Response to EPA Review Comments and Addendum to the Portneuf River TMDL

In the text that follows, EPA's comments (July 1999) to DEQ appear in *italics*, followed by DEQ's response. It is DEQ's intent that this entire document becomes an addendum to the Portneuf River Total Maximum Daily Load (TMDL) plan submitted 1 April 1999, to provide clarification and additional information as needed to complete that document for EPA approval.

New wasteloads are not in addition to target loads as specified at USGS surface-water stations, but are a part of the target load. In other words, the proposed wasteload allocations for Lava Hot Springs and Inkom sewage treatment plants and Batise Springs Trout Farm are already included in the target loads at Topaz, Pocatello, and Tyhee gage sites, respectively.

Pollutant allocations are based on data of varying levels of completeness. Some data used for pollutant allocations are dated (e.g., greater than 10 years old) and do not include sufficient resolution to definitively quantify existing loads. As data associated with wasteload and load allocations are not complete, allocations may be revised as new information is gathered. This new information will allow more accurate load and wasteload allocations. The Portneuf River TMDL will be revised based on analysis of data collected until September 2003, and any new information not currently considered in the TMDL. New load and wasteload allocations will be submitted for EPA approval in July 2004 according to the proposed plan as outlined in Appendix Table 1.

A TMDL plan is written to provide a framework to attain or maintain beneficial uses associated with a particular waterbody. Thus, the ultimate goal of any TMDL, including the implementation plan, is not necessarily to meet load and wasteload allocations but to support beneficial uses. Only through monitoring can progress toward beneficial use support be determined. Adaptive management allows a mechanism in which to implement changes (e.g., best management practices) and monitor results in terms of improvements in support of beneficial uses. Success of implemented changes can be part of a "feedback loop" to potentially guide further changes toward support of beneficial uses.

Phase II of the NPDES Storm Water Regulations will require the Pocatello-Chubbuck urban area to apply for an NPDES permit for stormwater. Therefore, all load allocations previously assigned to urban stormwater from Pocatello-Chubbuck should be considered wasteload allocations.

General Comments:

A summary table summarizing loading allocations for all pollutants is needed.

Table ES (TMDL, page 3) provides a summary of load allocations for all pollutants. Following is a new table (Table Add-1) summarizing wasteload allocations for point sources in the Portneuf River.

Table Add-1 includes a sliding scale of wasteload allocations for nutrients at various discharge regimes. Discharge was adjusted based on NPDES permits which may allow for a future flow greater than current discharge. Changes in wasteload allocation differences are wholly dependent on flow, target concentrations remain the same.

Wasteload Allocation Summary

Table Add-1. Wasteload allocations for NPDES-permitted dischargers in the Portneuf River.

NPDES permit holder[1]	Flow[2] (mgd)	Fecal coliform (FC)/*E. coli (Ec)* (CFU/100 ml)		Oil and grease (tons/ yr)	Total suspended solids (mg/l)			Total inorganic nitrogen (tons/yr)	Total phos-phorus (tons/yr)
		FC 30-day geomean	*Ec* 30-day number		Daily max[3]	7-day avg[4]	30-day avg		
BSTF	20.81				10		5	5.08	2.22
	22.2							5.42	2.37
Poky STP	6.01	200	8.60×10^{11}			45	30	2.76	0.69
	8							3.66	0.92
	10							4.58	1.14
	12							5.49	1.37
Storm water[5]	17.2			38				5.1	1.3
FMC IWW	2.09						10	0.96	0.24
	2.27							1.04	0.26
	3.07							1.41	0.35
Inkom STP	0.105	50	1.50×10^{10}				52	0.07	0.13
LHS STP[6]	0.191	50	1.55×10^{10}			45	30	0.02	0.03

[1]Poky=Pocatello, STP=sewage treatment plant, IWW=Industrial Waste Water ditch, LHS=Lava Hot Springs, BSTF=Batise Springs Trout Farm

[2]first flow is current flow, following flows are intermediate or NPDES permitted flows, mgd=million gallons per day

[3]max=maximum

[4]avg=average

[5]flow is estimated annual runoff converted to cfs

[6]flow is average flow per discharge

Reasonable Assurance:

There is not enough detail to ensure non-point source reductions will occur.

We acknowledge that there is a lack of detail about actions to be taken to control non-point sources in the TMDL but note that neither the law (Clean Water Act [CWA] section 303(d)) nor EPA's current rules mention reasonable assurance. We understand that EPA's lack of CWA authority over non-point sources causes consternation and a desire for assurances from the state. We maintain that all the assurance EPA can reasonably expect prior to implementation planning, and all which we can offer at this time, is provided by the state's Non-point Source (NPS) control program.

Idaho has developed a new Non-point Source Management Plan which covers our authorities, funding mechanisms, and interaction with other agencies to control non-point sources. This plan, dated December 1999, has been approved by EPA and is available on DEQ's web page (http://www2.state.id.us/deq/water/nps/nps.htm). We note that DEQ is obligated under state law to work with other state agencies identified as "designated management agencies" (DMAs). The DMAs have lead responsibility in the control of specific types of non-point source pollutants. These relationships are spelled out in Idaho's NPS Management Plan.

Further detail, such as a specific schedule of actions and applications for funding, must wait until we have had a chance to work with these other agencies and affected stakeholders in the watershed to develop an implementation plan based upon approved load and wasteload allocations. The state is committed to developing such an implementation plan within 18 months following EPA approval of the TMDL. In the case of the Portneuf, implementation planning has proceeded during EPA's deliberation on our April 1999 submittal.

For EPA information, DEQ is submitting as an attachment to this addendum, Chapter 4.0 "Management Actions and Implementation." Chapter 4.0 has been developed through significant efforts by Portneuf River subbasin stakeholders and is submitted as a supplement to the Final TMDL Plan for the Portneuf River. This document provides a framework for wasteload and load allocation refinement and implementation planning.

Clearly, implementation will require funding, but DEQ cannot guarantee funding. We can and will assist in identifying to responsible parties those funding sources available for non-point source control. These sources may be of state, federal, or possibly even private origin. We trust you will work with us to secure adequate funding.

Bacteria:

As of 5 April 2000, the state standard for bacteria changed from measuring fecal coliform to *E. coli*. The geometric mean standard for 5 samples taken every 3 to 5 days over a 30-day period is not to exceed 126 *E. coli* organisms per 100 ml for both primary and secondary contact recreation. A single sample that exceeds 406 *E. coli* organisms per 100 ml for primary contact recreation or 576 *E. coli* organisms per 100 ml for secondary contact recreation acts as a trigger for further sampling to determine violation of the geometric mean standard. In addition to changing the basis of the standards, the seasonality component of primary and secondary contact recreation has been removed. In other words, if a waterbody is designated for primary contact recreation, that standard applies at all times of the year.

To be in line with state standards, load and wasteload allocations will be set on the new standards. Moving to the new standards also facilitates sampling protocol for those entities monitoring water quality in the Portneuf River subbasin.

- *Load capacity and load allocation are stated as water quality standard rather than mass-per-unit-time.*

Water quality standards for bacteria apply regardless of flow condition. Examples of daily allocation of *E. coli* required to meet state water quality standards for primary contact recreation at various flows at Pocatello and Topaz USGS surface-water station sites are found in Table Add-2.

Table Add-2. Load allocations of *E. coli* at Pocatello and Topaz USGS gage sites.

Site	State water quality standard (geomean - CFU/100 ml)	May (1913-1998) average flow (cfs)	Load allocation (CFU/day)	August (1913-1998) average flow (cfs)	Load allocation (CFU/day)
Pocatello	126	528	1.63×10^{12}	95.8	2.95×10^{11}
Topaz	126	350	1.08×10^{12}	176	5.43×10^{11}

- *Load capacities, reductions, etc., do not address secondary standards.*

As part of recent changes in state water quality standards for bacteria, seasonality in streams has been eliminated. Streams, such as Portneuf River, which are listed for primary contact recreation are expected to meet such standards throughout the year. Regardless, although bacteria data collected from October to April in the Portneuf River

are limited, fecal coliform information collected since 1989 from various sources (Southeastern District Health Department, USGS, DEQ) did not indicate secondary contact recreation violations (TMDL, page 90 and Appendix C).

- *No load allocations given to tributaries.*

State water quality standards for bacteria apply to all waters of the state regardless of their presence on the 303(d) list. Some information on tributaries is more than 10 years old and only includes instantaneous measurements. Therefore, load allocations for all tributaries, as measured at their confluence with the Portneuf River, are set at the new state water quality standard for *E. coli*: a geometric mean for 5 samples taken every 3 to 5 days over a 30-day period shall not exceed 126 *E. coli* organisms per 100 ml.

- *Load allocations set at a coarse scale.*

No information was found to indicate the specific contribution of bacteria by land use in the Portneuf River subbasin. We agree that monitoring is needed to establish sources of input of bacteria into the mainstem Portneuf River. Again, a monitoring plan falls under the implementation phase of the TMDL which follows approval of the subbasin assessment and loading analysis.

- *Seasonal variation and critical conditions not considered.*

The new water quality standard for bacteria does not consider seasonality. However, in the case of the Portneuf River, which must now meet the primary/secondary contact recreation standard all year round, the new standard is more restrictive of bacterial input.

- *No wasteload allocations are established for any point source.*

As mentioned in the TMDL on page 92, there is no indication that sewage treatment plants (STPs) are significant contributors to bacteria problems in the Portneuf River. NPDES permit requirements for fecal coliform for Inkom and Lava Hot Springs (LHS) are average 30-day geomean and maximum 7-day geomean of 50 and 100 colonies/100 ml, respectively. Pocatello's NPDES permit for fecal coliform limits the STP to a geometric mean not to exceed a weekly or monthly average of 200 colonies/100 ml. The STPs are complying with their NPDES permit limits for fecal coliform. Wasteload allocations based on the *E. coli* geometric mean limit of 126 *E. coli* per 100 ml over a 30-day period and average monthly flows are presented in Table Add-3. Flows are based on Discharge Monitoring Reports (DMRs) for Inkom and Pocatello STPs (Appendix Table 2). Lava Hot Springs does not discharge on a regular basis. The STP land applies their effluent from 1 May to 1 October so input to the Portneuf River results from accumulation of seven months of effluent. From 1996 to 2000 NPDES Discharge Monitoring Reports, it appears that the LHS STP discharged to the Portneuf River at two

times per year for four of the five years and three times per year once in the five-year span. Therefore, number of discharge events per year is 2.2 ([2+2+2+2+3]/5). Average flow when discharging is about 191,000 million gallons/day for 17 days (Tony Hobson, City of Lava Hot Springs, personal communication).

Table Add-3. Wasteload allocations of *E. coli* at Lava Hot Springs, Inkom, and Pocatello sewage treatment plants.

STP	NPDES 30-day mean limit (geomean - CFU/100 ml)	Flow period	Average flow (cfs)	Wasteload allocation (CFU/30 days)
Lava Hot Springs	126	Per discharge	0.17	1.55×10^{10}
Inkom	126	Jan-Dec	0.16	1.50×10^{10}
Pocatello	126	Jan-Dec	9.30	8.60×10^{11}

Nutrients:

- *No assimilative capacity or allocations set for waterbodies listed for nutrients.*

On page 134 in the TMDL, it is mentioned that the tributaries listed for nutrients would have the same targets of 0.3 mg/l of total inorganic nitrogen (TIN) and 0.075 mg/l of total phosphorus (TP) as recommended at the USGS surface-water stations. Hawkins Reservoir was assigned a target concentration of 25 μg/l, or 0.025 mg/l TP (TMDL, page 135). Additional information is needed from tributaries and is presently being collected by the Idaho Association of Soil Conservation Districts. Though already underway, this follow-up monitoring falls under the implementation phase of the TMDL which officially begins with EPA approval of the subbasin assessment and loading analyses.

Until more data are gathered from which to identify definitive load reductions for non-point sources, and in some cases refinement of wasteload allocations for point sources above Pocatello gage, reductions of nutrient input will be the same as recommended at the USGS gaging stations (see Table Add-4).

Table Add-4. Percent reduction in nutrients at Tyhee, Pocatello, Marsh Creek, and Topaz USGS gage sites.

USGS gage site	Non-point input sources[1]	Other sources	Percent reduction - total inorganic nitrogen[2]	Percent reduction - total phosphorus[2]
Tyhee	all sources above Tyhee gage & below Pocatello gage	NPDES dischargers, stormwater, springs	86	81
Pocatello	all sources above Pocatello gage & below Marsh Creek & Topaz gages	NPDES dischargers	66	39
Marsh Creek	above Marsh Creek gage		66	33
Topaz	above Topaz gage	NPDES dischargers	50	15

[1]does not include non-point sources for which a specific load has been identified (e.g., springs, stormwater)
[2]percentages from TMDL, Table ES

- *Phosphorus target for the Portneuf River may not be adequately protective.*

We believe the selected phosphorus target will meet Idaho's narrative criteria for nutrients applicable to the Portneuf River. Our rationale is presented in the TMDL. The selected target represents a dramatic reduction from current phosphorus loads. It is possible the target concentration for phosphorus may be adjusted based on future information. However, reduction of phosphorus loads should begin forthwith, even though there may be uncertainty as to ultimate magnitude of reductions needed. Should future information indicate need for a more stringent phosphorus target, the TMDL will be revised accordingly.

