

Lake Walcott Subbasin Assessment and Total Maximum Daily Loads

Five-Year Review

(Includes Rueger Springs and Fall Creek TMDLs)



**State of Idaho
Department of Environmental Quality**

May 2012



*Printed on recycled paper, DEQ May 2012,
PID TM29, CA code 82037. Costs associated with
this publication are available from the State of Idaho
Department of Environmental Quality in accordance
with Section 60-202, Idaho Code.*

**Lake Walcott Subbasin Assessment and
Total Maximum Daily Loads
Five-Year Review**

(Includes Rueger Springs and Fall Creek TMDLs)

May 2012

**Prepared by
Idaho Department of Environmental Quality
Twin Falls Regional Office
1363 Fillmore Street
Twin Falls, Idaho 83301**

Acknowledgments

The five-year review of the *Lake Walcott Subbasin Assessment, Total Maximum Daily Load, and Implementation Plan* involved several individuals in the Idaho Department of Environmental Quality (DEQ) Twin Falls Regional Office and in the Technical Services Division at the state office. The following Twin Falls Regional Office staff helped with this evaluation: Dr. Balthasar B. Buhidar, Sue Switzer, Katie Shewmaker, Sean Woodhead, Mike Etcheverry, Robert “Chad” Chorney, Carolyn Rambough, and Alissa Bosscher. State Office Surface Water Program and Technical Services staff who assisted with GIS, TMDL program review, and technical editing include Sean Coyle, Marti Bridges, Dennis Meier, and Lisa Hansen.

The Lake Walcott total maximum daily load (TMDL) was initiated by Dr. Balthasar B. Buhidar in 1997 as part of the Middle Snake Watershed Management Area framework. As a result of a TMDL lawsuit and settlement agreement, the watershed management area was subsequently divided in 1998 into the Lake Walcott subbasin and the Upper Snake Rock subbasin. Milner Dam divided the two TMDL subbasins.

The initial Lake Walcott subbasin assessment and TMDL was drafted by Dr. Tom Miller. Mike Etcheverry participated in that effort and provided support to the water quality monitoring effort. The final version was continued by Clyde Lay and approved by the US Environmental Protection Agency in 2000.

The Lake Walcott Watershed Advisory Group (WAG) and the Upper Snake Basin Advisory Group (BAG) actively provided comments and suggestions to DEQ during TMDL development. The role of the Lake Walcott WAG was expanded with the passage of House Bill 145, which mandated that DEQ review all approved TMDLs on a five-year schedule. The Lake Walcott five-year review covers the period from 2000 through 2010. DEQ appreciates the role the WAG has played in this review.

Table of Contents

Acknowledgments	iv
Acronyms and Abbreviations.....	vii
Executive Summary	ix
Subbasin at a Glance	x
About Assessment Units	xi
Section 1: Introduction	1
Section 2: TMDL Review and Status	2
2.1 Subbasin at a Glance	3
2.1.1 Snake River and Tributary Segments with TMDLs	4
2.1.2 Critical Periods	6
2.1.3 Monitoring Plan and Control Locations	6
2.2 Pollutant Targets	7
2.2.1 Applicable Narrative Criteria	8
2.2.2 Evaluation of Critical Periods	9
2.2.3 Rationale for Target Selection	9
2.3 Control and Monitoring Points	9
2.3.1 Evaluation of the Control and Monitoring Points in the TMDL	9
2.3.2 Evaluation of the Monitoring Plan	10
2.4 Load Capacity	10
2.4.1 Summary of Methods Used to Estimate the Load Capacities	11
2.4.2 Evaluation of All Assumptions Made in the Lake Walcott TMDL	15
2.5 Allocations	18
2.5.1 Wasteload Allocations	18
2.5.2 Load Allocations	24
2.5.3. Comparison of Wasteload Allocations and Load Allocations to Load Reduction Targets...	27
2.6 Margin of Safety	27
2.7 Seasonal Variation	28
2.7.1 Evaluation of Load Capacity for Each Parameter with Seasonal Considerations	29
2.8 Future Growth Reserve	31
2.9 Background	31
Section 3: Beneficial Use Status	33
3.1 Beneficial Uses—Designations	33
3.2 Changes to Subbasin Characteristics	35
3.2.1 Major Land Use	35
3.2.2 Major Landownership	36
3.2.3 NPDES Facilities	37
3.2.4 Predicted Trends in Land Use	38
3.2.5 Population and Industry Growth	39
3.2.6 Changes in Water Resource Activities—Dams, Diversions, and Withdrawals	40
3.2.7 Unusual Events Affecting Watershed Characteristics	41

3.3 Summary and Analysis of Current Water Quality Data	44
3.3.1 Water Quality Data Collection Efforts.....	44
3.3.2 Summary of Biological Data.....	44
3.3.3 Summary of Water Quality Trends.....	46
3.4 Beneficial Uses—Assessment	46
3.4.1 Appropriateness of Use Designations	46
3.4.2 Status of Beneficial Use Support	46
3.4.3 Summary of Assessments Units Evaluated.....	53
Section 4: Review of Implementation Plan and Activities	55
4.1 Development and Purpose	55
4.1.1 Evaluation of the Feedback Loop in the Implementation Plan.....	55
4.2 Responsible Parties.....	56
4.3 Planned Activities	59
4.4 Accomplished Activities	59
4.4.1 Point Source Activities.....	59
4.4.2 Nonpoint Source Activities.....	61
4.5 Future Strategy.....	63
4.6 Planned Time Frame	64
4.7 Watershed Advisory Group Consultation.....	65
4.7.1 Consultation Provisions and Consultation History	65
4.7.2 Watershed Advisory Group Recommendations.....	68
Section 5: Summary of Five-Year Review.....	69
5.1 Data Review Process	69
5.2 Changes in the Subbasin.....	70
5.2.1 Summary of Changes.....	70
5.2.2 Significance of Changes.....	70
5.3 TMDL Analysis	71
5.4 Review of Beneficial Uses	71
5.5 Water Quality Criteria	71
5.6 Watershed Advisory Group Consultation.....	72
5.7 Recommendations for Further Action.....	72
References Cited	73
Appendix A. Designated Management Agency Report of Implementation Activities and Effectiveness	77

List of Tables

Table A. Existing US Environmental Protection Agency-approved TMDLs and TMDL status.	ix
Table B. Existing TMDLs and implementation status.....	x
Table C. Subbasin at a glance.	xi
Table 1. Existing TMDLs and TMDL status.	4
Table 2. Instream water quality targets in Lake Walcott	5
Table 3. Summary of Lake Walcott TMDLs, 2000–2007.	6
Table 4. Summary of water quality instream targets for EPA-Approved TMDLs in the Lake Walcott subbasin.	8
Table 5. Total suspended sediment load capacity of Snake River segments, with associated percentage of load capacity.	12
Table 6. Total suspended sediment load capacity of Rock Creek, with associated percentage of load capacity.	13
Table 7. Lake Walcott oil and grease TMDL with associated percentage of load capacity, Snake River—Minidoka Dam to Milner Dam.	14
Table 8. Total phosphorus load capacity of Minidoka Dam to Milner Dam segment of the Snake River, with associated percentage of load capacity.	14
Table 9. Sediment wasteload allocation (TSS) comparison before and after 2000 Lake Walcott TMDL for Snake River point sources.	19
Table 10. Sediment wasteload allocation (TSS) comparison before and after 2000 Lake Walcott TMDL for Rock Creek point sources.	20
Table 11. Sediment wasteload allocation (TSS) comparison before and after 2000 Lake Walcott TMDL for Fall Creek and Rueger Springs.	21
Table 12. Total phosphorus wasteload allocation comparison before and after 2000 Lake Walcott TMDL for the Snake River.	22
Table 13. Total phosphorus wasteload allocation comparison before and after for Fall Creek and Rueger Springs.	23
Table 14. E. coli wasteload allocation comparison before and after 2000 Lake Walcott TMDL.	24
Table 15. Total suspended sediment (TSS) load allocation comparison before and after 2000 Lake Walcott TMDL for the Snake River.	25
Table 16. Total suspended sediment (TSS) load allocation comparison before and after 2000 Lake Walcott TMDL for Rock Creek.	25
Table 17. Water Quality Data before and after the Lake Walcott TMDL in the Snake River.	26
Table 18. Effect of City of Rockland NPDES seasonal permit on (TSS) TMDL.	30
Table 19. Designated and existing beneficial uses of TMDL water bodies.	34
Table 20. Summary of water quality instream targets for the Lake Walcott subbasin, 2000 to 2007.	35
Table 21. Major land cover in the Lake Walcott subbasin.	36
Table 22. Major landownership in the Lake Walcott subbasin.	36
Table 23. Summary of point sources in the Lake Walcott TMDL.	37
Table 24. Population change and household statistics in Lake Walcott subbasin, by county.	39
Table 25. Population change in major cities in the Lake Walcott subbasin.	40

Table 26 Idaho Department of Water Resources drought emergency declarations.	41
Table 27. Summary of DEQ biological data for Lake Walcott subbasin.	45
Table 28. Summary of water quality data for the Snake River.	47
Table 29. Summary of water quality data for the tributaries.	49
Table 30. Summary of recommended changes for evaluated assessment units.	54
Table 31. Responsible parties for Lake Walcott TMDL implementation.	56
Table 32. Planned activities of the Lake Walcott TMDL implementation plan.	59
Table 33. Summary of NPDES permits for Lake Walcott TMDL point sources.	60
Table 34. Army Corps of Engineers (ACOE) §404-permitted implementation projects since 2000 in the Lake Walcott subbasin.	62
Table 35. Summary of Lake Walcott WAG meetings, 2000–2008.	66
Table 36. Summary of the Upper Snake BAG meetings, 1999–2008.	67
Table 37. Summary of the Lake Walcott WAG recommendations.	68

List of Figures

Figure 1. Location of subbasin.	3
--------------------------------------	---

Acronyms and Abbreviations

§	Section (usually a section of federal or state rules or statutes)	ESA	Endangered Species Act
§303(d)	Refers to section 303 subsection (d) of the Clean Water Act, or a list of impaired water bodies required by this section	FERC	Federal Energy Regulatory Commission
ACOE	Army Corps of Engineers	FG	future growth (reserve)
AHD	Albion Highway District	FS	full support
AU	assessment unit	GIS	geographical information systems
BAG	basin advisory group	IASCD	Idaho Association of Soil Conservation Districts
BK	background	IDAPA	Refers to citations of Idaho administrative rules
BLM	United States Bureau of Land Management	IDFG	Idaho Department of Fish and Game
BMP	best management practice	IDL	Idaho Department of Lands
BOR	United States Bureau of Reclamation	IDWR	Idaho Department of Water Resources
BURP	Beneficial Use Reconnaissance Program	IPC	Idaho Power Company
C	Celsius	ISCC	Idaho Soil Conservation Commission
cfs	cubic feet per second	ISPR	Idaho State Parks and Recreation
cfu	colony forming unit	ITD	Idaho Transportation Department
CWA	Clean Water Act	LA	load allocation
CWAL	cold water aquatic life	lb	pound
DEQ	Idaho Department of Environmental Quality	LC	load capacity
DMR	discharge monitoring report	mg/L	milligrams per liter
DO	dissolved oxygen	mL	milliliter
EPA	United States Environmental Protection Agency	MOS	margin of safety
		N	nitrogen

NA	not applicable	WWAL	warm water aquatic life
NM	not meeting (informational TMDL target)	WWTP	wastewater treatment plant
NOI	Notice of Intent		
NPDES	National Pollutant Discharge Elimination System		
NS	not supporting		
NWP	nationwide permit		
PCR	primary contact recreation		
POTW	publicly owned treatment work		
QA	quality assurance		
QAPP	quality assurance project plan		
RI	recurrence interval		
RM	river mile		
SCR	secondary contact recreation		
SS	salmonid spawning		
TMDL	total maximum daily load		
TP	total phosphorus		
TSS	total suspended sediment		
U.S.C.	United States Code		
USFS	United States Forest Service		
USFWS	United States Fish and Wildlife Service		
USGS	United States Geological Survey		
WAG	watershed advisory group		
WBID	water body identification number		
WLA	wasteload allocation		
WQLS	water quality limited segment		

Executive Summary

This document presents a five-year review of the *Lake Walcott Subbasin Assessment, Total Maximum Daily Load, and Implementation Plan* (Lake Walcott TMDL) (DEQ 2000). This review addresses water bodies in the Lake Walcott subbasin that are in the 2010 Integrated Report (DEQ 2011), including water bodies on the original 1996 and 1998 §303(d) list for the Lake Walcott TMDL. This five-year review has been developed to comply with Idaho Code § 39-3611(7). The review describes current water quality status, pollutant sources, and recent pollution control efforts in the Lake Walcott subbasin, located in south-central Idaho.

The total maximum daily loads (TMDLs) subject to five-year review are summarized in Tables A and B. Table A summarizes the existing approved TMDLs and their status relative to their specific assessment unit (AU), pollutants of concern, and TMDL approval year. The TMDLs include the Lake Walcott TMDL (approved in 2000), Rueger Springs TMDL addendum (approved in 2007), and Fall Creek TMDL addendum (approved in 2007) (DEQ 2000, 2007, 2006).

Table A. Existing US Environmental Protection Agency-approved TMDLs and TMDL status.

Stream	Assessment Unit	Pollutant(s)	TMDL and Approval Year
Main Stem Snake River			
Snake River—Minidoka Dam to Heyburn/Burley Bridge	ID17040209SK002_02 ID17040209SK002_07	TP	Lake Walcott TMDL, 2000
Snake River—Heyburn/Burley Bridge to Milner Dam-Gooding Canal	ID17040209SK001_02 ID17040209SK001_07	TP	Lake Walcott TMDL, 2000
Tributaries			
Rock Creek—main stem	ID17040209SK008_04	TSS	Lake Walcott TMDL, 2000
Rock Creek—East Fork Rock Creek	ID17040209SK010_02 ID17040209SK010_03	TSS,	Lake Walcott TMDL, 2000
Rock Creek—South Fork Rock Creek	ID17040209SK009_02, 03, 04	TSS	Lake Walcott TMDL, 2000
Rueger Springs	ID17040209SK011_03	TSS, TP, <i>E. coli</i>	Rueger Springs TMDL, 2007
Fall Creek	ID17040209SK007_02 ID17040209SK007_03	TSS, TP, <i>E. coli</i>	Fall Creek TMDL, 2007

Note: TSS = total suspended sediment; TP = total phosphorus

Table B summarizes the existing TMDLs and their implementation status relative to their planning efforts, project activities, and water quality improvement trends. The *Lake Walcott Total Maximum Daily Load (TMDL) Agricultural Implementation Plan* (PCSCD et al. 2001) is a component of the Lake Walcott TMDL and provides target dates and guidelines for meeting water quality standards and beneficial uses of the water bodies listed in Tables A and B.

Table B. Existing TMDLs and implementation status.

Stream	Implementation Plan?	Implementation Activities?	Water Quality Trend
<i>Snake River</i>			
American Falls Dam to Eagle Rock	Yes	Yes	Stationary
Eagle Rock to Massacre Rocks	Yes	Yes	Stationary
Massacre Rocks to Lake Walcott	Yes	Yes	Stationary
Minidoka Dam to Milner Dam	Yes	Yes	Stationary
<i>Tributaries</i>			
Rock Creek—main stem	Yes	In development	Stationary
Rock Creek—East Fork Rock Creek	Yes	In development	Stationary
Rock Creek—South Fork Rock Creek	Yes	In development	Stationary
Rueger Springs	Yes	NPDES permit ^a	Meeting DMR ^b
Fall Creek	Yes	NPDES permit	Meeting DMR

^a National Pollutant Discharge Elimination System^b DMR = discharge monitoring report

Although the upper reaches of the Snake River are not §303(d) listed, the Lake Walcott TMDL explicitly includes an informational sediment TMDL (given as tons per year) in the stretch from American Falls Dam to Massacre Rocks (which includes two subreaches: American Falls Dam to Eagle Rock and Eagle Rock to Massacre Rocks [DEQ 2000, Table 45]) and from Massacre Rocks to Lake Walcott (DEQ 2000, Table 46). Regarding implementation, certain nonpoint source implementation activities have occurred on US Bureau of Land Management land and on the Minidoka Wildlife Refuge to reduce the effects from erosional sediments along the stream corridor during high-flow events. In addition, the US Bureau of Reclamation (BOR) has interests in this part of the Snake River due to its ownership of certain lands affiliated with BOR hydropower projects; they too are looking at reducing the effects of erosional sediments along the stream corridor during high-flow events.

Subbasin at a Glance

Table C summarizes the status of the Lake Walcott subbasin regarding approved TMDLs, implementation plans and actions, pollutants of concern, and Integrated Report categories. Specifically, the table summarizes the following:

- Number of AUs moving from Category 4a (TMDL completed and US Environmental Protection Agency approved) to Category 2 (water bodies that have attained some water quality standards)
- Number of AUs moving from Category 3 (water bodies with insufficient data to assess if beneficial uses are being attained) to Category 5 (water bodies not meeting water quality standards for one or more designated beneficial uses by one or more pollutants)
- Estimated percent of watershed in Category 4a or Category 5

Table C. Subbasin at a glance.

Approved TMDLs	Pollutants of Concern Within Watershed	AUs Moving From Category 4a to Category 2
Lake Walcott TMDL (DEQ 2000) Rueger Springs TMDL (DEQ 2007) Fall Creek TMDL (DEQ 2006)	Sediment as TSS, TP, <i>E. coli</i>	None at this time
Implementation Plans	Implementation Actions	AUs Moving from Category 3 to Category 5
Lake Walcott TMDL and Implementation Plan (2000) Lake Walcott Implementation Plan (2005) Lake Walcott TMDL Agricultural Implementation Plan (2001)	Sediment ponds, riparian and wetland enhancements	None at this time
		Estimated Percent of Watershed in Category 4a or Category 5
		Category 4a = 60% Category 5 = 60%

Note: AUs = assessment units; TMDL = total maximum daily load; TSS = total suspended sediment; TP = total phosphorus; *E. coli* = *Escherichia coli*

About Assessment Units

AUs are geographical groupings of stream segments. The Idaho Department of Environmental Quality describes all water bodies that within the same drainage using Strahler stream order. First and second order streams are grouped together. All other stream orders are identified as such. AUs are groups of similar streams by order and may be further split based on land use practices, ownership, or land management. However, stream order is the primary basis for determining AUs—even if ownership and land use change significantly.

Section 1: Introduction

The federal Clean Water Act (CWA) requires that states and tribes restore and maintain the chemical, physical, and biological integrity of the nation's waters. States and tribes, pursuant to Section 303 of the CWA, are to adopt water quality standards necessary to protect fish, shellfish, and wildlife while providing for recreation in and on the nation's waters whenever possible. Section 303(d) of the CWA establishes requirements for states and tribes to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). States and tribes must periodically publish a priority list (a "§303(d) list") of impaired waters. This list is published every 2 years as the list of Category 5 waters in the Integrated Report. For waters identified on this list, states and tribes must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards.

Idaho Code § 39-3611(7) requires a five-year cyclic review process for Idaho TMDLs:

The director shall review and reevaluate each TMDL, supporting subbasin assessment, implementation plan(s) and all available data periodically at intervals of no greater than five (5) years. Such reviews shall include the assessments required by section 39-3607, Idaho Code, and an evaluation of the water quality criteria, instream targets, pollutant allocations, assumptions and analyses upon which the TMDL and subbasin assessment were based. If the members of the watershed advisory group, with the concurrence of the basin advisory group, advise the director that the water quality standards, the subbasin assessment, or the implementation plan(s) are not attainable or are inappropriate based upon supporting data, the director shall initiate the process or processes to determine whether to make recommended modifications. The director shall report to the legislature annually the results of such reviews.

The Lake Walcott TMDL five-year review is intended to meet the intent and purpose of Idaho Code § 39-3611(7). The report reviews the approved Lake Walcott TMDL and implementation plan and considers the most current and applicable information in conformance with Idaho Code § 39-3607, evaluates the appropriateness of the TMDL to current watershed conditions, evaluates implementation plan actions to date, and includes consultation with the watershed advisory group (WAG). Final decisions for TMDL modifications are decided by the Idaho Department of Environmental Quality (DEQ) director. Approval of TMDL modifications is made by the US Environmental Protection Agency (EPA), with consultation by DEQ.

The Lake Walcott TMDL five-year review is not intended to reopen the approved Lake Walcott TMDL (DEQ 2000) and make modifications to the allocations already approved for any of the listed water bodies. Point source wasteload allocations and nonpoint source load allocations will not be modified under the five-year review process. The original TMDL was EPA-approved in 2000 and serves as a starting point of comparison between pre-TMDL (before 2000) actions and the actions taken post-TMDL approval (2000 and later). This five-year review also includes the Rueger Springs and Fall Creek TMDL addendums using the same approach (DEQ 2007, 2006).

Section 2: TMDL Review and Status

This section discusses the TMDL review and status for the Lake Walcott TMDL, Rueger Springs TMDL, and Fall Creek TMDL (DEQ 2000, 2007, 2006). Approved TMDLs in the Lake Walcott subbasin can be accessed via DEQ's website: <http://www.deq.idaho.gov/water-quality/surface-water/tmdls/table-of-sbas-tmdls/walcott-lake-subbasin.aspx>. The TMDLs involved with the Lake Walcott subbasin are as follows:

- *Lake Walcott Subbasin Assessment, Total Maximum Daily Load, and Implementation Plan*—approved 2000 (DEQ 2000)
- *Rueger Springs Total Maximum Daily Load (TMDL) of the Lake Walcott Watershed Management Plan*—approved 2007 (DEQ 2007)
- *Fall Creek Total Maximum Daily Load (TMDL) of the Lake Walcott Watershed Management Plan*—approved 2007 (DEQ 2006)

The Rueger Springs and Fall Creek TMDLs are aquaculture facility addendums to the Lake Walcott TMDL. They deal primarily with fish farm facilities that ultimately discharge into the Snake River. TMDL targets for total phosphorus (TP) and total suspended sediment (TSS) are similar to those in the Lake Walcott TMDL. The Lake Walcott temperature TMDL addendum is now under development. It presumes temperature is impairing various tributaries and uses a potential natural vegetation shading methodology for the tributaries to reduce thermal loading to the tributaries and the Snake River.

Figure 1 provides the location of the Snake River and general overview of tributary segments of the Lake Walcott TMDL.

