaeration basin and ultra violet disinfection. The treatment plant has two separate outfalls: one to Five Mile Creek immediately below the confluence of Five Mile Creek and Nine Mile Creek (Outfall 001) and another to the south channel of the Boise River at river mile 39 (Outfall 002). Final effluent can be discharged to Five Mile Creek and/or the Boise River.

Sludge is treated by dissolved air flotation for waste activated sludge thickening and two anaerobic digesters. Final sludge is stored in eight lagoons and land applied to agricultural land. Currently, the city produces Class A sludge. In the future, the city anticipates using the following sludge disposal options: land application, transferring to another facility, accepting sludge from another facility, composting, disposal at a municipal solid waste landfill, and make available for a "Biosolids Give-Away" program.

B. Background Information

The NPDES permit for the wastewater treatment plant expired on April 24, 1997. Under federal law, specifically, the Administrative Procedures Act (APA), a federally issued NPDES permit is administratively extended (i.e., continues in force and effect) provided that the permittee submits a timely and complete application for a new permit prior to the expiration of the current permit. Since the City did

submit a timely application for a new permit, the current permit was administratively extended.

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.

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

III. RECEIVING WATER

A. Outfall locations

The treated effluent from the City of Meridian (hereafter referred to as the City) wastewater treatment facility is discharged from outfall 001, located at latitude 43° 38' 20" and longitude 116° 26' 24", to Five Mile Creek, and/or from outfall 002, located at latitude 43° 40' 27" and longitude 116° 24' 45", to the south channel of the Boise River at river mile 39.

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 that each water body is expected to achieve (such as cold water biota, contact recreation, etc.). 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 16.01.02.140.01.w) protect Five Mile Creek for the following beneficial use classifications: cold water biota, secondary contact recreation, and agricultural water supply.

The Boise River, at river mile 39, is protected for the following beneficial uses: cold water biota, primary contact recreation, agricultural water supply, and salmonid spawning (IDAPA 16.01.02.140.01.x) .

¹Discharge monitoring reports are forms that the facility uses to report the results of self-monitoring.

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

C. Water Quality Limited Segment

A water quality limited segment is any water body, or definable portion of 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.

Outfall 001 discharges to Five Mile Creek, which is listed as water quality limited for nutrients, sediment, and dissolved oxygen. Five Mile Creek discharges to Fifteen Mile Creek which is a tributary to the Boise River. At the confluence of Fifteen Mile Creek and the Boise River, the Boise River is listed as water quality limited for nutrients, sediment, temperature and bacteria. The Boise River, at Outfall 002, is listed as a water quality limited segment for sediment.

Section 303(d) of the Clean Water Act (CWA) requires States to develop a Total Maximum Daily Load (TMDL) management plan for water bodies determined to be water quality limited. A 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.

A TMDL for Five Mile Creek is scheduled to be completed in December 2001. The Idaho Division of Environmental Quality, Boise Regional Office has prepared a TMDL for the Boise River. The report, entitled *Lower Boise River, Subbasin Assessment, Total Maximum Loads* (hereafter referred to as the Boise River TMDL) was submitted to EPA on 12/18/98, but EPA has not yet approved the TMDL. Federal regulations require effluent limits in NPDES permits to be consistent with a TMDL that has been prepared by the state and approved by EPA. The requirements of the TMDL have been incorporated into the draft permit. However, if EPA does not approve the TMDL prior to final issuance of this permit the TMDL requirements will be removed from the final permit. For more information on the TMDL see Appendix C.

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 limits or water quality-based 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 water body are being met. For more information on deriving technology-based effluent limits and water quality-based effluent limits see Appendix C.

The following summarizes the effluent limitations that are in the draft permit.

1. The combined effluent flow of outfall 001 and 002 shall not exceed 7 mgd.
2. The effluent pH range shall be between 6.5 - 9.0 standard units.
3. 85% Removal Requirements for BOD₅ and TSS: For any month, the monthly average effluent concentration shall not exceed 15 percent of the monthly average influent concentration.
4. The minimum dissolved oxygen concentration in the effluent shall be 6.0 mg/L when discharging to Five Mile Creek.
5. The minimum dissolved oxygen concentration in the effluent shall be 75 percent saturation when discharging to the Boise River.
6. There shall be no discharge of floating solids or visible foam other than trace amounts to Five Mile Creek and the Boise River.

TABLE 1: Monthly, Weekly and Daily Effluent Limitations for Outfall 001

Parameters	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Biochemical Oxygen Demand (BOD ₅) Dilution ratio: < 4:1	10 mg/L	20 mg/L	---
Biochemical Oxygen Demand (BOD ₅) Dilution ratio: ≥ 4:1	20 mg/L	30 mg/L	---
Total Suspended Solids (TSS)	30 mg/L	45 mg/L	---
Fecal Coliform Bacteria	100 colonies/100 ml	200 colonies/100 ml	800 colonies/100 ml
Total Ammonia as N Dilution ratio ¹ : < 2:1	1.0 mg/L	---	1.6 mg/L
Total Ammonia as N Dilution ratio ¹ : 2:1 to <4:1	3.1 mg/L	---	5.0 mg/L
Total Ammonia as N Dilution ratio ¹ : 4:1 to <8:1	5.0 mg/L	---	12.0 mg/L
Total Ammonia as N Dilution ratio ¹ : 8:1 to 12:1	9.0 mg/L	---	22.0 mg/L
Total Ammonia as N Dilution ratio ¹ : > 12:1	12.0 mg/L	---	32.0 mg/L
Footnote: 1. Dilution ratio is the ratio of Five Mile Creek flow upstream of the Meridian facility to effluent flow from Outfall 001.			

TABLE 2: Monthly, Weekly and Daily Effluent Limitations for Outfall 002

Parameters	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Flow	---	---	---
BOD ₅	30 mg/L	45 mg/L	---
TSS	30 mg/L (710 #/day)	45 mg/L (1058 #/day)	---
Fecal Coliform Bacteria May 1 - September 30	50 colonies/100 ml	100 colonies/100 ml	500 colonies/100 ml
Fecal Coliform Bacteria October 1 - April 30	100 colonies/100 ml	200 colonies/100 ml	800 colonies/100 ml
Total Ammonia as N April 1 - September 30 Flow ¹ : > 0 - 2.5 mgd	10.0 mg/L	---	20.1 mg/L
Total Ammonia as N April 1 - September 30 Flow ¹ : > 2.5 - 5.0 mgd	5.5 mg/L	---	11.1 mg/L
Total Ammonia as N April 1 - September 30 Flow ¹ : > 5.0 - 7.0 mgd	4.3 mg/L	---	8.5 mg/L
Total Ammonia as N October 1 - March 31 Flow ¹ : > 0 - 2.5 mgd	7.1 mg/L	---	14.3 mg/L
Total Ammonia as N October 1 - March 31 Flow ¹ : > 2.5 - 5.0 mgd	4.1 mg/L	---	8.2 mg/L
Total Ammonia as N October 1 - March 31 Flow ¹ : > 5.0 - 7.0 mgd	3.2 mg/L	---	6.4 mg/L

1. Flow is the volume of effluent discharged from Outfall 002 into the Boise River.

V. SLUDGE REQUIREMENTS

Section 405(f) of the CWA requires sludge use and disposal requirements to be incorporated into NPDES permits issued to a treatment works treating domestic wastewater.

General conditions have been incorporated into the proposed permit requiring the Permittee to comply with federal and state laws, and regulations applying to sludge use and disposal. For more information on sludge requirements see Appendix D.

VI. PRETREATMENT REQUIREMENTS

Industrial sources are capable of discharging pollutants into the Meridian wastewater treatment facility, which could cause sludge contamination, water quality impacts, and interference with the operation of the plant. Since industrial sources discharge to the facility certain pretreatment requirements are included in the proposed permit. The permittee is required to (1) enforce provisions of its sewer pretreatment ordinance, (2) conduct and submit to the EPA Pretreatment Coordinator a summary of an industrial user survey six months before the expiration of this permit, and (3) notify EPA within 30 days of the date upon which it becomes aware of a Categorical Industrial User discharging to its system or applying to discharge to its system. Categorical industrial users are those users subject to the requirements of the pretreatment standards in 40 CFR 405 - 471.