- *Critical conditions and time periods not identified or discussed.*

The critical period for nutrients in terms of affecting beneficial uses in the Portneuf River is late summer (late July, August, early September). Nutrients promote growth of aquatic vegetation which usually is at highest density in late summer - a time of high demand by river recreationists. Summer also means warmer water temperatures, and because saturation levels of gases decline as temperature increases, decreased concentrations of dissolved oxygen result. These conditions stress aquatic biota when oxygen levels are low and respiration of dense aquatic vegetation pushes dissolved oxygen concentrations lower. Jim Brock (1989; personal communication) in his work for the City of Pocatello

has verified exceedances of state water quality standards for dissolved oxygen (less than 6 mg/l) in the lower Portneuf River.

It was mentioned on page 128 in the TMDL that nutrient input from the Portneuf River contributes to problems in American Falls Reservoir also listed on the 303(d) list. Nitrogen and phosphorus levels are high in the Portneuf River in winter - a time when growth of organic matter is slowest. However, some plant/algae growth does occur during colder periods of the year (often dependent on turbidity and subsequent light availability) resulting in uptake of both nitrogen and phosphorus. Phosphorus is also subject to sorption by particulate matter. Thus, nitrogen and especially phosphorus, although entering the stream at a time of low growth, may still be bioavailable months later in the summer - a time of high growth for plants and algae.

In addition, uneasiness exists, centered around lack of site-specific knowledge, associated with recommendation of any target concentration for nutrients. Establishing target concentrations based on seasonality only adds to that discomfort. Because of downstream effects, uncertainty associated with seasonality, and likely storage and lag in bioavailability, we believe that year round loading of nutrients is critical and have thus prescribed annual load reductions.

- *No wasteload allocations set for some point sources.*

Minimal information was available on nutrient input by point sources other than FMC IWW ditch and Pocatello Sewage Treatment Plant. Other NPDES-permitted dischargers have not routinely sampled for nutrients as part of their NPDES permit requirements. A one-time sampling event of Lava Hot Springs Sewage Treatment Plant effluent destined for land application (28 Sept 99, City of Lava Hot Springs, personal communication) showed the following concentrations of nitrogen: nitrate:N, 1.1 mg/l; nitrite:N < 0.1 mg/l; and, ammonia:N, 0.22 mg/l. Ignoring nitrite which was below detection limit, total inorganic nitrogen was 1.32 mg/l. Total phosphorus for this event measured 1.3 mg/l. No data were available for Inkom STP, so the same concentrations as measured at LHS STP were used for Inkom STP. Based on a discharge of 0.105 and 0.034 million gallons/day, Inkom and Lava Hot Springs, respectively, the estimated annual contributions in tons are in Table Add-5.

Table Add-5. Estimated annual load of nutrients from Inkom and Lava Hot Springs STPs into the Portneuf River, and estimated contributions of those loads to total loads at downstream USGS gage sites.

STP	Total inorganic nitrogen (tons/yr)	TIN contribution at downstream gage	Total phosphorus (tons/yr)	TP contribution at downstream gage
Inkom	0.21	0.1%	0.21	0.6%
Lava Hot Springs	0.04	< 0.1%	0.04	0.2%

The percentage contribution to loads at downstream gages was figured at Pocatello gage for Inkom and Topaz gage for Lava Hot Springs. The load of TIN and TP from the two STPs are already considered part of the target loads at the Topaz and Pocatello gages (Table Add-5). Target reductions at the Pocatello gage are 66% for TIN and 39% for TP. At the Topaz gage, target reductions are 50% for TIN and 15% for TP. Applying the percent reduction of TIN and TP at the Pocatello gage site for the Inkom STP results in a wasteload allocation of 0.07 tons/year TIN and 0.13 tons/year TP (Table Add-1). For LHS STP, wasteload allocations based on percent reductions at Topaz gage site are 0.02 tons/year TIN and 0.03 tons/year TP (Table Add-1).

As part of their monitoring effort in the lower Portneuf River, the City of Pocatello has been collecting nutrient information from above and below Batise Springs Trout Farm (BSTF) since January 1998 (Jim Brock, personal communication; Appendix Table 3). BSTF has also sampled for nutrients, mostly total phosphorus, beginning in May 00 (Appendix Table 4). Combining results of the two sampling efforts by averaging monthly concentrations, average net discharge from the hatchery is 0.157 mg/l of TIN and 0.065 mg/l of TP. Based on these concentrations, estimated annual wasteload for total inorganic nitrogen is 4.97 tons/year and 2.07 tons/year for total phosphorus. Recommended target concentrations for wasteload allocations are 0.16 mg/l TIN and 0.07 mg/l TP. Using expected hatchery flows (Appendix Table 2), wasteload allocations for Batise Springs Trout Farm are 5.42 tons/year for total inorganic nitrogen and 2.37 tons/year for total phosphorus (Tables Add-6 and Add-1).

Table Add-6. Wasteload allocations for total inorganic nitrogen and total phosphorus at Batise Springs Trout Farm.

Period	Flow (mgd)	Total inorganic nitrogen		Total phosphorus	
		Target (mg/l)	Wasteload allocation (tons/yr)	Target (mg/l)	Wasteload allocation (tons/yr)
Current	20.81	0.16	5.08	0.07	2.22
Expected	22.2	0.16	5.42	0.07	2.37

As data are limited, there is a need to monitor permitted discharges, especially Inkom and Lava Hot Springs sewage treatment plants to determine actual nutrient contributions to the Portneuf River. Results from this monitoring will determine any needed future modifications in wasteload allocations.

- *Wasteload allocations are in tons/year.*

As noted above with regard to critical conditions (page 7), some nutrient information suggests there is significant storage and a lag in bioavailability which makes annual loading more relevant than shorter term loads. We believe that while wasteload allocations could be established on a tons/month basis, enough flexibility should remain in meeting the monthly allocation just so long as total allocation for the year is not exceeded.

- *No link between concentration target in Hawkins Reservoir and achieving dissolved oxygen criteria.*

This is true. Data from Hawkins Reservoir are limited and as such there is a need to monitor the Reservoir to establish, if possible, such a link. At this time it is mere speculation that the two observed dissolved oxygen criteria exceedances are related to nutrient over-enrichment as opposed to reservoir drawdown, winter ice-over conditions, or combination of the two.

Sediment:

- *There is no explanation as to why suspended sediment targets only apply seasonally.*

This is a misunderstanding of our sediment targets. Two targets are specified, one or the other of which applies at all times; which one applies depends on the runoff season. As mentioned in the TMDL (Page 108), concentrations of suspended solids of 80 mg/l or

less should support good to moderate fisheries. Knowing that naturally higher sediment loads are observed during spring runoff, it makes sense to have a seasonal adjustment to the recommended targets. Thus, the higher target concentration of 80 mg/l during the historic spring runoff period allows for normal seasonal increases in suspended sediment while still within concentrations needed to maintain good to moderate fisheries. During periods of lower flows, the target concentration is lowered to 50 mg/l to further enhance and protect fisheries. These targets can be adjusted as additional information is collected.

- *Load allocations are not clearly defined, and for listed tributaries there appear to be no load allocations.*

Load allocations for those points (i.e., USGS gages) at which data were sufficient to develop such allocations are presented in Table 52 (TMDL, page 109). For tributaries, suspended sediment and flow data are limited such that establishment of an annual load would be little more than guesswork. Consequently, it was recommended that those tributaries identified as having sediment problems meet both targets for suspended sediment concentration and depth fines (TMDL, pages 112 and 115, respectively). Presently, the Idaho Association of Soil Conservation Districts is collecting flow and suspended sediment concentrations on Portneuf River tributaries which should eventually allow for identifying load allocations on the monitored tributaries and prioritizing non-point source control actions. In addition, DEQ during summer 2000 initiated depth fines sampling on 303(d)-listed tributaries in the Portneuf River subbasin.

- *Point source loading is not characterized in the TMDL, nor are wasteload allocations incorporated into the TMDL.*

Table 56 (TMDL, page 114) shows total suspended solids (TSS) data from Discharge Monitoring Reports (Nov 97 to Dec 98) submitted by Lava Hot Springs, Inkom, and Pocatello sewage treatment plants and Batise Springs Trout Farm. Only Inkom STP had an average monthly TSS concentration greater than 50 mg/l (52 mg/l for only 1 month). This measurement, however, was for total suspended solids whereas the target concentration of 50 mg/l is for suspended sediment. It is unknown what percentage of the TSS measurement is suspended sediment. Other than this one month, TSS concentrations were below the suspended sediment targets at all times. Until more information is gathered to indicate sediment problems originating from Pocatello and Lava Hot Springs sewage treatment plants and Batise Springs Trout Farm, wasteload allocations are set at current permit levels for discharge of total suspended solids: 7-day average not to exceed 45 mg/l and a 30-day average not to exceed 30 mg/l for the STPs; and, monthly average not to exceed 5 mg/l with the daily maximum no greater than 10 mg/l for Batise Springs Trout Farm.

For Inkom STP, NPDES permit levels for total suspended solids are maximum 7-day and 30-day averages of 105 and 70 mg/l, respectively. These permit levels could exceed

suspended sediment targets of not more than 80 mg/l, 14-day average, during high flows or 50 mg/l, 28-day average, during low flows. Therefore, the recommended wasteload allocation for Inkom STP is not to exceed a monthly average of 52 mg/l total suspended solids. It is expected this allocation for total suspended solids will meet both high and low flow suspended sediment targets. More information on percentage of total suspended solids represented by suspended sediment will allow a more accurate wasteload allocation.

Limited sampling of the FMC IWW ditch discharge found an average total suspended solids concentration of less than 5 mg/l (Bechtel Environmental, Inc. 1994). No restrictions for total suspended solids are included in FMC's NPDES permit. Therefore, a wasteload allocation for the FMC IWW ditch of total suspended solids not to exceed a monthly average of 10 mg/l is recommended. At present discharge levels for total suspended solids, FMC can meet this allocation along with high and low flow targets for suspended sediment.

Literature Cited:

Bechtel Environmental, Inc. 1994. Remedial investigation/feasibility study for the Eastern Michaud Flats Site: Volume III, preliminary site characterization summary. Report to FMC Corporation and J. R. Simplot Company, Pocatello, Idaho.

Brock, J. T. 1989. Assessment of possible effects of Pocatello's treated wastewater on the biology and chemistry of the Portneuf River: section 2, summary of findings and conclusions. Report of City of Pocatello, Idaho to U. S. Environmental Protection Agency, Seattle, Washington.

Appendix Table 1. Proposed implementation plan for the Portneuf River Total Maximum Daily Load plan.

Date	Activity	Stakeholders	State of Idaho	City of Pocatello
Jan 2001	TMDL Revised to Include the Proposed Implementation Plan with this Timeline		$X_{(Lead)}$	
Feb 2001	**Existing Monitoring Program Assessed/Expanded** 1. Define Monitoring Goals and Objectives (all stakeholders) (Example - What is the background phosphorus concentration in the Portneuf River drainage?) 2. Define Frequency of Sampling 3. Define Analytical Methods to Assess Data 4. Define Sampling Locations	X	X	$X_{(Lead)}$
Mar 2001/ Sep 2003	Collect Water Quality Data	X	X	$X_{(Lead)}$
Feb 2001/ Sep 2004	**Planning for Potential Upgrade** (Feasibility Study to meet current TMDL limits and/or other potential limits; identification of available technology, actual cost, cost to rate payers) This will be necessary for the development of a adequate compliance schedule once the Portneuf River TMDL is re-issued.			$X_{(Lead)}$
Mar 2001/ Mar 2004	Data Analysis / Pollutant Loading Analysis	X	$X_{(Lead)}$	X
Apr 2004	Completion of Refined Allocations for Portneuf River TMDL		$X_{(Lead)}$	
May/Jun 2004	Public Notice and Comment on New TMDL Allocations		$X_{(Lead)}$	
Jul 2004	Loading Analysis and Load Allocations Submitted to EPA for Review and Approval		$X_{(Lead)}$	
Sep 2004	Existing Permit Limits for City of Pocatello Expire - New WLAs/Effluent Limits Ready to be Incorporated into New Permit	EPA Administrative Action		

Appendix Table 2. Flows at NPDES-permitted discharges.