2.1 Subbasin at a Glance

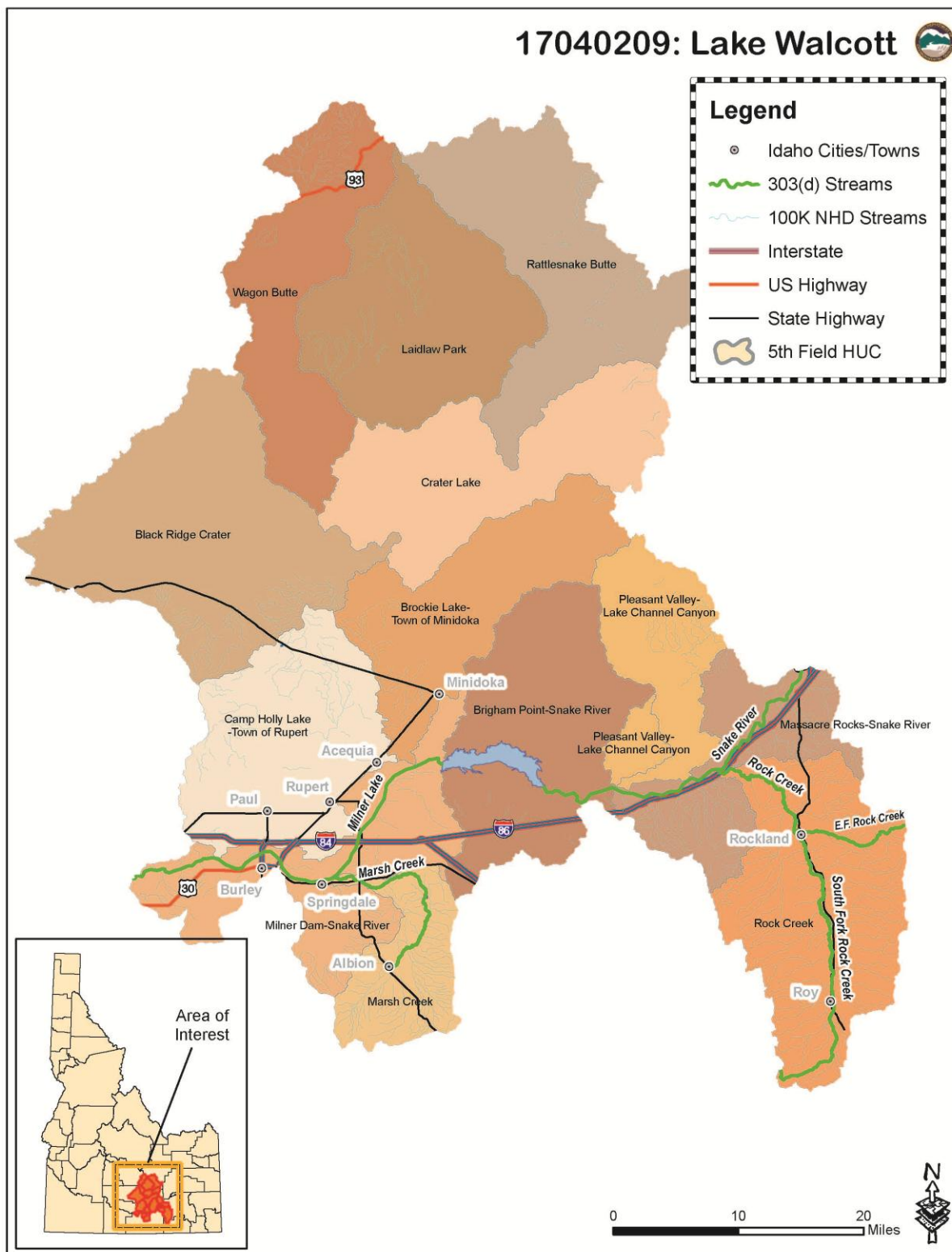


Figure 1. Location of subbasin.

2.1.1 Snake River and Tributary Segments with TMDLs

The Lake Walcott TMDL stream reaches subject to five-year review are shown below (Table 1).

Table 1. Existing TMDLs and TMDL status.

Stream	Assessment Unit	Pollutant(s)	TMDL and Approval Year
Main Stem Snake River			
Snake River—Minidoka Dam to Heyburn/Burley Bridge	ID17040209SK002_02 ID17040209SK002_07	TP	Lake Walcott TMDL, 2000
Snake River—Heyburn/Burley Bridge to Milner Dam-Gooding Canal	ID17040209SK001_02 ID17040209SK001_07	TP	Lake Walcott TMDL, 2000
Tributaries			
Rock Creek—main stem	ID17040209SK008_04	TSS	Lake Walcott TMDL, 2000
Rock Creek—East Fork Rock Creek	ID17040209SK010_02 ID17040209SK010_03	TSS,	Lake Walcott TMDL, 2000
Rock Creek—South Fork Rock Creek	ID17040209SK009_02, 03, 04	TSS	Lake Walcott TMDL, 2000
Rueger Springs	ID17040209SK011_03	TSS, TP, <i>E. coli</i>	Rueger Springs TMDL, 2007
Fall Creek	ID17040209SK007_02 ID17040209SK007_03	TSS, TP, <i>E. coli</i>	Fall Creek TMDL, 2007

Note: TSS = total suspended sediment; TP = total phosphorus

The original Lake Walcott TMDL described eight water bodies on the 1996 and 1998 §303(d) list of impaired waters. Sediment was the most common listed pollutant, along with nutrients, dissolved oxygen (DO), pesticides, and oil and grease. Some pollutants were found to not be impairing water quality and beneficial uses.

- TSS average concentrations were below 25 milligrams per liter (mg/L) at the time of the TMDL in the main stem Snake River. Upstream reservoirs created by dams acted as settling basins for bed load sediment and suspended solids. Informational TMDLs were developed as an antidegradation measure to establish a baseline for the main stem reaches. However, TSS loads in the Rock Creek watersheds (a tributary to the Snake River) ranged from 6 –150 mg/L, requiring an 88% reduction in total TSS load.
- TP levels were causing excessive algae growth, nuisance aquatic vegetation, and limited fish kills. TP reductions were prescribed for nonpoint and point sources in the Snake River from Minidoka Dam to Milner Dam.
- Temperature issues were described, but due to many unknowns and efforts to develop a regional water temperature guidance between EPA and the states of Idaho, Washington, and Oregon, temperature was not addressed in depth.

Under IDAPA 58.01.02.055, informational TMDLs may be developed for water bodies fully supporting beneficial uses as described under §303(d)(3) of the CWA; however, these water bodies will not necessarily be subject to the provisions that apply to water quality limited waters and TMDLs. When a downstream water is impaired and dependent on the water quality of the

upstream water, it is necessary and prudent for the upstream water to meet the water quality provisions of the downstream water. The Lake Walcott TMDL took into account the water quality effect of the upstream reaches for TSS, TP, and oil and grease because of their connectivity to the impaired downstream reaches. To the extent that the downstream reaches are undergoing implementation activities to reduce water quality impairment to meet water quality standards, the water quality effect from the upstream reaches must be considered as part of the overall TMDL objective of the Snake River. Therefore, informational TMDLs were developed for the following upstream reaches as part of the overall goals of the Lake Walcott TMDL:

- 1) Snake River—American Falls Reservoir to Rock Creek (ID17040209SK011_07, 02, and 03)
- 2) Snake River—Rock Creek to Raft River (ID17040209SK006_03, 02, and 07)
- 3) Snake River—Raft River to Lake Walcott (ID17040209SK005_07)
- 4) Snake River—Lake Walcott (from Section 17, Township 09 South, Range 27 East to Minidoka Dam; ID17040209SK004L_0L and ID17040209SK004_02)

Also, certain reaches as described in the 2010 Integrated Report assessment units (AUs) may not necessarily fit into the water quality limited stream segments originally described in the Lake Walcott TMDL. The Lake Walcott five-year review recognizes this deficiency but includes these AUs as part of the informational TMDLs previously discussed.

The instream water quality targets used in the TMDLs are summarized in Table 2.

Table 2. Instream water quality targets in Lake Walcott

Name of Water Body	Assessment Unit	Total Suspended Sediment^a	Total Phosphorus	<i>E. coli</i>
Snake River—Minidoka Dam to Milner Dam	ID17040209SK002_02 ID17040209SK002_07 ID17040209SK001_02 ID17040209SK001_07	NA	0.08 mg/L	NA
Rock Creek and Tributaries	ID17040209SK008_04 ID17040209SK009_02 ID17040209SK009_03 ID17040209SK009_04 ID17040209SK010_02 ID17040209SK010_03	50 mg/L mean 80 mg/L daily max	NA	NA
Rueger Springs	ID17040209SK011_03	50 mg/L mean 80 mg/L daily max	0.08 mg/L	126
Fall Creek	ID17040209SK007_02 ID17040209SK007_03	50 mg/L mean 80 mg/L daily max	0.1 mg/L	126

Table 3 summarizes EPA-approved TMDLs in the Lake Walcott subbasin between 2000 and 2007. The pollutants of concern addressed in these TMDLs were TSS, TP, and *E. coli*.

Table 3. Summary of Lake Walcott TMDLs, 2000–2007.

Category	Allocation							
	Snake River— Minidoka Dam to Milner Dam	Rock Creek Watersheds (Main Stem, East Fork, South Fork)	Rueger Springs			Fall Creek		
	TP (lb/day)	TSS (tons/day)	TSS (lb/day)	TP (lb/day)	<i>E. coli</i> (cfu ⁹ /day)	TSS (lb/day)	TP (lb/day)	<i>E. coli</i> (cfu ⁹ /day)
Background + Margin of Safety	1366	0	648.0	1.04	7.4	675	1.35	7.7
Nonpoint Source Load Allocation	284	4.54	5,297.4	0.78	66.5	4,824.9	1.39	69.3
Point Source Wasteload Allocation	802	0.01	534.6	8.55	0	1,250.1	10.76	0
Unallocated Load for Future Growth	0	0	0	0	0	0	0	0
Load Capacity	2,452	4.55	6,480	10.37	73.9	6,750.0	13.5	77

Note: TSS = total suspended sediment; TP = total phosphorus; cfu = colony forming unit; lb = pound

2.1.2 Critical Periods

The critical periods considered in the Lake Walcott TMDL(2000) were based on three critical flow regimes—high, low, and average flow years. According to the TMDL, “Final load capacity was determined to be the lowest load capacity from this analysis. At this capacity water quality targets would not be exceeded in a worst case basis. Actual daily flow records were used to incorporate day-to-day and seasonal variation in load capacity for the low and high flow regimes” (DEQ 2000, p. 139).

2.1.3 Monitoring Plan and Control Locations

The Lake Walcott TMDL (DEQ 2000, pp. 156–158) describes a trend monitoring plan. The plan integrates long-range components involving monitoring and education. Due to limited financial resources, minimal ambient water quality monitoring has occurred thus far. The trend monitoring plan included the following objectives:

1. **Monitor Water Quality**—Designated agencies in cooperation with land management agencies and DEQ shall ensure that best management practices (BMPs) are monitored for their effect on water quality.
2. **Monitor Effectiveness**—DEQ in conjunction with the land management agencies, designated agencies, and permitted industries will evaluate BMP effectiveness for protecting soil and water resources.
3. **Identify Data Gaps**—DEQ identifies areas in need of further investigation where water quality data gaps may need to be filled due to insufficient resources.
4. **Designate Reference Point**—DEQ usually establishes a reference point of overall compliance with BMPs such that efficacy monitoring will be the responsibility of all water user industries and DEQ.
5. **Provide On-Sight Education and Technical Assistance**—Designated agencies and land management agencies must determine whether farmers are aware of BMPs through on-site

education and technical assistance or other education methods that will bring such information to their attention for implementation purposes.

6. **Identify Implementation Problems**—Property owners, land management agencies, and the designated agencies must identify any BMP implementation problems and encourage their modification to prevent any degradation of water quality standards and beneficial uses of the receiving water body.
7. **Evaluate Agricultural Practices**—The agricultural industries in conjunction with the designated agencies will evaluate whether any agricultural practice causes environmental damage and what remedies can be applied to circumvent such damage.
8. **Evaluate Alternative Best Management Practices**—Land management agencies will compare the effectiveness of alternative BMPs.
9. **Assess Water Quality Standards Attainment**—DEQ will assess whether allocations are sufficient to attain water quality standards and beneficial uses.
10. **Assess Short-Term and Long-Term Goals**—DEQ will assess if short-term and long-term milestones are being met as described in Tables 49 and 50 of the Lake Walcott TMDL (DEQ 2000, pp. 149–150, 155). Point source goals are defined in section 3.7.1 of the Lake Walcott TMDL (DEQ 2000, pp. 149–150). Nonpoint source goals are defined in section 3.7.2 of the Lake Walcott TMDL (DEQ 2000, pp. 150–155).
11. **Determine Financial Stewardship for Monitoring Activities**—Describe who will carry out and finance the monitoring activities via the various water user industries in the Lake Walcott subbasin.

In addition, the TMDL called for monitoring at compliance points for all tributaries and irrigation return flows where they discharge to the Snake River or where any stream or irrigation return flow discharges to a water quality limited stream segment. The extent to which actual water quality monitoring by DEQ takes place is dependent on available resources. Some monitoring was expected to occur by other entities, dependent on resources.

2.2 Pollutant Targets

This section summarizes the applicable water quality criteria used in the TMDLs. The water quality instream targets used in the Lake Walcott TMDL, Rueger Springs TMDL, and Fall Creek TMDL are shown in Table 4.

Table 4. Summary of water quality instream targets for EPA-Approved TMDLs in the Lake Walcott subbasin.

Water Body	Total Suspended Sediment	Total Phosphorus	<i>E. coli</i>
Snake River— Minidoka Dam to Milner Dam	NA	0.08 mg/L	NA
Rock Creek and Tributaries	50 mg/L monthly average 80 mg/L daily maximum	NA	NA
Tributary	50 mg/L monthly average	0.08 mg/L	126 geometric mean 406 instantaneous max
Tributary	50 mg/L monthly average	0.10 mg/L	126 geometric mean 406 instantaneous max

The linkage between the instream targets (Table 4) and the beneficial uses of the water body are as follows:

- TSS is primarily addressed in IDAPA 58.01.02.200.08: “Sediment shall not exceed quantities specified in Sections 250 and 252, or, in the absence of specific sediment criteria, quantities which impair designated beneficial uses.” TSS is not considered a deleterious material under IDAPA 58.01.02.200.03 in that sediment results from nonpoint source activities. TSS has the potential at certain concentrations to impact cold water aquatic life and salmonid spawning beneficial uses.
- TP is primarily addressed in IDAPA 58.01.02.200.06: “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.” TP has the potential at certain concentrations to impact cold water aquatic life and salmonid spawning beneficial uses.
- *E. coli* bacteria are primarily addressed in IDAPA 58.01.02.251.01: “Waters designated for recreation are not to contain *E. coli* bacteria, used as indicators of human pathogens,” in concentrations exceeding certain criteria based on beneficial uses. *E. coli* is widely distributed in the intestines of humans *and* other warm-blooded animals, is the predominant facultative anaerobe in the bowel, and is part of the essential intestinal flora that maintains the physiology of the healthy host. Therefore, the IDAPA regulation is concerned with any warm-blooded animal (human or otherwise); thus, at certain concentrations, *E. coli* has the potential to impact primary and secondary contact recreation.

2.2.1 Applicable Narrative Criteria

The Lake Walcott TMDL used the following narrative criteria:

- **IDAPA 58.01.02.200.08** (sediment)—TSS for sediment cannot exceed quantities that impair designated beneficial uses. The TMDL used the target for TSS shown in Table 4, thus converting the narrative criteria into a TMDL instream target.
- **IDAPA 58.01.02.200.06** (excess nutrients)—TP for excess nutrients cannot “cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses.” The TMDL used the target for TP shown in Table 4, thus converting the narrative criteria into a TMDL instream target.

This same approach was applied in the Rueger Springs TMDL and Fall Creek TMDL.

DEQ does not propose any changes to the TSS and TP targets and supports converting the narrative criteria (for sediment and nutrients) to a water quality instream target as a reasonable approach for linking the beneficial uses to a water quality standard.

2.2.2 Evaluation of Critical Periods

The critical periods considered in the Lake Walcott TMDL were based on three flow regimes—high, low, and average flow years. These critical periods were reviewed by DEQ for the five-year review. DEQ concluded that the approach was reasonable and applicable to the Snake River, and potentially to the tributaries if sufficient flow information was available. The decision to use the lowest load capacity from the three flow regimes (lowest flow scenario), which would not be exceeded in a worst-case basis, has merit and precedence with other previously written and approved TMDLs in Idaho. This seasonal approach to the flow regime of any river or tributary system can be evaluated, assuming sufficient data exist to qualify the approach.

DEQ identified the critical period for temperature impairment of cold water aquatic life and salmonid spawning beneficial uses. Since the water quality criteria for cold water aquatic life are not seasonal but year round, the approach is more conservative than if a seasonal approach were used. Salmonid spawning criteria apply to time frames by species, where known, or by default time frames. However, the typical critical months are July and August for cold water aquatic life and April, September, and October for salmonid spawning. These months are those when temperature exceedances may occur.

2.2.3 Rationale for Target Selection

DEQ evaluated the rationale for instream target selection for TP, TSS, and *E. coli*. DEQ maintains the selection of such targets (as shown in Table 4) was reasonable, appropriate, and prudent; therefore, those targets will continue to be used in the Lake Walcott TMDL, Rueger Springs TMDL, and Fall Creek TMDL. No changes to these targets are suggested at this time.

2.3 Control and Monitoring Points

This section discusses the control and monitoring points used in the Lake Walcott TMDL, Rueger Springs TMDL, and Fall Creek TMDL.

2.3.1 Evaluation of the Control and Monitoring Points in the TMDL

A trend monitoring plan was developed by DEQ with concurrence from the Lake Walcott WAG. This plan was developed as part of the Lake Walcott TMDL and is discussed in section 3.7.3 of the TMDL (DEQ 2000, pp. 156–158). Since 2000, the trend monitoring plan has been used on the Snake River to some extent but not on a monthly basis due to budget constraints. The plan incorporates the following monitoring locations:

- Four compliance *and* monitoring locations were selected on the Snake River for purposes of assessing and evaluating the TMDL for water quality standards (inclusive of TMDL standards) and beneficial use attainment. These four locations include Milner Dam, Minidoka Dam, Massacre Rocks, and Register Rocks. Since TMDL approval in 2000, this plan has been expanded to include American Falls Dam, Eagle Rock, and the Gifford Springs area.

- Two compliance *and* monitoring locations were selected at the confluence of East Fork Rock Creek with Rock Creek (in Power County) and the confluence of South Fork Rock Creek with East Fork Rock Creek. These locations continue to be used with the most recent round of monitoring.
- Compliance points for all tributaries and irrigation return flows were selected at their confluence with the Snake River or where any stream or irrigation return flow discharges to a water quality limited stream segment (i.e., a §303(d)-listed stream). Although Rueger Springs and Fall Creek are tributaries to the Snake River, monitoring in these tributaries has included additional locations within the main stem of the stream.

Due to resource constraints, monitoring at these compliance locations was marginal at best. However, monitoring has been more frequent since 2006. DEQ's intent is to continue to provide some level of monitoring depending on available resources, but at this point, the frequency of monitoring is uncertain.

2.3.2 Evaluation of the Monitoring Plan

The trend monitoring plan was evaluated by DEQ for the five-year review. To the extent practical, the plan is achievable with adequate resources. However, resource constraints prohibit monitoring on a continual monthly basis for any of the locations. Consequently, the amount of information available to evaluate the plan since 2000 is small and constitutes a data gap in this evaluation.

2.4 Load Capacity

The CWA requires that a TMDL be developed from a load capacity expressed as the greatest amount of pollutant load that a water body can carry without violating water quality standards. Where numeric water quality standards are defined in the IDAPA rules and regulations for different pollutants, the load capacity can be straight forward. However, numeric water quality standards do not exist for sediment and nutrients. Rather, the rules define narrative standards, from which the Lake Walcott TMDL developed numeric instream targets that can be used to develop a load capacity. This process is described in section 3.4 of the Lake Walcott TMDL (DEQ 2000, p. 137).

Under the TMDL process, the load capacity is described with the following formula:

$$\text{TMDL} = \text{Load Capacity} = \text{WLA} + \text{LA} + \text{MOS} + \text{BK} + \text{FG}$$

Where

- WLA = wasteload allocation (for point sources)
- LA = load allocation (for nonpoint sources)
- MOS = margin of safety (sometimes combined with BK)
- BK = background (sometimes combined with WLA or LA)
- FG = future growth reserve

More specifically, the load capacities for three pollutants are as follows:

$$\text{TP Load Capacity (lb/day)} = \text{TP target (mg/L)} \times \text{Flow (cubic feet per second [cfs])} \times 5.4$$

$$\text{TSS Load Capacity (lb/day)} = \text{TSS target (mg/L)} \times \text{Flow (cfs)} \times 5.4$$

$$\text{E. coli Load Capacity (cfu}^9\text{/day)} = \text{E. coli (cfu/100 mL)} \times \text{Flow (cfs)} \times 0.02445$$

The conversion factor of 5.4 used in the load capacity calculation for TP and TSS is to convert the mg/L concentration to a pound (lb)/day load. The conversion factor of 0.02445 in the load capacity calculation for *E. coli* is to convert the colony forming units (cfu)/100 milliliter (mL) concentration to a cfu⁹/day load.

Each of these formulas is the basis for the Lake Walcott TMDL as approved in 2000 as well as 2007 Addendums. The load capacity is discussed in more detail below. Wasteload allocations and load allocations are described in section 2.5 of this five-year review. The margin of safety, future growth reserve, and background are described in sections 2.6, 2.8, and 2.9, respectively. Section 2.7 describes seasonal variation and how it was considered in the TMDLs.

2.4.1 Summary of Methods Used to Estimate the Load Capacities

According to the Lake Walcott TMDL, “the load capacity of the various segments and tributaries in the Lake Walcott Subbasin, were estimated from the flow records available from USGS or reconstructed by IDEQ, and a variety of sources relating concentrations of pollutant to effects on ‘beneficial uses’ or aquatic communities.” In addition, “Other sources used for concentrations were: the Clean Water Act; the Code of Federal Regulations; USEPA recommendations and guidelines; other states water quality standards; other TMDLs written by the State of Idaho and submitted to or approved by USEPA; and scientific papers from refereed journals. Load capacities developed from sources other than the State of Idaho’s water quality standards will be reviewed at such time that numeric standards are adopted and codified by the State of Idaho following negotiated rule making” (DEQ 2000, p. 137).

The following sections summarize the load capacity estimation methods for: sediment, oil and grease, and TP.

Sediment

The Lake Walcott TMDL explains that excess sediment (TSS) load capacities “were based on protection of salmonids, other fish, and aquatic communities as suggested by the European Inland Fisheries Advisory Commission (EIFAC 1965) and the Committee on Water Quality Criteria from the Environmental Studies Board of the National Academy of Science and National Academy of Engineers (NAS/NAE 1973).” These load capacities were proposed to provide protection “for both cold and warm water biota as well as salmonid spawning” (DEQ 2000, p. 138).

The Lake Walcott TMDL describes these as “high protection levels for the fisheries” for the Snake River and “moderate protection of the fisheries” for the tributaries (DEQ 2000, p. 138).

From these TSS instream targets, the Lake Walcott TMDL defined the load capacity for the Snake River segments (Table 5). The TSS allocations and load capacities identified for the Snake River in the Lake Walcott TMDL are considered informational TMDLs. Informational TMDLs identify desirable conditions to maintain or meet water quality standards. These reaches were not considered impaired by sediment at the time of TMDL development.

Table 5. Total suspended sediment load capacity of Snake River segments, with associated percentage of load capacity.

Category	Allocation (tons/day)	Approximate Percentage of Load Capacity
<i>Snake River—American Falls to Massacre Rocks Informational TMDL</i>		
Background + Margin of Safety	110.000	34.6%
Nonpoint Source Load Allocation	28.582	9.0%
Point Source Wasteload Allocation	0.418 ^a	0.1%
Unallocated Load for Future Growth	179.000	56.3%
Load Capacity	318.000	100.0%
<i>Snake River—Massacre Rocks to Lake Walcott Informational TMDL</i>		
Background + Margin of Safety	76.000	23.1%
Nonpoint Source Load Allocation	151.000	45.9%
Point Source Wasteload Allocation	0.000	0.0%
Unallocated Load for Future Growth	102.000	31.0%
Load Capacity	329.000	100.0%
<i>Snake River—Minidoka Dam to Milner Dam Informational TMDL</i>		
Background + Margin of Safety	84.000	30.9%
Nonpoint Source Load Allocation	123.300	45.2%
Point Source Wasteload Allocation	1.701 ^b	0.6%
Unallocated Load for Future Growth	63.000	23.2%
Load Capacity	272.000	99.9%

Source: DEQ 2000, pp. 145–146

Note: The instream targets were calculated to loads based on the 25 mg/L monthly average and the 40 mg/L daily maximum for the Snake River.