VII. MONITORING REQUIREMENTS

Section 308 of the Clean Water Act and federal regulation 40 CFR 122.44(i) require effluent monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather data to determine if effluent limitations may be needed in the next permit reissuance, 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. Table 3 presents the proposed effluent monitoring requirements based on the minimum sampling necessary to adequately monitor the facility's performance. Table 4 presents the proposed monitoring requirements for Five Mile Creek and the Boise River, upstream and downstream of the respective outfalls. Ambient monitoring will be required for two years, except for metals. Metals will be monitored for 18 months.

TABLE 3: Effluent Monitoring Requirements

Parameter	Sample Location	Sample Frequency	Sample Type
Flow, mgd	Effluent	Continuous	----
BOD ₅ , mg/L	Influent and effluent	2/week	24-hour composite
TSS, mg/L	Influent and effluent	2/week	24-hour composite
pH, standard units	Effluent	3/week	grab
Fecal Coliform Bacteria, colonies/100 ml	Effluent	5/week	grab
Temperature, °C	Effluent	1/month	grab
Dissolved Oxygen, mg/L and % saturation	Effluent	5/week	grab
Total Ammonia as N, mg/L	Effluent	2/week	24-hour composite
Nitrate-Nitrite ¹ , mg/L	Effluent	1/week	24-hour composite
Total Kjeldahl Nitrogen ¹ , mg/L	Effluent	1/week	24-hour composite
Total Phosphorus ¹ , mg/L	Effluent	1/week	24-hour composite
Ortho Phosphate ¹ , mg/L	Effluent	1/week	24-hour composite
Cadmium ² , µg/L	Effluent	1/week	24-hour composite
Chromium VI ² , µg/L	Effluent	1/week	24-hour composite
Copper ² , µg/L	Effluent	1/week	24-hour composite
Lead ² , µg/L	Effluent	1/week	24-hour composite
Mercury ² , µg/L	Effluent	1/week	24-hour composite
Silver ² , µg/L	Effluent	1/week	24-hour composite
Footnotes:			
1. Monitoring for these parameters shall continue for 24 months.			
2. Monitoring for these parameters shall continue for 18 months.			

TABLE 4: Five Mile Creek and the Boise River Monitoring Requirements

Parameter	Five Mile Creek Sampling Frequency		Boise River Sampling Frequency	
	Upstream	Downstream	Upstream	Downstream
Flow ¹ , mgd	1/week	-----		-----
BOD ₅ , mg/L	1/week	-----		-----
TSS, mg/L	1/week	-----	1/week	-----
Dissolved Oxygen, mg/L	1/week	-----	-----	-----
Total Phosphorus ² , mg/L	1/week	1/week	1/week	1/week
Ortho-phosphate ² , mg/L	1/week	1/week	1/week	1/week
Total Ammonia as N ² , mg/L	1/week	1/week	1/week	1/week
Total Kjeldahl Nitrogen ² , mg/L	1/week	1/week	1/week	1/week
Nitrate-Nitrite ² , mg/L	1/week	1/week	1/week	1/week
Temperature ³ , °C	1/week	1/week	1/week	1/week
pH, standard units	1/week	1/week	1/week	1/week
Turbidity, NTU	1/week	1/week	1/week	1/week
Hardness as CaCO ₃ , mg/L	1/month	1/month	1/month	1/month
Cadmium ⁴ , µg/L	1/month	-----	1/month	-----
Chromium IV ⁴ , µg/L	1/month	-----	1/month	-----
Copper ⁴ , µg/L	1/month	-----	1/month	-----
Lead ⁴ , µg/L	1/month	-----	1/month	-----
Mercury ⁴ , µg/L	1/month	-----	1/month	-----
Silver ⁴ , µg/L	1/month	-----	1/month	-----

Footnotes:

1. The flow rate shall be measured as near as practical to the time that other ambient parameters are sampled.
2. Sampling frequency for these parameters shall be 1/week for the first year. After the first year of monitoring the sampling may be decreased.
3. Weekly temperature samples shall be taken at the hottest time of the day.
4. Arsenic, cadmium, chromium, copper, lead, nickel, and zinc shall be analyzed as dissolved. Mercury shall be analyzed as total.

VIII. 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 submit a Quality Assurance Plan within 60 days of the effective date of the draft 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.

IX. 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 beneficially or adversely affect any threatened or endangered species. EPA has determined that issuance of this permit will not affect any of the threatened or endangered species in the vicinity of the discharge. See Appendix E for further details.

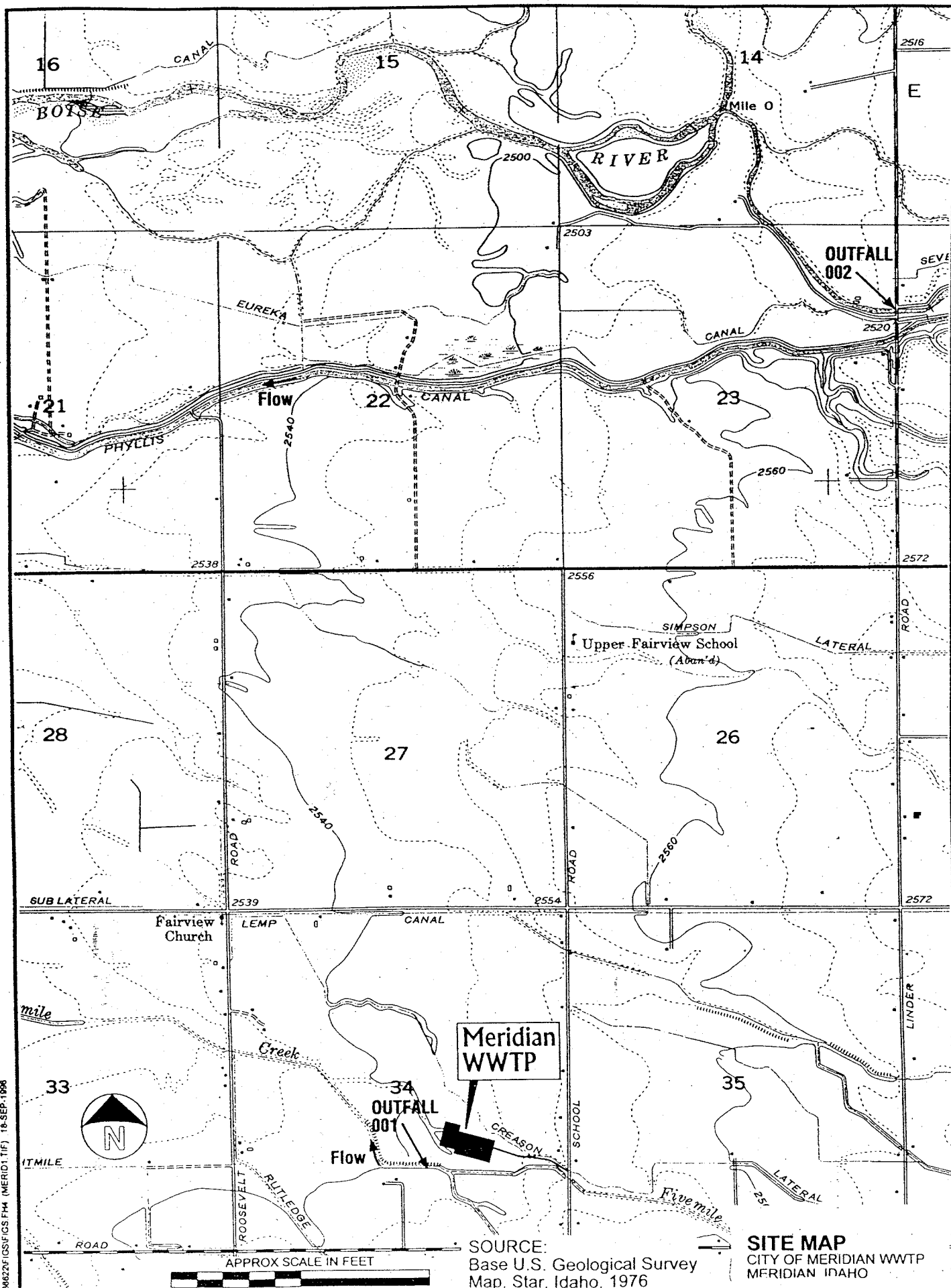
B. State Certification

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 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