Site	Data source	Average daily flow per month (mgd)												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
BSTF	DMR[1]	20.66	20.81	20.81	20.81	20.81	20.6	20.42	20.51	20.44	20.64	20.64	22.6	20.81
	Expected	22.6	22.6	22.6	22.6	22.6	21.0	21.0	21.0	22.6	22.6	22.6	22.6	22.2
Poky	DMR	5.46	4.74	5.73	6.15	6.24	3.78	6.4	7.84	5.51	6.86	6.75	6.65	6.01
	Permit maximum	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
FMC	DMR	2.18	2.35	2.40	2.42	1.91	1.87	2.00	1.90	2.07	1.85	1.99	2.14	2.09
	Permit average	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27
	Permit maximum	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07	3.07
Inkom	DMR[2]	0.107	0.110	0.102	0.103	0.108	0.097	0.108	0.105	0.103	0.105	0.105	0.105	0.105

[1]Feb-May flows not reported so average of Jan and Jun-Sep flows used
[2]Oct-Dec flows based on average of Jan-Sep flows

Appendix Table 3. Concentrations of total inorganic nitrogen and total phosphorus above and below Batise Springs Trout Farm (City of Pocatello, Jim Brock, personal communication).

Date	Site	Nitrate/nitrite (mg/l)[1]	Ammonia (mg/l)	Total inorganic	Total phosphorus
15 Jan 98	Above	4.00	0.55	4.55	1.70
	Below	3.80	0.77	4.57	1.60
30 Apr 98	Above	5.26	0.93	6.19	3.40
	Below	5.20	0.96	6.16	3.20
21 May 98	Above[2]	5.30	1.20	6.50	3.05
	Below	5.20	1.30	6.50	3.00
25 Jun 98	Above	7.10	1.70	8.80	
	Below	6.83	1.70	8.53	
23 Jul 98	Above	2.46	0.10	2.56	0.39
	Below	2.48	0.31	2.79	0.36
6 Aug 98	Above	2.64	0.13	2.77	0.34
	Below	2.46	0.23	2.69	0.41
23 Sep 98	Above	3.51	0.41	3.92	
	Below	3.62	0.51	4.13	
25 Oct 98	Above	3.70	0.31	4.01	0.91
	Below	3.80	0.34	4.14	0.91
12 Jan 99	Above[3]	2.81	0.04	2.83	0.77
	Below[3]	2.82	0.04	2.84	0.80
26 Feb 99	Above	3.64	0.30	3.94	1.38
	Below	3.75	0.57	4.32	1.42
15 Apr 99	Above[3]	0.76	0.04	0.78	0.17
	Below[3]	0.78	0.04	0.80	0.15
16 Apr 99	Above	3.85	0.20	4.05	2.01
	Below[3]	3.79	0.04	3.81	2.02

Date	Site	Nitrate/nitrite (mg/l)[1]	Ammonia (mg/l)	Total inorganic	Total phosphorus
6 May 99	Above	4.33	0.38	4.71	3.32
	Below	4.42	1.13	5.55	3.44
3 Jun 99	Above	5.40	1.00	6.40	4.08
	Below	5.44	1.10	6.54	4.28
15 Jul 99	Above[3]	2.28	0.10	2.33	0.25
	Below	2.25	0.20	2.45	0.31
10 Aug 99	Above[3]	2.09	0.10	2.14	0.17
	Below	2.01	0.10	2.11	0.20
23 Sep 99	Above	2.76	0.20	2.96	0.70
	Below	2.66	0.30	2.96	0.86
19 Oct 99	Above	3.03	0.20	3.23	0.97
	Below	3.01	0.30	3.31	0.98
3 Nov 99	Above	3.14	0.20	3.34	1.10
	Below	3.14	0.30	3.44	1.05
1 Dec 99	Above	3.17	0.20	3.37	1.10
	Below	3.18	0.30	3.48	1.28
12 Jan 00	Above	2.98	0.20	3.18	1.09
	Below	2.99	0.30	3.29	1.04
8 Feb 00	Above	2.94	0.10	3.04	1.05
	Below	2.92	0.20	3.12	1.09
3 Mar 00	Above	3.76	0.40	4.16	2.64
	Below	3.79	0.50	4.29	2.51
5 Apr 00	Above	3.60	0.20	3.80	2.00
	Below	3.60	0.30	3.90	2.17
3 May 00	Above	3.31	0.20	3.51	1.86
	Below	3.29	0.30	3.59	2.17

Date	Site	Nitrate/nitrite (mg/l)[1]	Ammonia (mg/l)	Total inorganic	Total phosphorus
14 Jun 00	Above[3]	2.03	0.10	2.08	0.28
	Below	1.89	1.40	3.29	0.63
12 Jul 00	Above[3]	1.85	0.10	1.90	0.07
	Below	1.82	0.20	2.02	0.14
10 Aug 00	Above[3]	2.10	0.10	2.15	0.07
	Below	2.00	0.20	2.20	0.17

[1]nitrate and nitrite analyzed separately until Oct 98, any nitrite concentration less than minimum detection limit considered 0.0 mg/l

[2]represents average of two samples

[3]ammonia level below detection limit so half of limit (number shown) used for analysis

Appendix Table 4. Concentrations of total inorganic nitrogen and total phosphorus above and below Batise Springs Trout Farm (Andy Rowland, Batise Springs Trout Farm, personal communication).

Date	Site	Nitrate/nitrite (mg/l)	Ammonia (mg/l)	Total inorganic	Total phosphorus
26 Apr 00	Above				2.440
	Below				2.307
28 Jun 00	Above				0.088
	Below				0.163
12 Jul 00	Above[1]	2.03	0.05	2.055	0.067
	Below	2.00	0.13	2.13	0.128
26 Jul 00	Above				0.061
	Below				0.104
17 Aug 00	Above				0.124
	Below				0.086
13 Sep 00	Above				0.065
	Below				0.108

[1]ammonia level below detection limit so half of limit (number shown) used for analysis

Supplement to Final TMDL Plan for the Portneuf River

4.0 Management Actions and Implementation

Revised 23 February 2001

TABLE OF CONTENTS

4.0 MANAGEMENT ACTIONS AND IMPLEMENTATION

4.1 Introduction

This section, which represents the coordinated effort of many groups and stakeholders, describes an implementation strategy intended to enable the Portneuf River to attain its beneficial uses. As with many complex resource management issues, because key data are not yet available to realize multiple goals with a singular, deductive plan, we will apply an adaptive management process in order to facilitate a phased-implementation of the TMDL.

The Portneuf River implementation goals include:

- Pollution reduction so the water quality limited segments (WQLS) of the Portneuf River will attain its beneficial uses.
- Water quality improvement to allow removal from the 303 (d) list
- Soil conservation by reducing soil erosion and sediment delivery throughout forest, range, urban, and agricultural lands within the subbasin.
- Fish and wildlife habitat improvement.
- Streambank revegetation promotion to increase filtering capabilities of the riparian area and create shade to lower water temperatures.
- Attenuation of urban nonpoint source pollution by educating citizens about pollution prevention and erosion control as well as integrating other aspects of storm-water control.
- Stakeholder involvement throughout the subbasin in TMDL program implementation
- Stakeholder education in river ecology, modeling, and other applicable topics.
- Program design and implementation with an eye towards cost-effectiveness.

4.2 The Phased Implementation Process

When faced with a complex problem where little information is known, a phased implementation approach is the logical choice (USEPA 1991). The Portneuf River subbasin provides an excellent opportunity both to put into action an adaptive management process that will take advantage of information already known and allow stakeholders to begin the cleanup process without waiting for further studies. The appeal of the adaptive management approach is that it allows remedies to be initiated immediately and, in conjunction with study and monitoring programs, allows the regulators to assess progress and guide future control measures.

Adaptive management has been used successfully in addressing resource management issues in other areas. The process assumes that knowledge will never be adequate, that many questions can only be answered by experience and experiment, that analyses get simplified, that nothing is certain, and that much of what we know is wrong, we just don't know precisely what. Because of these uncertainties, the adaptive management process will allow experimental approaches -- learning by doing -- and encourage an evolutionary path.

As applied to water quality improvement in the Portneuf, an adaptive management strategy allows us to expand existing pollution reduction programs and initiate new measures

expected to improve conditions. Concurrent with these immediate steps to rehabilitate river conditions, the monitoring and assessment program will provide information on environmental response to these control measures and how to optimize the design and implementation of BMPs. The beauty of an adaptive management strategy is that it allows us to move forward with implementation in spite of the acknowledged shortcomings in our knowledge of the system.

Phase I of the implementation consists of assessing current and past improvements, and implementing control measures as outlined in the "short term" part of Section 4.5. Phase I will also consist of development and implementation of a collaborative water quality monitoring program by both watershed stakeholders and IDEQ from 2001 - 2003 (See Timeline for Refined Loading Assessment). Phase I will effectively end in December 2003, when we will assess progress to that point, evaluate water quality data, update the TMDL, and refine the control measures for Phase II. Phase II will pick up from there and continue until 2009. Long term monitoring established during Phase I will continue throughout the life of implementation in order to assess improvements and act as the feedback loop necessary to apply adaptive management strategies. At the end of 2009 control measures will be reassessed and future plans will be determined.

An expanded implementation plan will be prepared and a commitment by stakeholders within 18 months of approval of the TMDL. The implementation plan will be a dynamic document subject to revision based on feedback from monitoring beneficial uses. The plan will expand on the control measures presented in this section with details on who will do what and by when. Figure 4-1 shows the timing and major tasks associated with implementation of the TMDL plan for Portneuf River.

4.2.1 Refinement of Pollution Allocation

The initial allocation of pollutant loads presented in the TMDL plan (April 1999 Section 3.2 and 7 July 2000 Portneuf TMDL Addendum) was prepared with the knowledge that pollutant allocations would be revisited and potentially revised once more extensive data became available. The load allocations and associated pollutant reductions required to meet target levels given in the TMDL plan represent estimates made with varying levels of uncertainty. Some pollutant loads (e.g., from point sources subject to regular monitoring programs) are fairly well quantified, while other loads (e.g., sediment from non-point sources) are based on gross estimates of flow volume as well as concentration and should not be considered absolute representations of present conditions.

The uncertainty related to pollutant loads, especially in middle and upper portions of the basin above Pocatello, dictates a phased approach be taken to implement the TMDL, with subsequent analyses used to revise the pollutant load reduction and allocation scheme. The allocations presented in the TMDL plan will be refined through a monitoring program that focuses on the pollutant load sources that are poorly quantified but thought to be significant.

The allocation is calculated according to the formula shown in the box below:

TMDL Allocation Equation

LC= WLA + LA + MOS

Where:

loading capacity (LC) is the maximum amount of pollutant loading that the water body can receive without violating water quality standards,

wasteload allocation (WLA) is the portion of a receiving water's loading capacity that is allocated to existing and future point sources,

load allocation (LA) is the portion of a receiving water's loading capacity that is allocated to existing and future nonpoint sources and to natural background sources,

margin of safety (MOS) is the prescribed mechanism to account for the uncertainty in determining the amount of pollutant load and its effect on water quality.

The load allocation will be refined taking into account the following factors.

1) **Future Growth**. A portion of the WLA should be reserved for future growth. If future growth is not planned for, then no pollutant loading will be available for new sources or for the expansion of existing sources.

2) **Seasonal or Climatic Variations in Pollutant Load**. Variations in climate, hydrology and effluent discharge need to be considered in allocating pollutant loads. An acceptable pollutant load may vary depending on rainfall and seasonal factors including solar radiation and temperature.

3) **Temporal Aspects**. The appropriateness of various time frames comes into play when allocating pollution loads. In some instances an annual load may be appropriate, for example when the goal may be to restrict nutrient loading to a downstream impoundment. In other cases a daily maximum pollutant concentration may be most critical to protect beneficial uses.

4) **Antibacksliding Requirements**. The CWA specifies requirements that generally prohibit reissuing an NPDES permit with less-stringent technology-based effluent limits than those contained in an existing permit.

5) **Antidegradation Requirements**. Loading allocations must be consistent with the antidegradation policy in Idaho law (Idaho Code Section 39-3603, IDAPA 58.01.02.051), which prohibits an increase in loading that would impair an existing use.

6) **Margin of Safety**. The MOS provides a means to account for the uncertainty associated with TMDL projects. The MOS can be included implicitly, by means of conservative assumptions, or explicitly, by setting water quality targets at more conservative levels than analytical results indicate.

7) **Allocation Refinement**. The pollutant allocations in the TMDL Plan are based on data of varying levels of completeness. Some of the data used for the pollutant allocation are dated (20+ years) and do not include sufficient resolution to quantify existing loads to any more than a gross degree. DEQ agrees that additional data should be collected and the load and wasteload allocations reevaluated in light of new information. As DEQ did in the approved Mid-Snake River TMDL for total phosphorus, initial load and wasteload allocations are set that will be reevaluated with new data. To implement this arrangement, DEQ intends to include in its 401 certification of the City's NPDES permit a compliance schedule for the nutrients in question.

8) **Principles of Fairness.** Loading allocations among point and nonpoint sources should be consistent with principles of fairness as enumerated below:

   A. Information should be adequate to base decisions, with the monitoring intensity and associated level of uncertainty tailored to match the level of monetary significance of the water quality and aquatic habitat issues.