^a American Falls to Massacre Rocks TMDL wasteload allocation: American Falls Wastewater Treatment Plant = 0.162 tons/day; Idaho Department of Fish and Game American Falls Fish Hatchery = 0.256 tons/day; confined animal feeding operations = 0.000 tons/day; and land application = 0.000 tons/day

^b Minidoka Dam to Milner Dam TMDL wasteload allocation: Minidoka State Park = 0.005 tons/day; Simplot = 0.679 tons/day; Heyburn City = 0.015 tons/day; Burley City = 0.083 tons/day; McCain Foods = 0.919 tons/day

TSS instream targets were approved by EPA for Rock Creek and its tributaries, as they were identified as water quality impaired. The tributary TSS load capacity is shown in Table 6 for Rock Creek in Power County.

Table 6. Total suspended sediment load capacity of Rock Creek, with associated percentage of load capacity.

Category	Allocation (tons/day)	Approximate Percentage of Load Capacity
Background + Margin of Safety	0.00	0.0%
Nonpoint Source Load Allocation	4.54 ^a	99.8%
Point Source Wasteload Allocation	0.01 ^b	0.2%
Unallocated Load for Future Growth	0.00	0.0%
Load Capacity	4.55	100.0%

Source: DEQ 2000, p. 148

Note: The instream targets were calculated to loads based on the 50 mg/L monthly average and the 80 mg/L daily maximum for the tributaries.

^a Load allocation: Nonpoint source component categorized into Rock Creek watershed = 0.82 tons/day; East Fork Rock Creek watershed = 0.59 tons/day; South Fork Rock Creek watershed = 3.13 tons/day

^b Wasteload allocation: Rockland City = 0.01 tons/day; confined animal feeding operations = 0.00 tons/day

In addition, the Lake Walcott TMDL provides a sediment loading analysis model that describes the basic mass balance approach: “The approach will be to consider all §303(d) listed segments on a segment by segment and pollutant by pollutant basis” (DEQ 2000, pp. 143–144). Sediment rating curves were developed from linear regression of monitoring data and flow. This approach was then used to formulate the overall load capacity of the river segments and tributaries.

DEQ also considered a flow duration curve model as an approach that would show the percentage of time that flow and load (in pounds/day) in a stream would likely equal or exceed the load capacity of the stream. Unfortunately, to use this approach it would be necessary to have a substantial amount of flow data for the stream of interest. Obtaining this amount of data was not possible for all of the tributaries involved in this five-year review.

Oil and Grease

The Lake Walcott TMDL explains that oil and grease are regulated by narrative water quality standards, thus necessitating a search for targets that could be used to quantify the narrative standard. The State of Wyoming Department of Environmental Quality uses a value of 10 mg/L of oil and grease. Using the flow design flow regime explained in section 2.6 below, a load capacity was established for oil and grease. To allow for a margin of safety, the Wyoming value was decreased by half to 5 mg/L. This margin of safety would account for a lack of data on the effects of oil and grease on beneficial uses. Following the same pattern described in section 2.6, similar conservative assumptions were applied to oil and grease, thus adding an implicit component to the margin of safety.

The Lake Walcott TMDL summarizes the oil and grease load capacity for the Minidoka Dam to Milner Dam segment of the Snake River (DEQ 2000, pp. 146–147). Table 7 summarizes the components of the oil and grease informational TMDL.

The oil and grease TMDL is an informational TMDL and is not approved by EPA. Informational TMDLs identify desirable conditions to maintain or meet water quality standards.

Table 7. Lake Walcott oil and grease TMDL with associated percentage of load capacity, Snake River—Minidoka Dam to Milner Dam.

Category	Allocation (tons/day)	Approximate Percentage of Load Capacity
Background + Margin of Safety	34.0	63%
Nonpoint Source Load Allocation	4.0	7%
Point Source Wasteload Allocation ^a	1.0	2%
Unallocated Load for Future Growth	15.0	28%
Load Capacity	54.0	100%

Source: DEQ 2000, pp. 146–147

^a The primary point source considered was McCain Foods with 1.0 ton/day wasteload allocation.

The Lake Walcott TMDL provides an oil and grease loading analysis model that describes the basic mass balance approach for the Milner Pool. The model “was derived from: mass balance spreadsheets; load capacity determination under the 3 design flows previously identified; an urban runoff model; and historical monitoring data and flow” (DEQ 2000, pp. 144–145).

Total Phosphorus

The Lake Walcott TMDL explains that the TP loading analysis model for the Milner Pool “was derived from a mass balance approach” based on monitoring data, upstream monitoring, downstream monitoring, source monitoring, and estimations of loads from the monitoring data. “Links to the water quality targets and beneficial uses were drawn from other TMDLs completed by the State of Idaho; the RBM-10 model; USEPA guidelines and recommendations; and scientific literature sources” (DEQ 2000, p. 145). The Lake Walcott TMDL provides the allocations for the various components of the load capacity for the Minidoka Dam to Milner Dam segment of the Snake River (DEQ 2000, p. 147). Table 8 summarizes the allocations and load capacity.

Table 8. Total phosphorus load capacity of Minidoka Dam to Milner Dam segment of the Snake River, with associated percentage of load capacity.

Category	Allocation (lb/day)	Approximate Percentage of Load Capacity
Background + Margin of Safety	1366.0	55.7%
Nonpoint Source Load Allocation	284.0	11.6%
Point Source Wasteload Allocation	802.0 ^a	32.7%
Unallocated Load for Future Growth	0.0	0.0%
Load Capacity	2,452.0	100.0%

Source: DEQ 2000, p. 147

Note: The instream targets were calculated to loads based on the 0.080 mg/L monthly average for run-of-river type systems based on three design flows (as explained in DEQ 2000, p. 143).

^a Wasteload allocation: Minidoka State Park = 0.0 lb/day; Simplot = 359.0 lb/day; Heyburn City = 5.0 lb/day; Burley City = 39.0 lb/day; McCain Foods = 399.0 lb/day; confined animal feeding operations = 0.0 lb/day; land application = 0.0 lb/day

2.4.2 Evaluation of All Assumptions Made in the Lake Walcott TMDL

Sediment Evaluation

DEQ reviewed the TSS assumptions made in the Lake Walcott TMDL again in 2010 as part of the five-year review process. The overall approach to the TSS instream targets was based on a 25 mg/L monthly average and 40 mg/L daily maximum for the Snake River and a 50 mg/L monthly average and 80 mg/L daily maximum for the tributaries (e.g., Rock Creek in Power County). The primary basis for using the “moderate protection” level (i.e., 50 mg/L monthly average) in tributaries is because historically, tributary streams are highly developed, are related to flow diversions associated with water rights, and serve as conveyance channels during the annual irrigation season. Thus, the expectation level for such tributaries meeting a “high protection” level (i.e., 25 mg/L monthly average) when their water quality is legally affected by industry development, flow diversions, and irrigation channel conveyance is not practical or realistic. A “moderate protection” level does not imply or suggest an allowance of reduced water quality in favor of enhanced water quality pollution. Rather, it is the ability to deal with the available water that has been culturally developed since the early 1900s for its legally intended use.

Consequently, DEQ continues to support the approach used on the instream TSS targets based on the following:

- The TMDL for aquatic biota for York Creek in Kent County, Michigan (Michigan DEQ 2005), established a secondary numeric TSS target of 80 mg/L for wet-weather runoff events with a primary numeric target of a minimum of 50 fish species with 1% trout. The secondary numeric target is intended to help guide proper control over nonpoint sources of excessive suspended solids loads from runoff, as well as the runoff discharge rates and instantaneous runoff volumes that affect increased streamflow instability, streambank erosion, and increased suspended solids concentrations. Using the 80 mg/L instream TSS target for stormwater-related events is appropriate to account for such conditions when they occur, but it is not intended to exceed the monthly average concentration of 50 mg/L in the tributaries.
- Vohs et al. (1993) indicated that a chemically inert suspended solids concentration of 100 mg/L appears to distinguish those streams *with* a fish population from those without. Thus, TSS concentration values exceeding 100 mg/L can have a deleterious effect on various aquatic biota that may exist in the Snake River and its tributaries. DEQ also understands that at certain times of the year, the seasonal nature of stormwater events may cause values to exceed 100 mg/L in the tributaries. However, these stormwater events are not persistent and are short-term; thus, achieving the 25 mg/L monthly average for the Snake River and 50 mg/L monthly average for tributaries is achievable.
- Gammon (1970) demonstrated decreases in the standing crop of both fishes and macroinvertebrates in river reaches continuously receiving suspended solids loadings of less than 40 mg/L. Monitoring by DEQ of the Snake River and the tributaries indicates that TSS concentration values greater than 40 mg/L are not necessarily characteristic of the Snake River or of some spring-fed tributaries, thus indicating that certain non-spring-fed tributaries may require implementation projects that can provide better control of nonpoint source inputs for both the Snake River and tributaries under a wide variety of flow regimes.

- The European Inland Fisheries Advisory Commission stated that in the absence of other pollution, a fishery would not be harmed at TSS concentrations less than 25 mg/L (EIFAC 1980). However, this instream TSS target is not necessarily achievable where point and nonpoint source inputs (inclusive of diversion and flow-altered regimes) have a great influence on the TSS concentrations in both the Snake River and various tributaries. Although a 25 mg/L TSS instream concentration as a monthly average is achievable for the Snake River under present conditions, it is highly unlikely that this would be possible in tributaries where historical nonpoint source practices are predominant in conjunction with flow-diverted regimes.
- Alabaster (1972) provided the following water quality goals for suspended solids (finely divided solids) for the protection of fish communities: optimum = ≤ 25 mg/L; good to moderate = > 25 to 80 mg/L; less than moderate = > 80 to 400 mg/L; and poor = > 400 mg/L. The optimum TSS concentration value (as a monthly average) was selected for the Snake River. The good to moderate TSS concentration value (as a monthly average) was selected for the tributaries.

Based on a review of these various scientific sources, DEQ supports the original targets for the Snake River and tributaries based on the overall impact to the beneficial uses and water quality standards of the various receiving water bodies. DEQ believes that the instream TSS targets are appropriate at this time because high flows and other precipitation or runoff-induced events may result in short-term sediment concentrations that are greater than 40 mg/L in the Snake River and 80 mg/L in the tributaries. However, even with these short-term stormwater events, the TSS concentrations are unlikely to exceed the average monthly target of 25 mg/L in the Snake River and 50 mg/L in tributaries.

Oil and Grease Evaluation

DEQ reviewed the oil and grease assumptions made in the Lake Walcott TMDL again in 2008 as part of the five-year review process. Most source materials reviewed for oil and grease agree that toxicity contributes to the decline of zooplankton and benthic organisms. Oil and grease accumulates in tissues of benthic organisms and can cause a threat to humans when consumed directly or when passed through the food chain. The primary cultural source of these pollutants is automobile oil and lubricants. Consequently, the primary concern considered by DEQ and the Lake Walcott WAG was to protect human health due to a developing industrial base in the area associated with the Snake River.

The primary target, as explained above, is based on the Wyoming 10 mg/L oil and grease instream target, which was reduced by half (to 5 mg/L) to account for the lack of data on the effects of oil and grease on the beneficial uses of the Snake River (Minidoka Dam to Milner Dam segment).

Since the Lake Walcott TMDL was approved in 2000, the *North Fork Payette River Subbasin Assessment and Total Maximum Daily Load* was approved by EPA in 2005 (DEQ 2005a). As explained in that TMDL, “In-reservoir oil and grease concentrations were below the 5 mg/L target set for oil/grease and this pollutant is recommended for delisting from the 303(d) list” (DEQ 2005a, p. xviii). This finding implies that an instream target of 5 mg/L for oil and grease is an appropriate target for in-reservoir systems, much like the Minidoka Dam to Milner Dam segment is in the Snake River.

However, the *District of Columbia Final Total Maximum Daily Load for Oil and Grease in Anacostia River* (approved October 2003) was associated with the flow of the river. In this TMDL, Class C waters (or waters that have to be protected for the propagation of fish, shellfish, and wildlife) must not exceed 10 mg/L of oil and grease (D.C. Department of Health 2003). This value is the approximate amount of oil that will cause a visible sheen on a water surface. This criterion does not apply at flows less than the average 7-day low flow, which has the probability of occurring once in 10 years.

On the other hand, the Tahoe Regional Planning Agency has set discharge limits into Lake Tahoe (State of Nevada) for surface runoff of 2 mg/L oil and grease as a maximum concentration (TRPA 1987). This stringency is necessary because of the concern for Lake Tahoe by citizens of the area and the historical effects of oil and grease on the aquatic biota and fishery of Lake Tahoe.

Consequently, a criterion of 5 mg/L (as in the North Fork Payette River TMDL) falls in the middle of other reviewed targets. This criterion was acceptable to the Lake Walcott WAG in 2000 when the TMDL was approved. One of the considerations for this level of protection was the developing population and industrial economy in the Burley-Rupert-Heyburn area that buffers the Minidoka Dam to Milner Dam segment of the Snake River. A 2% wasteload allocation (1 ton/day) was considered and approved for the one point source (i.e., McCain Foods) but with a future growth reserve of 28% wasteload allocation (15 tons/day) for other industries, resulting in an overall 30% wasteload allocation (16 tons/day) of the load capacity. Consequently, DEQ concluded during this five-year review that the initial consideration of 5 mg/L oil and grease as an instream criterion was appropriate and should be retained.

Total Phosphorus Evaluation

DEQ reviewed the TP assumptions made in the Lake Walcott TMDL again in 2010 as part of the five-year review process. The TP instream targets were based on a 0.080 mg/L target for the Snake River. Macrophyte and phytoplankton growth is primarily stimulated by nutrients such as phosphorus and nitrogen. DEQ continues to support the approach used on the instream TP target based on the following:

- Using the 0.080 mg/L TP instream target has some scientific bearing as this TP concentration level is associated with a DO concentration level greater than 6.0 mg/L. The Idaho *Clark Fork/Pend Oreille Sub-Basin Assessment and Total Maximum Daily Loads* (approved in April 2001 by EPA) is based on a similar TP instream target of 0.080 mg/L for the Cocolalla Lake TMDL, thus allowing the DO criteria of 6.0 mg/L to be achieved (DEQ 2001).
- Use of the 0.080 mg/L TP instream target has been supported by the Water Management Institute of the Lithuanian University of Agriculture as an “allowable norm” where semipolluted streams would be greater than 0.080 mg/L TP (Guzys et al. 2006).
- Generally speaking, no state criteria have been established for concentrations of phosphorus compounds in water. However, DEQ has opted to use EPA’s “Gold Book standard” of 0.05 mg/L as phosphorus as a measure to prevent the development of biological nuisances and to control accelerated or cultural eutrophication at the point where the water enters any lake or reservoir (EPA 1986). The same approach was used to develop the target of no more than 0.1 mg/L as phosphorus in streams that do not discharge directly into lakes or reservoirs (see

<http://bouldercommunity.net/basin/data/BACT///info/TP.html> Murphy 2007). This approach is supported by Mueller and Helsel (2009), who explain that total phosphates should not exceed 0.05 mg/L (as phosphorus) in a stream at a point where it enters a lake or reservoir and that TP should not exceed 0.1 mg/L in streams that do not discharge directly into lakes or reservoirs. Consequently, in a run-of-river stream that is not flowing into a lake or reservoir, the average TP concentration could be 0.075 TP (the midvalue between 0.05 mg/L TP and 0.100 mg/L TP). This approach is supported by the Upper Snake Rock Watershed Management Plan (TMDL) (DEQ 1999) and Middle Snake River Watershed Management Plan (TMDL) (DEQ 1998), both of which use the 0.075 mg/L TP instream standard.

DEQ concludes that the approach taken for TP targets for the Snake River in the Lake Walcott TMDL is consistent with other similar approaches on large river systems. It is also a good first approach to achieving water quality standards and beneficial uses in a system that is used for recreation and industrial, municipal, and agricultural uses.

2.5 Allocations

Under the CWA, Congress recognized two sources of pollution: point sources, which are discharged from a “discernable, confined and discrete conveyance such as a pipe [or] ditch” (33 U.S.C. § 1362 (14) 2002) and nonpoint sources from runoff from a variety of sources including urban areas and agricultural and forestry sites. The TMDL process defines allowable point source pollution as wasteload allocations and nonpoint source pollution as load allocations; both are components of the load capacity of an impaired water body (along with its margin of safety, background, and future growth reserve).

The pollutant loading allocations for the pollutants of concern are summarized in the following subsections, with a comparison before and after the TMDL.

2.5.1 Wasteload Allocations

The Lake Walcott TMDL wasteload allocations were previously identified in section 2.4, Load Capacity, but are further described as follows.

Sediment Wasteload Allocations

Table 9 provides a comparison of the TSS wasteload allocations before and after 2000. The comparison is based on the monthly mean and daily maximum (unless indicated as average weekly) as noted in National Pollutant Discharge Elimination System (NPDES) permits. Table 9 indicates that after the Lake Walcott TMDL was approved and the wasteload allocations were implemented into the NPDES permits of the various point sources, a 34.9% overall reduction in TSS was anticipated from the point source community.

Table 9. Sediment wasteload allocation (TSS) comparison before and after 2000 Lake Walcott TMDL for Snake River point sources.

Name of Facility	TSS Wasteload Allocation Before 2000 (lb/day)		TSS Wasteload Allocation 2000 and After (lb/day)	
	Monthly Mean	Daily Maximum	Monthly Mean	Daily Maximum
<i>American Falls to Massacre Rocks TMDL</i>				
American Falls POTW (ID-0020753)	324	No limit	225	338 (average weekly)
IDFG American Falls Fish Hatchery (IDG-130031)	512	No limit	534.6 ^a	1,015.7 ^a
Subtotal	836	—	759.6 (9.1% reduction)	—
<i>Massacre Rocks to Lake Walcott TMDL</i>				
No point sources	0.000	0	0.000	0
Subtotal	0.0	0	0.0 (No % reduction)	0
<i>Minidoka Dam to Milner Dam TMDL</i>				
BOR Minidoka Power Plant and State Park (ID-0026824)	10	No limit	0.29	No limit
Simplot (2005 and earlier) City of Burley Industrial Plant (after 2005) ^b (ID-0000663)	4,408	8780	359	539 (average weekly)
Heyburn POTW (ID-0020940)	137	205 (average weekly)	165	248 (average weekly)
Burley POTW (ID-0020095)	563	845 (average weekly)	563	845 (average weekly)
McCain Foods (ID-0000612)	4,100	8200	4,244	8,488
Subtotal	8,518.098	—	5,331.29 (37.4% reduction)	—
Total	9,354.098	—	6,090.89 (34.9% reduction)	—

Note: TSS = total suspended sediment; POTW = publicly owned treatment works; IDFG = Idaho Department of Fish and Game; BOR = Bureau of Reclamation

^a The TSS wasteload allocation for the fish hatchery is based on the Rueger Springs TMDL (DEQ 2007), which has a net TSS instream target of 5.0 mg/L for the effluent net load.

^b The J. R. Simplot Company bequeathed the Simplot potato processing plant to the City of Burley who applied for an NPDES permit as an industrial wastewater treatment facility.

In addition to the Snake River, Rock Creek also includes a TSS wasteload allocation. Table 10 summarizes the Rock Creek TSS seasonal wasteload allocations. After the Lake Walcott TMDL was approved and the wasteload allocations were implemented into the NPDES permits of the various point sources, it was not possible to determine if a reduction in TSS would have occurred because seasonal TSS monitoring was not a component of the permit prior to 2000.

Table 10. Sediment wasteload allocation (TSS) comparison before and after 2000 Lake Walcott TMDL for Rock Creek point sources.

Name of Facility	TSS Wasteload Allocation Before 2000 (lb/day)		TSS Wasteload Allocation 2000 and After (lb/day)	
	Monthly Mean	Daily Maximum	Monthly Mean	Daily Maximum
<i>Rock Creek TMDL</i>				
City of Rockland POTW ID-0022047 (May–October)	No limit	No limit	36	54 (average weekly)
City of Rockland POTW ID-0022047 (November–April)	No limit	No limit	24	36 (average weekly)
Total	No limit	—	30 (seasonal mean)^a	—

Note: POTW = publicly owned treatment work

^aThe Rockland POTW TSS TMDL incorporates a seasonal component allowing for a higher discharge in TSS during the May–October period into Rock Creek. Prior to the Lake Walcott TMDL (2000), no seasonal component was incorporated into the NPDES permit for the facility. The value 30 lb/day is the average of 24 lb/day (November–April) and 36 lb/day (May–October).

No other TSS TMDLs were written for other point sources under the Lake Walcott TMDL. However, in 2007 the Rueger Springs and Fall Creek TMDLs were approved by EPA as addendums to the Lake Walcott TMDL for fish hatchery point sources. These wasteload allocations are summarized in Table 11.

Table 11. Sediment wasteload allocation (TSS) comparison before and after 2000 Lake Walcott TMDL for Fall Creek and Rueger Springs.

Name of Facility	TSS Wasteload Allocation Before 2000 (lb/day)		TSS Wasteload Allocation 2000 and After (lb/day)	
	Monthly Mean	Daily Maximum	Monthly Mean	Daily Maximum
<i>Fall Creek TMDL</i>				
Fall Creek Fish Hatchery—Upper (IDG-130078)	602.1	No limit	577.8	1,097.8
Fall Creek Fish Hatchery—Lower (IDG-130085)	685.8	No limit	672.3	1,277.4
Fall Creek Total	1,287.9	—	1,250.1 (2.9% reduction)	2,375.2
<i>Rueger Springs TMDL</i>				
IDFG American Falls Fish Hatchery (IDG-130031)	972.2 ^a	No limit	534.6	1,015.7
Rueger Springs Total	972.2	—	534.6 (45% reduction)	1,015.7

Note: TSS = total suspended sediment; IDFG = Idaho Department of Fish and Game

^a The 972.2 lb/day TSS wasteload allocation is based on the IDFG annual report (IDFG 1985) annual average of 8.825 mg/L TSS (as a grab sample) and a 20.45 cubic feet per second maximum flow from December to September as an annual flow.

Total Phosphorus Wasteload Allocations

Table 12 provides a comparison of the TP wasteload allocations before and after 2000. The comparison is based on the monthly mean and daily maximum (unless indicated as average weekly) as noted in NPDES permits. Table 12 indicates that after the Lake Walcott TMDL was approved and the wasteload allocations were implemented into the NPDES permits of the various point sources, a 16.2% overall reduction in TP was anticipated from the point source community.

Table 12. Total phosphorus wasteload allocation comparison before and after 2000 Lake Walcott TMDL for the Snake River.

Name of Facility	Total Phosphorus Wasteload Allocation Before 2000 (lb/day)		Total Phosphorus Wasteload Allocation 2000 and After (lb/day)	
	Monthly Mean	Daily Maximum	Monthly Mean	Daily Maximum
American Falls to Massacre Rocks TMDL				
American Falls POTW ^a	No limit	No limit	No limit	No limit
IDFG American Falls Fish Hatchery (ID-130031)	No limit	No limit	8.6 ^b	12.7 ^b
Fall Creek Fish Hatchery—Upper (ID-130078)	9.6	No limit	6.7	9.9
Fall Creek Fish Hatchery—Lower (ID-130085)	11.0	No limit	4.0	5.9
Subtotal	20.6	—	19.3 (6.3% reduction)	—
Massacre Rocks to Lake Walcott TMDL				
No point sources	0.000	0	0.000	0
Subtotal	0.0	0	0.0 (No % reduction)	0
Minidoka Dam to Milner Dam TMDL				
BOR Minidoka Power Plant and State Park (ID-0026824)	No limit	No limit	0.0	No limit
Simplot (2005 and earlier) City of Burley Industrial Plant (after 2005) ^c (ID-0000663)	460	750	359	539 (average weekly)
Heyburn POTW (ID-0020940)	No limit	No limit	5.0	10.1 (average weekly)
Burley POTW (ID-0020095)	No limit	No limit	39	78.4 (average weekly)
McCain Foods (ID-0000612)	500	820	399	772
Subtotal	960	—	802 (16.5% reduction)	—
Total	980.6	—	821.3 (16.2% reduction)	—

Note: POTW = publicly owned treatment works; IDFG = Idaho Department of Fish and Game; BOR = Bureau of Reclamation

^a The American Falls POTW reported total phosphorus on a quarterly basis during the 2002–2007 NPDES permit cycle. No total phosphorus limits were imposed.