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SOURCE:
Base U.S. Geological Survey
Map, Star, Idaho, 1976

SITE MAP
CITY OF MERIDIAN WWTP
MERIDIAN IDAHO

APPENDIX B
WATER QUALITY STANDARDS

(A) Water Quality Criteria

The following water quality criteria are necessary for the protection of the designated uses of both Five Mile Creek and the Boise River:

2. IDAPA 16.01.02.200.02 - 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 produced as a result of nonpoint source activities.
3. IDAPA 16.01.02.200.05 - 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.
4. IDAPA 16.01.02.200.06 - 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.
5. IDAPA 16.01.02.200.08 - 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.
6. IDAPA 16.01.02.250.01.b. - Secondary Contact Recreation: waters designated for secondary contact recreation are not to contain fecal coliform bacteria significant to the public health in concentrations exceeding:
 1. 800/100 ml. at any time,
 2. 400/100 ml in more than ten percent of the total samples taken over a thirty day period; and
 3. a geometric mean of 200/100 ml based on a minimum of five samples taken over a thirty day period.
7. IDAPA 16.01.02.250.02.a - Hydrogen ion concentration (pH) values within the range of 6.5 to 9.5 standard units.
8. IDAPA 16.01.02.250.02.c.i - Dissolved oxygen concentrations shall exceed 6 mg/L at all times.
9. IDAPA 16.01.02.250.02.c.ii - Water temperature of 22°C or less with a maximum daily

average of no greater than 19°C .

10. IDAPA 16.01.02.250.02.c.iii - The one hour average concentration of un-ionized ammonia (as N) is not to exceed $(0.43/A/B/2)$ mg/L, where:

A = 1 if the water temperature (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

11. IDAPA 16.01.02.250.02.c.iii - The four day average concentration of un-ionized ammonia (as N) is not to exceed $(0.66A/B/C)$ mg/L, where:

A = 1.4 if T is $\geq 15^\circ\text{C}$, or
A = $10^{(0.03(20-T))}$ if T < 15°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

The following water quality criteria are necessary for the protection of the designated uses of the Boise River:

1. IDAPA 16.01.02.250.01.a. - Primary Contact Recreation: between May 1 and September 30 of each calendar year, waters designated for primary contact recreation are not to contain fecal coliform bacteria significant to the public health in concentrations exceeding:
 1. 500/100 ml. at any time,
 2. 200/100 ml in more than ten percent of the total samples taken over a thirty day period; and
 3. a geometric mean of 50/100 ml based on a minimum of five samples taken over a thirty day period.
2. IDAPA 16.01.02.250.02.d. - Water temperature of thirteen (13) degrees of less with a maximum daily average no greater than nine (9) degrees C. The Boise River TMDL indicated that Rainbow trout, brown trout and mountain whitefish are present in the Boise River, therefore the temperature criterion is applicable between October 1 through July 15.

(B) Anti-Degradation Policy

The State of Idaho has adopted an anti-degradation policy as part of their water quality standard. 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 provides the absolute floor of water quality.
- 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 wastes can be lowered, there must be an anti-degradation review consisting of: (1) a finding that it is necessary to accommodate important economical 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.

Five Mile Creek and the Boise River are tier 1 waterbodies, 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 Five Mile Creek and the Boise River will be maintained.

APPENDIX C
Basis for Effluent Limitations

The CWA requires Publicly Owned Treatment Works 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 may find, by analyzing the effect of a discharge on the receiving water, that technology based permit limits are not sufficiently stringent to meet water quality standards. In such cases, EPA is required to develop more stringent, water quality-based limits designed to ensure that water quality standards are met. The draft permit 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 for municipal wastewater treatment facilities and water quality based effluent limits.

A. Technology-based Effluent Limitations

The CWA requires Publicly Owned Treatment Works 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 40 CFR 133. These technology-based 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 technology based effluent limits applicable to the City of Meridian are as follows:

1. BOD₅ and TSS:
Average monthly limit = 30 mg/L
Average weekly limit = 45 mg/L

Federal regulations at 40 CFR § 122.45 (f), require all pollutants limited in permits to be expressed in terms of mass except for pH, temperature, radiation or other pollutants which cannot appropriately be expressed as mass. Mass loading limits are calculated as follows:

design flow of facility (mgd) X concentration (mg/L) X 8.34

In this case, the City has the ability to discharge their effluent from two outfalls, outfall 001 discharges to Five Mile Creek and outfall 002 discharges to the Boise River. The flow volume discharged from each outfall depends on the flow of Five Mile Creek, which

can change daily. Since the flow volume from each outfall can vary from day to day an accurate reflection of the mass loading cannot be determined. Therefore, mass limits generally will not be included in the proposed permit, except as required by the Boise River TMDL. However, a flow limit of 7 mgd will be incorporated into the final permit.

2. Percent Removal Requirements:
The thirty day average percent removal shall not be less than 85 percent for BOD₅ and TSS.
3. pH:
The pH of the effluent shall be between 6.0 and 9.0 standard units.
5. Fecal Coliform Bacteria: In addition to the above the, the Idaho *Water Quality Standards and Wastewater Treatment Requirements* (IDAPA16.01.02.420.02.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 Evaluation

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. Reasonable Potential Determination

When evaluating the effluent to determine if water quality-based effluent limits are needed based on chemical specific numeric criteria, a projection of the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern is made. The chemical specific concentration of the effluent and ambient water and, if appropriate, the dilution available from the ambient water are factors used to project the receiving water concentration. If the projected concentration of the receiving water exceeds the numeric criterion for a specific chemical, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required (see Appendix B for the applicable water quality criteria).

As mentioned above, sometimes it is appropriate to allow a small area of ambient water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body, and decrease treatment requirements. Mixing zones can be used only when there is adequate ambient flow volume and the ambient water is below the criteria necessary to protect designated uses. Mixing zones can only be authorized by the Idaho Department of Environmental Quality.

3. Procedure for Deriving Water Quality-Based Effluent Limits

The first step in developing a 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 (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 (called load allocations), point sources (called wasteload allocations), natural background loadings, and a margin of safety to account for any uncertainties. Federal regulations at 40 CFR 122.44 (d)(vii) require effluent limitations, in NPDES permits, to be consistent with the assumptions and requirements of any available wasteload allocation prepared by the State and approved by EPA.

The Boise River TMDL developed WLAs for total suspended solids and fecal coliform bacteria for sources that discharge directly into the Boise River.

(b) Mixing zone based WLA

When the State authorizes a mixing zone for the discharge, the WLA is calculated by using a simple mass balancing equation. The equation takes into account the available dilution provided by the mixing zone, and the background concentrations of the pollutant. Effluent limitations for ammonia are based on a mixing zone.

(c) Criterion as the Wasteload Allocation:

In some cases a mixing zone cannot be authorized, either because the receiving water already exceeds the criteria or the receiving water flow is too low to provide dilution. 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 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.

4. Water Quality-Based Effluent Limits

(a) Floating, Suspended or Submerged Matter

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 or that may impair designated beneficial uses. A condition of the permit requires that there shall be no discharge of floating solids or visible foam in other than trace amounts.

(b) 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. Both Five Mile Creek and the Boise River are listed as water quality limited for nutrients. There was insufficient information to adequately address phosphorus in the Boise River TMDL. Therefore, the State has deferred the phosphorus portion of the TMDL to the year 2001. The TMDL for Five Mile Creek is also scheduled for completion in the year 2001.