   B. Allocations should treat like dischargers equally (non-point = non-point and point = point), with considerations made to promote equity with respect to the costs of pollutant removal.

   C. There must be an equitable allocation between point and nonpoint sources.

   D. Dischargers should not be penalized for past voluntary pollution reduction measures. This principal of giving credit for expenditures prior to TMDL-required pollutant reductions should be considered when making future allocations.

   E. The allocations should not penalize dischargers in any part of the basin because of naturally occurring background concentration.

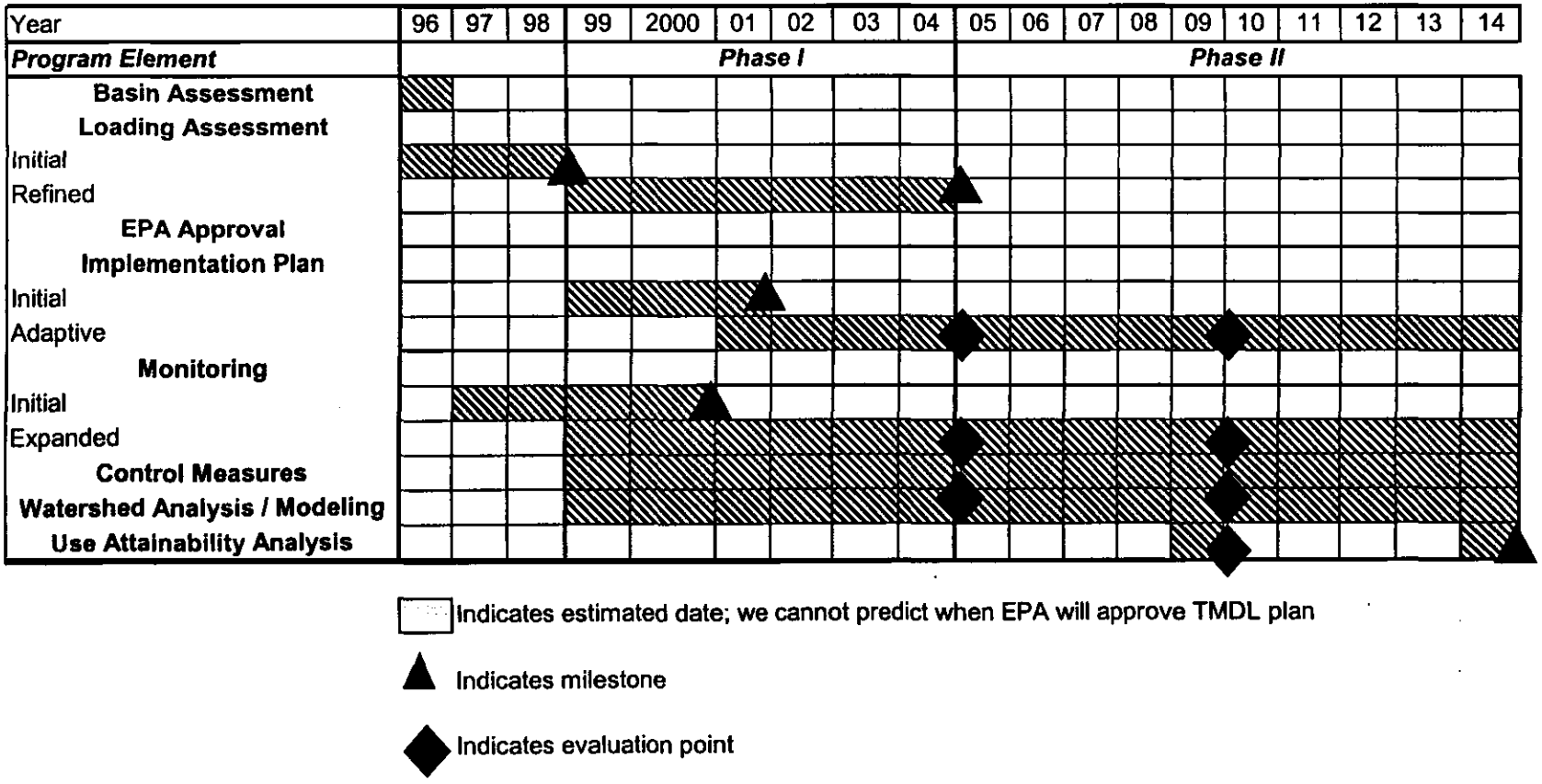
   F. Principles of equity should extend beyond the Portneuf River Basin to include dischargers throughout the entire Snake River Basin.

Timeline for Refined Loading Assessment

The TMDL Timeline and Tasks (Figure 4-1) is consistent with the schedule shown in the following table:

Date	Activity
March 2001	Begin assessing data and expand as necessary
March 2001-Sept 2003	Collect and assess water quality data
April 2004	Complete refined allocations
July 2004	Submit new loading analysis and allocations to EPA

Figure 4-1. TMDL timeline and tasks



4.3 Recovery Time Frames

Implementing water pollution reduction measures will take time. It is unrealistic to expect that damage inflicted on the environment – in some cases, the result of over a century of deleterious land use practices -- can heal instantly, or even within a span of a few years. Human societies have traditionally displayed an alarming sense of inertia with respect to understanding ecological impact and responsibility. To recover environmental loss, it takes time to plan, secure funds, and implement management practices. Because of such factors as ground water and sediment retentiveness, we can anticipate a lag period of years -- if not decades in more recalcitrant cases—to realize improvements in pollutant reduction. Certain events, such as the frequency of channel scouring floods, can also accelerate the speed in which a river recovers.

Re-growth of riparian vegetation and channel function will take several years before significant impacts are realized. On a positive note, in response to the fencing of livestock and the implementation of other conservation measures, tangible improvement has already occurred in the upper Portneuf subbasin during the1990's. If given the opportunity, rivers can heal themselves.

4.4 Problems and Uncertainties in the Portneuf River TMDL

4.4.1 Uncertainties in the TMDL Analysis

Load analyses were made in the TMDL that were based on available water quality data. Uncertainties about the loading analysis are outlined below:

- It is not known whether the historical flow and pollutant concentration data reflects current conditions. Most data are 10 to 20 years old and do not reflect changes over the last decade with respect to non-point sources (NPS).
- The TMDL established reduction targets on the mainstem Portneuf River. It is not known how these reduction targets apply to listed tributaries as most of the data is poor.
- Water quality from urban runoff has not been measured; consequently, it is difficult to design appropriate implementation measures.
- We lack a defensible scientific basis to evaluate attainment of beneficial uses related to nutrients.
- Uncertainty exists regarding beneficial use impairment from some listed pollutants. For example, oil and grease was listed as a pollutant of concern in the Portneuf below the urbanized areas, although no oil or grease has been detected thus far in monitoring over the past year.

4.4.2 Pollution Targets

Targets are essential components of the TMDL process, and will be used (as specified in Section 3 of the TMDL) to frame the initial scope and direction of pollution reduction programs. Because the targets were not based on specific conditions in the Portneuf River, further information may lead to a revision -- upward or downward -- of the target concentrations. Until the final targets are refined, implementation should be phased in. Targets should be seen as goals and refined as necessary, based on monitoring results from implementing controls. By monitoring both prior to and during the application of controls, results can be used to refine control strategies in order to accommodate those that are working and to alter those that are not effective.

4.4.3 Holistic River Basin Management

Specifying appropriate levels of pollution reduction for the Portneuf River requires a holistic perspective that looks beyond this watershed to adjoining Snake River watersheds upstream and down. The TMDL implementation plans for the American Falls Reservoir reach of the Snake River as well as other adjoining waterbodies will be developed over the next few years. These TMDL plans should reflect the costs and benefits of pollution reduction measures in the contributing subbasins. For example, if it is found that background phosphorus levels in the Portneuf River are high relative to other Snake River catchments, we might reach the point in TMDL implementation where to attain necessary targets in American Falls Reservoir, it would be most efficient from a basin-wide perspective to emphasize further nutrient reductions in watersheds with lower phosphorus content parent bedrock.

4.4.4 Anthropogenic Influences

We do not know what sediment and nutrient levels existed before anthropogenic or pre-European settlement influences. Given the soils and bedrock type of the Portneuf River Subbasin as well as the knowledge that large deposits of phosphate exist in the area, the targets for nutrients and sediment may not be attainable. Consequently, BMPs alone may not be able to bring the subbasin nutrient and sediment yield below specified target levels.

4.4.5 Flow Regime

Volume and timing of water flows in the Portneuf affect the river's ability to assimilate sediment and nutrients. Insofar as water quantity is pollution and not a pollutant, a TMDL is not required for flow, although alteration of the flow regime could help sustain beneficial uses. We must further the understanding of the hydrology of the Portneuf River subbasin during wet and dry years to be able to develop flow regime alternatives. There may be several options available for increasing flows in the river while fully protecting established water rights, such as water conservation projects, leases of water rights, conjunctive use management, or river impoundment management that could be used to augment flow during critical periods. Because other water

quality improvement measures may reach a point of diminishing returns, the stakeholders are willing to explore appropriate flow enhancing alternatives.

4.4.6 Loading Capacity for Nutrients

The TMDL establishes reduction targets on the mainstem and applies those target reductions accordingly to the tributaries. Due to data limitations, however, the loading capacity of the Portneuf River for nutrients established in the TMDL is subject to refinement. Further study that relates to in-stream assimilative capacity is also needed to properly conduct nutrient WLAs and LAs. This requirement of the TMDL evaluation process will be addressed during the design of the monitoring program.

4.4.7 Nutrient Targets and Excessive Aquatic Vegetation

Although nutrient targets for the Portneuf River have been established to protect beneficial uses, the linkage of nutrient targets to attainment of beneficial uses of the Portneuf River caused by excess aquatic vegetation has not been defined. A better quantification of the extent to which beneficial uses in the Portneuf River are impaired due to excessive aquatic vegetation is necessary in order to achieve specified targets. Uncertainty exists with respect to whether reductions in nutrient loads from surface waters will result in reduced impairment of beneficial uses. The initial step is to better quantify beneficial use impairment.

4.4.8 Attainability

Once pollutant loading is reduced through control strategies and implementation of BMPs, the plan will assess compliance with water quality standards. It may become necessary to evaluate beneficial use attainability. A Use Attainability Analysis (UAA) is the process designated under the Clean Water Act to be used when beneficial uses for a waterbody do not or cannot meet the fishable-swimmable goals of the act. The UAA is a structured, scientific assessment of the factors affecting the attainment of a use which may include physical, biological, and economic factors as described in 40 CFR 130.10(g).

4.4.9 Ground Water Influences on Beneficial Use Attainment

While the springs emanating to the Lower Portneuf River improve water quality with respect to temperature and suspended sediment, their nutrient load may serve to stimulate growth of aquatic vegetation. It is not known whether the springs are responsible for impairment of beneficial uses or not. No historical quantitative data exist on aquatic vegetation; consequently, a short-term program will be developed and implemented to monitor aquatic vegetation. Application of BMPs will be evaluated with respect to ground water protection. The impact of lagoons and settling basins on ground water quality will be examined.

4.4.10 Reasonable Assurance

For watersheds that have a combination of point and nonpoint sources where pollution reduction goals can only be achieved by including some nonpoint source reduction, a reasonable assurance that reductions will be met must be incorporated into the TMDL (EPA, 1991). The load reductions for the Portneuf River TMDL Implementation Plan will rely on nonpoint source reductions in order to meet both the load allocations to achieve desired water quality and to restore designated beneficial uses.

Further, both to ensure that nonpoint source reduction mechanisms are operating effectively, and to give some quantitative indication of the reduction efficiency for in-place BMPs, monitoring will be conducted. If instream monitoring indicates either an increasing total phosphorus concentration trend (not directly attributable to environmental conditions) or a violation of standards despite use of approved BMPs or knowledgeable and reasonable efforts, then BMPs for the nonpoint sources activity must be modified by the appropriate agency to ensure protection of beneficial uses (Subsection 350.02.b.ii). This process is known as the "feedback loop," in which BMPs or other efforts are periodically monitored and modified if necessary to ensure protection of beneficial uses (Figure 4-2). With continued instream monitoring, the TMDL will initiate the feedback loop process and will evaluate the success of BMP implementation and its effectiveness in controlling nonpoint source pollution.