^b The total phosphorus wasteload allocation for the fish hatchery is based on the Rueger Springs TMDL (DEQ 2007), which has a total phosphorus instream target of 0.08 mg/L for the Snake River as the receiving water body from Rueger Springs.

^c The J. R. Simplot Company bequeathed the Simplot potato processing plant to the City of Burley who applied for an NPDES permit as an industrial wastewater treatment facility. At the time of this writing, the city's NPDES permit was still undergoing finalization.

No other TP TMDLs were written for other point sources under the Lake Walcott TMDL. However, the Rueger Springs and Fall Creek TMDLs were approved by EPA in 2007 as addendums to the Lake Walcott TMDL for fish hatchery point sources. These wasteload allocations are summarized in Table 13.

Table 13. Total phosphorus wasteload allocation comparison before and after for Fall Creek and Rueger Springs.

Name of Facility	Total Phosphorus Wasteload Allocation Before 2000 (lb/day)		Total Phosphorus Wasteload Allocation 2000 and After (lb/day)	
	Monthly Mean	Daily Maximum	Monthly Mean	Daily Maximum
Fall Creek TMDL				
Fall Creek Fish Hatchery—Upper (ID-130078)	9.6	No limit	6.7	9.9
Fall Creek Fish Hatchery—Lower (ID-130085)	11.0	No limit	4.0	5.9
Fall Creek Total	20.6	—	10.7 (48.1% reduction)	15.8
Rueger Springs TMDL				
IDFG American Falls Fish Hatchery (ID-130031)	No limit	No limit	8.6	12.7
Rueger Springs Total	Unknown	—	8.6	12.7

Note: IDFG = Idaho Department of Fish and Game

***E. coli* Wasteload Allocations**

Table 14 provides a comparison of the *E. coli* wasteload allocations before and after 2000. However, the Idaho Legislature changed the fecal coliform water quality standard to *E. coli* in 2000; therefore, *E. coli* monitoring was not conducted before 2000. The comparison is based on the monthly mean (unless indicated as a geometric mean) and daily maximum (unless indicated as an instantaneous maximum). After the Lake Walcott TMDL was approved and the wasteload allocations were implemented into the NPDES permits of the various point sources, it was not possible to determine if a reduction in *E. coli* would have occurred because *E. coli* monitoring was not a component of the permit prior to 2000.

Table 14. *E. coli* wasteload allocation comparison before and after 2000 Lake Walcott TMDL.

Name of Facility	<i>E. coli</i> Wasteload Allocation Before 2000 (cfu/100 mL)		<i>E. coli</i> Wasteload Allocation 2000 and After (cfu/100 mL)	
	Monthly Mean	Daily Maximum	Geometric Mean	Instantaneous Maximum
<i>American Falls to Massacre Rocks TMDL</i>				
American Falls POTW (ID-0020753)	No limit	No limit	126	406
IDFG American Falls Fish Hatchery (ID-130031)	No limit	No limit	0.0 ^a	0.0 ^a
Subtotal	No limit	—	126	—
<i>Massacre Rocks to Lake Walcott TMDL</i>				
No point sources	0.000	0	0.000	0
Subtotal	0.0	0	0.0 (no reduction)	0
<i>Minidoka Dam to Milner Dam TMDL</i>				
BOR Minidoka Power Plant and State Park (ID-0026824)	No limit	No limit	126	406
Simplot (≤ 2005) City of Burley Industrial Plant (>2005) ^b (ID-0000663)	No limit	No limit	Report	Report
Heyburn POTW (ID-0020940)	No limit	No limit	126	406
Burley POTW (ID-0020095)	No limit	No limit	126	406
McCain Foods (ID-0000612)	No limit	No limit	126	406

Note: POTW = publicly owned treatment works; IDFG = Idaho Department of Fish and Game; BOR = Bureau of Reclamation

^a The *E. coli* value of 0.0/100 mL is based on the Rueger Springs TMDL (DEQ 2007) that stipulates that *E. coli* are not generated in the intestines of cold- or warmwater fish.

^b The J. R. Simplot Company bequeathed the Simplot potato processing plant to the City of Burley who applied for an NPDES permit as an industrial wastewater treatment facility. At the time of this writing, the city's NPDES permit was still undergoing finalization.

^c The value 126 is based on the geometric mean water quality standard.

No other TMDLs are being considered at the present time.

2.5.2 Load Allocations

The Lake Walcott TMDL load allocations were previously identified in section 2.4, Load Capacity, but are further described as follows. The water quality TMDL monitoring values are also summarized.

Total Suspended Sediments Load Allocations

Tables 15 and 16 summarize the TSS load allocations on the Snake River and Rock Creek as defined in the Lake Walcott TMDL (DEQ 2000). No changes in the overall load allocations for the segments described have occurred since the TMDL was implemented in 2000.

Table 15. Total suspended sediment (TSS) load allocation comparison before and after 2000 Lake Walcott TMDL for the Snake River.

Nonpoint Sources	TSS Load Before 2000 (tons/day)	TSS Load Allocation 2000 and After (tons/day)
<i>American Falls to Massacre Rocks TMDL</i>		
All nonpoint sources	28.582	28.582
<i>Massacre Rocks to Lake Walcott TMDL</i>		
All nonpoint sources	151.0	151.0
<i>Minidoka Dam to Milner Dam TMDL</i>		
All nonpoint sources	123.3	123.3
Total (all nonpoint sources)	302.882	302.882

Note: Nonpoint source loads are based on the Lake Walcott TMDL (DEQ 2000, pp. 145–146).

Table 16. Total suspended sediment (TSS) load allocation comparison before and after 2000 Lake Walcott TMDL for Rock Creek.

Nonpoint Sources	TSS Load Before 2000 (tons/day)	TSS Load Allocation 2000 and After (tons/day)
<i>Rock Creek</i>		
All nonpoint sources	0.82	0.82
<i>East Fork Rock Creek</i>		
All nonpoint sources	0.59	0.59
<i>South Fork Rock Creek</i>		
All nonpoint sources	3.13	3.13
Total (all nonpoint sources)	4.54	4.54

Note: Nonpoint source loads are based on the Lake Walcott TMDL (DEQ 2000, p. 148).

No other TMDLs are being considered at the present time.

Summary of Water Quality Monitoring

Water quality monitoring was conducted on the Snake River, and a comparison is shown in Table 17 before and after 2000 for the TMDL parameters (i.e., *E. coli*, TP, and TSS). An inference for full support (FS) or not supporting (NS) of the water quality TMDL standard is provided.

Table 17. Water Quality Data before and after the Lake Walcott TMDL in the Snake River.

Snake River Location	Before 2000 TMDL		After 2000 TMDL	
	Value	Support Status	Value	Support Status
<i>Bacteria (cfu/100 mL)—TMDL standard: <126 cfu/100 mL (geometric mean)^a</i>				
Below American Falls	7 (Fecal)	FS	43 (<i>E. coli</i>)	FS
Below Rock Creek Discharge	14	FS	23	FS
Below Minidoka Dam	5	FS	5	FS
Above Burley Power Lines	20	FS	14	FS
Below Burley at Rock Island	53	FS	—	FS
Milner Pool Area	35	FS	4	FS
Overall Mean Value	22	FS	18	FS
<i>Total Phosphorus (mg/L)—TMDL target: <0.080 mg/L</i>				
Below American Falls	0.057	FS	0.157	NM
Below Rock Creek Discharge	0.061	FS	0.166	NM
Below Minidoka Dam	0.061	FS	0.101	NS
Above Burley Power Lines	0.064	FS	0.076	NS
Below Burley at Rock Island	0.084	NS	—	—
Milner Pool Area	0.086	NS	0.176	NS
Overall Mean Value (incl NM)	0.069	FS	0.135	NS
<i>Total Suspended Sediment (mg/L)—TMDL target: <25 mg/L</i>				
Below American Falls	8.3	FS	40.9	NM
Below Rock Creek Discharge	8.9	FS	61.2	NM
Below Minidoka Dam	8.8	FS	11.8	FS
Above Burley Power Lines	16.9	FS	7.8	FS
Below Burley at Rock Island	13.0	FS	—	—
Milner Pool Area	16.9	FS	13.8	FS
Overall Mean Value (incl NM)	12.1	FS	27.1	NM

Note: TMDL = total maximum daily load; FS = full support; NS = not supporting ; NM = not meeting informational TMDL target

^a cfu = colony forming units

Overall, the inference that may be drawn from the water quality TMDL data, as shown in Table 17, is as follows (based on instream concentration values and the instream TMDL concentration targets):

- *E. coli* data indicate that the Snake River was at full support before the Lake Walcott TMDL. Since the TMDL was approved in 2000, the Snake River is still at full support.
- TP data indicate that the Snake River from Minidoka Dam to Milner Dam was not at full support before the Lake Walcott TMDL. Since the TMDL was approved in 2000, the Snake River has not achieved full support. This reach was the only one listed as impaired for TP. Additional data would need to be gathered to determine if there are DO sags, nuisance aquatic growth and visible slimes, or other metrics that would show TP levels are impairing water quality and beneficial uses in the reaches with informational TMDLs.

- TSS data indicate that the Snake River was meeting suggested targets before the Lake Walcott TMDL. Since the informational TMDL targets recommended in 2000, the Snake River TSS levels in three reaches have declined and uses may not be fully supported. Additional information for large river metrics would need to be gathered to determine if TSS levels are impairing cold water aquatic life.

2.5.3. Comparison of Wasteload Allocations and Load Allocations to Load Reduction Targets

A comparison of the wasteload allocations and the load allocations to their load reduction targets is summarized as follows:

- 1) Table 9 summarizes the TSS wasteload allocations for seven point sources in the Lake Walcott TMDL. An overall 34.9% reduction is achieved just through the NPDES permit limitations for TSS (based on monthly mean TSS values).
- 2) Table 10 summarizes the TSS wasteload allocations for the City of Rockland under a seasonal approach (May–October and November–April). No comparison to its previous NPDES TSS limitation can be made because no limitations had previously been included in the permit.
- 3) Table 11 summarizes the TSS wasteload allocations for the fish hatcheries on Fall Creek and Rueger Springs. Data indicate a 2.9% reduction in TSS for the Fall Creek facilities and a 45% reduction in TSS for the American Falls facility.
- 4) Table 12 summarizes the TP wasteload allocations for the point sources in the Snake River and indicates a 6.3% TP reduction in the American Falls to Massacre Rocks reach, a 16.5% reduction in the Minidoka Dam to Milner Dam reach, and an overall TP reduction of 16.2%. Table 13 describes TP reductions in Fall Creek and Rueger Springs as 48.1% for the Fall Creek fish farm facilities but unknown for the American Falls fish hatchery due to a lack of previous information.
- 5) Table 14 summarizes the *E. coli* wasteload allocation based on the water quality standard of a geometric mean of 126 cfu/100 mL for each individual facility.
- 6) Tables 15 and 16 indicate the nonpoint source load allocations for TSS, which have not been modified since the Lake Walcott TMDL was approved in 2000.

In general, load reduction targets are being achieved for the point sources in their NPDES permits. The nonpoint sources have not achieved their instream targets identified in the Lake Walcott TMDL. DEQ does not propose making changes to these allocations.

2.6 Margin of Safety

Under the CWA a margin of safety is incorporated into the TMDL to take into account “any lack of knowledge concerning the relationship between effluent limitations and water quality.” This margin of safety accounts for uncertainty concerning the relationship between the pollutant loading and water quality standards.

The Lake Walcott TMDL has an implicit margin of safety for TSS, oil and grease, and TP that relies on conservative assumptions. In the Lake Walcott TMDL, the margin of safety is combined with background (DEQ 2000, pp. 138–139, 143). The basis of the implicit margin of safety is the conservative assumptions used in calculating the load capacities, wasteload allocations, and load allocations for TSS, oil and grease, and TP. No explicit margin of safety

was used for any of the pollutant load capacities on the Snake River or in the tributaries. These assumptions include the following as discussed in the Lake Walcott TMDL (DEQ 2000, p. 139):

- **Overall Flow Design**—Flow design analysis was based initially on three flow regimes. These flow regimes were used to estimate load capacity during high flow, low flow, and average flow water years. The final load capacity was the lowest load capacity from this flow analysis, which meant that water quality instream targets would not be exceeded in a worst-case scenario.
- **Daily Average Flows**—Actual daily flow records were used to incorporate day-to-day and seasonal variation in load capacities for the low- and high-flow regimes. DEQ used daily averages from 1927 to 1998 to conservatively calculate the average flow regime.
- **Low Flow Scenario**—The low-flow regime was chosen from those water years with an annual peak flow recurrence interval (RI) of less than 1.5 years. An RI of 1.5 years corresponds with the bank-full discharge or average annual flooding in a system. Consequently, years with RIs less than bank-full were considered low-flow years. By taking the average of these peak flows, a single year could be chosen conservatively. The year 1941 was chosen as the closest to this average low-flow condition, thus describing the conservative estimate of this average low-flow 1.5-year condition.
- **High Flow Scenario**—The high-flow regime was chosen from the RIs and annual peak flows similar to the low-flow scenario. An RI of 25 years was chosen to conservatively determine the hydrograph for high-flow design flows. The year 1983 was chosen as the closest to this average high-flow condition, thus describing the conservative estimate of this average high-flow 25-year flood event condition.
- **Additional Conservative Assumptions**—The Lake Walcott TMDL describes additional assumptions used in the TMDL:

Other conservative assumptions include conservation of constituents. In all cases, the pollutant of concern was considered a conservative constituent with no assimilation being incorporated into subsequent calculations. Additionally, where there was uncertainty in the target chosen, as was the case with both the sediment and oil and grease targets, the targets were reduced by 50 percent. For example, the Wyoming standard for oil and grease (10 mg/L) was used for the oil and grease target. However, the target was reduced by 50 percent in order to provide a very conservative margin of safety. Also, several other TMDLs in Idaho have set TSS targets at 50-52 mg/L. Those targets were determined to be protective of the beneficial uses (both cold water biota and salmonid spawning). In the Lake Walcott TMDL the TSS target was set at 25 mg/L to provide for a very conservative margin of safety. (DEQ 2000, p. 228)

The five-year review of the Lake Walcott TMDL retains the existing margins of safety as described above.

2.7 Seasonal Variation

Under the CWA, seasonal variation may be considered in order to apply the TMDL instream narrative water quality standards for sediment, oil and grease, and TP. The Lake Walcott TMDL considered seasonality as a component of the TMDL for TSS, oil and grease, and TP. Seasonality was explored in various sections of the TMDL, described as follows:

- **Ground Water Seasonality**—There is a pronounced seasonality to the ground water interchange, as described in the Lake Walcott TMDL (DEQ 2000, p. 24).

- **Seasonality Prior to Milner Dam Project**—There were “large seasonal changes in level” of the water flow in the Snake River channel prior to the Milner Dam project in 1909. After Milner Dam construction, the Snake River upstream to American Falls Dam was not dewatered for irrigation demands, as described in the Lake Walcott TMDL (DEQ 2000, p. 39).
- **Seasonality in Sediment Loads from Tributaries**—The apparent stability (in terms of sediment concentrations) of the Snake River system from American Falls Dam to the Burley-Heyburn Bridge is a result of few point and nonpoint sources contributing sediment to the reaches, as well as sediment dropping out of the river and accumulating in the low-velocity water. Tributaries (like Rock Creek and Raft River) do contribute seasonal sediment loads; however, these loads appear to sink to the bottom of Lake Walcott, thus providing little seasonality for sediment in the Snake River, as described in the Lake Walcott TMDL (DEQ 2000, p. 63).
- **Seasonality Considerations for Sediment and Oil and Grease Pollutants**—The Lake Walcott TMDL stipulates that “throughout the TMDL, seasonal and annual critical conditions were considered. This is most evident in the load capacities developed for sediment and oil and grease.” The discussion focuses on the use of the low-flow regime (i.e., 1.5 years from 1941) and the high-flow regime (i.e., 25 years from 1983), as described in the Lake Walcott TMDL (DEQ 2000, pp. 227).
- **Seasonality Considerations of Snake River Segments**—The TMDL analysis also considered seasonality in developing the load capacity:

Seasonal considerations were also considered in the load capacity of the different segments. Impacts from sediment, and excess nutrients were more clearly noted during the warm months of the year. These months also corresponded with the runoff and irrigation seasons. In order to simplify the TMDL and the various allocations, the average annual discharge from the year 1941 was used to develop the load capacities. By doing this the load capacity would be more conservative, in those months when the increases in sediment and TP were seen, than would be so using an average monthly flow and developing the load capacities for each month. Therefore, the current load capacity takes into account both annual and seasonal critical conditions.” (DEQ 2000, p. 228)

The five-year review of the Lake Walcott TMDL retains the existing seasonality considerations as described above and summarized below:

In summary, only the City of Rockland received seasonality consideration in its NPDES permit. Seasonality was considered but not applied for other point and nonpoint sources due to a lack of data. When more data is acquired in the future, seasonality will be considered as an option for those entities requiring it.

2.7.1 Evaluation of Load Capacity for Each Parameter with Seasonal Considerations

Seasonality was only evaluated for the City of Rockland as part of the NPDES permit to determine the load capacity. The Lake Walcott TMDL was finalized and approved in 2000. The City of Rockland NPDES permit was finalized in 2002 (to expire in 2007). In the fact sheet of the NPDES permit, the following is noted:

In December 2000, the Idaho Division of Environmental Quality (IDEQ) completed the Lake Walcott Subbasin Assessment and TMDL (Subbasin Assessment). The Subbasin Assessment indicates that sediment levels in Rock Creek range from 6 to 150 mg/l, well above suggested

levels for protection of aquatic life. The Assessment also suggests that the discharge from Outfall 001 does not contribute significant sediment loadings to the Creek compared to nonpoint source discharges. Sediment levels throughout the Snake River were found to be below aquatic life impairment levels. The Subbasin Assessment includes a TMDL and wasteload allocations for sediment in Rock Creek. However, the sediment TMDL has not received EPA approval and the wasteload allocations are not included in the draft permit. The Subbasin Assessment further indicates that dissolved oxygen and pesticides are not present, in the Massacre Rocks to Lake Walcott segment of the Snake River, at levels that impair designated uses and no TMDLs or wasteload allocations have been established for these parameters to date. (EPA 2001, p. 4)

The fact sheet also stated the following:

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 BOD₅, TSS, and pH. The definition of “secondary treatment” includes special considerations regarding waste stabilization ponds. The regulations allow alternative limits for facilities, such as the City of Rockland, using waste stabilization ponds. These alternative limits are called “treatment equivalent to secondary treatment.” (EPA 2001, p. C-1)

Thus, the technology-based effluent limitations applicable to the City of Rockland in 2002 for TSS included a 70 mg/L TSS monthly average and 105 mg/L TSS weekly average limit. The effect on the load capacity to the Rock Creek TSS TMDL is summarized in Table 18.

Table 18. Effect of City of Rockland NPDES seasonal permit on (TSS) TMDL.

Category	Allocation (lb/day)	
	May–October	November–April
Background	0.0	0.0
Nonpoint Source Load Allocation	9,064.0	9,076.0
Point Source Wasteload Allocation	36.0	24.0
Unallocated Load for Future Growth	0.0	0.0
Load Capacity	9,100.0	9,100.0
<i>Note: The calculations used in this table are based on lb/day versus the tons/day used in Table 6.</i>		

As shown in Table 18, there has been no change in the load capacity of Rock Creek as approved in the Lake Walcott TMDL (i.e., 4.55 tons/day = 9,100 lb/day). However, for the wasteload allocations to be applicable, it is necessary to borrow additional TSS from the load allocation but maintain the load capacity as is. Thus, the initial wasteload allocation of 20 lb/day (0.01 tons/day as shown in Table 6) represents 0.22% of the load capacity. As shown in Table 18, the seasonal wasteload allocations were modified to 0.40% (May–October) and 0.26% (November–April) to accommodate the “treatment equivalent to secondary treatment” (or 70–105 mg/L TSS), which means that the original 99.78% load capacity assigned as load allocations is now 99.6% (May–October) and 99.74% (November–April). It is DEQ’s understanding, based on EPA’s 2003 change in NPDES permitting to secondary treatment standards, that the TSS limit for the City of Rockland will be modified from the 70–105 mg/L TSS standard to a 30–45 mg/L TSS standard (based on similar modifications in other small community systems) during the next NPDES permit cycle.

2.8 Future Growth Reserve

A future growth reserve was allocated in the Lake Walcott TMDL. However, it should be noted that where pollutants are now exceeding these reserves in the informational TMDLs, there in fact may not be a reserve now available. The unallocated load for future growth by pollutant is as follows:

- **Snake River Segment (American Falls to Massacre Rocks)**—An unallocated load for future growth of 179 tons/day sediment was allocated in this TMDL, which represents 56.3% of the load capacity for this river segment.
- **Snake River Segment (Massacre Rocks to Lake Walcott)**—An unallocated load for future growth of 102 tons/day sediment was allocated in this TMDL, which represents 31.0% of the load capacity for this river segment.
- **Snake River Segment (Minidoka Dam to Milner Dam)**—An unallocated load for future growth of 63 tons/day sediment was allocated in this TMDL, which represents 23.2% of the load capacity for this river segment.
- **Snake River Segment (Minidoka Dam to Milner Dam)**—An unallocated load for future growth of 15 tons/day oil and grease was allocated in this TMDL, which represents 27.8% of the load capacity for this river segment.
- **Snake River Segment (Minidoka Dam to Milner Dam)**—An unallocated load for future growth of 0 lb/day TP was allocated in this TMDL, which represents 0% of the load capacity for this river segment.
- **Rock Creek Watersheds in Power County**—An unallocated load for future growth of zero 0 tons/day sediment was allocated in this TMDL, which represents 0% of the load capacity for this river segment.

The five-year review of the Lake Walcott TMDL does not propose to make any modifications to the future growth reserve component of the TMDL.

2.9 Background

As defined in IDAPA 58.01.02.010.06, *background* is “the biological, chemical or physical condition of waters measured at a point immediately upstream (up-gradient) of the influence of an individual point or nonpoint source discharge.” *Natural background* (conditions) is defined in IDAPA 58.01.02.010.61 as “the physical, chemical, biological, or radiological conditions existing in a water body without human sources of pollution within the watershed. Natural disturbances including, but not limited to, wildfire, geologic disturbance, diseased vegetation, or flow extremes that affect the physical, chemical, and biological integrity of the water are part of natural background conditions.”

In the Lake Walcott TMDL, background (or *existing background*) is used in preference to natural background because of impacts immediately upstream of the point or segment of concern. As described in the TMDL, background represents those point, nonpoint, and natural sources located upriver from Minidoka Dam (DEQ 2000, p. 197). However, certain natural effects in the subbasin are considered natural background, such as the effects from waterfowl (DEQ 2000, p. 42). However, these natural sources are included in the overall background component.

Background loads are included in Table 5 (TSS load capacity on the Snake River), Table 6 (TSS load capacity on Rock Creek), Table 7 (oil and grease load capacity in the Snake River from Minidoka Dam to Milner Dam), and Table 8 (TP load capacity on the Snake River from Minidoka Dam to Milner Dam). No changes in background are recommended in this five-year review.

Section 3: Beneficial Use Status

Idaho water quality standards require that surface waters of the state be protected for beneficial uses, wherever attainable (IDAPA 58.01.02.050.02). These beneficial uses are interpreted as existing uses, designated uses, and presumed uses. The *Water Body Assessment Guidance* (Grafe et al. 2002) gives a detailed description of beneficial use identification for use assessment purposes.