Monitoring for nutrients has been incorporated into the draft permit to help gather information to support the development of the Boise River and the Five Mile Creek TMDLs. The monitoring requirements are similar to monitoring requirements recently imposed on other municipalities that discharge within the Boise watershed (the Cities of Caldwell and Nampa).

(c) Sediment/TSS

The Idaho state water quality standards state that sediment shall not exceed quantities which impair designated beneficial uses. Both Five Mile Creek and the Boise River are listed as water quality limited for sediment.

A TMDL has not been completed for Five Mile Creek therefore, water quality based effluent limits will be deferred until the TMDL is completed. The Boise River TMDL limits the effluent from Outfall 002, which discharges directly to the Boise River, to an average monthly limit of 30 mg/L and 710 lbs/day for TSS. In addition, federal regulations at 40 CFR 122.45(d)(2) require effluent limitations for municipal wastewater treatment facilities to be expressed as average weekly limits as well as average monthly limits, unless impracticable. Therefore, the average weekly limit will be expressed as 1.5 times the average monthly limit (45 mg/L, and 1058 lbs/day).

(d) Fecal Coliform Bacteria

For the protection of primary and secondary contact recreation the Idaho water quality standards require limits on fecal coliform bacteria. The Boise River, from Star to the Snake River, is listed as water quality limited for bacteria.

The Boise River TMDL requires all point source discharges into the Boise River to meet the following effluent limitations:

	<u>May 1 - September 30</u>	<u>October 1- April 30</u>
Average Monthly Limit:	50 colonies/100 ml	100 colonies/100 ml
Average Weekly Limit:	200 colonies/100 ml	200 colonies/100 ml
Maximum Daily Limit:	500 colonies/100 ml	800 colonies/100 ml

The above requirements apply to the City of Meridian's Outfall 002 (which discharges directly to the Boise River).

Fecal coliform limits for point sources on the tributaries to the Boise River, such as Outfall 001, has been deferred until the year 2001. The effluent limits in the current permit for Outfall 001 are fully protective of the beneficial uses for Five Mile Creek, therefore, these limits will be retained until the TMDL is completed. The limits when discharging effluent from Outfall 001 to Five Mile Creek are:

Average Monthly Limit:	100 colonies/100 ml
Average Weekly Limit:	200 colonies/100 ml
Maximum Daily Limit:	800 colonies/100 ml

(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.

(f) Dissolved Oxygen/Biochemical Oxygen Demand (BOD₅)

To protect water quality effluent limits were originally recommended by the Idaho Department of Environmental Quality for dissolved oxygen and BOD₅². These recommendations were incorporated into the NPDES permit and require the following effluent limits for dissolved oxygen and BOD₅;

Outfall 001

- 1) a minimum dissolved oxygen level of 6 mg/L
- 2) When the flow of Five Mile Creek to effluent flow was greater than 4:1 then the average monthly limit for BOD₅ is 20 mg/L, and the average weekly limit for BOD₅ is 30 mg/L.

Outfall 002

- 1) a minimum dissolved oxygen level of 75% saturation.

The permittee has requested to have the option of discharging to Five Mile Creek when the dilution ratio of Five Mile Creek flow to effluent flow is less than 4:1. In order to accommodate this request the recommendation in the 1980 IDEQ staff evaluation has been incorporated into the proposed permit. The condition requires that when the dilution ratio is less than 4:1 the average monthly limit is 10 mg/L and the average weekly limit is 15 mg/L.

(g) Temperature

Sections of the Boise River have been listed as water quality limited for temperature. The Boise River TMDL recommended that temperature limitations be deferred until other regulatory options (such as developing

² Staff Evaluation on the Effluent Limitations for the City of Meridian, May 5, 1980.

site specific criteria or doing a use attainability analysis) are explored.

Temperature monitoring has been incorporated into the draft permit to help gather information. The monitoring requirements are similar to monitoring requirements recently imposed on other municipalities that discharge within the Boise watershed (the Cities of Caldwell and Nampa).

(h) Ammonia

To protect water quality standards the current permit contains water quality based effluent limits for ammonia for outfall 001 and 002.

Outfall 001 (Five Mile Creek)

The effluent limits for Outfall 001 were a requirement of the State 401 certification of the NPDES permit, and will be retained in the proposed permit. However, the State will have to re-certify that a 100% mixing zone is protective of state water quality standards. If the State does not certify the 100% mixing zone, the permit limits will be recalculated based on no mixing zone, or an alternative mixing zone if one is allowed by the State.

In addition, the permittee requested the option of discharging to Five Mile Creek when the dilution ratio is less than 4:1. To accommodate this request two additional tiers have been added to the proposed permit. One tier is for a dilution ratio between 2:1 and 4:1, this tier was originally in the 1980 IDEQ staff evaluation. Another tier has been added for a dilution ratio less than 2:1. For additional information on the ammonia calculation see Section C, page C-11. See Table C-1 for the proposed effluent limits for Outfall 001.

Outfall 002 (Boise River)

The effluent limits, in the current permit, for Outfall 002 were based on a 75% mixing zone in the Boise River. In the 401 certification for the current permit, the State indicated that a 75% mixing zone was for the current permit only and would need to be reevaluated during the next permit reissuance. In the proposed permit, the ammonia limits for outfall 002 have been revised using a 25% mixing zone which is in accordance with the State's water quality standards. If the State does not certify this mixing zone, or if a different mixing zone is authorized the ammonia limits will be recalculated based on the appropriate mixing zone. Additionally, the proposed effluent limits are based on flow tiers. For additional information on the ammonia calculation see Section C, page C-11. In the current permit, the effluent limitations included an average monthly limit, an average weekly limit and a maximum daily limit. The NPDES

regulations at 40 CFR 122.45(d) require that permit limits for publicly owned treatment works (POTW) be expressed as average monthly limits (AMLs) and average weekly limits (AWLs) unless impracticable. Additionally, federal regulations do not prohibit a Permittee from increasing their sampling events above what is required in an NPDES permit. This is significant because a Permittee may collect as many samples as necessary during a week to bring the average of the data set below the average weekly effluent limit. In such cases, spikes of a pollutant could be masked by the increased sampling. While this is not a concern with pollutants that are not toxic, such as total suspended solids or phosphorus, it is a significant concern when toxic pollutants, such as chlorine or ammonia, are being discharged. Using a maximum daily limit will ensure that spikes do not occur, and will be protective of aquatic life. In this case, an average weekly limit is not protective of water quality standards, therefore, it is impracticable to have it in the permit. The final permit contains an average monthly limit and a maximum daily limit for ammonia. The limits in the proposed permit are:

TABLE C-1: Outfall 001: Proposed Total Ammonia Effluent Limitations

Total Ammonia as N	Average Monthly Limit (mg/L)	Maximum Daily Limit (mg/L)
Dilution Ratio ¹ : < 2:1	1.0	1.6
Dilution Ratio ¹ : 2:1 to < 4:1	3.1	5.0
Dilution Ratio ¹ : 4:1 to < 8:1	5.0	12.0
Dilution Ratio ¹ : 8:1 to 12:1	9.0	22.0
Dilution Ratio ¹ : > 12:1	12.0	32.0

1. Dilution ration is the ratio of Five Mile Creek flow, upstream of the Meridian facility, to effluent flow from Outfall 001.

TABLE C-2: Outfall 002: Proposed Total Ammonia Effluent Limitations

Total Ammonia as N	April 1 - September 30		October 1 - March 31	
	Average Monthly Limit (mg/L)	Maximum Daily Limit (mg/L)	Average Monthly Limit (mg/L)	Maximum Daily Limit (mg/L)
Flow ¹ : > 0 - 2.5 mgd	10.0 mg/L	20.1 mg/L	7.1 mg/L	14.3 mg/L
Flow ¹ : > 2.5 - 5.0 mgd	5.5 mg/L	11.1 mg/L	4.1 mg/L	8.2 mg/L
Flow ¹ : >5.0 - 7.0 mgd	4.3 mg/L	8.5 mg/L	3.2 mg/L	6.4 mg/L

1. Flow is the volume of effluent discharged from Outfall 002 into the Boise River.

(i) Whole Effluent Toxicity (WET)

The Idaho water quality standards require surface waters of the State be free from toxic substances in concentrations that impair designated beneficial uses. Some data exist for WET, however, sufficient data do not exist to support the development of a WET limit at this time. The proposed permit will require the permittee to monitor for WET, and this information will be used in the next permitting cycle to determine if a WET limit may be required.