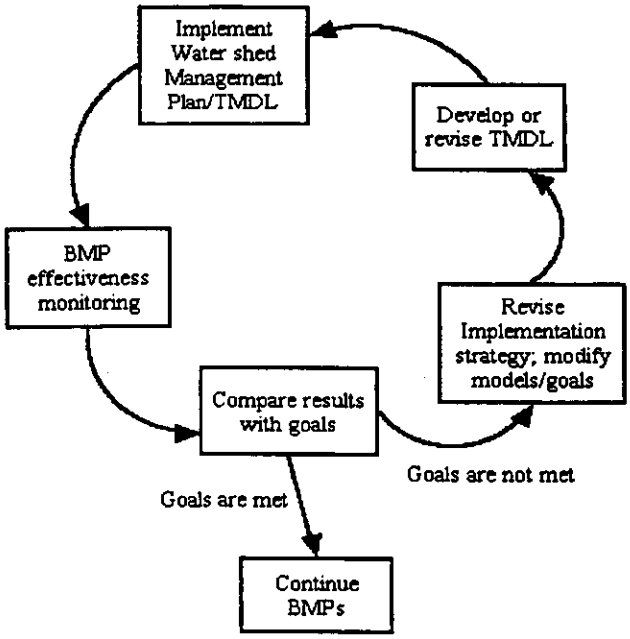


Figure 4-2. Feedback loop

The State of Idaho uses a voluntary approach to control agricultural nonpoint sources. However, regulatory authority can be found in the state water-quality standards (IDAPA 58.01.02350.01 through 58.01.02.350.03). IDAPA 58.01.02.054.07 refers to the Idaho Agricultural Pollution Abatement Plan (IAPAP), that provides direction to the agricultural community for approved BMPs. A portion of the IAPAP outlines responsible agencies or elected groups (Soil Conservation Districts or SCDs) that will take the lead if nonpoint pollution problems require addressing. With respect to agricultural activity, the local SCDs are assigned to assist the landowner/operator to develop and implement BMPs to abate nonpoint pollution associated with the land use. If a voluntary approach does not succeed in abating the pollutant problem, the state may provide injunctive relief for those situations that may be determined imminent and substantial danger to public health or environment (IDAPA 16.01.02350.02 (a)).

If on the other hand, nonpoint pollutants are determined to be impacting beneficial uses and the activity already has in-place referenced BMPs, or knowledgeable and reasonable practices, the State may request that the BMPs be evaluated and/or modified in order to determine appropriate actions. If evaluations and/or modifications do not occur, injunctive relief may be requested (IDAPA 58.01.023.50.2, ii (l)).

It is expected that a voluntary approach will be able to achieve LAs needed in the Portneuf Subbasin. Public involvement in conjunction with the eagerness of the agricultural community has historically demonstrated a willingness to implement BMPs to protect water quality. In the past, state and federal cost-share projects have provided the agricultural community technical assistance, information and education, and cost share incentives to implement BMPs. The continued funding of these projects will be critical for successful achievement of LAs in the Portneuf Subbasin.

4.5 Proposed Solutions by Dischargers

It is recognized by all parties that phased implementation will take time and will most likely be revised as we learn more and more about river dynamics. The steps we will use in the phased implementation process are described below:

1. Identify critical areas/sources of pollution.
2. Develop control strategies and best management practices for point/nonpoint sources.
3. Select most effective strategy options.
4. Design a monitoring program to measure progress.
5. Secure funding to implement the monitoring program.
6. Secure funding to implement control strategies and best management practices.

With these steps, this implementation plan presents the critical areas/sources of pollution, the control strategies and BMPs, describes a monitoring program, and provides the commitment to fund both monitoring and pollution controls. Control strategies are grouped into both short-term (four to five years) and long-term (ten years) solutions. The common thread between all the stakeholder control strategies is the monitoring plan described below in the "Monitoring Plan" Section.

Industry-specific controls will be implemented during the initial four-year period. Conditions will be re-evaluated at the end of year four in order to assess the extent to which beneficial uses are impaired as well as whether additional control measures may be needed for implementation during years five through ten.

4.5.1 Point Source Reductions

The NPDES permit program regulates point source discharges. The Clean Water Act requires NPDES permits for point sources to be consistent with an approved TMDL implementation plan. The NPDES permits are issued on a 5-year cycle. Because permits of several major point source discharges were either recently issued during 1999 or remain pending, the analysis associated with Phase I is scheduled to be completed prior to the next cycle of permit reissuance in 2004. Control strategies planned as part of TMDL implementation for point sources are outlined in this section.

Pocatello Water Pollution Control (WPC) Facility

Serving the cities of Pocatello and Chubbuck, the WPC facility removes the majority of organic matter and suspended solids, using both primary and secondary treatment processes and disinfects the wastewater. The facility was upgraded in 1990 with a de-chlorination facility to reduce effluent toxicity. An anaerobic selector basin was installed in 1997 to control bulking organisms and expand the capacity of the WPC facility. The anaerobic selection process also removes a minimum of 50 % of total phosphorus. WPC's impact on the River is reduced during the irrigation season, when, via a cooperative land treatment program with J.R. Simplot Co., a small portion (~5-10%) of the City's effluent is used to irrigate cropland. Control strategies proposed by the WPC follow.

Short-Term

- Upgrade plant by 2004 to include nitrification, which will convert ammonia to nitrate and reduce problems with un-ionized ammonia and oxygen demand associated with ammonia. Maintain or improve enhanced biological phosphorus removal and provide the foundation for future expansion.
- Continue monitoring program of plant effluent and river as needed to implement TMDL Plan, determine optimal nutrient control strategies, and evaluate opportunities for effluent trading. Monitoring program includes installation and operation of stations to measure dissolved oxygen, temperature, and nutrients in the Portneuf River, as well as to monitor effluent quality at the Water Pollution Control Plant.

Long Term

- Once nitrification is operational and Phase I TMDL implementation monitoring results are available (2004), the possible benefits to river quality, if any, of additional nitrogen treatment (e.g., denitrification) will be evaluated in conjunction with facilities planning for biological nutrient removal.
- Based on information presently available, the WPC Plant goal is to improve phosphorus treatment up to 90% (approximately 0.9 mg/L total phosphorus in effluent).
- Evaluate opportunities for effluent trading and participate to an appropriate extent if it is shown to be the most cost-effective means to further reduce pollutant loading to the Portneuf.

The facilities improvements identified above as short-term pollution reduction measures are included as requirements in the Pocatello WPC Facility's NPDES permit, which is scheduled for reissuance in 2004. Refinements to the pollutant loading analysis and allocation (see Section 4.2.1) are timed so that results of additional monitoring and analysis will be available in the fall of 2003 to provide a firmer technical basis for decisions on an appropriate level of additional nutrient reduction, if any, to undertake at the WPC Facility. Further pollution control enhancements beyond those contained in the current permit should not be required of Pocatello prior to 2004.

City of Pocatello Urban Runoff

In 1998, the City of Pocatello committed to complying with the impending NPDES Phase II stormwater regulations by creating an environmental engineer position in order to coordinate activities related to urban runoff. Since then, the City has begun an intensive-monitoring program, starting with the Portneuf River. The current monitoring program was designed to measure the contribution of pollution to the River from the City of Pocatello as well as to measure the incoming pollutant load. Additionally, the City received an EPA 319 Grant to design and construct a pilot-scale wetland to improve water quality from stormwater runoff. Drainage and stormwater treatment policies have been implemented for new and modified developments. A stormwater quantity master plan has been developed as well. The City has initiated a build-out analysis that will consider and plan for the impacts for a growing city in relation to its watershed and other environmental factors.

Short-term

- Continued monitoring of the Portneuf River, stormwater runoff monitoring.
- Installation and operation of a monitoring station upstream from the City of Pocatello.
- Construction BMPs for new developments.

- Develop a stormwater management plan which will include an aggressive citizen awareness campaign, digital mapping of the watershed, watershed modeling to show "what if" scenarios for planning and development, and financial provisions for future management of the stormwater management plan.
- Develop BMPs through City demonstration projects such as alternatives to paving and increased infiltration.
- A hotline that citizens can call to report problems.

Long-term

- Strategies will be formulated based on the results of the stormwater monitoring program. As critical areas are identified, appropriate remediation actions will be taken. Appropriate actions may include additional constructed wetlands, end-of-pipe treatments, and pollution prevention actions. BMPs will be refined for pre-and post-construction based on experiences as well as cooperative demonstration projects with developers.

Astaris Corporation

Astaris Corporation manufactures elemental phosphorus at its plant located west of Pocatello in Power County. Astaris extracts ground water from within its site property for use as cooling agents for equipment subject to heat buildup. In turn, under an NPDES permit, this cooling water is discharged to the Portneuf River. Nutrient concentrations in the cooling water are at levels representative of deep ground water in the area. Astaris will conduct the following remedial strategies to control nutrient loading and support assessment of nutrient impacts on the river.

Short-Term

- Possibly divert a portion of its discharge from the river. During the April through September irrigation season, Astaris may will divert water from its discharge for use in irrigation. This will remove nutrients from the river during the peak growing months.
- Assess additional uses or options for cooling water to further reduce the volume of water and amount of nutrients discharged to the river.
- Modify current discharge monitoring program to include routine measurements of total phosphorus, total inorganic nitrogen, and flow. These data will supplement existing knowledge of nutrient loading and will be available for future load determinations.
- Assess installation of additional monitoring station(s) located on Portneuf's main stem. Data from the additional site(s) would be available for use by TMDL stakeholders.
- Evaluate additional studies focusing on nutrient effects on the river.

Astaris is one of two industrial/processing facilities within the Eastern Michaud Flats (EMF) Superfund Site. The EMF Record of Decision details the EPA selected response actions to which FMC must comply in order to control releases and exposures of site-related constituents. A summary of these response actions follows.

Long-Term

- Cap old waste ponds and a solids storage area. Line a storm water detention area to reduce or eliminate infiltration of rainwater and prevent incidental exposure to site contaminants.
- Monitor ground water until site contaminants in ground water decline to measures below the approved action levels.
- Implement legally binding land use controls that will run with the land in order to prevent potential future residential use as well as to control potential worker exposures under future ownership.
- Conduct ground water monitoring off-site from the plant property in order to: 1) determine the effectiveness of the Plant's source control measures; 2) ensure contaminants are not migrating into the off-plant area; and 3) ensure that the remedy remains protective of human health and the environment.

Simplot

The J.R. Simplot Company's (Simplot) involvement in this TMDL process is a result of the company's base enterprise that supports agriculture in the Portneuf River subbasin, the state of Idaho, the western United States, and Canada. Additionally, Simplot has production facilities and offices within the Portneuf River Basin. These business interests, the ownership of miles of riverbank, and the fact that many of Simplot's employees and families live in the Portneuf River subbasin have lead Simplot to take a supportive and constructive role in the cleaning of the lower Portneuf River.

Simplot does not directly discharge sediments or nutrients to the River from any of its facilities in the Basin. Simplot's influence in reducing these pollutants can best be described as indirect and supportive.

Short-Term

- Restrict disruptive development on lands it owns along the lower Portneuf River.
- Review existing agricultural use on lands it owns and continue to implement Best Management Practices.
- Continue to work with the DEQ to provide technical support.
- Continue to support the Watershed Advisory Group. (Portneuf Watershed Council)
- Continue to support the City of Pocatello in its efforts to reduce pollutants due to storm water runoff.
- Continue to develop precision application techniques for Simplot's agricultural products.
- Implement measures as provided for in the Record of Decision for the Eastern Michaud Flats. Some remedial efforts designed to reduce heavy metal contaminants from ground water under the site of the manufacturing facility may have a small, beneficial impact on waters that reach the lower Portneuf by way of the springs.

Small municipalities

Although data are limited, and total contributions are expected to be minimal compared with other sources, input from small municipal waste water treatment plants (Inkom and Lava Hot Springs), and other point sources, will be estimated and waste load allocations assigned, accordingly.

4.5.2 Nonpoint Source Reductions

The process to control nonpoint source pollution is identified in the Non-point Source Management Plan (December 1999) and the Idaho Water Quality Standards and Wastewater Treatment Requirements (Section 350). Nonpoint source activities are required to operate according to state approved BMPs; or, in the absence of approved BMPs, activities must be conducted using "knowledgeable and reasonable efforts to minimize water-quality impacts"(Subsection 350.02.a). Routine instream monitoring will be required in order to evaluate overall water quality trends within the watershed (see Monitoring section below). New or developing BMPs may incorporate on-site monitoring to evaluate reduction efficiencies. If instream monitoring indicates a violation of standards or targets, despite use of approved BMPs or knowledgeable and reasonable efforts, then BMPs for the nonpoint source's activity must be modified by the appropriate agency to ensure protection of beneficial uses (Subsection 350.02.b.ii). During the initial implementation phase stakeholders will aggressively explore options for non-point source reductions, including pollution trading.

With continued instream monitoring, this TMDL implementation plan will initiate the feedback loop process and will evaluate the success of BMP implementation and its effectiveness in controlling nonpoint source pollution.

[The section above was modified from p. 74 of Cascade Reservoir Phase II Watershed Management Plan, December 1998. Idaho Department of Environmental Quality]

Agricultural Lands

The Portneuf River Subbasin covers approximately 861,590 acres, of which approximately 496,000 are privately owned land. Subbasin characteristics such as size, land use, ownership, and hydrology make the agricultural implementation portion of the Portneuf River TMDL very challenging. Agricultural land uses include dry cropland, irrigated cropland, rangeland, forest and riparian habitat. Agricultural nonpoint sources in the Portneuf River Subbasin that may contribute to impairment of beneficial uses on waterbodies include: accelerated soil erosion, nutrient over-application, improper grazing management, inefficient irrigation systems, inefficient irrigation water conveyances, and degraded riparian areas.