Existing uses under the CWA are “those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards.”

Undesignated uses are to be designated. In the interim, and absent information on existing uses, DEQ presumes most waters in the state will support cold water aquatic life and either primary or secondary contact recreation

3.1 Beneficial Uses—Designations

The beneficial uses for the Snake River and its associated tributaries in the Lake Walcott subbasin have not been modified since the development of the approved Lake Walcott TMDL, Rueger Springs TMDL, and Fall Creek TMDL. Beneficial uses are listed in each approved TMDL:

- 1) Lake Walcott TMDL (approved 2000), pages 51–54
- 2) Rueger Springs TMDL (approved 2007), pages 4–5 and 14
- 3) Fall Creek TMDL (approved 2007), pages 2–3 and 10–11

Current beneficial uses are summarized in Table 19 and include cold water aquatic life, salmonid spawning, primary and secondary contact recreation, and warm water aquatic life, depending on the tributary or reach. Table 19 describes the beneficial uses of the water bodies that apply to the Lake Walcott TMDL, Rueger Springs TMDL, and Fall Creek TMDL.

Table 19. Designated and existing beneficial uses of TMDL water bodies.

Water Body	Assessment Unit	Beneficial Uses^a	Type of Use (Designated, Existing, Presumed)
<i>Snake River</i>			
Snake River from American Falls Dam to Lake Walcott	ID17040209SK011_02 ID17040209SK011_07 ID17040209SK006_07 ID17040209SK005_07	CWAL, PCR,	Designated
Snake River—Minidoka Dam to Heyburn/Burley Bridge	ID17040209SK002_07 ID17040209SK002_02	CWAL, SS, PCR	Designated
Snake River—Heyburn/Burley Bridge to Milner Dam-Gooding Canal	ID17040209SK001_07 ID17040209SK001_02	WWAL, PCR	Designated
<i>Tributaries</i>			
Rock Creek—main stem	ID17040209SK008_04	CWAL, SS, PCR	Designated
Rock Creek—East Fork Rock Creek	ID17040209SK010_02 ID17040209SK010_03	CWAL, SS, SCR	Existing
Rock Creek—South Fork Rock Creek	ID17040209SK009_02 ID17040209SK009_03 ID17040209SK009_04	CWAL, SCR	Existing
Marsh Creek	ID17040209SK003_03 ID17040209SK003_04 ID17040209SK003_04a	CWAL, SCR	Existing
Rueger Springs	ID17040209SK011_03	CWAL, SS, PCR	Designated
Fall Creek	ID17040209SK007_02, 03	CWAL, SS, SCR	Existing

^a CWAL = cold water aquatic life; PCR = primary contact recreation; SCR = secondary contact recreation; SS = salmonid spawning; WWAL = warm water aquatic life

Beneficial uses are protected by a set of criteria, which includes narrative and numeric criteria. Narrative criteria, unlike numeric criteria, do not have specific numeric values that define the limits of compliance. Consequently, the Lake Walcott TMDL utilized instream water quality targets as numeric surrogates for the narrative criteria for TSS, TP, and oil and grease. Some numeric criteria (like those for *E. coli*) became the TMDL instream target because the measure was already defined in the water quality standards. Consequently, the combination of narrative criteria (as TMDL instream targets) and numeric criteria became the measure to determine compliance in the Lake Walcott TMDL. This approach is summarized in Table 20.

Table 20. Summary of water quality instream targets for the Lake Walcott subbasin, 2000 to 2007.

Water Body	Narrative Targets			Numeric Criteria
	TSS	TP	Oil and Grease	<i>E. coli</i> (cfu/100 mL)
Lake Walcott TMDL				
Snake River— Minidoka Dam to Milner Dam	25 mg/L monthly avg 40 mg/L daily max	0.08 mg/L	5 mg/L monthly avg	126 geometric mean 406 instantaneous max
Rock Creek and Tributaries	50 mg/L monthly avg 80 mg/L daily max	0.10 mg/L	NA	126 geometric mean 406 instantaneous max
Rueger Springs TMDL				
Tributary	50 mg/L monthly avg	0.08 mg/L	NA	126 geometric mean 406 instantaneous max
Fall Creek TMDL				
Tributary	50 mg/L monthly avg	0.10 mg/L	NA	126 geometric mean 406 instantaneous max

Note: TSS = total suspended sediment; TP = total phosphorus; NA = not applicable

3.2 Changes to Subbasin Characteristics

This section discusses the major land use and landownership, NPDES facilities, locations and types of pollutant controls, population and industry growth, and changes in water resource activities of the subbasin, with an eye toward how human activity has affected pollutant loads. The following subsections address some of the more prominent changes in the Lake Walcott subbasin since the TMDL was finalized in 2000.

3.2.1 Major Land Use

The Lake Walcott subbasin includes forested lands, rangelands, agricultural lands (dry land and irrigated lands), riparian lands, and wetlands. Table 21 summarizes the major land cover before 2000 and in 2006 (NRCS 2006). In general, few changes have occurred in the land cover since 2000.

Table 21. Major land cover in the Lake Walcott subbasin.

Land Cover	Before 2000 ^a	2006 ^b
Forested lands ^c	2.5%	2%
Rangelands ^d	49.3%	52%
Agricultural lands ^e	28%	27%
Riparian lands—wetlands ^f	20.2%	18%
Total land cover	100%	99%
Total acres	2,332,400 acres ^g	2,296,320 acres

^a Pre-2000 data from the Lake Walcott TMDL (DEQ 2000, pp. 10–11)^b NRCS 2006^c Forested lands = lands managed by US Forest Service^d Rangelands = lands managed by US Bureau of Land Management and Idaho Department of Lands for shrub/rangelands^e Agricultural lands = lands managed privately for grain crops, grass/pasture/hay lands, orchards/vineyards/berries, and row crops^f Riparian lands—wetlands = lands managed as riparian lands, wetlands, water and barren lands^g Total acres for pre-2000 came from the Upper Snake Rock TMDL (DEQ 2000b, p. 17).

3.2.2 Major Landownership

The Lake Walcott subbasin covers approximately 2.3 million acres in an eight-county area. A comparison of the major landownership before 2000 versus in 2006 is shown in Table 22. Major landownership has stayed about the same, with only a slight increase in public lands.

Table 22. Major landownership in the Lake Walcott subbasin.

Landownership	Before 2000 ^a	2006 ^b
Public lands ^c	64.7%	67%
Privately owned lands ^d	32.4%	33%
Background ^e	1.3%	1.3%
Tribal lands	<1%	<1%
Total landownership	≈99%	≈101.3%
Total acres	2,332,400 acres ^f	2,296,320 acres

^a Pre-2000 data from the Lake Walcott TMDL (DEQ 2000, pp. 10 and 12)^b NRCS 2006^c Public lands = Bureau of Land Management, US Forest Service, National Park Service, Idaho state lands^d Privately owned lands = agriculture^e Background = open water and US Fish and Wildlife Service lands^f Total acres for pre-2000 came from the Upper Snake Rock TMDL (DEQ 1999, p. 17).

3.2.3 NPDES Facilities

The Lake Walcott subbasin has a number of point source facilities that are described in Table 23. The table also summarizes the development of the TMDL in conjunction with the NPDES permitting process.

Table 23. Summary of point sources in the Lake Walcott TMDL.

Facility	Pre-2000	2007	2011
<i>Snake River Segment—American Falls to Massacre Rocks</i>			
City of American Falls	Lake Walcott TMDL	—	5-year review
IDFG American Falls Fish Hatchery	—	Rueger Springs TMDL	5-year review
Fall Creek fish hatcheries	—	Fall Creek TMDL	5-year review
<i>Snake River Segment—Massacre Rocks to Lake Walcott</i>			
No point sources	Lake Walcott TMDL	—	5-year review
<i>Snake River Segment—Minidoka Dam to Milner Dam</i>			
BOR Minidoka Power Plant	Lake Walcott TMDL	—	5-year review
Simplot	Lake Walcott TMDL	Shut down in 2002	5-year review
City of Burley Industrial WWTP	—	Currently developing NPDES permit	5-year review
City of Heyburn	Lake Walcott TMDL	—	5-year review
City of Burley	Lake Walcott TMDL	—	5-year review
McCain Foods	Lake Walcott TMDL	—	5-year review

Note: IDFG = Idaho Department of Fish and Game; BOR = US Bureau of Reclamation; WWTP = wastewater treatment plant

As shown in Table 23, the following point sources are recognized in the subbasin:

- **City of American Falls**—This publicly owned treatment work (POTW) was identified in the Lake Walcott TMDL and has an NPDES permit (#ID-0020753). It received a wasteload allocation as part of the TMDL process. Regulated pollutants include biochemical oxygen demand, pH, TSS, TP, *E. coli*, flow, nitrogen, ammonia as nitrogen (N), and chlorine.
- **American Falls Fish Hatchery**—This fish hatchery (NPDES #IDG-130031) was identified in the NPDES permitting process under the General Aquaculture Permit. The Rueger Springs TMDL addendum (DEQ 2007) defined the wasteload allocation. Regulated pollutants include TSS and TP.
- **Fall Creek Fish Hatcheries**—These two fish hatcheries (NPDES #IDG-130078 and #IDG-130085) were identified in the NPDES permitting process under the General Aquaculture Permit. The Fall Creek TMDL addendum (DEQ 2006) defined the wasteload allocation. Regulated pollutants include TSS and TP.
- **US Bureau of Reclamation (BOR) Minidoka Power Plant**—This recreation park and wastewater treatment facility was identified in the Lake Walcott TMDL and has an NPDES permit (#ID-0026824). It received a wasteload allocation as part of the TMDL process. It is not currently discharging to the Snake River due to on-site containment.

Regulated pollutants include biochemical oxygen demand, pH, TSS, TP, fecal coliform, *E. coli*, flow, and chlorine.

- **Simplot**—This facility was identified in the Lake Walcott TMDL and had an NPDES permit (ID-0000663). It received a wasteload allocation as part of the TMDL process. In 2002, Simplot announced that the plant would be shut down. In 2004, Simplot announced that it was bequeathing the plant to the City of Burley. The plant is now known as the City of Burley Industrial Wastewater Treatment Plant (see below).
- **City of Burley Industrial Wastewater Treatment Plant (WWTP)**—This plant (ID-0000663) is currently undergoing the NPDES permitting process as an industrial plant, but EPA has determined that it is a POTW and not an industrial plant. It is discharging (by way of a pipeline) directly to the City of Burley POTW and the former Simplot facility. Which then treats the effluent and discharges under the NDPEs permit to the Snake River utilizing both discharge outfalls. The WWTP is currently in the planning stages to upgrade the municipality and former Simplot facility to meet current permit limits. Regulated pollutants include biochemical oxygen demand, pH, TSS, TP, *E. coli*, temperature, alkalinity, oil and grease, ammonia as N, Nitrogen, flow, TDS, hardness, floating solids, and wet test.
- **City of Heyburn**—This POTW was identified in the Lake Walcott TMDL and has an NPDES permit (#ID-0020940). It received a wasteload allocation as part of the TMDL process. Regulated pollutants include biochemical oxygen demand, pH, TSS, TP, fecal coliform, *E. coli*, flow, temperature, oil and grease, ammonia as N, and nitrogen.
- **City of Burley POTW**—This POTW was identified in the Lake Walcott TMDL and has an NPDES permit (#ID-0020095). It received a wasteload allocation as part of the TMDL process. It currently discharges to the Snake River under its NDPEs permit. It also treats the industrial plant's wastewater effluent. Regulated pollutants include biochemical oxygen demand, pH, TSS, TP, fecal coliform, *E. coli*, flow, temperature, oil and grease, ammonia as N, nitrogen, cyanide, cadmium, lead, chlorine, and mercury.
- **McCain Foods**—This food processor was identified in the Lake Walcott TMDL and has an NPDES permit (#ID-0000612). It received a wasteload allocation as part of the TMDL process. Regulated pollutants include biochemical oxygen demand, pH, TSS, TP, *E. coli*, flow, temperature, oil and grease, ammonia as N, nitrogen, chlorine, floating solids, and visible foam.

3.2.4 Predicted Trends in Land Use

One of the primary issues of concern in this subbasin is a growing population and developing industry growth in south-central Idaho. Both concerns necessitate infrastructure considerations that may have been left unaddressed in many of the municipalities. Land uses change as population increases and are a concern to water quality. The land use changes that may impact water quality are listed as follows:

- New subdivisions and businesses converting agricultural lands into concrete-asphalt areas
- Increased recreational attraction to public lands and the Snake River
- A shift in the natural landscape to regional urban centers
- New development on open spaces and undeveloped lands, which are a concern for the protection of future recreation uses, watershed health, and water quality, thus minimizing

natural habitat destruction. Once an open tract of land is developed, it is highly unlikely that the natural landscape will be protected for future use.

- Maintaining scenic views of the Snake River and back road areas on public lands, which are important for the population to connect with the natural environment.

The general trend in land use changes is increased recreational pressure and economic urban and rural development. In 1997, it was estimated that the population in southern Idaho would increase by 40% (MSRRWG 1997). Although population growth has essentially stabilized since 2006, attracting economic development is a growing concern at county and city levels.

3.2.5 Population and Industry Growth

Tables 24 and 25 summarize the population base in the larger counties and cities, respectively, in the Lake Walcott subbasin in 2000 versus 2010. Population has increased by 5.4% from 2000 through 2010 countywide and by 8% within the major cities overall.

Table 24. Population change and household statistics in Lake Walcott subbasin, by county.

Table 24: Population change and household statistics in Lake Walcott subbasin		
Main Counties	Year 2000	Year 2010
Population per County		
Cassia County	21,416	22,952
Minidoka County	20,174	20,069
Power County	7,538	7,817
Lincoln County	4,044	5,208
Total population	53,172	56,046
Change, 2000–2006	5.4% increase in population	
Household Units per County		
Cassia County	7,060	8,372
Minidoka County	6,973	7,665
Power County	2,560	2,598
Lincoln County	1,447	1,814
Total household units	18,040	20,449
Change, 2000–2010	13.35% increase in household units	

Source: US Census Bureau 2011

Table 25. Population change in major cities in the Lake Walcott subbasin.

Major Cities	Year 2000	Year 2010
Burley	9,376	10,345
Rupert	5,415	5,554
Heyburn	2,958	3,089
Paul	906	1,169
Declo	301	343
Rockland	295	295
Total	19,251	20,795
Change, 2000–2006	8.0% increase in population	

Source: US Census Bureau 2011

Counties and cities have tried to attract new industry into the Lake Walcott subbasin to increase population. This strategy is reflected in the commercial history of Burley, Idaho, which started showing a downward trend in the business community in 2002 as major businesses shut down. J. R. Simplot Company downsized the Burley plant by 400 employees and eventually closed completely in 2004. The City of Burley focused on revitalizing its own commercial storefronts to counter the approach of mall-driven type business and began to implement an aggressive approach to economic development by soliciting new business. The following types of businesses have been attracted to the area:

- Food distributorships and re-distributorships
- Ethanol plants
- Recreational vehicle manufacturing companies
- Milk processing plants—cheese plants and dry-milk processors
- Chicken processing plants
- Cull-cow beef / slaughter house operations
- Egg hatchery plants
- Potato processing plants
- Sugar processing plants
- New subdivisions
- Dairies associated with cow production and associated feed operations
- Swine-hog production
- Tile-stone manufacturing operations
- Geothermal power development
- Wind power development
- Natural gas / oil pipeline expansion

3.2.6 Changes in Water Resource Activities—Dams, Diversions, and Withdrawals

The most dramatic concern in water resource management is the decline in spring flows and ground water levels in southern Idaho. This concern was evident in 1996 as a consequence of measured ground water levels in 1996 compared to 1980, which showed declines of up to 10 feet

or more in nearly all areas of the 10,100-square-mile eastern Snake River Plain aquifer. These levels continue to decline as water resources are developed by various industries. Hundreds of thousands of acres of irrigated farmland depend on the annual delivery of that water from the Snake River, and this resource is slowly being depleted and affected by reduced water levels and long periods of drought.

In addition, reduced water levels in the Snake River and various tributaries have the potential to cause increased aquatic plant growths (i.e., macrophytes and algae) due to reduced flow, eutrophication, and reduced water velocity. Diversions and withdrawals affect much of the water in the Snake River and its tributaries in the Lake Walcott subbasin and have a tendency to do the following:

- Elevate stream temperatures
- Reduce DO levels if temperature levels are elevated
- Enhance nuisance aquatic plant growth if the water flow has a reduced velocity, thus causing stagnation
- Enhance algal mat growth if eutrophication is a characteristic of the stream
- Negatively impact downstream users if a reduction in the natural streamflow is coupled with a discharge of lower-quality drainage water from agricultural drains
- Reduce the ecological health if there are substantial flow reductions

3.2.7 Unusual Events Affecting Watershed Characteristics

Climate

The climate around Minidoka Dam is semiarid. Annual precipitation ranges between 9 and 13 inches. Summers are hot and dry; winters are cold, with a mean annual temperature of 9.4 °C. Drought conditions have persisted in all of south-central Idaho. Under the Idaho Department of Water Resources' (IDWR) *Idaho Drought Plan*, drought emergency declarations are issued by IDWR and approved by the Idaho governor. These declarations apply only to the administrative processing of water right applications and do not apply to issues such as financial or disaster support (IDWR 2008). However, the process does bring political attention to the existing drought condition. Under a county drought declaration, county water users coordinate with IDWR to secure temporary modifications to existing water rights, generally implying that water rights are delivered at a partial amount. Table 26 shows the drought declarations from 2002 through 2007 that have affected counties in the Lake Walcott subbasin.

Table 26 Idaho Department of Water Resources drought emergency declarations.

County	2002	2003	2004	2005	2006 ^a	2007
Blaine	X	X	X	X		X
Butte	X	X	X	X		X
Cassia		X	X			
Lincoln	X	X	X	X		X
Minidoka			X			X
Power	X	X	X	X		

^a Drought emergency declarations were not issued in 2006.

The drought trend has been present since irrigation and water storage began in the early 1900s, occurring in 10- or 20-year cycles (depending on the severity). Since precipitation is the basis for water storage capacity in the reservoirs and lakes, the historical drought trend will likely continue, thus prompting water users to find better ways to conserve the limited resource now and in the future.

Hydrology and/or Flooding

The following aspects of water resource management in the Lake Walcott subbasin are top priorities for all state agencies involved with water volume and water quality.

Water Operation Concerns—The BOR has biologically assessed its operations on the Snake River (BOR 2004, pp. 64–65). The dams and water operations from American Falls to Milner Dam (inclusive of irrigation activities) have caused the following issues:

- Water operations have contributed to the discontinuous distribution of aquatic species (such as threatened and endangered snails).
- Because of water storage and irrigation delivery, river flows and reservoirs have demonstrated large seasonal fluctuations.
- When seasonal high river flows occur, these are considered characteristic of the natural river environment as these would have occurred naturally and are essential to creating and maintaining riverine habitats.
- Low river flows and year-round regulated flows have limited habitat suitability, water quality, and habitat connectivity.
- Water operations have altered the natural hydrograph of the river system by reducing spring peak flows, increasing summer flows, reducing the river's connection to the floodplain, and reducing winter low flows.
- During certain water years, flood control operations have caused increased late winter flows that are reduced before the spring runoff.

To the extent practicable, the water operations in the Snake River portion of the Lake Walcott subbasin have not been modified since approval of the Lake Walcott TMDL in 2000 and its two addendums in 2007.

Water Quality Effects from Impoundment Management Strategies—The Snake River in the Lake Walcott subbasin is part of the BOR's Upper Snake River System in Idaho and Wyoming. As a component of this river system, the Snake River is volume-controlled through a series of reservoirs that capture and store water, which provides for water storage rights and hydropower generation. The three main storage reservoirs that affect the Snake River in the Lake Walcott subbasin are the Milner Pool, Lake Walcott, and American Falls Reservoir. These in turn are affected by storage pools in Palisades Reservoir (Idaho) and Jackson Lake (Wyoming).

During periods of low flow and drought, as water storage levels drop at American Falls Reservoir (due to little water coming from Palisades Reservoir and Jackson Lake), entrained sediment may be discharged into the Snake River in the Lake Walcott subbasin. This discharge causes instream TSS and turbidity to increase, which in turn may impact recreational fishing and boating and the cold water aquatic life beneficial use. This situation occurred during a 45-day period from August 31–October 14, 2007, during which the BOR's management actions caused the water in American Falls Reservoir and the Snake River downstream to have elevated

sediment and turbidity levels such that water quality violations and a fish kill occurred. In 1994 and 2001, similar water quality violations occurred due to similar BOR management actions. However, this most recent event occurred for a much longer duration than in past years.

DEQ and BOR are undergoing discussions to finalize and implement a water quality management action plan in the American Falls Reservoir and Snake River below the American Falls Dam during periods of drought or low flow. The purpose is to manage the water volume in American Falls Reservoir when the potential is greatest for sediment and turbidity to be elevated in the Snake River.

Ground Water and Aquifer Concerns—In the early 1950s, water levels in the eastern Snake River Plain aquifer (which discharges into the Snake River) reached an all-time high due to recharge from surface irrigation applications and a wet climatic period. Since then, ground water levels have shown a net decline, primarily from increased ground water pumping for irrigation and increased water conservation by upstream irrigators (BOR 2004, p. 65). The combination of ground water level declines with drought conditions has contributed to a dramatic decline in spring discharge rates, particularly in the Thousand Springs reach of the Snake River. The Lake Walcott subbasin has experienced a similar trend in ground water level depletions, and these have increased since the approval of the Lake Walcott TMDL in 2000 and its two addendums in 2007.

Flooding seldom occurs in the Lake Walcott subbasin tributaries and the Snake River, with the exception of during high-flow events (inclusive of high precipitation events), which generally occur in the spring.

Wildfires

In general, seasonal wildfires that are sparked by humans or dry lightning burn large tracts of primarily shrub steppe habitats each year in the Lake Walcott subbasin. This disturbed land is of primary concern due to the potential invasion of noxious and exotic weeds, such as cheatgrass. Cheatgrass is highly flammable in summer months and thrives with frequent burns, while other native vegetation is inhibited.

Terrestrial Habitats

Although habitat fragmentation in the subbasin is largely a function of agriculture, with the Snake River and interstate highway corridors being highly developed, water supply concerns have been heightened in recent years, mainly due to many sequential years of below-average precipitation in combination with consistent increases in water consumption due to agricultural development (including an increased dependence on environmentally inefficient irrigation techniques such as sprinkler irrigation). Water rights users sometimes demand an increase in water diversions for consumptive use, and such increases dewater rivers, degrading the quantity and extent of preexisting terrestrial habitats (NPCC 2004, p. 3-12).

These limiting factors (NPCC 2004) to terrestrial focal habitats have been ranked by a technical team of the NPCC for their risk in the Lake Walcott subbasin as follows:

1. Timber harvest—None to insignificant
2. Altered fire regime—Low
3. Grazing and browsing—High
4. Altered hydrologic regime—High

5. Land use conversion—High
6. Invasive/exotics—High

Landslides

In general, the Lake Walcott subbasin has low to moderate risk for landslides due to primarily flat topography with some rolling hills. Concern for landslides would only be found in the higher elevation forestland where snow cover is predominant, and only during those years with large snow events.

Sensitive, Threatened, or Endangered Species Designations

The US Fish and Wildlife Service (USFWS) identified Snake River physa snail, Bliss Rapids snail, and Ute ladies'-tresses as federally listed endangered species in the subbasin. The National Oceanic and Atmospheric Administration has not identified any additional listed endangered species within the Snake River basin.

3.3 Summary and Analysis of Current Water Quality Data

This section includes a list of available water quality data gathered since the 2000 TMDL, along with a discussion of what the data say about TMDL targets and beneficial use status. Discernable trends in water quality are considered along with TMDL achievements and current beneficial use status.