(j) Metals

The metals that may be of concern in the effluent are cadmium, chromium VI, copper, lead, mercury and silver. In the past the facility has monitored for these parameters. However, the method detection limits used in the analysis were higher than the criteria, therefore, it is not clear whether or not the effluent is causing or contributing to a water quality standard.

To determine if effluent limitations for metals are necessary monitoring for metals in the effluent and ambient water will be included in the proposed permit. Method detection limits for analytical methods has been included in the proposed permit to ensure the data is measured to levels that can be accurately compared to the applicable criteria.

(C) Water Quality Based Effluent Limit Calculations

The purpose of a permit limit is to specify an upper bound of acceptable effluent quality. For water quality based requirements, the permit limits are based on maintaining the effluent quality at a level that will comply with the water quality standards, even during critical conditions in the receiving water (i.e., low flows). These requirements are determined by the wasteload allocation (WLA). The WLA dictates the required effluent quality which, in turn, defines the desired level of treatment plant performance or target Long-term average (LTA).

To support the implementation of EPA's national policy for controlling the discharge of toxicants, EPA developed the "Technical Support Document for Water Quality-Based Toxics Control" (EPA/505/2-90-001, March 1991). The following is a summary of the procedures recommended in the TSD in deriving water quality-based effluent limitations for toxicants. This procedure translates water quality criteria for chlorine and ammonia to "end of the pipe" effluent limits.

I. DISCHARGE TO BOISE RIVER

Step 1- Determine the WLA

The acute and chronic aquatic life criteria are converted to acute and chronic waste load allocations (WLA_{acute} or $WLA_{chronic}$) for the receiving waters based on the following mass balance equation:

$$Q_d C_d = Q_e C_e + Q_u C_u$$

where,

Q_d = downstream flow = $Q_u + Q_e$

C_d = aquatic life criteria that cannot be exceeded downstream

April - September: C_d (acute) = 7.9 mg/L; C_d (chronic) = 1.3 mg/L

October - March: C_d (acute) = 6.8 mg/L; C_d (chronic) = 1.3 mg/L

Q_e = effluent flow

C_e = allowable concentration of pollutant in effluent = WLA_{acute} or $WLA_{chronic}$

Q_u = upstream flow

April - September: 1Q10 = 62.2 mgd; 7Q10 = 97.7 mgd

October - March: 1Q10 = 64 mgd; 7Q10 = 69.2 mgd

C_u = upstream background concentration of pollutant =

April - September: 0.18 mg/L

October - March: 0.21 mg/L

Rearranging the above equation to determine the effluent concentration (C_e) or the wasteload allocation (WLA) results in the following:

$$C_e = WLA = \frac{Q_d C_d - Q_u C_u}{Q_e}$$

When a mixing zone is allowed, this equation becomes:

$$C_e = WLA = \frac{C_d(Q_u \times \%MZ) + C_u Q_e - Q_d C_u (\%MZ)}{Q_e}$$

where, %MZ is the mixing zone³ allowable by the state standards.

The effluent limits have been derived using a 25 percent mixing zone. However, establishing a mixing zone is a State discretionary function, if the State does not certify this mixing zone in the 401 certification the effluent limits will be recalculated without a mixing zone. Additionally, the effluent limits will be based on effluent flow tiers. Three flow tiers were used, they are: Tier 1: > 0 - 2.5 mgd; Tier 2: >2.5 - 5.0 mgd; and Tier 3: > 5.0 - 7.0 mgd. The following calculations are an example of how to develop an effluent limit. The example used is for flow tier 1 during the months of April through September. A summary of all calculations can be found in Table C-3 (page C-14).

April - September

$$\text{Ammonia WLA}_{\text{acute}} = \frac{7.9(62.2 \times 0.25) + (7.9 \times 2.5)}{2.5} - \frac{62.2 \times 0.18 \times 0.25}{2.5} = 55.9 \text{ mg/L}$$

$$\text{Ammonia WLA}_{\text{chronic}} = \frac{1.3(97.7 \times 0.25) + (1.3 \times 2.5)}{2.5} - \frac{97.7 \times 0.18 \times 0.25}{2.5} = 12.2 \text{ mg/L}$$

Step 2 - Determine the Long Term Average (LTA)

The acute and chronic WLAs are then converted to Long Term Average concentrations (LTA_{acute} and LTA_{chronic}) using the following equations:

$$LTA_{\text{acute}} = WLA_{\text{acute}} \times e^{[0.5\sigma^2 - z\sigma]}$$

where,

$$\sigma^2 = \ln(CV^2 + 1)$$

$$z = 2.326 \text{ for } 99^{\text{th}} \text{ percentile probability basis}$$

$$CV = \text{coefficient of variation} = \text{standard deviation/mean}; CV_{\text{ammonia}} = .6$$

$$LTA_{\text{chronic}} = WLA_{\text{chronic}} \times e^{[0.5\sigma^2 - z\sigma]}$$

where,

³ Mixing zone - is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented. Only the State of Idaho has the regulatory authority to grant a mixing zone.

$$\begin{aligned}\sigma^2 &= \ln(CV^2/4 + 1) \\ z &= 2.326 \text{ for } 99^{\text{th}} \text{ percentile probability basis} \\ CV &= \text{coefficient of variation} = \text{standard deviation/mean}\end{aligned}$$

Calculate the LTA_{acute} and the LTA_{chronic} :

$$\begin{aligned}\text{Ammonia } LTA_{\text{acute}} &= 55.9 \times 0.321 = 17.9 \text{ mg/L} \\ \text{Ammonia } LTA_{\text{chronic}} &= 12.2 \times 0.527 = 6.4 \text{ mg/L}\end{aligned}$$

Step 3

To protect a waterbody from both acute and chronic effects, the more limiting of the calculated LTA_{acute} and LTA_{chronic} is used to derive the effluent limitations. The TSD recommends using the 95th percentile for the Average Monthly Limit (AML) and the 99th percentile for the Maximum Daily Limit (MDL).

Step 4 - Determine the Permit Limits

1. The MDL and the AML are calculated as follows:

$$MDL = LTA_{\text{chronic}} \times e^{[z\sigma - 0.5\sigma^2]}$$

where,

$$\begin{aligned}\sigma^2 &= \ln(CV^2 + 1) \\ z &= 2.326 \text{ for } 99^{\text{th}} \text{ percentile probability basis} \\ CV &= \text{coefficient of variation}\end{aligned}$$

$$\text{April - September: } MDL = 6.4 \times 3.11 = 20.0 \text{ mg/L}$$

$$AML = LTA_{\text{chronic}} \times e^{[z\sigma - 0.5\sigma^2]}$$

where,

$$\begin{aligned}\sigma^2 &= \ln(CV^2/n + 1) \\ z &= 1.645 \text{ for } 95^{\text{th}} \text{ percentile probability basis} \\ CV &= \text{coefficient of variation} = \text{standard deviation/mean} \\ n &= \text{number of sampling events required per month for ammonia} = 4\end{aligned}$$

$$\text{April - September: } AML = 6.4 \times 1.55 = 10.0 \text{ mg/L}$$

The following table summarizes the calculations used in developing effluent limitations for ammonia:

C-3: Summary of Calculations

Cd	Qu	MZ	Qe	$\frac{C_d(Q_u \times MZ) + C_d Q_e}{Q_e}$	$\frac{Q_u C_u (\%MZ)}{Q_e}$	WLA (acute)	WLA (chronic)	LTA (acute)	LTA (chronic)	MDL	AML
7.9	62.2	0.25	2.5	57.0	1.1	55.9	---	18.0	---	---	---
7.9	62.2	0.25	5.0	32.5	0.6	31.9	---	10.2	---	---	---
7.9	62.2	0.25	7.0	25.5	0.4	25.1	---	8.0	---	---	---
1.3	97.7	0.25	2.5	14.0	1.8	---	12.2	---	6.5	20.1	10.0
1.3	97.7	0.25	5.0	7.7	0.9	---	6.8	---	3.6	11.1	5.5
1.3	97.7	0.25	7.0	5.8	0.6	---	5.2	---	2.8	8.5	4.3
6.8	64.0	0.25	2.5	50.3	1.3	50.0	---	15.7	---	---	---
6.8	64.0	0.25	5.0	28.6	0.7	25.2	---	8.1	---	---	---
6.8	64.0	0.25	7.0	22.3	0.5	18.9	---	6.1	---	---	---
1.3	69.2	0.25	2.5	10.3	1.5	---	8.8	---	4.6	14.3	7.1
1.3	69.2	0.25	5.0	5.8	0.7	---	5.1	---	2.6	8.2	4.1
1.3	69.2	0.25	7.0	4.5	0.5	---	3.9	---	2.0	6.4	3.2

II DISCHARGE TO FIVE MILE CREEK (when dilution ratio is less than 2:1)

Step 1- Determine the WLA

The acute and chronic aquatic life criteria are converted to acute and chronic waste load allocations (WLA_{acute} or $WLA_{chronic}$) for the receiving waters based on the following mass balance equation:

$$Q_d C_d = Q_e C_e + Q_u C_u$$

where,

- Q_d = downstream flow
- C_d = aquatic life criteria that cannot be exceeded downstream
 - C_d (acute) = 6.6 mg/L
 - C_d (chronic) = 1.0 mg/L
- Q_e = effluent flow = 7 mgd
- C_e = concentration of pollutant in effluent = WLA_{acute} or $WLA_{chronic}$
- Q_u = upstream flow
- C_u = upstream background concentration of pollutant

Rearranging the above equation to determine the effluent concentration (C_e) or the wasteload allocation (WLA) results in the following:

$$C_e = WLA = \frac{Q_d C_d - Q_u C_u}{Q_e}$$

When a mixing zone is allowed, this equation becomes:

$$C_e = WLA = \frac{C_d(Q_u \times \%MZ) + C_d Q_e - Q_u C_u (\%MZ)}{Q_e}$$

where, %MZ is the mixing zone⁴ allowable by the state standards.

State standards allow 25% of the stream for mixing. In this instance, the creek flow is too low to support a mixing zone. Therefore the equation can be simplified to:

$C_e = WLA = \frac{C_d Q_e}{Q_e} = C_d$; the concentration of the effluent must not exceed the aquatic life criterion.

Ammonia $WLA_{acute} = 6.6$ mg/L

Ammonia $WLA_{chronic} = 1.0$ mg/L

Step 2: Determine the Long Term Average (LTA)

Ammonia $LTA_{acute} = 6.6 \times 0.321 = 2.1$ mg/L

⁴ Mixing zone - is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented. Only the State of Idaho has the regulatory authority to grant a mixing zone.

$$\text{Ammonia } LTA_{\text{chronic}} = 1.0 \times 0.527 = 0.53 \text{ mg/L}$$

Step 3:

To protect a waterbody from both acute and chronic effects, the more limiting of the calculated LTA_{acute} and LTA_{chronic} is used to derive the effluent limitations. The TSD recommends using the 95th percentile for the Average Monthly Limit (AML) and the 99th percentile for the Maximum Daily Limit (MDL).

Step 4: Determine the Permit Limits

1. The MDL and the AML are calculated as follows:

$$MDL = LTA_{\text{chronic}} \times e^{[z\sigma - 0.5\sigma^2]}$$

where,

$$\sigma^2 = \ln(CV^2 + 1)$$

$$z = 2.326 \text{ for } 99^{\text{th}} \text{ percentile probability basis}$$

CV = coefficient of variation

$$MDL = 0.53 \times 3.11 = 1.6 \text{ mg/L}$$

$$AML = LTA_{\text{chronic}} \times e^{[z\sigma - 0.5\sigma^2]}$$

where,

$$\sigma^2 = \ln(CV^2/n + 1)$$

$$z = 1.645 \text{ for } 95^{\text{th}} \text{ percentile probability basis}$$

CV = coefficient of variation = standard deviation/mean = .6

n = number of sampling events required per month for ammonia = 4

$$AML = .53 \times 1.55 = 0.8 \text{ mg/L}$$

(D) Comparison of Technology Based Effluent Limits and Water Quality Based Effluent Limits

The following is a summary of the more stringent of the technology based effluent limits (see Section A) and water quality based effluent limits (see Section B):

OUTFALL 001

TABLE C-4: Effluent Limitations for Outfall 001

PARAMETER	EFFLUENT LIMITATIONS		
	Average Monthly Limit	Average Weekly Limit	Daily Maximum Limit
Biochemical Oxygen Demand (BOD ₅) Dilution ratio ¹ : < 4:1	10 mg/l	20 mg/l	---
Biochemical Oxygen Demand (BOD ₅) Dilution ratio ¹ : ≥ 4:1	20 mg/l	30 mg/l	---
Total Suspended Solids (TSS)	30 mg/l	45 mg/l	—
Fecal Coliform Bacteria	100/100 ml	200/100 ml	800/100 ml
Total Ammonia as N Dilution Ratio: < 2:1	1.0 mg/L	—	1.6 mg/L
Total Ammonia as N Dilution Ratio: 2:1 to 4:1	3.1 mg/L	—	5.0 mg/L
Total Ammonia as N Dilution Ratio: 4: to <8:1	5.0 mg/L	—	12.0 mg/L
Total Ammonia as N Dilution Ratio: 8:1 to 12:1	9.0 mg/L	—	22.0 mg/L
Total Ammonia as N Dilution Ratio: >12:1	12.0 mg/L	—	32 mg/L
Note: Dilution ratio is the ratio of Five Mile Creek flow, upstream of the Meridian facility to effluent flow from Outfall 001.			

- There shall be no discharge of floating solids or visible foam, other than trace amounts, to Five Mile Creek.
- The pH range of the effluent at Outfall 001 shall be between 6.5 - 9.0 standard units.
- 85% Removal Requirements for BOD₅ and TSS: For any month, the monthly average effluent concentration shall not exceed 15 percent of the monthly average influent concentration.

Percent removal of BOD₅ and TSS shall be reported on the Discharge Monitoring Reports (DMRs). For each parameter, the monthly average percent removal shall be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples shall be taken over approximately the same time period.

- At a minimum, the dissolved oxygen concentration of the effluent shall be 6 mg/L.

OUTFALL OO2

TABLE C-5: Effluent Limitations for Outfall 002

Parameters	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Flow	---	---	---
BOD ₅	30 mg/L	45 mg/L	---
TSS	30 mg/L (710 #/day)	45 mg/L (1058 #/day)	---
Fecal Coliform Bacteria May 1 - September 30	50 colonies/100 ml	100 colonies/100 ml	500 colonies/100 ml
Fecal Coliform Bacteria October 1 - April 30	100 colonies/100 ml	200 colonies/100 ml	800 colonies/100 ml
Total Ammonia as N April 1 - September 30 Flow ¹ : > 0 - 2.5 mgd	10.0 mg/L	---	20.1 mg/L
Total Ammonia as N April 1 - September 30 Flow ¹ : >	5.5 mg/L	---	11.1 mg/L
Total Ammonia as N April 1 - September 30 Flow ¹ : >	4.3 mg/L	---	8.5 mg/L
Total Ammonia as N October 1 - March 31 Flow ¹ : > 0 - 2.5 mgd	7.1 mg/L	---	14.3 mg/L
Total Ammonia as N October 1 - March 31 Flow ¹ : > 2.5 - 5.0 mgd	4.1 mg/L	---	8.2 mg/L
Total Ammonia as N October 1 - March 31 Flow ¹ : > 5.0 - 7.0 mgd	3.2 mg/L	---	6.4 mg/L
1. Flow is the volume of effluent discharged from Outfall 002 into the Boise River.			