It is the intent of the Portneuf Soil and Water Conservation District and the Caribou Soil Conservation District to take a proactive approach towards water quality management within the Portneuf River subbasin. In order for a proactive voluntary approach to be effective, it is important to realize that resource conditions vary widely throughout the Portneuf River subbasin. The extent and causes of impairment of beneficial uses on waterbodies must be fully known before we can understand the problem and develop cost-effective solutions to restore beneficial uses. The Portneuf and Caribou Districts will attempt to reduce the impairment of beneficial uses from agricultural nonpoint sources by utilizing all of their technical, financial, and educational capabilities.

The Portneuf Soil and Water Conservation District and the Caribou Soil Conservation District recognize the need for a combination of approaches to restore beneficial uses. Historically, conservation projects have been implemented with a minimal amount of data collection to determine the projects' effectiveness. Not until recently have conservation districts performed monitoring to document positive impacts brought about by conservation projects and their associated BMPs. In cooperation with the Idaho Association of Soil Conservation Districts and the Idaho State Department of Agriculture, districts are currently conducting water quality monitoring on 303(d) listed streams to determine project effectiveness and identify potential critical areas or sources.

The Portneuf and Caribou Districts will utilize non-regulatory approaches, including the provision of financial incentives and technical assistance to voluntarily implement BMPs, inter-agency coordination of activities, water quality monitoring, public outreach, BMP effectiveness evaluation, pollutant trading, and demonstration projects to reduce impairment of beneficial uses.

Short-Term

- This short-term goal is dependent upon available funding and agricultural landowner/operator participation. Based on preliminary estimates, within five years of acceptance of the Portneuf River TMDL and this section by the Environmental Protection Agency, the Portneuf and Caribou Districts can achieve a 10% reduction in total suspended sediment loads and a 5% reduction in total phosphorus and total inorganic nitrogen loads originating from agricultural lands. These load reductions could be accomplished through the enrollment of approximately 5,200 acres of dry cropland into the Conservation Reserve Program (CRP). The remaining pollutant load reductions will be made by riparian/wetland BMP systems, irrigated cropland/pastureland BMP systems, non-irrigated cropland/rangeland BMP systems that are installed under contract in the Environmental Quality Incentives Program (EQIP), and the newly-created Agricultural Water Quality Cost-Share Program for Idaho. The combined efforts of Portneuf and Caribou Districts, in cooperation with the Idaho Department of Environmental Quality, Idaho Soil Conservation Commission, City of Pocatello, Bannock and Caribou Counties, Astaris Corporation, J.R. Simplot Company, Shoshone-Bannock Tribes, the Portneuf Watershed Council, and other stakeholders, will develop and implement a continuous monitoring program for the Portneuf River and its tributaries. This will enable stakeholders to investigate and develop procedures for potential pollutant trading.

Long-Term

- Within one year of the acceptance of the Portneuf River TMDL and this section the Portneuf Soil and Water Conservation District and the Caribou Soil Conservation District will develop an agricultural source implementation plan for the Portneuf River TMDL. The Portneuf River Agricultural Source Plan will contain critical areas and sources, priority subwatersheds, tiered implementation design, subwatershed load allocations, applicable BMP systems with component practices, reasonable assurances, schedule for implementation, a BMP evaluation method, project monitoring plan, and progress reporting.

Riparian Area Management

Proper management of livestock within the riparian zone has the dual potential to allow recovery of vegetation and improve the stream channel. Since the mid-1970s, the Idaho Department of Fish and Game and the Friends of the Portneuf have undertaken several projects emphasizing livestock exclusion that have visibly improved both riparian conditions and water quality of the Portneuf. For example, Friends of the Portneuf worked in conjunction with King Creek Cattle Company and other landowners to build several miles of fence in the vicinity of Kelly Toponce Road on both sides of the river.

Building upon the successful outcome of the Friends of the Portneuf project, the Caribou Soil Conservation District implemented the Upper Portneuf River State Agricultural Water Quality Program project (SAWQP). This program enabled landowners to install fencing along the channelized portion of the Portneuf River (i.e., Downey Canal) to block livestock from entering the River. That project successfully excluded livestock from approximately 75% of the upper Portneuf River. Recently, the Idaho Department of Fish and Game has been working with landowners to install exclusion fencing on the remaining portion of the upper Portneuf River. On account of a Section 319 grant obtained by the Idaho Department of Fish and Game to fund a large fencing project on the lower end of the upper Portneuf River, only one mile of the River remains unfenced. A cooperative effort is currently being made to work with the landowner on possible solutions. Proper grazing management in riparian areas in conjunction with the exclusion of livestock from streambanks allows riparian vegetation to recover, in turn, this helps to anchor streambanks, improve channel functions, increase stream shading, enhance aquatic habitat, and reduce the loading of nutrients, sediment, and bacteria.

State of Idaho Forest/Range Lands

Idaho Department Of Lands - Range Management In The Portneuf River Subbasin

The Idaho Department of Lands (IDL) manages 30,080 acres of endowment land within the Portneuf River watershed - 95% of which are leased for livestock grazing. Approximately 1/3 of the lands leased for grazing consist of isolated parcels that are typically managed cooperatively with surrounding Federal grazing allotments.

The remaining approximately 20,000 acres of endowment ownership consists of portions of two large areas of consolidated ownership, the Cottonwood Block in the headwaters of Dempsey and Marsh Creeks, and the Chesterfield Block in the headwaters of 24 Mile and 18 Mile Creeks.

In 1996, the Idaho Land Board adopted a new Vegetation Management Policy to guide management of vegetation and associated resources on endowment land, provide for improvement in the condition of these lands, and to maximize the endowment fund. The intent of the policy is to address potential/existing problems such as noxious weeds, vegetation composition and vigor, watershed/stream conditions, and wildfire since they directly impact the long-term productivity of endowment lands.

The heart of this new policy is completion of an "Endowment Land Resource Assessment and Vegetation Management Objectives – IDL 1541" for each expiring grazing lease. This form documents IDL staff assessments of existing vegetation and other resource conditions and articulates desired resource conditions/management objectives for each lease. This assessment includes a Proper Functioning Condition (PFC) estimate for all perennial streams with the stated desired future condition being, in all cases, for all perennial streams to be in Proper Functioning Condition.

All applicants for a given grazing lease are required to review the IDL 1541 for that lease and submit a management proposal explaining how they intend to manage livestock grazing on the lease to attain the desired condition objectives. An applicant's proposal is reviewed by IDL staff for completeness and acceptability. Acceptable proposals are summarized and the summary, along with the lessee's proposal, become the grazing management plan for that lease and, as such, an enforceable provision of the lease.

For areas of consolidated ownership, such as the Cottonwood and Chesterfield Block, this process is merely the first step in development of a more comprehensive range management plan. The current range management plan for the Cottonwood Block, originally developed in 1989, is under revision as a part of the lease renewal process. A range management plan for the Chesterfield Block is currently scheduled for completion no later than 2004.

The protection of water quality during forest harvesting operations within the State is regulated by the Idaho Forest Practices Act (FPA) and administered by the Idaho Department of Lands. The act requires that Best Management Practices (BMPs) be used on all forestry activities on state and private land in order to "protect and maintain the forest soil, air, water

resources, wildlife and aquatic habitat." The act also applies to activities on federal lands to meet the requirements of the Federal Clean Water Act.

BMPs will protect water quality through controlling sediment delivery to streams, maintaining shade to control water temperature, establishing safeguards against petroleum and chemical spills, and providing large organic debris to maintain the natural function of the stream. The BMPs also set minimum standards for the number of and quality of trees left after a harvesting activity. All forestry operations are required to maintain a steam protection zone of 75 feet on streams with fish and 30 feet on streams that have no fish. Timber harvesting is regulated inside the Stream Protection Zone and no road building or ground based skidded equipment is allowed. At least 75% of the stream shading must be maintained and a minimum number of standing trees left for large organic debris recruitment. In addition, all roads, landings, and skid trails must have erosion control measures installed to control sediment delivery to streams.

The proper implementation of these practices on state, private, and federal lands will ensure that water quality is not adversely impacted from forestry operations.

Forestry activities on Idaho Endowment lands utilize BMPs to protect water quality with the goal to meet or exceed the requirements of the Forest Practices Act. Harvesting operations are designed to minimize impact through controlling sediment by utilizing cross-ditching, mulching, seeding, and maintaining ground cover for soil protection. Stream protection zones are established and special management criteria applied within these areas. As opportunities arise, where sediment is being delivered to streams, corrections are made and old roads within stream zones are stabilized or closed. Culverts are redesigned to handle 50-year peak flows and replaced where needed to prevent major fill failures.

The United States Forest Service

Short-Term

The Pocatello Ranger District has several projects planned for the 2000 fiscal year.

- Lead Draw reseeding. Several years ago the District fenced off Lead Draw to restrict ORV use in the drainage. They plan on reseeding it this year.
- Pocatello Municipal watershed fence reconstruction – construct approximately ½ mile of new fence to better control livestock in the upper Mink Creek area.
- Pocatello Cow Camp fence reconstruction – construct about two miles of fence in the East Mink Creek area. The corral has been moved back from the stream and the new fence will serve to help control livestock access to the stream.

Long-Term

In addition, projects planned for the next five years include:

- South Mink hydrologic improvement;
- Cherry Creek riparian improvement;
- Noxious weed control throughout the Portneuf watershed; and
- Oxford Mountain trail rehabilitation and watershed improvement.

Public Roads/Construction Activities

For the last several years the Bannock County Road and Bridge Department has been very cognizant of the importance of minimizing sediment run-off from road building, and other construction activities. Utilizing retention basins, restoring eroded areas, and minimizing areas of disturbance have become standard operating procedures. Road & Bridge has been very cooperative with other county departments, particularly the solid waste department, in implementing measures to minimize sediment laden run-off. Road and Bridge has also provided technical assistance and equipment to private landowners in cooperative efforts to address problem erosion areas.

Bannock County

Bannock County is exploring two major projects intended to mitigate sediment and nutrient impacts to the lower reaches of the Portneuf River:

1) Bannock County is considering the construction of an engineered wetland system to improve management of storm water emanating from the Ft. Hall Canyon Landfill complex. While inadequate data exist to document or quantify sediment and/or nutrient impacts resulting from the County's landfill operation, the County believes a significant potential for the reduction of contaminant impacts may exist.
2) The County is supportive of a proposed project to restore natural stream channels, riparian zone and related flood plains on the lower Portneuf, south of Pocatello to the Portneuf Gap. This would be a major community effort and would involve active participation from a variety of public and private interests.

The County believes that these projects (and other related projects such as the City of Pocatello's engineered wetlands) would constitute cost-effective load reduction strategies and are, as such, deserving of resource commitments for the purpose of restoring beneficial uses of the Portneuf River. However, it is understood that such planning and implementation processes cannot happen overnight.

The County submits that phased implementation of TMDL load reduction strategies will not only facilitate but will encourage long-range planning and data acquisition such that the chance of truly restoring beneficial uses on the Portneuf River is maximized.

Bannock County has implemented practices to mitigate impacts to surface waters resulting directly from county activities or from land development activities over which the county has regulatory oversight. These are provided with the intention of emphasizing that surface water contaminant load reduction is a priority for Bannock County and that realizing those goals is a direct function of implementation timeframes, resource identification, and our ability to accomplish local organization and cooperation.

In 1998, Bannock County enacted a new subdivision ordinance that provides a basis for resource protection as an integral part of the land development process. Provisions include, but are not limited to:

- Specific language imposing storm water management provisions on land developers;
- The use of approved BMPs during land development activities;
- Broad discretionary authority delegated to the building official to require environmental impact studies where appropriate and to enforce compliance with sound engineering practices;
- Requirements for the use of "open space" subdivision design concepts which minimize the area of surface disturbance and road construction;
- Protection of riparian corridors;
- Carefully planned land use zones, which encourage development appropriate to a given zone.

Bannock County is willing to participate in expanded water quality monitoring as part of a cooperative regional effort in order to provide baseline data on which to evaluate mitigation strategies employed currently and in the future.

The County believes these efforts will result in tangible improvements to Portneuf River water quality but that the lack of information on current water quality hinders the evaluation process. A need exists to expand monitoring activities such that objective evaluations can be conducted.

Short-term

- The County will conduct a mile-by-mile assessment of rural roads with respect to sediment sources, problem areas, and potential remedies relating to sediment, channel, and riparian alteration. This assessment will be performed in cooperation with aquatic specialists from other agencies.

Caribou County [To be determined]

Hydroelectric Power

Portneuf River Hydroelectric Project (Project No. 07447-14; Commercial Energy Management; Order Issuing License, 29 December 1986) located just east of Lava Hot Springs

The facility is expected to abide by the terms of their Federal Energy Regulatory Commission (FERC) license to :

- Prevent soil erosion and stream sedimentation,
- Prevent any other form of water pollution,
- Pass 40 cfs of water over the diversion spillway for protection of fish and wildlife resources in the Portneuf River,
- Minimize fluctuation of reservoir surface elevation,

- Provide a flushing flow of all inflow or 350 cfs, whichever is less, past the diversion for a consecutive 10-day period between 1 April and 20 May, and
- Operate the project to ensure maintenance of state dissolved oxygen standards.