3.3.1 Water Quality Data Collection Efforts

DEQ's monitoring effort was limited to only those streams identified in the original Lake Walcott TMDL, primarily because of budgetary constraints. The streams included seven segments of the Snake River and three tributaries (Rock Creek main stem, East Fork Rock Creek, and South Fork Rock Creek). Monitoring only covered the TMDL parameters and was limited to less than 2 years. Because of budgetary constraints, DEQ was unable to collect sufficient water quality monitoring data on Rueger Springs, Fall Creek, and Marsh Creek and on those additional tributaries identified in the 2010 Integrated Report, which included 15 tributaries. DEQ was able to obtain water quality monitoring information for Marsh Creek from the Idaho Soil Conservation Commission/Idaho Association of Soil Conservation Districts (ISCC/IASCD).

3.3.2 Summary of Biological Data

This section summarizes the macroinvertebrate data (i.e., Beneficial Use Reconnaissance Program [BURP] data), stream inventory data (e.g., US Bureau of Land Management [BLM] proper riparian functioning condition information), fish counts (from BURP or other programs), and other data as appropriate to the pollutants of concern (e.g., sediment). Large rivers like the main stem of the Snake River are not subject to the BURP assessment process because BURP protocols for large rivers have yet to be developed. However, large river BURP-type data has been collected for some of the river segments. In the case of proper riparian functioning condition, the use of such data for a large river is inappropriate for those locations where BLM land is associated with the Snake River. In terms of the tributaries, BURP monitoring was conducted on several of the tributaries listed below. However, SFI, SHI, and SMI scores are not available from the last 8 years on these tributaries due to private land access issues.

Table 27 summarizes the type of data collected by DEQ and the corresponding beneficial use support status. The data can be accessed at the DEQ website listed in the table notes.

Table 27. Summary of DEQ biological data for Lake Walcott subbasin.

Water Body	Assessment Unit Evaluated	Beneficial Use Reconnaissance Program (BURP) Data and Other Biological Information
<i>Snake River</i>		
American Falls Dam to Eagle Rock	ID17040209SK011_02	Not supporting (based on assessment of Little Creek)
	ID17040209SK011_07	Fully supporting (based on pathogen, physical, and chemical data)
Eagle Rock to Massacre Rocks	ID17040209SK011_02	Not supporting (based on assessment of Little Creek)
	ID17040209SK011_07	Fully supporting (based on pathogen, physical, and chemical data)
Massacre Rocks to Lake Walcott	ID17040209SK005_07	Fully supporting (based on BURP data)
	ID17040209SK006_07	Fully supporting (pathogen, physical, and chemical data)
	ID17040209SK011_02	Not supporting (based on assessment of Little Creek)
	ID17040209SK011_07	Fully supporting (based on pathogen, physical, and chemical data)
Minidoka Dam to Heyburn/Burley Bridge	ID17040209SK002_02 (Milner Lake)	Not supporting (based on assessment of an unnamed stream, A-1 Canal, D-Five Drain, D-Four Drain, Duck Creek, Spring Creek, and Spring Creek Drain)
	ID17040209SK004L_0L (Lake Walcott)	Not supporting (based on assessment for mercury)
Heyburn/ Burley Bridge to Milner	ID17040209SK001_02 (Milner Lake)	Not supporting (based on assessment of an unnamed stream, A-4 Canal, B Canal, D-Fifteen Canal, Goose Creek, Main Drain, Milner Lake)
<i>Tributaries</i>		
Rock Creek—main stem	ID17040209SK008_04	Not supporting
East Fork Rock Creek	ID17040209SK010_03	Not supporting
South Fork Rock Creek	ID17040209SK009_04	Not supporting
Marsh Creek	ID17040209SK003_02	Fully supporting
	ID17040209SK003_03	Not supporting
	ID17040209SK003_04	Not supporting
Rueger Springs	ID17040209SK011_07 (Snake River)	Fully supporting
Fall Creek	ID17040209SK007_02	Not assessed

Source: BURP information is from the 2010 Integrated Report at <http://mapcase.deq.idaho.gov/wq2010/>.

^a Grafe et al. 2002

3.3.3 Summary of Water Quality Trends

Although DEQ performed some water quality monitoring, the frequency of monitoring was not sufficient to statistically consider an evaluation of water quality trends for any particular parameter. Water quality data also included the data from the Idaho Soil and Water Conservation Commission. TMDL targets or criteria exceedances based on the water quality data collected are summarized as part of section 3.4.2, which considers beneficial use support status. Currently, the lack of sufficient water quality data prohibits any discussion on water quality trends.

3.4 Beneficial Uses—Assessment

This section provides a current beneficial use status determination following the water body assessment process.

3.4.1 Appropriateness of Use Designations

DEQ reviewed the use designations from the original TMDL and addendums (as summarized in Table 19) and concurs with those designations. DEQ does not support a change in any of these designations until sufficient corroborative evidence indicates otherwise.

3.4.2 Status of Beneficial Use Support

As described in section 3.1, beneficial uses are protected by a set of criteria, which include narrative and numeric criteria. Narrative criteria were “converted” to numeric instream water quality targets. It is these numeric targets that are used to preliminarily assess the beneficial use support status for the Category 5 streams.

Tables 28 and 29 provide a summary of water quality data for the Snake River and tributaries. The beneficial uses assessed are cold water aquatic life, primary and secondary contact recreation, salmonid spawning, and warm water aquatic life. Agricultural water supply was not considered in this assessment since it is included for all water bodies under IDAPA regulations.

Table 28. Summary of water quality data for the Snake River.

Snake River Segment	Assessment Unit	Beneficial Uses^a	Water Quality Data Evaluation^b
American Falls Dam to Eagle Rock	ID17040209SK011_07	CWAL, PCR	CWAL DO: 3.4% values < 6.0 mg/L Temp: 0% values > 22 °C pH: 0% values > pH 9.0 PCR <i>E. coli</i> : 0% values > 406 cfu/100 mL (geometric mean)
Eagle Rock to Massacre Rocks	ID17040209SK011_07	CWAL, PCR	CWAL DO: 0% values < 6.0 mg/L Temp: 0% values > 22 °C pH: 0% values > pH 9.0 PCR <i>E. coli</i> : 0% values > 406 cfu/100 mL (geometric mean)
Massacre Rocks to Lake Walcott	ID17040209SK011_07 ID17040209SK006_07 ID17040209SK005_07	CWAL, PCR	CWAL DO: 2.1% values < 6.0 mg/L Temp: 0% values > 22 °C pH: 0% values > pH 9.0 PCR <i>E. coli</i> : 0% values > 406 cfu/100 mL (geometric mean)
Minidoka Dam to Heyburn/Burley Bridge	ID17040209SK002_07 ID17040209SK002_02	CWAL, SS, PCR	CWAL DO: 0% values < 6.0 mg/L Temp: 0% values > 22 °C pH: 0% values > pH 9.0 SS DO: 0% values < 6.0 mg/L Temp: 77.8% values > 13 °C PCR <i>E. coli</i> : 0% values > 406 cfu/100 mL (geometric mean)
Heyburn/Burley Bridge to Milner Dam-Gooding Canal	ID17040209SK001_07 ID17040209SK001_02	WWAL, PCR	WWAL DO: 0% values < 5.0 mg/L Temp: 0% values > 33 °C PCR <i>E. coli</i> : 0% values > 406 cfu/100 mL (geometric mean)

^a CWAL = cold water aquatic life; PCR = primary contact recreation; SS = salmonid spawning; WWAL = warm water aquatic life

^b DO = dissolved oxygen; Temp = temperature

In the stretch of the Snake River from American Falls Dam to Minidoka Dam, rainbow trout (NPCC 2004, p. 3-26; IDFG 1982, pp. 3, 6, 10, and 16; IDFG 1991, p. 45) and mountain

whitefish (NPCC 2004, p. 3-40; IDFG 1982, pp. 6 and 10) exist. However, salmonid spawning has not been designated as a beneficial use. The Idaho Department of Fish and Game (IDFG) confirms through its own research (cited in this paragraph) that a rainbow trout and mountain whitefish fishery do exist. Additionally, this same segment was historically Yellowstone cutthroat trout water (IDFG 1982, pp. 3, 5, 6, 10, and 16; IDFG 1991, p. 45; IDFG 2001, p. 21; NPCC 2004, pp. 3-26, 3-39, and 3-40). Spawning of rainbow trout and Yellowstone cutthroat trout in the Snake River at and below American Falls Reservoir is not known to occur but is primarily confined to tributary coldwater spring-fed streams that discharge into American Falls Reservoir or the Snake River below American Falls Reservoir (BPA 2009, p. 2; USFWS 1995, p. 52).

Table 29. Summary of water quality data for the tributaries.

Stream	Assessment Unit	Beneficial Uses ^a	Water Quality Data Evaluation ^b
Rock Creek—main stem ^c	ID17040209SK008_04	CWAL, SS, PCR ^d	CWAL DO: 10.3% values < 6.0 mg/L Temp: 0% values > 22 °C pH: 0% values > pH 9.0 SS DO: 10.3% values < 6.0 mg/L Temp: 64.5% values > 13 °C PCR <i>E. coli</i> : 19.0% values > 406 cfu/100 mL SCR <i>E. coli</i> : 9.5% values > 576 cfu/100 mL
East Fork Rock Creek ^e	ID17040209SK010_02, 03	CWAL, SS, SCR	CWAL DO: 0% values < 6.0 mg/L Temp: 0% values > 22 °C pH: 0% values > pH 9.0 SS DO: 0% values < 6.0 mg/L Temp: 33.3% values > 13 °C SCR <i>E. coli</i> : 9.5% values > 576 cfu/100 mL
South Fork Rock Creek ^f	ID17040209SK009_02, 03, 04	CWAL, SCR	CWAL DO: 4.3% values < 6.0 mg/L Temp: 0% values > 22 °C pH: 0% values > pH 9.0 SCR <i>E. coli</i> : 0% values > 576 cfu/100 mL
Marsh Creek ^g	ID17040209SK003_04	CWAL, SCR	CWAL DO: 0% values < 6.0 mg/L Temp: 0% values > 22 °C pH: 1.5% values > pH 9.0 SS DO: 0% values < 6.0 mg/L Temp: 35.4% values > 13 °C PCR <i>E. coli</i> : 36.6% values > 406 cfu/100 mL SCR <i>E. coli</i> : 29.6% values > 576 cfu/100 mL
Rueger Springs	ID17040209SK011_03	CWAL, SS, PCR	Little monitoring conducted
Fall Creek	ID17040209SK007_02, 03	CWAL, SS, PCR	Little monitoring conducted

^a CWAL = cold water aquatic life; PCR = primary contact recreation; SCR = secondary contact recreation;

SS = salmonid spawning

^b DO = dissolved oxygen; Temp = temperature^c Rock Creek main stem water quality data obtained from DEQ 2007–2008 monitoring.^d Primary contact recreation protected for future use.^e East Fork Rock Creek water quality data obtained from DEQ 2007–2008 monitoring.^f South Fork Rock Creek water quality data obtained from DEQ 2007–2008 monitoring.^g Marsh Creek water quality data obtained from IASCD 2007–2008 monitoring.

Rock Creek (Main Stem) Assessment

The beneficial use support status of Rock Creek main stem, based on water quality monitoring conducted by DEQ, is as follows:

- **Cold Water Aquatic Life**—The numeric criterion for DO was violated 10.3% of the time for the DO instantaneous values. This reach should continue to be monitored since it is at the threshold of being impaired (slightly over 10% of the time) but the number of times monitoring occurred was not for continuous DO and should be analyzed using that method as opposed to instantaneous.
- **Salmonid Spawning**—The numeric criteria for temperature were not met 64.5% of the time, indicating that the salmonid spawning beneficial use is not met. Continuous temp monitoring would need to be conducted to determine if this use is actually impaired as opposed to instantaneous.
- **Primary Contact Recreation**—The numeric criterion for *E. coli* for was exceeded 19.0% of the time, indicating that the primary contact recreation beneficial use is not met.
- **Secondary Contact Recreation**—The numeric criterion for *E. coli* was exceeded 9.5% of the time, indicating that the secondary contact recreation beneficial use is not met.

East Fork Rock Creek Assessment

The beneficial use support status of East Fork Rock Creek, based on water quality monitoring conducted by DEQ, is as follows:

- **Cold Water Aquatic Life**—There were no exceedances of the numeric criteria for DO, temperature, or pH.
- **Salmonid Spawning**—Temperature criteria for salmonid spawning were exceeded 33.3% of the time.
- **Secondary Contact Recreation**—The numeric criterion for *E. coli* (based on instantaneous values) was exceeded 9.5% of the time. Additional monitoring should occur to determine the geometric mean from 5 samples in 30 days and is best conducted during summer months.

South Fork Rock Creek Assessment Explanation

The beneficial use support status of South Fork Rock Creek, based on water quality monitoring conducted by DEQ, is as follows:

- **Cold Water Aquatic Life**—The data for DO, temperature, and pH met the beneficial use criteria for cold water aquatic life; although, 4.3% of the time DO was below the standard (<6.0 mg/L).
- **Secondary Contact Recreation**—The data for *E. coli* (based on instantaneous values) met the beneficial use criteria for secondary contact recreation all the time.

Marsh Creek Assessment Explanation

The beneficial use support status of Marsh Creek, based on water quality monitoring conducted by the IASCD during 2007–2008, is as follows:

- **Cold Water Aquatic Life**—The data for DO, temperature, and pH met the beneficial use criteria for cold water aquatic life.

- **Salmonid Spawning**—The data for DO met the beneficial use criteria for salmonid spawning, but the temperature data exceeded the temperature criterion for salmonid spawning 35.4% of the time.
- **Primary Contact Recreation**—The data for *E. coli* (based on instantaneous values) did not meet the beneficial use criteria for primary contact recreation 36.6% of the time. Additional monitoring should occur to determine the geometric mean from 5 samples in 30 days and is best conducted during summer months.
- **Secondary Contact Recreation**—The data for *E. coli* (based on instantaneous values) did not meet the beneficial use criteria for secondary contact recreation 29.6% of the time.

Rueger Springs and Fall Creek

Rueger Springs and Fall Creek had little monitoring conducted due to resource constraints.

Snake River—American Falls Dam to Eagle Rock

The Snake River from American Falls Dam to Eagle Rock has an NPDES-permitted point source that discharges into the Snake River—the City of American Falls POTW. Land use in this area includes private dry-land farms, private irrigated croplands, and public BLM- and Idaho Department of Lands (IDL)-managed lands. BLM and IDL lands are primarily governed by grazing permits; private landowners are guided by voluntary implementation of BMPs. In addition, several nonpoint (Ferry Hollow Creek, Warm Creek, and Little Creek) and point source (Rueger Springs) tributaries discharge into this stretch of the Snake River. Land use concerns are primarily associated with BMPs, grazing permits, and the NPDES permit.

Snake River—Eagle Rock to Massacre Rocks

The primary land use concerns involve private land and BLM- and IDL-managed public lands. No known point sources discharge into this stretch of the Snake River. For BLM and IDL, the primary regulatory mechanism is the grazing permit. For private landowners, voluntary BMPs are the mechanism to limit water quality impacts to the Snake River. In addition, several unnamed nonpoint source tributaries discharge into this stretch of the Snake River. These are primarily governed by BLM, IDL, and private landowners.

Snake River—Massacre Rocks to Lake Walcott

The primary land use concerns involve private land and BLM- and IDL-managed public land. No known point sources discharge into this stretch of the Snake River. For BLM and IDL, the primary regulatory mechanism is the grazing permit. For private landowners, voluntary BMPs are the mechanism to limit water quality impacts to the Snake River. In addition, several unnamed nonpoint source tributaries and named tributaries (Rock Creek, Dry Hollow, Little Warm Creek, Fall Creek, Lanes Gulch, Gifford Spring, and Raft River) discharge into this stretch of the Snake River. These are primarily governed by BLM, IDL, and private landowners. Rock Creek and Fall Creek (discussed below) have point source facilities that discharge into their waters prior to discharging into the Snake River.

Snake River—Milner Reservoir (Minidoka Dam to Heyburn/Burley Bridge)

This section of the Snake River only covers the area from Jackson Bridge (southeast of Acequia, Idaho) to the Burley Bridge (or State Highway 27) in Burley, Idaho. The point source influence is due to the BOR Minidoka Power Plant, City of Burley Industrial WWTP, City of Heyburn,

City of Burley WWTP, and McCain Foods. The regulatory mechanism for these point sources is their NPDES permits. The predominant nonpoint source land managers (east of Burley) include the BOR, USFWS, BLM, and private landowners. For BOR, USFWS, and BLM, regulatory mechanisms involve the Federal Energy Regulatory Commission (FERC), the Endangered Species Act, and grazing permits. For private landowners, voluntary BMPs are the primary mechanism to limit water quality impacts to the reservoir.

Snake River—Milner Reservoir (Heyburn/Burley Bridge to Milner Dam)

The Milner Reservoir area covers a large section of the Snake River that is subject to backwater influences due to Milner Dam. The predominant nonpoint source land managers (west of Burley) include BOR, USFWS, BLM, and private landowners. For BOR, USFWS, and BLM, regulatory mechanisms involve FERC, the Endangered Species Act, and grazing permits. For private landowners, voluntary BMPs are the primary mechanism to limit water quality impacts to the reservoir.

Rock Creek—Main Stem

Nonpoint source industries are the predominant land use along the Rock Creek main stem. However, the City of Rockland does discharge into Rock Creek and is the only point source. Nonpoint source concerns primarily involve BLM, IDL, and private landowners. For BLM and IDL, the regulatory mechanism involved is the grazing permit. For private landowners, voluntary BMPs are the primary mechanism to limit water quality impacts to the creek.

East Fork Rock Creek

Nonpoint source industries are the predominant land use along East Fork Rock Creek. No point sources exist. Nonpoint source concerns primarily involve BLM, IDL, and private landowners. For BLM and IDL, the regulatory mechanism involved is the grazing permit. For private landowners, voluntary BMPs are the primary mechanism to limit water quality impacts to the creek.

South Fork Rock Creek

Nonpoint source industries are the predominant land use along South Fork Rock Creek. No point sources exist. Nonpoint source concerns primarily involve private landowners. For private landowners, voluntary BMPs are the primary mechanism to limit water quality impacts to the creek.

Marsh Creek

Marsh Creek is dominated by nonpoint source land uses. Point sources are not known to exist at this time. The dominant land use of Marsh Creek is agriculture and grazing, with some forestland in the headwaters. BLM controls some of the grazing, while private landowners control the greater portion. The effect of cultural practices on the Marsh Creek drainage is demonstrated to some extent in the quality of its ground water.

Marsh Creek has been designated by DEQ, IDWR, and the Idaho State Department of Agriculture as a nitrate priority area of concern primarily due to agricultural practices (Mahler and Keith 2000). Due to land use practices, nitrate levels have increased, ranking Burley/Marsh Creek as having the third highest nitrate levels out of 25 areas in the state. As a consequence, the Cassia County Ground Water Quality Advisory Committee was established, and a ground water quality management plan was finalized in June 2004. The primary recommendation and goal from the committee was to reduce excessive leaching of nitrates past the crop root zone by

developing nutrient management plans for producers. Through the monitoring of crop water use and soil moisture status, irrigation water was also noted as playing a significant role in nitrate leaching. The committee's goal is to demonstrate the feasibility and advantages of increasing water application efficiencies and irrigating to meet crop demands by educating irrigators in the project area.

Rueger Springs

Nonpoint source industries are the predominant land use along Rueger Springs. However, the IDFG American Falls Fish Hatchery does discharge into Rueger Springs and is the only point source. Nonpoint source concerns primarily involve IDL and private land. For IDL, the regulatory mechanism involved is the grazing permit. For private landowners, voluntary BMPs are the primary mechanism to limit water quality impacts to the springs.

Fall Creek

Nonpoint source industries are the predominant land use along Fall Creek. However, the Fall Creek Fish hatcheries (upper and lower) discharge into Fall Creek and are the only point sources. Nonpoint source concerns primarily involve BOR and private land.

3.4.3 Summary of Assessments Units Evaluated

Table 30 summarizes the AUs evaluated and recommended changes for the next Integrated Report.

Table 30. Summary of recommended changes for evaluated assessment units.

Assessment Unit (2010 Integrated Report)	Stream Segment Description ^a	TMDL Pollutant	Recommend- ations	Justification
Snake River				
ID17040209SK011_02	Snake River— American Falls Dam to Rock Creek	Combined biota/habitat bioassessment	Complete TMDL	Combined biota/habitat bioassessment not being met
ID17040209SK011_07	Snake River— American Falls Dam to Rock Creek	Sediment	None	Has TSS informational TMDL
ID17040209SK006_07	Snake River— Rock Creek to Raft River	Sediment	None	Water quality appears to meet numeric criteria for CWAL, PCR; has TSS informational TMDL
ID17040209SK005_07	Snake River—Raft River to Lake Walcott	Sediment	None	Water quality appears to meet numeric criteria for CWAL, PCR; has TSS informational TMDL
ID17040209SK004L_0L	Lake Walcott	Mercury	Schedule mercury fish tissue TMDL	Listed for mercury on 2008 Integrated Report based on fish tissue sampling for methyl mercury
ID17040209SK001_02 ID17040209SK001_07	Heyburn/ Burley Bridge to Milner Dam-Gooding Canal	Sediment, nutrients	None	Water quality appears to meet numeric criteria for WWAL, PCR; has TSS informational TMDL
Tributaries				
ID17040209SK008_03	Rock Creek— main stem	Sediment, <i>E. coli</i> , temperature	None	Water attaining some standards—listed in Category 2
ID17040209SK008_04	Rock Creek— main stem	Sediment	None	TMDL completed and approved
ID17040209SK010_02, 03	East Fork Rock Creek	Sediment	None	TMDL completed and approved
ID17040209SK009_02, 03, 04	South Fork Rock Creek	Sediment	None—Continue implementing TSS TMDL	Water quality appears to meet numeric criteria for CWAL, SCR
ID17040209SK003_03, 04, 04a	Marsh Creek— headwaters to mouth	Temperature	Complete temperature TMDL	Listed for combined biota/habitat assessment; temperature criterion not met and deemed causal pollutant
ID17040209SK011_03	Rueger Springs	Sediment, nutrients, <i>E. coli</i>	None	TMDL developed to provide wasteload allocations in NPDES permit
ID17040209SK007_02, 03	Fall Creek	Sediment, nutrients, <i>E. coli</i>	None	TMDL developed to provide wasteload allocation in NPDES permit

Note: TSS = total suspended sediment; TP = total phosphorus; CWAL = cold water aquatic life; WWAL = warm water aquatic life; SS = salmonid spawning; PCR = primary contact recreation; SCR = secondary contact recreation

^a This table reflects the stream reaches as described in the 2010 Integrated Report. The original Lake Walcott TMDL was written to water quality limited segments (WQLS). The current stream reaches may vary slightly from the 2000 EPA-approved Lake Walcott TMDLs as they have been “translated” to assessment units, stream reaches that are based on stream order.

Section 4: Review of Implementation Plan and Activities

This section of the five-year review references *The Lake Walcott Implementation Plan* (2005), lists all of the parties that created the document, and provides a summary of what each participant planned to do (or may be doing). For additional resources pertaining to designated management agencies and implementation activities, see Appendix A.

4.1 Development and Purpose

The Lake Walcott Implementation Plan was developed in 2005 and brought together DEQ and several major water user industries in the Lake Walcott subbasin. The implementation plan is an outgrowth of the Lake Walcott TMDL (DEQ 2000, specifically pp. 148–162) and addresses point and nonpoint sources and designated land management agencies. The express purpose of the plan is to restore the beneficial uses and/or water quality standards of the §303(d)-listed streams in the Lake Walcott subbasin. Oversight and preparation of the plan was done by DEQ with assistance from state designated management agencies for specific water user industries and the Lake Walcott WAG.