- There shall be no discharge of floating solids or visible foam, other than trace amounts, to the Boise River.
- The pH range of the effluent at Outfall 002 shall be between 6.5 - 9.0 standard units.
- 85% Removal Requirements for BOD₅ and TSS: For any month, the monthly average effluent concentration shall not exceed 15 percent of the monthly average influent concentration.

Percent removal of BOD₅ and TSS shall be reported on the Discharge Monitoring Reports (DMRs). For each parameter, the monthly average percent removal shall be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples shall be taken over approximately the same time period.

- At a minimum, the dissolved oxygen concentration in the effluent shall be 75% saturation.

APPENDIX D
Sludge (Biosolids) Management Requirements

1. General

The biosolids management regulations of 40 CFR §303 were designed so that the standards are directly enforceable against most users or disposers of biosolids, whether or not they obtain a permit. Therefore, the publication of Part 503 in the *Federal Register* on February 19, 1993 served as notice to the regulated community of its duty to comply with the requirements of the rule, except those requirements that indicate that the permitting authority shall specify what has to be done.

Even though Part 503 is largely self-implementing, Section 405(f) of the CWA requires the inclusion of biosolids use or disposal requirements in any NPDES permit issued to a Treatment Works Treating Domestic Sewage (TWTDS). In addition, the biosolids permitting regulations in 40 CFR §122 and §124 have been revised to expand its authority to issue NPDES permits with these requirements. This includes all biosolids generators, biosolids treaters and blenders, surface disposal sites and biosolids incinerators. Therefore, the requirements of 40 CFR §503 have to be met when biosolids is applied to the land, placed on a surface disposal site, placed on a municipal solid waste landfill (MSWLF) unit, or fired in a biosolids incinerator.

Requirements are included in Part 503 for pollutants in biosolids, the reduction of pathogens in biosolids, the reduction of the characteristics in biosolids that attract vectors, the quality of the exit gas from a biosolids incinerator stack, the quality of biosolids that is placed in a MSWLF unit, the sites where biosolids is either land applied or placed for final disposal, and for a biosolids incinerator. The sections of the federal standards at 40 CFR §503 applicable to this facility's proposed practices are Section A (General Provisions, 503.1-9), Section B (Land Application, 503.10-18), and Section D (Pathogen & Vector Control, 503.30-33).

2. Biosolids Management Practices

The permittee produces and distributes Class A biosolids for use on agricultural land in Ada County. Class A biosolids are applied as a soil amendment product. The permittee has submitted, to EPA, land application plans for sites where biosolids are being applied as a fertilizer or soil amendment to land. In the biosolids application the permittee indicated that land application may occur at other sites, biosolids may be transferred to other facilities, biosolids may be accepted from other facilities, biosolids may be sent to a municipal solid waste landfill, and biosolids may be made available for a "Biosolids Give-Away" program.

3. Permit Requirements

To ensure compliance with the CWA and the federal standards for the use or disposal biosolids (40 CFR 503), the proposed permit contains the following requirements:

- a. State and Federal regulations: Pursuant to 40 CFR 122.41(a), a condition has been incorporated into the proposed permit requiring the Permittee to comply with existing federal and state regulations that apply to biosolids use and disposal. These regulations shall be interpreted using the proposed permit and the specific EPA guidance documents listed in paragraph b, below. These documents are used by EPA Region 10 as the primary technical references for both permitting and enforcement activities.
- b. Health and Environmental General Requirement: The CWA requires that the environment and public health be protected from toxic effects of any pollutants in biosolids. Therefore, the Permittee must handle and use/dispose of biosolids so that human health and the environment are protected. The permittee is responsible for being aware of all pollutants allowed to accumulate in the biosolids, and for preventing harm to the public from those pollutants.

The U.S. Department of Agriculture can assist the facility in evaluating potential nutrient or micro nutrient problems. Additionally, EPA has published the following guidance to assist facilities in evaluating their biosolids for pollutants other than those listed in 40 CFR §503: *Part 503 Implementation Guidance*, EPA 833-R-95-001, and *Environmental Regulations and Technology: Control of Pathogens and Vector Attraction in Sewage Sludge*, EPA/625/R-92/013.

- c. Protection of Surface Waters from Biosolids Pollutants: Section 405(a) of the CWA prohibits any practice where biosolids pollutants removed in a treatment works at one location would ultimately enter surface waters at another location. Under this requirement the Permittee must protect surface waters from metals, nutrients, and pathogens contained in the biosolids.
- d. Responsibility for Land Application: Federal regulations at 40 CFR §503.7 specify that generators are responsible for correct use or disposal of their biosolids. For determining compliance with the permit and with the land application requirements of 40 CFR §503, the Permittee is considered the “person who applies biosolids.”⁵

All haulers, contractors, farmers, or others who might be involved in the land application process or in post-application control of the land and the crops are considered agents for the “person who applies biosolids.”

- e. Control of Pathogens, Vectors, and Metals: The regulations allow alternative methods and measurements for preparing Class A and B biosolids. The proposed permit establishes basic standards that the biosolids must meet for metals, pathogens, and vector control. Additionally, the proposed permit allows the

⁵ The Permittee is not considered the “person who applies biosolids” if they transfer their biosolids to a processing facility that derives a material from the biosolids.

Permittee to use alternative standards which are available under the regulations. The permittee must submit written notice to EPA 30 days in advance of using an alternative standard.

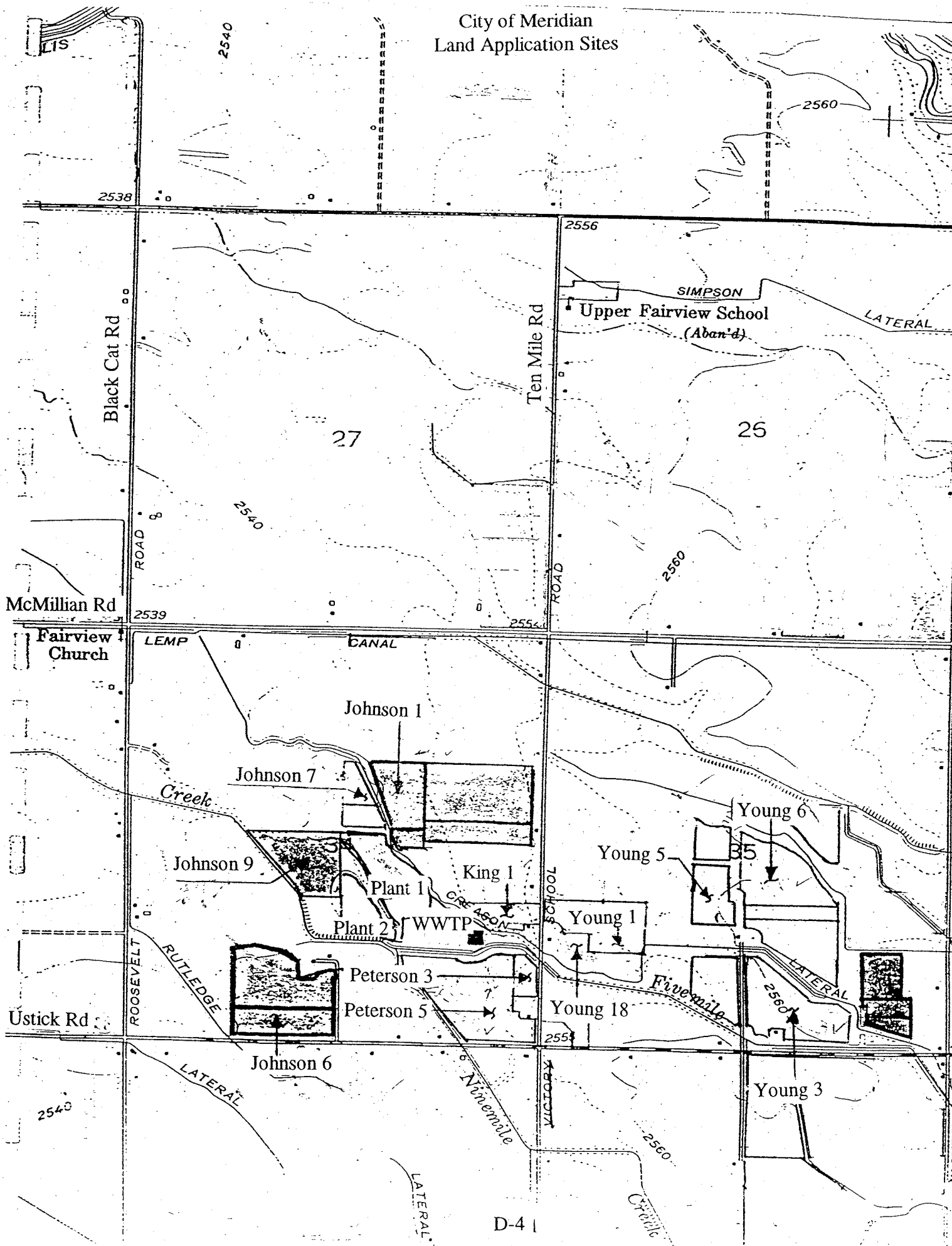
- f. Biosolids Use/Disposal Practices: The permit application indicates the facility uses or may use the following biosolids disposal options: land application, transfers biosolids to other facilities, accepts biosolids from other facilities, dispose of biosolids in a municipal solid waste landfill. These practices are authorized in the proposed permit. For authorized land application sites see pages D-4 and D-5).
- g. Notification: A condition has been incorporated into the permit which requires the permittee to comply with 40 CFR 503.12(g). This condition requires the City of Meridian to provide, to any facility that Meridian transfers its biosolids to, the information necessary to comply with the 40 CFR 503 regulations.
- h. Crop Trials: Optimum loading rates, application methods, crop responses, environmental impacts, cost-effectiveness, and other agricultural practices may vary with different crops and from site to site when using biosolids as a soil amendment. Applying biosolids to areas of land two acres or less facilitates the development of appropriate agricultural practices when using biosolids as a soil amendment.