Marsh Valley Hydroelectric Project (Project No. 1046-09; Marsh Valley Hydroelectric Company; Order Issuing License, 1 December 1989) located on the Portneuf-Marsh Valley Canal

The facility is expected to abide by the terms of their FERC license to protect fish and wildlife resources by providing for a continuous year-round minimum flow release of 10 cfs or inflow to the project, whichever is less, to the bypass reach of the river.

Shoshone-Bannock Tribes

The Shoshone-Bannock Tribe's interest in the Portneuf River stems from the fact that the river begins and ends on the Fort Hall Indian Reservation. The Tribes have done fencing projects along the river banks, have implemented agricultural BMP's and are continuing to work with farmers on changing pivots to more efficient, low-flow systems. In 2000, the Fisheries Department acquired a grazing lease that covers a one-mile stretch of the Portneuf in which cattle will no longer graze and allow for restoration of the streambanks.

The Tribes will participate in water quality monitoring activities on the Portneuf while coordinating with the other stakeholders. This monitoring will include assessment of water quality of springs discharging into the river as they relate to agricultural run-off and infiltration. In addition, the Tribes are planning to improve an existing boat ramp at Swanson's Loop by replacing clayey sand with gravel which will mitigate the impact of sedimentation to the Portneuf.

4.5.3 Additional Monitoring Solutions by Stakeholders

Idaho Department of Environmental Quality

The Idaho Department of Environmental Quality (DEQ) is responsible for assessing progress towards supporting beneficial uses in the Portneuf River and tributaries. The Beneficial Use Reconnaissance Project (BURP) is one method DEQ uses to assess this support. DEQ will coordinate and review BURP and other monitoring data as to support of waterbodies of their beneficial uses. DEQ will also examine performing BURP monitoring at selected sites within the Portneuf River subbasin to examine between-years variation in the process.

DEQ also commits to cost sharing up to $10,000 per annum with other concerned entities to monitor the lower Portneuf River through and downstream of Pocatello. The agency will continue to fund 6 months (April to September) of sampling on a biennial basis at the Pocatello, Topaz, and Marsh Creek USGS surface-water stations. DEQ will consider, should funds be available, increased monitoring at the Topaz gage site.

4.5.4 Local Citizen Involvement

A local spirit of cooperation in the protection and restoration of the Portneuf River is evident by the various groups that have substantially contributed their time and effort. The Portneuf Greenway organization has been successful in focusing local residents' attention towards the Portneuf River. Friends of the Portneuf is a group of dedicated sportsmen that have worked on various projects since 1975 with the aim of improving the quality of riverine habitat and water. Friends of the Portneuf efforts have been directed primarily towards fencing of streambanks and other channel restoration efforts such as streambank revetments and willow plantings.

Since 1994, a cooperative approach to watershed management and protection has been an explicit mandate for the Portneuf Watershed Council, DEQ's Watershed Advisory Group for the Portneuf River TMDL development. The Portneuf River Watershed Management Effort was first initiated to bring together local, state, federal, and tribal agencies to discuss programs and plans within the Portneuf River subbasin. This group eventually became known as the Portneuf Watershed Council. In 1995 the Idaho Legislature enacted legislation that formed watershed advisory groups (WAGs) and basin advisory groups (BAGs) to advise DEQ on water quality standards and TMDL development. The Portneuf Watershed Council decided to take on the role of the WAG, which has specific statutory responsibilities. The Portneuf Watershed Council has worked closely with DEQ and other agencies to develop and review the Portneuf River TMDL.

4.5.5 Pollutant Trading

Pollutant trading is a market-based, business-like means to help solve water quality problems by focusing on cost-effective, watershed level solutions to problems caused by discharges of pollution. Pollutant trading is most practical when pollution sources face substantially different pollution reduction costs. Typically, a party facing relatively high pollution reduction costs compensates another party to achieve an equivalent, though less costly, pollutant reduction. The result is overall lowered pollution discharges and pollution reduction costs.

Most importantly, pollutant trading is voluntary. Parties trade only if both are better off as a result of the trade. Pollutant trading does not create any new regulatory obligations because trading systems are designed to fit within existing regulatory frameworks. A successful pollutant trading program will create flexibility that allows selection of pollutant reduction methods to be based on financial merit while ensuring water quality goals are met.

Implementation and restoration efforts need to concentrate on subwatersheds with the highest pollutant loads and where improvements will have the most impact. Upstream investments, including rehabilitation of riparian zones and restoration of natural stream channels and associated flood plains, may provide the most cost effective means to mitigate sediment and nutrient impacts to surface waters. Pollutant trading may offer a useful means to facilitate the application of funds to areas where the most cost-effective control measures can be achieved. Application of pollutant trading to the Portneuf Subbasin will be actively pursued.

4.5.6 Surface Water Quality Modeling of the Portneuf River for Support of TMDL

In order to support regional TMDL efforts on the Portneuf River, water quality modeling is being performed by Idaho State University (College of Engineering, Environmental Engineering Program) under a Cooperative Agreement with the Idaho Department of Environmental Quality. The primary purpose of the modeling is to determine the extent of existing water quality impacts, areas of concern, and impacts related to future land and industrial uses.

The EPA model Water Quality Analysis Simulation Program (WASP5) was the model selected for the Portneuf River. The model has been used for numerous applications, has been validated, and is well documented. WASP5 is a dynamic compartment model that can be used to analyze a variety of water quality problems in diverse water environment such as ponds, lakes, streams, rivers, reservoirs, estuaries, and coastal waters. WASP5 allows one, two, or three dimensional modeling of the aquatic system including the water column and underlying benthos, using advection, dispersion, point and non-point mass loading, and boundary exchanges as the basic program. The WASP5 system consists of two stand-alone computer programs, DYNHYD5 and WASP5. The movement of water will be simulated by the hydrodynamic program, DYNHYD5, while the movement and interaction of pollutants within the water will be simulated by the water quality program, WASP5.

The first task of the modeling effort is to collect and compile Portneuf river data including river characteristics and water quality parameters from various sources including, but not limited to, DEQ, USGS, ISU, FMC (Astaris), Simplot, City of Pocatello, Natural Resource Conservation Service (NRCS), and IASCD. The data will be analyzed for its overall applicability and viability for the use in the modeling as well as evaluation of data gaps and recommendations for future sampling efforts within the watershed. The initial modeling effort will structure a one-dimensional river model focusing on the lower Portneuf River (particularly the region surrounding the Pocatello Water Pollution Control Facility). The model will next be expanded toward the upper region of the Portneuf River. This modeling effort using WASP5 is expected to help DEQ interpret and predict water quality responses to natural phenomena and man-made pollution in the Portneuf River for various pollution management decisions. The model is also capable of examining the impact of stormwater runoff from the City of Pocatello on the Portneuf River.

4.5.7 Coordinating Activities

Coordinated Resource Management (CRM) is a stakeholder consensus decision-making process. Stakeholders are any interest with a stake in the consequences of the decision. In this process, the stakeholders make decisions by consensus, rather than by traditional voting and majority rule. CRM enables stakeholders to manage natural resources in a creative, efficient and economical fashion. CRM combines voluntary efforts, local common sense and technical expertise to achieve common goals and objectives.

Citizen involvement is crucial to the restoration of the Portneuf River and attainment of beneficial uses. Various private and public interests are represented in the Portneuf River Watershed Council, which consists of industrial manufacturers, irrigators, residents, landowners, and local, state and federal agencies. The Portneuf Watershed Council is currently performing "CRM" for the Portneuf River. Stakeholders come together to develop recommendations for plans, proposals, and projects. The Council could coordinate monitoring efforts along the Portneuf River between point and non-point sources. The Council also builds consensus among these various interests and advises the Idaho Department of Environmental Quality about the Portneuf River TMDL development and implementation. This cooperation demonstrates stakeholder commitment and ensures that private and public resources are integrated to enhance the water quality of the Portneuf River while restoring beneficial uses.

4.5.8 Milestones for Measuring Progress

Support of beneficial uses will be measured through water quality, habitat, fisheries and BURP monitoring programs. At several key points during program implementation, stakeholders will evaluate progress at reducing impairment of beneficial use. At the end of each five-year period (2004, 2009) we will review and analyze available data, assess progress towards support of beneficial uses, and make recommendations for future program modification. If future data indicates that a beneficial use cannot e supported in a particular river reach, the appropriate mechanism to remove that use is a "use attainability analysis."

4.6 Monitoring Program

The entire TMDL process requires an active monitoring program. Data are needed for various aspects of the TMDL process including:

- Assess on a regular basis whether beneficial uses are impaired for a water body which determines if a stream segment will be 303(d) listed for a particular pollutant;
- Quantify pollutant loads from point and nonpoint sources;
- Determine assimilative capacity of the water body;
- Quantify pollutant reductions from BMPs and also for effluent trading purposes; and,
- Determine when conditions in an impaired water body have improved to the point that they can be delisted.

These needs greatly exceed the scope of current and past monitoring programs in the Portneuf Subbasin. This section addresses the basis for, and elements of, the Portneuf Subbasin monitoring program. The monitoring program will be reviewed on a regular basis (possibly in a series of workshops). Stakeholders commit to working towards development of funding sources required to implement the monitoring program for the TMDL program. Figure 4-3 shows current monitoring sites.

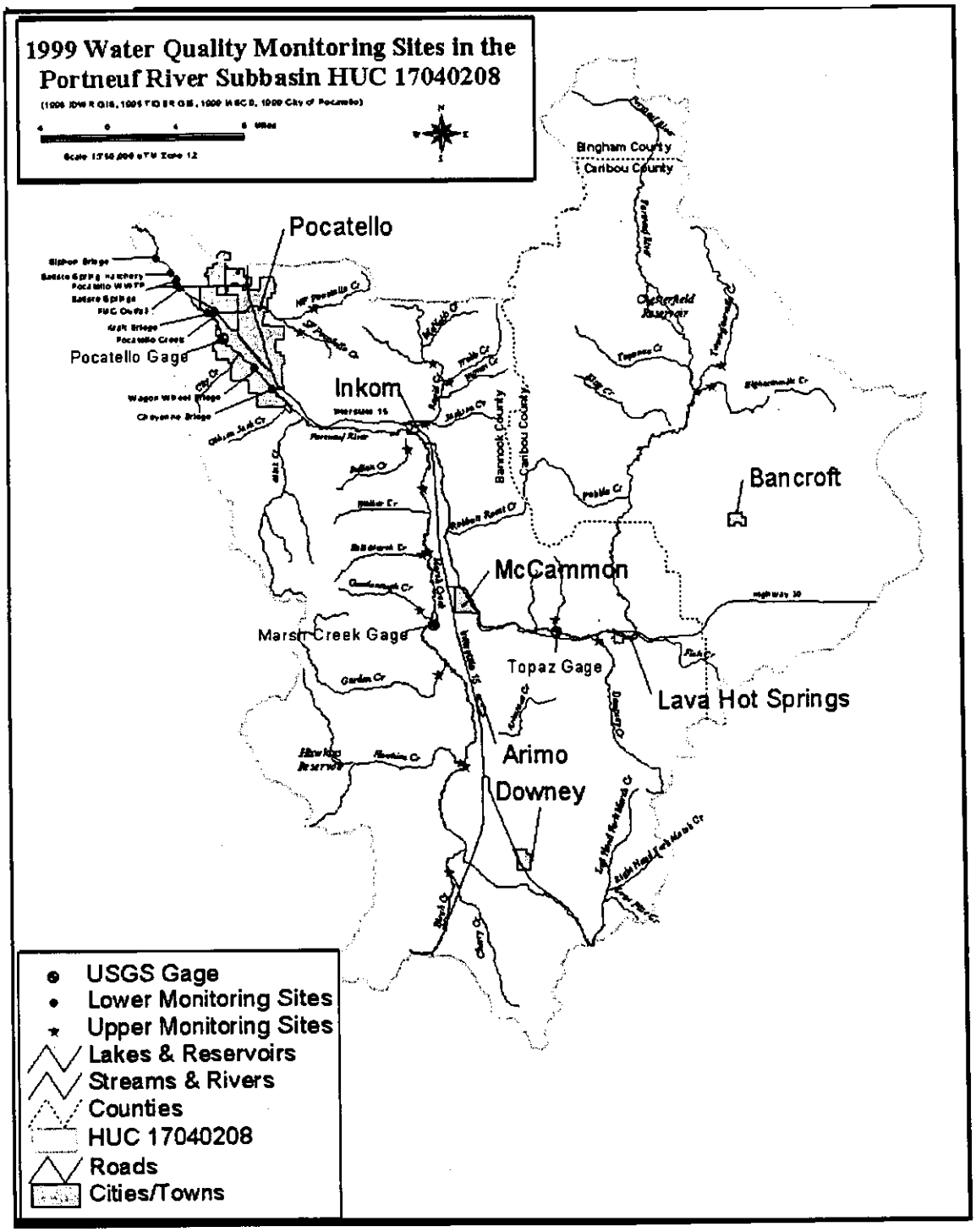


Figure 4-3. Map of monitoring sites

4.6.1 Types of Monitoring

Control Points and Monitoring Station Locations

Past monitoring programs in the Portneuf Subbasin have had various diverse objectives and the stations and monitoring points used historically have not necessarily been situated optimally for assessment of subwatershed loads. A topic for discussion during TMDL program monitoring assessment will be the suitability of monitoring stations and control points with respect to the current TMDL program. In may be appropriate to develop new control points to allow assessment of pollutant reductions associated with specific activities. For example, the Pocatello USGS Gage on Carson Street provides the basis for the loading analysis presented in Section 3 of the TMDL, but its location in the center of the urban area diminishes its utility for differentiating changes in urban and agricultural impacts. As an early action item during TMDL monitoring program development we will be evaluating the possibility of funding new control points at locations where there are discontinuities in land usage with respect to rural versus urban impacts.