The primary purposes of *The Lake Walcott Implementation Plan* is as follows:

- Identify and describe the specific pollution controls or management measures to be undertaken.
- Identify the mechanisms by which the selected pollution control and management measures will be put into action.
- Incorporate the authorities, regulations, permits, contracts, commitments, or other resources to ensure that implementation will take place.

The Lake Walcott WAG has been instrumental in implementing the overall plan by endorsing those §319 projects that target §303(d)-listed water bodies under the Lake Walcott TMDL. DEQ has assisted in this process by providing technical assistance to those who have sought §319 funds. DEQ will continue to pursue these on-the-ground water quality cleanup efforts with cooperation and support from the Lake Walcott WAG.

4.1.1 Evaluation of the Feedback Loop in the Implementation Plan

The feedback loop is addressed in section 3.7.6 of the Lake Walcott TMDL (DEQ 2000, pp. 160–162). Although adaptive management as a style and process is suggested, applying and implementing this approach is dependent on water quality monitoring data. As described above, resource constraints prohibit monitoring at a level sufficient to evaluate the feedback loop in the monitoring and implementation planning components of the TMDL.

However, to the extent practical, the feedback loop as a component of monitoring and implementation is an excellent approach for documenting accountability of plan goals for the various pollutants. Therefore, DEQ evaluated the approach and continues to support its use. Short-term and long-term goals are necessary for point and nonpoint sources, and these are documented in the Lake Walcott TMDL in section 3.7.1 for point sources and 3.7.2 for nonpoint sources (DEQ 2000, pp. 149–155).

4.2 Responsible Parties

Table 31 summarizes the parties responsible for implementing the TMDL for the various segments of the Snake River and its tributaries.

Table 31. Responsible parties for Lake Walcott TMDL implementation.

Stream or Segment	Responsible Party	Resource Responsibility	Type of Involvement
<i>Snake River: RM 714 (American Falls Dam) To RM 709 (Eagle Rock)</i>			
Snake River— American Falls to Eagle Rock	Point Sources		
	BOR	American Falls Dam: Operational procedures that restrict minimum voluntary flow > 300 cfs	Regulatory (FERC), monitoring assistance
	BOR and IPC	American Falls Dam: Operational procedures for DO limits > 6.0 mg/L	Regulatory (FERC), monitoring assistance
	City of American Falls	NPDES permit	Regulatory (NPDES)
	Private dry-land farms	50.2% of land use along stream corridor	Best management practices
	Private irrigated croplands	25.3% of land use along stream corridor (0.3% is gravity-fed)	Best management practices
	BLM and IDL	24.5% of land use as rangelands along stream corridor	Regulatory (grazing permits), best management practices
	Nonpoint and Point Source Tributaries		
	Private	Ferry Hollow Creek	Best management practices
	NPDES permit, IDL, and private	Rueger Springs	Regulatory (NPDES), best management practices
	Private	Warm Creek	Best management practices
	BLM and private	Little Creek	Regulatory (grazing permits), best management practices
<i>Snake River: RM 709 (Eagle Rock) to RM 706 (Massacre Rocks)</i>			
Snake River— Eagle Rock to Massacre Rocks	Point Sources—None		
	Nonpoint and Point Source Tributaries		
	BLM and private	Unnamed tributary	Regulatory (grazing permits), best management practices
	IDL and private	Unnamed tributary	Regulatory (grazing permits), best management practices
<i>Snake River: RM 706 (Massacre Rocks) to RM 674.5 (Minidoka Dam)</i>			
Snake River— Massacre Rocks to Minidoka Dam	Point Sources—None		
	Nonpoint and Point Source Tributaries		
	Private	Unnamed tributary	Best management practices
	ISPR and private	Unnamed tributary	Best management practices
	ISPR and private	Rock Creek	Best management practices
	BOR and private	Dry Hollow	Regulatory (FERC), best management practices
	Private	Little Warm Creek	Best management practices

Stream or Segment	Responsible Party	Resource Responsibility	Type of Involvement
	BOR and private	Fall Creek	Regulatory (FERC), best management practices
	BOR, BLM, and private	Lanes Gulch	Regulatory (FERC), regulatory (grazing permits), best management practices
	USFWS and private	Unnamed tributary	Regulatory (ESA), best management practices
	USFWS	Gifford Spring	Regulatory (ESA)
	USFWS, BLM, and private	Unnamed tributary	Regulatory (ESA), regulatory (grazing permits), best management practices
	USFWS, BLM, and private	Raft River	Regulatory (ESA), regulatory (grazing permits), best management practices
Snake River: RM 674.5 (Minidoka Dam) to RM 639.1 (Milner Dam)			
Snake River— Minidoka Dam to Milner Dam	Point Sources		
	NPDES permit	BOR Minidoka Power Plant	Regulatory (NPDES)
	NPDES permit	City of Burley Industrial WWTP	Regulatory (NPDES)
	NPDES permit	City of Heyburn	Regulatory (NPDES)
	NPDES permit	City of Burley	Regulatory (NPDES)
	NPDES permit	McCain Foods	Regulatory (NPDES)
	Nonpoint and Point Source Tributaries		
	USFWS, BOR, and private	Main North Side Canal	Regulatory (ESA), regulatory (FERC), best management practices
	BOR, BLM, and private	Main South Side Canal	Regulatory (FERC), regulatory (grazing permits), best management practices
	Private	Canal Lateral "Input"	Best management practices
	Private	A-1 Canal "Input"	Best management practices
	Private	D-4 Drain "Input"	Best management practices
	Private	D-5 Drain "Input"	Best management practices
	Private	Marsh Creek	Best management practices
	Private	Spring Creek	Best management practices
	Private	Duck Creek	Best management practices
	Private	Goose Creek	Best management practices
	Private	D-15 Drain "Input"	Best management practices
	Private	Marshland tributaries	Best management practices
	Private	Main Drain Canal	Best management practices
	BLM and private	Canal Lateral "Input"	Regulatory (grazing permits), best management practices
	BOR and private	Canal Lateral "Input"	Regulatory (FERC), best management practices
	BOR and private	Unit A Main Canal	Regulatory (FERC), best management practices

Stream or Segment	Responsible Party	Resource Responsibility	Type of Involvement
	BOR and private	Canal Lateral "Input"	Regulatory (FERC), best management practices
<i>Tributaries</i>			
East Fork Rock Creek	IDL, BLM, and private	Nonpoint source tributary	Regulatory (grazing permits), best management practices
South Fork Rock Creek	Private	Nonpoint source tributary	Best management practices
Rock Creek—main stem	City of Rockland, ISPR, and private	Point and nonpoint source tributary	Regulatory (NPDES), best management practices
Marsh Creek	Private	Nonpoint source tributary	Best management practices
Fall Creek	BOR and private	Nonpoint source tributary	Regulatory (FERC), best management practices
Rueger Springs	IDFG (NPDES permit), IDL, and private	Point and nonpoint source tributary	Regulatory (NPDES), regulatory (grazing permit), best management practices

Note: RM = river mile; BOR = Bureau of Reclamation; IPC = Idaho Power Company; cfs = cubic feet per second; DO = dissolved oxygen; IDL = Idaho Department of Lands; ISPR = Idaho State Parks and Recreation; BLM = Bureau of Reclamation; Private = private landuse; USFWS = US Fish and Wildlife Service—Minidoka National Wildlife Refuge; FERC = Federal Energy Regulatory Commission; ESA = Endangered Species Act; NPDES = National Pollutant Discharge Elimination System

4.3 Planned Activities

This section lists the activities, structures, and management strategies included in the Lake Walcott TMDL implementation plan, including funding and completion status (Table 32).

Table 32. Planned activities of the Lake Walcott TMDL implementation plan.

Water Body	Pollutant	Activity or Strategy	Schedule	Completion Status
Snake River Segments				
Snake River—American Falls to Eagle Rock	TSS, TP, <i>E. coli</i> , Temp	Wetland and riparian restoration and enhancement	§319 grant process	A project is being sought.
Snake River—Massacre Rocks to Lake Walcott				
Snake River—Minidoka Dam to Milner Dam				
Tributaries				
Marsh Creek	TSS, TP, <i>E. coli</i> , Temp	Wetland and riparian restoration and enhancement	§319 grant process	A project has been started.
Fall Creek	TSS, TP, <i>E. coli</i> , Temp	Wetland and riparian restoration and enhancement	§319 grant process	A project is being sought.
Rock Creek—main stem				
East Fork Rock Creek				
South Fork Rock Creek				
Rueger Springs				

Note: TSS = total suspended sediment; TP = total phosphorus; Temp = temperature

4.4 Accomplished Activities

Accomplished activities are summarized in section 4.4.1 for point sources and 4.4.2 for nonpoint sources. In each case, implementation stressed consistency with the Lake Walcott TMDL through NPDES permitting and the application of BMPs.

4.4.1 Point Source Activities

Point source accomplished activities are primarily focused in NPDES permitting activities. NPDES permit status is summarized in Table 33. Some of the permits had been administratively extended by EPA but were permitted under the General Aquaculture Permit. Some of the permits are expired and under review for reissuance.

Table 33. Summary of NPDES permits for Lake Walcott TMDL point sources.

Point Source Facility	NPDES Permit Number	Permitting Status
City of American Falls POTW	ID-0020753	Expired January 8, 2007—under review for new permit
IDFG American Falls Fish Hatchery	ID-130031	New permit expires November 30, 2012
City of Rockland POTW	ID-0022047	Expired January 8, 2007—under review for new permit
Fall Creek Fish Hatcheries (upper and lower)	ID-130078 ID-130085	New permit expires November 30, 2012
BOR Minidoka Power Plant	ID-0026824	Expired January 8, 2007—under review for new permit
City of Burley Industrial WWTP	ID-0000663	New permit expires May 31, 2014
City of Heyburn POTW	ID-0020940	Expired January 8, 2007—under review for new permit
City of Burley POTW	ID-0020095	Expired January 8, 2007—under review for new permit
McCain Foods	ID-0000612	Expired June 30, 2011

Note: NPDES = National Pollutant Discharge Elimination System; POTW = publicly owned treatment works; BOR = Bureau of Reclamation; IDFG = Idaho Department of Fish and Game; WWTP = wastewater treatment plant

In general, the newer permits will contain the following components in addition to compliance limitations and monitoring requirements:

- Monthly monitoring reporting via discharge monitoring reports (DMRs), unless otherwise noted, which are due monthly and must be postmarked by the 20th day of the following month.
- The permittee must develop and implement a quality assurance (QA) plan within 60 days of coverage under the NPDES permit. The QA plan must be kept on site and made available to EPA and DEQ upon request. The permittee must submit a certification to EPA and DEQ that the QA plan was developed and implemented within 90 days of the effective date of the permit. A new permittee must submit the certification with the notice of intent (NOI) to be covered under the permit.
- An existing permittee must submit to EPA and DEQ a certification that the BMP plan was developed and implemented within 90 days of the effective date of the permit. A new permittee must submit the certification with the NOI to be covered under this permit.
- The NOI to be covered under the next permit must be submitted by a certain time as determined by the new permit under consideration.
- A receiving water monitoring report must be submitted with the DMR for the month in which the monitoring is conducted.
- Reports or progress reports of compliance or noncompliance with interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.
- An annual report must be submitted by January 20 each year.

4.4.2 Nonpoint Source Activities

All proposed nonpoint source management actions (or BMPs) on all water bodies must be implemented with the purpose of attaining beneficial uses and state water quality standards. Unless otherwise stated, it is assumed that attainment of beneficial uses is the principal goal on all streams in the Lake Walcott subbasin. This strategy and approach has been implemented by DEQ on all projects where a water body may be involved, such as projects where activities will occur below the ordinary high water mark of the stream (i.e., §404 projects).

Section 404 Water Quality Projects

The Army Corps of Engineers (ACOE) issues permits, under §404 of the CWA, for the discharge of dredged or fill material into waters of the State of Idaho. The IDWR and IDL are also involved with these types of projects. As part of the §404 process, the State of Idaho provides the licensing or permitting federal agency with a water quality certification stating that the activity meets the water quality standards of the State of Idaho. Since 2000, various §404 implementation projects have been permitted in the Lake Walcott subbasin. Each of these projects has required a §401 water quality certification. These implementation projects are summarized in Table 34.

Table 34. Army Corps of Engineers (ACOE) §404-permitted implementation projects since 2000 in the Lake Walcott subbasin.

ACOE Permit Number	Water Body	Year Initiated	Business or Agency ^a	Project Description ^b
Snake River Projects				
002200190	Snake River	2000	Private	NWP 13—Bank stabilization
012200270		2001	Private	NWP 13—Bank stabilization
012200250		2001	Private	NWP 13 and 14—Bank stabilization and linear transportation projects
043200045		2004	Private	NWP 13—Bank stabilization
053300139	Milner Lake Reservoir	2005	Private	NWP 20—Oil spill cleanup
053200178	Snake River	2005	Private	—
053200160		2005	Private	NWP 13—Bank stabilization
052600026		2005	ITD	NWP 3—Maintenance
IDWR L-45-S-51	Milner Reservoir	2005	Private	—
063200012		2006	Private	NWP 13—Bank stabilization
063300031	Snake River	2006	Private	NWP 13—Bank stabilization
06xxxxxxx		2006	McCain Foods	Discharge of wastewater
063300190		2006	Private	NWP 36—Boat ramps
2007-453-I02	Snake River, Milner Pool	2007	Private	NWP 18—Minor discharges
2007-351-I01	Snake River	2007	City of Burley	NWP 39—Commercial and institutional developments
2007-351-I01		2007	City of Burley	NWP 13—Bank stabilization
IDWR L-45-S-58		2008	Private	Retaining wall and dredging
IDWR L-45-S-59A		2008	Private	NWP 13 and 36—Bank stabilization and boat ramps
ITD Key No. 8903		2008	ITD	North Overland Road project
Tributary Projects				
022200170	Howell Creek	2001	AHD	NWP 3—Maintenance
012201260		2001	AHD	NWP 3—Maintenance
002201280	Marsh Creek	2000	AHD	NWP 13 and 14—Bank stabilization and linear transportation projects
043200057		2004	Private	NWP 13—Bank stabilization
053200052		2005	Private	NWP 27—Aquatic habitat restoration, establishment, and enhancement activities
063300141		2006	Private	NWP 33—Temporary construction, access, and dewatering
2007-01190-B02		2007	ITD	NWP 14—Linear transportation projects
022101710	Summit Creek	2002	AHD	NWP 3 and 13—Maintenance and bank stabilization
043200056		2004	Private	NWP 14—Linear transportation projects
IDWR 45-20014	Land Creek	2007	AHD	Emergency repair
2007-1059-I01		2007	Private	NWP 14—Linear transportation projects

^a ITD = Idaho Transportation Department; AHD = Albion Highway District^b NWP = Nationwide Permit classification

Section 319 Projects

Only three §319 projects have been implemented in the Lake Walcott subbasin since the TMDL was approved in 2000:

- **Shoreline Stabilization and Riparian Restoration of the Milner Lake Segment of the Snake River in Cassia County**—Since 1964 (or earlier), bank recession rates due to wave action have impacted the streambanks of the Snake River causing property losses along the Snake River. Natural Resources Conservation Service-Burley in conjunction with the ISCC-Burley estimated a loss in sediment to the river of 2,018 tons/year based on a total loss of 80,742 tons of soil since 1964
- **Marsh Creek Wetlands Restoration Project**—The wetlands restoration project will make improvements to over 60 acres of important emergent wetland and riparian habitat along Marsh Creek. The restoration work will benefit thousands of migrating and wintering waterfowl and many other bird species that use the Middle Snake River area.
- **Copper Creek Wetlands Restoration Project**—The restoration project will take place along Copper Creek and springs, Barn Canyon Creek and springs, and Payne Creek. The approach is to exclude wetlands, spring areas, and riparian zones from grazing and farming with exclosures varying in width from 50 to 500 feet on each side of the stream or wetland feature. Habitat rehabilitation through planting and seeding will be conducted in the areas that will no longer be farmed. Water gaps or off-stream watering will be established for livestock. In 84 acres of wet meadow areas, light grazing will be implemented with an emphasis on late-season, short-duration grazing. Approximately 120 acres of wetland or riparian habitat will be excluded from grazing. In addition, 6 miles of fencing will be installed, with some temporary fencing to allow for wildlife passage; all fencing will be in place as needed to prevent livestock grazing. Approximately 48 acres of wetlands will be restored/rehabilitated. Approximately 2 miles of stream will be revegetated with woody riparian plants.

4.5 Future Strategy

The future strategy of the Lake Walcott implementation effort is highly dependent on sufficient monitoring, resources (i.e., staff and funds), and on-the-ground water quality restoration projects. It is also dependent on coordination and mutual cooperation between DEQ and the Lake Walcott WAG. To the extent possible, DEQ and the WAG will pursue the following goals:

- DEQ, with cooperation from the Lake Walcott WAG, will continue to pursue a monitoring strategy to obtain water quality monitoring information on the §303(d)-listed water bodies (and AUs). This strategy includes monitoring on the Snake River at the seven compliance points and on the tributaries (both man-made and natural water bodies) at the pour point of each AU. This effort is based on fulfilling Idaho Code § 39-3607 in order to determine the status of designated beneficial uses in each water body.
- DEQ, with cooperation from the WAG, shall implement such measures to determine the appropriate designated uses and the status of the designated beneficial uses (through such instruments as five-year reviews). These reviews shall include appropriate water quality standards, as identified in state rules, in conjunction with biological or aquatic habitat measures that may include the following:
 - Stream width

- Stream depth
- Stream shade
- Sediment
- Bank stability
- Water flows
- Physical characteristics of the stream that affect habitat for fish, macroinvertebrate species, or other aquatic life
- The variety and number of fish or other aquatic life
- DEQ, with cooperation from the WAG, will continue to pursue §319 grant projects for §303(d)-listed water bodies (and AUs), especially where the projects enhance existing riparian lands and promote the restoration of wetlands along stream channels.
- DEQ, with cooperation from the WAG, will incorporate Idaho Code § 39-3611 into its implementation planning effort. Specifically, DEQ and the Lake Walcott WAG shall do the following:
 - 1) Review and analyze why current control strategies are not effective in ensuring full support of designated beneficial uses.
 - 2) Review and provide a plan to monitor and evaluate progress toward meeting water quality standards.
 - 3) Review and provide pollution control strategies for both point and nonpoint sources.
 - 4) Review and identify the time period necessary to achieve full support of designated beneficial uses through implementation of pollution control strategies, which takes into account any expected changes to applicable water quality standards.
- DEQ shall assist the WAG, as specified in Idaho Code § 39-3616, in recommending those specific actions needed to control point and nonpoint sources of pollution within the watershed so that, within reasonable periods of time, designated beneficial uses are fully supported and other state water quality plans are achieved. In addition, the Lake Walcott WAG shall consult with and participate in the development of each TMDL and any supporting subbasin assessment for water bodies within the watershed and shall develop and recommend actions needed to effectively control sources of pollution. Finally, the Lake Walcott WAG shall employ all means of public involvement deemed necessary or required in chapter 52, title 67, Idaho Code, and shall cooperate fully with the public involvement or planning processes of other appropriate public agencies.

4.6 Planned Time Frame

Implementation timelines were included in the Lake Walcott TMDL. These timelines are based on the pollutant of concern and are industry-specific. To the extent practicable, these timelines will be continued until the TMDL is reopened at some time in the future. Until such time, the implementation time frame will continue as follows:

- Each industry will develop more specific timelines within its individual implementation plan.

- DEQ will provide oversight for review and assessment of short- and long-term goals.
- DEQ will maintain a database for purposes of review and assessment of wasteload allocation limits.
- Reviews and/or assessments of the TMDL will be done on a regular basis with incorporation of comments from the WAG.

4.7 Watershed Advisory Group Consultation

The consultation process between DEQ and the Lake Walcott WAG for this five-year review is summarized in this section and is a critical factor in implementation planning and follow up. Although a public comment period is not a requirement of the five-year review, DEQ still requested comments from the Lake Walcott WAG when developing this document.

4.7.1 Consultation Provisions and Consultation History

Idaho Statute § 39-3611(7) requires that consultation with the appropriate WAG be included in the five-year cyclic reviews of Idaho TMDLs. Idaho Statute § 39-3611(8) defines consultation to include providing the group with all available information and data; utilizing the knowledge, expertise, experience, and information of the WAG; and providing opportunities for the WAG to participate in the drafting of documents and suggest recommended changes.

The Lake Walcott WAG was instrumental in providing input on this five-year review. Consultation had already commenced immediately after the Lake Walcott TMDL was completed and approved by EPA. The consultation was primarily to address those streams that might have the potential for water quality improvement projects (e.g., §319 grant projects). A summary of Lake Walcott WAG meetings is provided in Table 35.

Table 35. Summary of Lake Walcott WAG meetings, 2000–2008.

Year	Date	Place	Attendance
2000	July 26	Burley, Idaho	13 people
	September 27	Rockland, Idaho	13 people
	November 20	Burley, Idaho	NA
2001	January 24	Burley, Idaho	19 people
	March 28		15 people
	May 23		24 people
	July 25		10 people
	August 29	Malta, Idaho	12 people
	September 26	Burley, Idaho	NA
	November 28	Rockland, Idaho	NA
2002	January 23	Burley, Idaho	14 people
	March 27	Rockland, Idaho	NA
	May 22	Burley, Idaho	10 people
2003	January 22	Burley, Idaho	12 people
	March 26		15 people
	May 28	Malta, Idaho	NA
	September 24	Rockland, Idaho	17 people
	November 12	Oakley, Idaho	10 people
2004	February 25	Burley, Idaho	15 people
	April 28		17 people
	July 28		9 people
	October 27		23 people
2005	January 26	Burley, Idaho	16 people
	July 27		8 people
2006	January 25	Burley, Idaho	13 people
	April 26		10 people
	September 27		8 people
	October 25	Malta, Idaho	NA
2007	January 31	Burley, Idaho	13 people
	April 25		13 people
	July 25		12 people
	October 24		11 people
2008	April 23	Burley, Idaho	10 people
	September 24		10 people
	November 4		NA
2010	December 2	Burley, Idaho	7 people

NA indicates that a sign-up sheet was not collected during the meeting.

In addition, the Upper Snake Basin Advisory Group (BAG) also consulted with DEQ on the five-year review. After the Lake Walcott TMDL was approved by EPA, the Upper Snake BAG continued to meet regularly. A summary of the official Upper Snake BAG meetings is provided in Table 36.

Table 36. Summary of the Upper Snake BAG meetings, 1999–2008.

Year	Day	Place	Attendance
1999	April 7	Twin Falls, Idaho	28 people
	June 2	Ririe, Idaho	38 people
	October 6	Twin Falls, Idaho	19 people
	December 8	Pocatello, Idaho	NA
2000	April 5	Twin Falls, Idaho	14 people
	June 7	Idaho Falls, Idaho	20 people
	September 6	Sun Valley, Idaho	26 people
	November 1	Pocatello, Idaho	NA
	December 6	Pocatello, Idaho	NA
2001	February 7	Pocatello, Idaho	17 people
	April 4	Twin Falls, Idaho	17 people
	June 6	Pocatello, Idaho	NA
	August 1	Pocatello, Idaho	14 people
	October 3	Twin Falls, Idaho	12 people
	December 5	Idaho Falls, Idaho	20 people
2002	April 3	Pocatello, Idaho	15 people
	September 4	Idaho Falls, Idaho	18 people
	December 4	Twin Falls, Idaho	13 people
2003	March 3	Telephone conference call ^a	7 people
	April 2	Pocatello, Idaho	26 people
	July 9	Idaho Falls, Idaho	27 people
	September 9	Twin Falls, Idaho	18 people
	November 12	Pocatello, Idaho	20 people
2004	February 4	Pocatello, Idaho	NA
	April 7	Twin Falls, Idaho	27 people
	September 1	Pocatello, Idaho	18 people
	December 1	Idaho Falls, Idaho	16 people
2005	April 6	Twin Falls, Idaho	20 people
	September 7	Pocatello, Idaho	20 people
	November 17	Telephone conference call	13 people
	December 7	Idaho Falls, Idaho	27 people
2006	February 23	Telephone conference call	13 people
	April 12	Twin Falls, Idaho	32 people
	September 6	Pocatello, Idaho	13 people
	December 6	Idaho Falls, Idaho	16 people
2007	April 4	Twin Falls, Idaho	24 people
	September 5	Driggs, Idaho	19 people
	December 12	Pocatello, Idaho	21 people
2008	April 2	Jerome, Idaho	26 people
	July 16	Pocatello, Idaho	21 people

“NA” indicates that a sign-in sheet was not collected during the meeting.