The permit authorizes the distribution of biosolids on areas of land two acres or less for the purpose of optimizing agricultural practices. The land used for crop trials does not need to be within the authorized land application sites (see pages D-4 and D-5 for authorized land application sites).

The permittee must notify the Environmental Protection Agency, Idaho Operations Office, the Idaho Division of Environmental Quality, Southwest Idaho Regional Office, and the Natural Resources Conservation Service of the U.S. Department of Agriculture nearest the area of the site when distributing biosolids for crop trials outside the authorized land application sites.

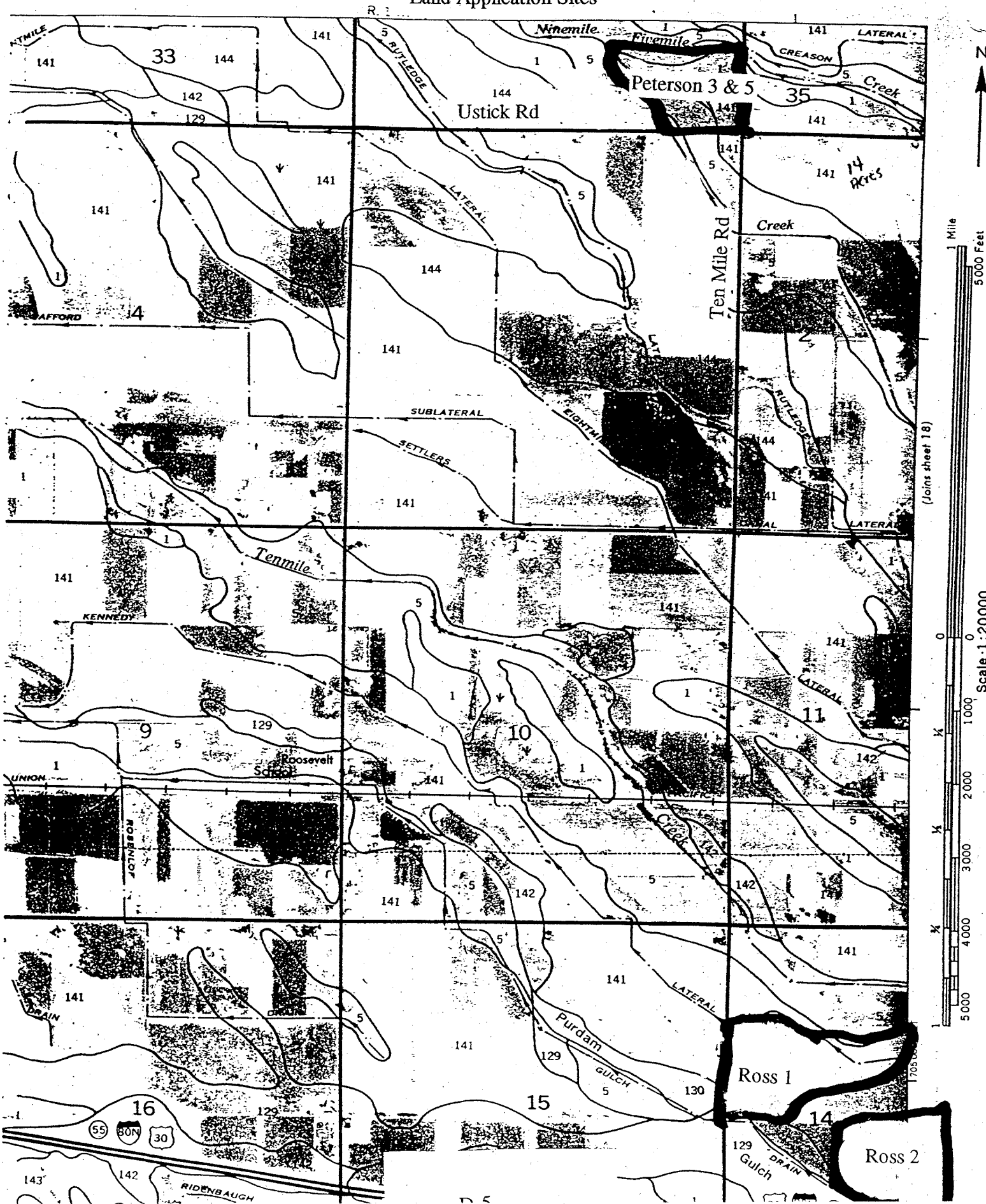
- i. Reporting: At a minimum, 40 CFR 503.18 specifies that certain facilities report annually the information that they are required to develop and retain under the record keeping requirements (40 CFR 503.17). This requirement applies to facilities defined as Class I management facilities, POTWs with a flow rate equal to or greater than one mgd, and POTWs serving a population of 10,000 or greater. The following information should be included in the report: (1) units for reported concentrations, (2) dry weight concentrations, (3) number of samples collected during the monitoring period, (4) number of excursions during the monitoring period, (5) sample collection techniques, and (6) analytical methods.

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APPENDIX E
ENDANGERED SPECIES ACT

Section 7 of the Endangered Species Act (ESA) requires federal agencies to request a consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service regarding potential effects an action may have on listed endangered species.

In a letter dated February 11, 1999, the U.S. Fish and Wildlife Service identified the Gray wolf as being a federally-listed endangered species. There are no proposed or candidate species in the area of the discharge. In a letter dated February 9, 1999, the National Oceanic and Atmospheric Administration, National Marine Fisheries Service stated that there are no listed endangered species within the Boise River basin.

EPA has determined that the requirements contained in the draft permit will not have an impact on the gray wolf. Hunting and habitat destruction are the primary causes of the gray wolf's decline. Issuance of an NPDES permit for the City of meridian wastewater treatment plant will not result in habitat destruction, nor will it result in changes in population that could result in increased habitat destruction. Furthermore, issuance of this permit will not impact the food sources of the gray wolf.