Instrumented Monitoring Stations

Instrumented stations play a central role in assessing attainment of beneficial uses. Sensors that continuously monitor water quality characteristics provide an excellent means to cost-effectively assess the impairment of water bodies. Monitoring instruments are available to measure the following constituents:

- water level
- water temperature
- dissolved oxygen
- pH
- specific conductance
- turbidity
- additional local conditions such as air/ground temperature and precipitation

The combination of discharge, water temperature, dissolved oxygen, and turbidity provides fundamental diagnostic information regarding the pollution status or "health" of a stream. Although regular probe maintenance and calibration of sensors is necessary, these constituents are amenable to automated monitoring, which provides a number of advantages over manual data collection procedures. These advantages include cost-savings and substantially more representative sampling of episodic events. For water quality characteristics that can vary significantly on a 24-hr basis, continuous monitoring provides the data needed to determine biologically critical conditions such as maximum temperature and minimum dissolved oxygen concentration.

Dissolved oxygen

Although recording of dissolved oxygen (DO) conditions in the Portneuf subbasin has not received much emphasis in past monitoring programs, we plan more extensive use of such instrumentation in the TMDL assessment program. In low gradient reaches such as the middle and lower Portneuf subbasin, the record of DO variation over the 24-hr period provides one of the most direct measures available of the potential impact of pollutants on aquatic biota. Comparison of the minimum daily DO with numeric standards serves as a key indicator of whether nutrient loading is resulting in impairment of beneficial uses. Further, analysis of 24-hr DO data provides a means to assess the trophic status of a water body, which is a fundamental measure of the suitability of nutrient targets.

Discharge

Discharge monitoring constitutes a fundamental component of the TMDL program insofar as it constitutes half of the equation used to calculate pollutant loading (Load = Concentration x Discharge). The Portneuf Subbasin is no different from elsewhere in Idaho, where discharge-monitoring stations have been abandoned through the years as budgets have been cut. We anticipate the need for enlargement of the present network of three gauging stations in the Portneuf Subbasin, especially higher in the subbasin to allow loading analysis by subwatershed. Stakeholders will encourage greater cooperation among the USGS, State, and local agencies to ensure that funding is adequate to support flow data needed for the TMDL program. We plan to evaluate the dual role of discharge stations and telemetry for flood control as well as loading and instream flow needs for beneficial use attainment.

Turbidity/Suspended Sediment

Instrumentation has developed over the past decade that has greatly improved the continuous *in situ* monitoring of turbidity and suspended particles. When properly calibrated to a site, continuous turbidity probes provide a means to estimate suspended sediment and total phosphorus loads. Installation of a network of turbidity and discharge monitoring stations will provide a direct means for monitoring load reduction for sediment and phosphorus.

4.6.2 Continuous Monitoring Stations

The existing and anticipated monitoring stations in the Portneuf subbasin are given in Table 4-3. The list of proposed stations is provisional and represents the product of initial discussions of what will be needed to assess loading trends required for the TMDL program. Continuous monitoring sites will enable us to understand the hydrologic characteristics of watersheds (i.e., water and pollutant yield) and the dynamics of pollutants in the Portneuf River subbasin. Once these are understood, BMPs can be designed and implemented to effectively reduce pollutants and accelerate the restoration of beneficial uses.

Table 4-1 shows proposed monitoring sites in the subbasin and their measured parameters.

Table 4-1. Proposed instrumented monitoring stations in Portneuf Basin.

Location	Constituents	
	Present	Proposed
Portneuf R. at Toponce	Q	
Marsh Ck	Q	
Marsh Ck nr mouth		WT,EC,pH,DO,Turb,AT,Ppt
Subwatershed to be determined		Q, WT, EC, Turb,AT,Ppt
Subwatershed to be determined		Q, WT, EC, Turb,AT,Ppt
Subwatershed to be determined		Q, WT, EC, Turb,AT,Ppt
Portneuf R at Inkom		WT,EC,pH,DO,Turb,AT,Ppt
Portneuf R at Fichter Park		Wt,EC,pH,DO,Turb,AT,Ppt
Portneuf R at Carson	Q	
Pocatello Ck		Q, WT, EC, pH,DO,Turb,AT, Ppt
Portneuf R above Astaris		Q,WT,EC,pH,DO,Turb,AT,Ppt
Astaris Outfall	Q	
Portneuf R. at Batise	WT,EC,pH,DO,,	
Pocatello WPC Outfall	Q,WT,EC,pH,DO	
Portneuf R at Siphon	WT,EC,pH,DO,	

Abbreviations:

WT = Water Temperature
AT = Air Temperature
Ppt = Precipitation
EC = Electrical Conductivity
DO = Dissolved Oxygen
Turb = Turbidity
Q = discharge

Current Monitoring Programs

Table 4-2 gives a summary of constituents in present water quality monitoring programs of Portneuf River (sans USGS constituents).

Monitoring Impact of Agriculture

The Portneuf Soil and Water Conservation District and the Caribou Soil Conservation District, in cooperation with the Idaho Association of Soil Conservation Districts, the Idaho Soil Conservation Commission, Idaho State Department of Agriculture, Natural Resources Conservation Service, and the Idaho Department of Environmental Quality, have implemented a monitoring program that collects water quality samples from eighteen sites that are analyzed for sediment, nutrients and bacteria. The monitoring program began in May 1999 and continued until May 2000 and allows the Districts ability to evaluate impacts of agriculture on the tributaries and mainstem of the Portneuf River, determine critical areas or sources that contribute the greatest level of pollutant loading, identify areas where BMPs need implemented, and use monitoring results to increase landowner/public awareness. Future monitoring to assess specific project implementation effectiveness on a subwatershed basis is anticipated.

City of Pocatello Urban Runoff Water

City of Pocatello storm water runoff has been identified as a source of pollutants into the Portneuf River. Proposed pending legislation for revision of the water pollution control program addressing stormwater discharges (NPDES Phase II) will require municipalities to monitor and assess water quality from stormwater runoff; then plan accordingly to reach and maintain water quality standards as set forth by the TMDL requirements. The 303(d) list identified bacteria, nutrients, sediment, and oil and grease as pollutants of concern in the Portneuf River.

The sampling project is designed to assess the quantity and quality of water entering the urban area and as well as assessing the water leaving the urban area. Goals of this sampling project are, 1) identify pollutants of concern in the Portneuf River above and below the urban area reach, and; 2) determine Portneuf River discharge into and out of the Pocatello urban area reach. Information gained from this monitoring project will be used to evaluate the appropriateness of the listed pollutants, assess current conditions as well as demonstrating improvements in water quality due to BMPs and control strategies.

Monitoring Attainment of Beneficial Uses

Section 304(a)(1) of the Clean Water Act says, "States shall develop and publish criteria for water quality accurately reflecting the latest scientific knowledge...on the effects of pollutants on biological community diversity, productivity, and stability...". Water quality standards are legally established rules which include designated uses. Designated uses are those beneficial uses listed in the *Water Quality Standards and Wastewater Treatment Requirements* (Idaho Department of Health and Welfare n.d.a.).

Table 4-2. Summary of constituents in present water quality monitoring programs of Portneuf River (sans USGS constituents).

Location Name	Agency	Frequency	Bacteria	Turbidity	TDS	Suspended Solids	Total Alk	P	N	SO_4	Cl	TPH	Discharge	DO	Temp	pH
Topaz	USGS	a														
Marsh Creek	USGS	a														
Cheyenne Bridge	Poc	b	x	X	x	x	x	X	x	x	x	x		x	x	x
Wagon Wheel Bridge	Poc	b											x	x	x	x
Carson Street Gage	USGS	a														
Kraft Bridge	Poc	b	x	X	x	x	x	X	x	x	x	x	x	x	x	x
Pocatello Creek	Poc	b	x	X	x	x	x	X	x	x	x	x	x	x	x	x
Batiste Bridge	Poc	b	x	X	x	x	x	X	x				x	x	x	x
Siphon Bridge	Poc	b	x	X	x	x	x	X	x				x	x	x	x
Batise Spring Weir	Poc	b		X	x	x	x	X	x					x	x	x
Batise Spring LoadingDock	Poc	b		X	x	x	x	X	x					x	x	x
Batise Spring Culvert	Poc	b		X	x	x	x	X	x					x	x	x
Batise Spring Spill	Poc	b		X	x	x	x	X	x					x	x	x
Batise Spring Hatchery Effluent	Poc	b		X	x	x	x	X	x					x	x	x
E4 Spring	Poc	b		X	x	x	x	X	x							
Pocatello WPC Outfall	Poc	b	x	X	x	x	x	X	x	x	x	x	x	x	x	x
Astaris Outfall	FMC	b	x	X	x	x	x	X	x	x	x	x		x	x	x

Notes: Frequency: a= once/month April to October every other year;
b=once/month;
c=twice/month April to October, once/month November to March.

B = Bacteria (Total Coliform, Fecal Coliform, E. coli)
P = Total ortho-phosphorus, total phosphorus
N = Ammonia, nitrate+nitrite, TKN

Table 4-1 (Cont'.) Summary of constituents in present water quality monitoring programs of Portneuf River (this does not include USGS constituents).

Location Name	Agency	Freq-uency	Bacteria	Turbidity	TDS	Suspended Solids	Total Alk	P	N	SO_4	Cl	TPH	Discharge	DO	Temp	pH
North FK Pocatello Ck	IASCD	c	x		x	x		X	x	x	x		x	x	x	x
South Fk Pocatello Ck	IASCD	c	x		x	x		X	x	x	x		x	x	x	x
Indian Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Lower Marsh Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Middle Marsh Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Bell Marsh Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Goodenough Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Garden Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Hawkins C	IASCD	c	x		x	x		X	x				x	x	x	x
Upper Marsh Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Birch Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Webb Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Upper Rapid Ck	IASCD	c	x		x	x		X	x				x	x	x	x
East Bob Smith Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Dempsey Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Eighteenmile Ck	IASCD	c	x		x	x		X	x				x	x	x	x
Twentyfourmile Ck	IASCD	c	x		x	x		X	x				x	x	x	x

Notes: Frequency: a= once/month April to October every other year;
b=once/month;
c=twice/month April to October, once/month November to March.

B = Bacteria (Total Coliform, Fecal Coliform, E. coli)
P = Total ortho-phosphorus, total phosphorus
N = Ammonia, nitrate+nitrite, TKN

Idaho recognizes 10 Beneficial Uses. They are as follows:

- Water Supply: Agricultural, Domestic, Industrial
- Aquatic Life: Cold Water Biota (instantaneous temperature < 22 C),Warm Water Biota (instantaneous temperature < 33 C), and Seasonal Cold water (< 27 C)
- Salmonid Spawning (trout, char, whitefish)
- Recreation: Primary Contact (swimmable), Secondary Contact (fishable)
- Wildlife Habitat
- Aesthetics

To determine the beneficial use status and attainability of Idaho streams, DEQ developed the Beneficial Use Reconnaissance Program (BURP). BURP integrates chemical, physical, and biological aspects of a stream to characterize water quality. BURP looks at the macroinvertebrate and fish communities within the waterbody. In some streams the algae community is also examined. BURP results are incorporated into the State's "Waterbody Assessment Guidance" for determination of beneficial use support.

The State of Idaho is currently developing its second edition of "Waterbody Assessment Guidance." At this writing, this document along with "Idaho River Ecological Assessment Framework" and "Idaho Small Stream Ecological Assessment Framework" are available for a 90-day public comment period. These documents will provide a scientifically defensible protocol for determining beneficial use support in the coming years.

4.6.3 Future Monitoring Programs [To Be Determined]

References

USEPA 1991. *Guidance for water quality-based decisions: The TMDL process.* EPA 440/4-91-001. U.S. Environmental Protection Agency, Assessment and Watershed Protection Division, Washington, DC.

Prsupl4p.doc