^a Telephone conference calls originated from the DEQ Twin Falls Regional Office.

4.7.2 Watershed Advisory Group Recommendations

The primary issue of concern for the Lake Walcott WAG is how to deal with growth due to population and industry development. This issue will be explored more fully as soon as practicable. Table 37 summarizes WAG concerns and recommendations.

Table 37. Summary of the Lake Walcott WAG recommendations.

Recommended Action	Budget	Responsibility	Mechanism
Address urban population growth	Uncertain	Connections to wastewater and drinking water	NPDES permitting; TMDL considerations
Address rural population growth	Uncertain	Connections to septic systems ^a	District health—siting inspections; septic permits
Address industry development	Uncertain	On-site treatment	Land application regulations; NPDES permitting; TMDL considerations
		Connection to wastewater treatment	
		Discharge to surface water and ground water	
Address stormwater issues	Uncertain	Construction sites >1 acre	NPDES permitting; TMDL considerations

^a Septic systems are also covered under subsurface disposal regulations.

Section 5: Summary of Five-Year Review

This section provides a summary of the review process; changes to subbasin conditions since the last assessment; analysis, assumptions, and allocations for TMDLs; appropriateness of use designations; and water quality criteria. It also summarizes the WAG consultation process and recommendations for further action.

5.1 Data Review Process

This section summarizes the data requested, how the data were collected and reviewed, and how the data were determined to be relevant to the TMDL.

- Data have been requested from the Lake Walcott WAG since approval of the Lake Walcott TMDL in 2000, but even more recently since beginning the development of the Lake Walcott TMDL five-year review.
- DEQ collected data under its standard operating field protocols governed under a quality assurance project plan (QAPP) for the Lake Walcott subbasin. DEQ reviewed its own data under these protocols and applied the same protocols to other data submitted from outside sources.
- The determination of data relevancy was dependent on the following:
 - 1) Monitoring points were selected prior to TMDL approval that reflected the overall water quality condition of the stream and had key linkages to the designated or existing beneficial uses based on instream targets.
 - 2) To maintain consistency from year to year, the same monitoring points were retained in order to provide meaningful comparison between pre-TMDL and post-TMDL considerations.
 - 3) Water quality monitoring was conducted by DEQ under the provisions of a QAPP that ensured quality control and QA were present in sample preparation, field collection, and laboratory testing. The QAPP included provisions for field data determinations (for flow, conductivity, pH, temperature, DO, and turbidity) and laboratory data determinations (for TSS, TP, and *E. coli*).
 - 4) Where water quality cleanup projects were identified, selected, and implemented, the provisions were applied for field data determinations, laboratory data determinations, and the selection of monitoring points for the project(s).
 - 5) Monitoring was conducted at a frequency that was dependent on available resources, which were primarily dictated by budget constraints.
 - 6) Water quality data were solicited from other agencies and organizations with provisions that reflected DEQ's QAPP process.
 - 7) The five-year review followed the same provisions designated for the TMDL and used the same monitoring locations.
 - 8) The water quality data were entered into a database; statistical analysis of the data was conducted and determined by DEQ based on meeting beneficial use attainment provisions and TMDL water quality standards.

- 9) In order to provide a measure of accountability and potential credit, the year 2000 (when the Lake Walcott TMDL was approved) was used as the baseline year to draw comparisons for post-TMDL applications.

5.2 Changes in the Subbasin

This section summarizes changes in the Lake Walcott subbasin since the approval of the Lake Walcott TMDL.

5.2.1 Summary of Changes

In general, land use in the Lake Walcott subbasin has not changed dramatically since 2000. However, with future population growth and economic development, land use changes will occur as agricultural lands are converted to subdivisions and industrial development.

Nonpoint source pollutant sources are still the same, primarily agriculture and grazing. Point sources are also the same with the exception that the J.R. Simplot Company shut down its potato processing plant and bequeathed the plant and its appurtenances to the City of Burley. The City converted the plant from its wastewater NPDES permit to an industrial permit as the City of Burley Industrial WWTP.

The allocations to point and nonpoint sources have not been modified since approval of the Lake Walcott TMDL, but these allocations may change as population growth and economic development take place.

5.2.2 Significance of Changes

The primary concern regarding the Lake Walcott TMDL is that potential changes in the subbasin that may impact water quality may also impact the pollutant loads to the streams. Unless BMPs are applied in nonpoint source areas to substantially control these additional loads (for excess nutrients, sediment, and bacteria), the water quality resource may degrade. Likewise, point sources may be impacted if their ability to plan and control additional volume inputs above their facility design capacity is exceeded due to population growth and economic development.

DEQ encourages all point and nonpoint source industries to engage in long-range planning, but it must be consistent with the concept of sustainability. Sustainability implies “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987). Safeguarding the environment is fundamental to sustainable development. Society, its members, and its economies must meet their needs and express their greatest potential in the present while preserving biodiversity and natural ecosystems for the future. This ability requires environmental planning and acting to maintain these ideals in the very long-term. Therefore, DEQ supports a sustainable development strategy that demonstrates interrelationships among the industries of the Lake Walcott subbasin that requires the following:

1. Integrated economic, environmental, and social planning that extends beyond the current generation
2. Restoration and maintenance of the water quality of the Snake River and associated tributaries, and protection of their beneficial uses and water quality standards such that these uses and standards are recognized as important factors for influencing the future economic and social well-being of the Lake Walcott subbasin

3. Management actions that support practices and recommend policies that lead toward sustainable and responsible development such that the actions provide mechanisms for regional cooperation in developing long-term environmental, economic, and community sustainability plans through watershed management plans
4. Each industry (both point and nonpoint source) developing their watershed management plan to focus on strategies that promote sustainable options
5. An emphasis on soil, water, and energy conservation programs
6. Waste minimization, pollution prevention, and waste recycling programs

5.3 TMDL Analysis

This section summarizes the review that was performed on the original TMDL assumptions, the appropriateness of those assumptions, and the appropriateness of the allocations.

- The original assumptions are still valid for the Lake Walcott TMDL, Rueger Springs TMDL, and Fall Creek TMDL.
- The original analyses are appropriate for the Lake Walcott TMDL, Rueger Springs TMDL, and Fall Creek TMDL.
- The allocations for point and nonpoint sources are appropriate for the Lake Walcott TMDL, Rueger Springs TMDL, and Fall Creek TMDL. However, population growth and economic development may affect wastewater treatment and require changes to the wasteload allocations and load allocations in the future.

5.4 Review of Beneficial Uses

The section summarizes the appropriateness of the beneficial uses identified in the Lake Walcott TMDL, any recommended changes, and the beneficial use attainment status.

- The designated beneficial uses in the Lake Walcott TMDL, Rueger Springs TMDL, and Fall Creek TMDL are appropriate. Designation of existing beneficial uses will require going through the public comment process for legislative approval to become designated in the IDAPA regulations at some point in the future.
- No changes to the beneficial uses are recommended at this time.
- The beneficial uses for the Snake River are either being met or will be met in the future based on TMDL reductions being implemented by point and nonpoint sources. However, DEQ must have sufficient resources for water quality monitoring to make a complete beneficial use assessment. The same is true for the tributaries.

5.5 Water Quality Criteria

This section summarizes how water quality criteria changes have affected the TMDL, the appropriateness of those changes, TMDL implementation and its effect on water quality, and any warranted changes in criteria based on the data collected.

- With the exception of the *E. coli* criterion, no other criteria, numeric or narrative, have changed that affect the TMDL. The *E. coli* criterion was changed from fecal coliform to *E. coli* by the Idaho Legislature in 2000 to conform to the EPA-recommended criterion.
- The change in the *E. coli* criterion from fecal coliform is appropriate and is now being applied in NPDES point source permits and in nonpoint source streams.

- The Lake Walcott TMDL was approved in 2000 and has since been under implementation planning. Water quality monitoring of the Snake River shows the following:
 - 1) *E. coli* data indicate that the Snake River was at full support before the Lake Walcott TMDL and remains at full support.
 - 2) TP data indicate that the Snake River was at full support before the Lake Walcott TMDL but is not at full support after the TMDL.
 - 3) TSS data indicate that the Snake River was at full support before the Lake Walcott TMDL. After the TMDL was approved, the Snake River may not be at full support, but better monitoring data are needed.
- No changes in the criteria are warranted or suggested at this time.

5.6 Watershed Advisory Group Consultation

No documentation was requested by the Lake Walcott WAG for the five-year review, but DEQ provided the WAG with copies of the final document for review and comments. WAG involvement was primarily in the monitoring of Marsh Creek (via the ISCC/IASCD).

No changes were suggested by the Lake Walcott WAG to the five-year review. However, DEQ provided the WAG with information regarding monitoring, analyses, criteria, targets, allocations, and implementation for its review and consideration.

No recommendations were suggested by the Lake Walcott WAG relative to modifications to beneficial use status, control/target monitoring, or implementation.

5.7 Recommendations for Further Action

DEQ and the Lake Walcott WAG will continue to work together to implement on-the-ground strategies to meet the beneficial uses and water quality standards of the Snake River and its tributaries. Point source facilities will operate through their NPDES permits, while nonpoint source industries will operate through the application of BMPs. At this time, DEQ recommends that the implementation strategy be modified to incorporate BMPs that specifically target the TMDL parameters for meeting beneficial uses and water quality standards of the Snake River and its tributaries.

DEQ recommends that the original EPA-approved TMDL (DEQ 2000) be updated to clearly identify the targets for the respective AUs and more clearly differentiate between the informational versus EPA-approved TMDLs. The Lake Walcott TMDL is one of DEQ's oldest and first TMDLs, having been drafted in 1996 and approved in 2000. After a thorough review of the TMDL during this five-year review process, DEQ believes it is necessary to update and correct stream reaches identified in the TMDL to be consistent with changes in April 2000 to Idaho's water quality standards that identify water body identification numbers (WBIDs) for the Lake Walcott subbasin. Such an update could also incorporate the two new NPDES aquaculture TMDLs and correct errors found in all three documents. These errors include incorrect beneficial use identification and some AUs incorrectly identified.

References Cited

- Alabaster, J.S. 1972. "Suspended Solids and Fisheries." Proceedings of the Royal Society of London, Series B 180:395–406.
- Association of Idaho Cities. 2000. *Directory of Idaho Government Officials*. Boise, ID: Association of Idaho Cities.
- Association of Idaho Cities. 2006. *Directory of Idaho Government Officials*. Boise, ID: Association of Idaho Cities.
- BOR (Bureau of Reclamation). 2004. Aquatic Snails. Chapter 4 in *Reclamation Managing Water in the West: Biological Assessment for Bureau of Reclamation Operations and Maintenance in the Snake River Basin Above Brownlee Reservoir*. Available at: <http://www.usbr.gov/pn/programs/UpperSnake/2004ba/pdf/complete.pdf>.
- BPA (Bonneville Power Administration). 2009. *Habitat Restoration/Enhancement Fort Hall Reservation 2008 Annual Report*. Portland, OR: BPA. Document #P112652.
- Clean Water Act (Federal water pollution control act), 33 U.S.C. § 1251-1387. 1972.
- D.C. Department of Health. 2003. *District of Columbia Final Total Maximum Daily Load for Oil and Grease in Anacostia River*. Washington DC: D.C. Department of Health, Environmental Health Administration, Bureau of Environmental Quality. Available at: http://ddoe.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/fin_ana_oil_grease.pdf.
- DEQ (Idaho Department of Environmental Quality). 1998. *The Middle Snake River Watershed Management Plan*. Twin Falls, ID: DEQ, Twin Falls Regional Office.
- DEQ (Idaho Department of Environmental Quality). 1999. *The Upper Snake Rock Watershed Management Plan*. Twin Falls, ID: DEQ, Twin Falls Regional Office.
- DEQ (Idaho Department of Environmental Quality). 2000. *Lake Walcott Subbasin Assessment, Total Maximum Daily Load, and Implementation Plan*. Boise, ID: DEQ.
- DEQ (Idaho Department of Environmental Quality). 2001. *Clark Fork/Pend Oreille Sub-Basin Assessment and Total Maximum Daily Loads*. Coeur d'Alene, ID: DEQ, Coeur d'Alene Regional Office. Available at: http://www.deq.idaho.gov/media/453325-_water_data_reports_surface_water_tmdls_pend_oreille_clark_fork_clarkfork_pend_oreille_entire.pdf.
- DEQ (Idaho Department of Environmental Quality). 2005. *Lake Walcott Implementation Plan*. Twin Falls, ID: DEQ, Twin Falls Regional Office.
- DEQ (Idaho Department of Environmental Quality). 2005a. *North Fork Payette River Subbasin Assessment and Total Maximum Daily Load*. Boise, ID: DEQ.
- DEQ (Idaho Department of Environmental Quality). 2005b. *Principles and Policies for the 2002 Integrated (303(d)/305(b)) Report*. Boise, ID: DEQ.
- DEQ (Idaho Department of Environmental Quality). 2006. *The Fall Creek Total Maximum Daily Load (TMDL) of the Lake Walcott Watershed Management Plan*. Twin Falls, ID: DEQ, Twin Falls Regional Office.

- DEQ (Idaho Department of Environmental Quality). 2007. *The Rueger Springs Total Maximum Daily Load (TMDL) of the Lake Walcott Watershed Management Plan*. Twin Falls, ID: DEQ, Twin Falls Regional Office.
- DEQ (Idaho Department of Environmental Quality). 2009. *Department of Environmental Quality Working Principles and Policies for the 2008 Integrated (303[d]/305[b]) Report*. Boise, ID: DEQ.
- DEQ (Idaho Department of Environmental Quality). 2011. *Idaho's 2010 Integrated Report*. Boise, ID: DEQ.
- EIFAC (European Inland Fisheries Advisory Commission). 1980. *Water Quality Criteria for European Freshwater Fish: Report on Combined Effects on Freshwater Fish and Other Aquatic Life of Mixtures of Toxicants in Water*. Rome: Food and Agriculture Organization of the United Nations. SH 328. E85, No. 37.
- EPA (US Environmental Protection Agency). 1986. *Quality Criteria for Water 1986* [The Gold Book]. Washington DC: EPA, Office of Water Regulations and Standards.
- EPA (US Environmental Protection Agency). 2001. Fact Sheet for the City of Rockland. Boise, ID: EPA Idaho Operations Office. Available at: <http://yosemite.epa.gov/r10/water.nsf/NPDES+Permits/Current+ID1319>.
- Gammon, J.R. 1970. "The Effect of Inorganic Sediment on Stream Biota." Water Pollution Control Research Series. Washington DC: US Environmental Protection Agency. 145 pp. Water Quality 18050 DWC12/70.
- Grafe, C.S., C.A. Mebane, M.J. McIntyre, D.A. Essig, D.H. Brandt, and D.T. Mosier. 2002. *The Idaho Department of Environmental Quality Water Body Assessment Guidance*, second edition-final. Boise, ID: Idaho Department of Environmental Quality.
- Guzys, S., L. Berankiene, H. Pauliukevicius, and Z. Petrokiene. 2006. "The Variation of Nitrogen and Phosphorus in the Nevezis Affluents." *Water Management Engineering* 29(49):34–42.
- Idaho Code § 39.3611. "Development and Implementation of Total Maximum Daily Load or Equivalent Processes."
- IDAPA 58.01.02. "Idaho Water Quality Standards."
- IDFG (Idaho Department of Fish and Game). 1982. *American Falls – Snake River Fisheries Investigations*. Boise, ID: IDFG.
- IDFG (Idaho Department of Fish and Game). 1985. *Annual Report of Operations*. Boise, ID: IDFG.
- IDFG (Idaho Department of Fish and Game). 1991. *Hatchery Trout Evaluations – American Falls Reservoir Fisher Evaluations*. Boise, ID: IDFG. Study Completion Report Project F-71-R-13; Subproject V, Study II.
- IDFG (Idaho Department of Fish and Game). 2001. *Wetland Conservation Strategy for the Upper Snake River, Portneuf Drainage, and Adjacent Valleys*. Boise, ID: IDFG.
- IDWR (Idaho Department of Water Resources). 2008. *Drought Emergency Declarations*. Available at: <http://www.idwr.idaho.gov/news/drought/drought08.htm>.

- Mahler, R.L and K.E. Keith. 2000. *Idaho's Nitrate Areas of Concern*. Moscow, ID: University of Idaho, College of Agricultural and Life Sciences.
- Michigan DEQ (Department of Environmental Quality). 2005. *Total Maximum Daily Load for Biota for York Creek, Kent County, Michigan*. Lansing, MI: Michigan DEQ, Water Bureau. Available at: <http://www.deq.state.mi.us/documents/deq-wb-swas-tmdl-biota-yorkcreek.pdf>.
- MSRRWG (Middle Snake River Recreation Work Group). 1997. *Middle Snake River Recreational Opportunities at Risk*. Twin Falls, ID: MSRRWG.
- Mueller, D.K. and D.R. Helsel. 2009. *Nutrients in the Nation's Waters—Too Much of a Good Thing?* US Geological Survey Circular 1136. Available at: <http://pubs.usgs.gov/circ/circ1136/circ1136.html#PHOS>.
- Murphy, S. 2007. "General Information on Phosphorus." Boulder, CO: Boulder Area Sustainability Information Network. Available at: <http://bouldercommunity.net/basin/data/BACT/info/TP.html>.
- NPCC (Northwest Power and Conservation Council). 2004. Biological Resources Limiting Factors. Section 3 in *Upper Snake Province Assessment*. Available at: <http://www.nwcouncil.org/fw/subbasinplanning/uppersnake/plan/Assessment/3LimitingFactors.pdf>.
- NRCS (Natural Resources Conservation Service). 2006. *Lake Walcott – 17040209: 8 Digit Hydrologic Unit Profile*. NRCS.
- PCSCD (Power County Soil Conservation District), West Cassia Soil and Water Conservation District, East Cassia Soil Conservation District, Minidoka Soil and Water Conservation District, Natural Resources Conservation Service, Idaho Soil Conservation Commission, and Idaho Association of Soil Conservation Districts. 2001. *Lake Walcott Total Maximum Daily Load (TMDL) Agricultural Implementation Plan*. Boise, ID: Prepared for the Idaho Department of Environmental Quality.
- TRPA (Tahoe Regional Planning Agency). 1987. Water Quality Control. Chapter 81 in *Code of Ordinances*. Stateline, NV: TRPA. Available at: <http://www.trpa.org/documents/docdownlds/ordinances/COCh81.pdf>.
- US Census Bureau. 2011. "State and County QuickFacts: Idaho." Available at: <http://quickfacts.census.gov/qfd/states/16000.html>.
- USFWS (US Fish and Wildlife Service). 1995. *Snake River Aquatic Species Recovery Plan*. Boise, ID: USFWS.
- Vohs, P., I. Moore, and J. Ramsey. 1993. *A Critical Review of the Effects of Turbidity on Aquatic Organisms in Large Rivers*. Report by Iowa State University, Ames, Iowa, for the U.S. Fish and Wildlife Service, Environmental Management Technical Center, Onalaska, Wisconsin. EMTC 93-s002. 139 pp.
- Water Quality Act of 1987, Public Law 100-4. 1987.
- WCED (World Commission on Environment and Development). 1987. *The Brundtland Commission: Our Common Future*. New York: Oxford University Press.

This page intentionally left blank for correct double-sided printing.

Appendix A. Designated Management Agency Report of Implementation Activities and Effectiveness

This appendix provides websites for implementation activities that may have been done (or will be done) by designated land management agencies.

Nonpoint Source Industries

- **Private landownership: Private individuals and owners and Idaho Soil Conservation Commission (ISCC)**
 - **ISCC**—*Lake Walcott Total Maximum Daily Load (TMDL) Agricultural Implementation Plan* (December 2001): http://www.deq.idaho.gov/media/449735-lake_walcott_ag_imp_plan.pdf
 - **ISCC**—*Idaho Agricultural Pollution Abatement Plan* (March 2003): <http://scc.idaho.gov/PDF/AgPlan.pdf>
 - **ISCC**—*Idaho Agricultural Best Management Practices: A Field Guide for Evaluating BMP Effectiveness* (October 2003): <http://scc.idaho.gov/PDF/BMPEffectivenessGuidanceDocument.pdf>
- **Public lands grazing: Bureau of Land Management (BLM), US Forest Service (USFS)**
 - **BLM**—*Idaho Standards for Rangeland Health and Guidelines for Livestock Grazing Management* (August 1997): <http://www.blm.gov/pgdata/etc/medialib/blm/id/publications.Par.91993.File.dat/SGFinal.pdf>
 - **USFS**—*Idaho Forestry Best Management Practices: Compilation of Research on Their Effectiveness* (October 1996): http://www.fs.fed.us/rm/pubs_int/int_gtr339.pdf
- **State lands grazing: Idaho Department of Lands (IDL)**
 - **IDL**—*Best Management Practices for Mining in Idaho* (addresses surface mining) (November 1992): http://www.idl.idaho.gov/bureau/Minerals/bmp_manual1992/bmp_index.htm
 - **IDL**—“Rules Pertaining to the Idaho Forest Practices Act:” <http://adminrules.idaho.gov/rules/current/20/0201.pdf>
 - **IDL**—*Forest Practices Cumulative Watershed Effects Process for Idaho* (March 2000): <http://www.idl.idaho.gov/Bureau/ForestAssist/CWE-Combined.pdf>
- **Forestland: USFS**
 - **Idaho Forest Products Commission**—“Forestry for Idaho: Forest Stewardship Guidelines for Water Quality” (Best Management Practices): <http://www.idahoforests.org/bmps.htm>
 - **USFS**—*Idaho Forestry Best Management Practices: Compilation of Research on Their Effectiveness* (October 1996): http://www.fs.fed.us/rm/pubs_int/int_gtr339.pdf
 - **USFS**—Sawtooth National Forest website: <http://www.fs.fed.us/r4/sawtooth/>

- **Recreation: BLM, USFS, private individuals, and state and federal departments of parks and recreation**
 - **USFS**—Sawtooth National Forest recreation web page:
<http://www.fs.usda.gov/recmain/sawtooth/recreation>
 - **BLM**—Bureau of Land Management recreation web page:
<http://www.blm.gov/id/st/en/prog/recreation.html>
 - **BLM**—Shoshone Field Office recreation sites and activities web page:
http://www.blm.gov/id/st/en/fo/shoshone/recreation_sites_.html
 - **BLM**—Burley Field Office recreation sites and activities web page:
http://www.blm.gov/id/st/en/fo/burley/recreation_sites_.html
 - **BLM**—Jarbidge Field Office recreation sites and activities web page:
http://www.blm.gov/id/st/en/fo/jarbidge/recreation_sites_.html

Point Source Industries

- **Municipalities and Industrial Plants—Via their US Environmental Protection Agency (EPA) NPDES permits**
 - **EPA**—Current NPDES permits in Idaho:
<http://yosemite.epa.gov/r10/water.nsf/NPDES+Permits/Current+ID1319>
 - **EPA**—Draft NPDES permits for Idaho dischargers:
<http://yosemite.epa.gov/r10/WATER.NSF/NPDES+Permits/DraftPermitsID>