WATER MONITORING STRATEGY

FOR THE

KALISPEL TRIBE

Date issued: May 27, 2010
Time period this strategy covers: May 2010 - September 2012
Tribal contact: Ken Merrill, Water Resources Program Manager
Phone: 509-447-7276
email: kmerrill@knrd.org

I. Introduction

The Kalispel people have always been a part of the waters of the Pend Oreille River and its tributaries and have been termed "water people" or "river people" (Allan H. Smith Ethnography, 1936-1938, unpublished). A large proportion of the lower Kalispel lived along the Pend Oreille River near present day Cusick. The river was an important source of food, tools, and shelter materials (Fahey, 1986; Nenema, 1996). The Tribal Council has directed the Natural Resources Department to actively participate in the cooperative management of the resources of these watersheds within and outside of the formal reservation boundaries. This importance of water throughout the Kalispel's ceded lands is reflected in the design of the water quality monitoring and fisheries restoration efforts.

Overview of the Kalispel Reservation:

- The reservation totals approximately 4,700 acres. However, there are an additional 1,873 acres of trust lands with several small streams and many acres of wetlands.
- It includes approximately 16.8 miles of shoreline on the reservation, with an additional 7.5 miles of shoreline on trust land.
- There are five watersheds that are part of, or contact, the reservation/ trust land ranging from 135 acres in Trimble Creek to 5,500 acres of contiguous watershed along the Pend Oreille River.
- There are three small lakes that contribute water into watersheds of the reservation. Pend Oreille River is impounded by the Box Canyon hydroelectric project which forms a run of the river reservoir.
- There are about 1,400 acres of wetlands on the reservation with about another 1,250 of wetlands on trust land
- There are no major potable aquifer systems identified on the Reservation.

In March, 2003, The Kalispel Tribal Council formally adopted water quality standards applicable to reservation waters and submitted these for review by the EPA. The Tribe submitted an application for Treatment as a State (TAS) under Clean Water Act Sections 303(c) and 401 in November, 2000. In November, 2002, TAS status was granted to the Tribe for these sections. In May, 2004, the Tribe submitted to EPA an errata sheet correcting typographical errors and making minor editorial changes to the standards. In June, 2004, the EPA approved the Tribe's water quality standards.

Important environmental issues facing the Tribe include land use practices leading to water quality violations in the watershed, degradation of habitat for native bull trout and west slope cutthroat trout, impacts from the introduction of invasive species, and adverse affects caused by hydroelectric projects.

This monitoring strategy focuses on the main-stem of the Pend Oreille River and its tributaries. However, it has also serves to characterize watersheds that are a priority for bull trout and west slope cutthroat trout enhancement projects. In the future, the tribe may begin to evaluate the distribution and impacts of invasive species (e.g., Eurasian milfoil). Long term goals may also include using our GIS capabilities to map the potential effects of climate change on the tribe's water resources and developing adaptive management strategies for restoring water quality and native fish populations.

II. Monitoring Objectives

The Kalispel Tribal monitoring program is in the Water Resources Program of the Natural Resources Department (KNRD). The Natural Resources Department is also responsible for Fish, Wildlife, and Forestry resources. The KNRD have been monitoring waters at various degrees of effort for about seven years.

Monitoring Objectives	
Program Area	**Objectives**
Overall Water Resources Program	• Assess whether water quality criteria are being met and beneficial uses are being supported for water bodies across the reservation (Overall Water Quality). • Establish a baseline of water quality condition for all waters and periodically reassess the baseline water quality to look for changes (Status and Trends).
Nonpoint Source Program	• Identify waters needing restoration. • Determine the effectiveness of individual NPS projects in meeting water quality criteria and supporting beneficial uses. • Evaluate cumulative watershed impacts from best management practice (BMP) implementation.
Water Quality Standards	• Identify the reference condition for streams to use in the development of biological criteria. • Develop and refine water quality standards.

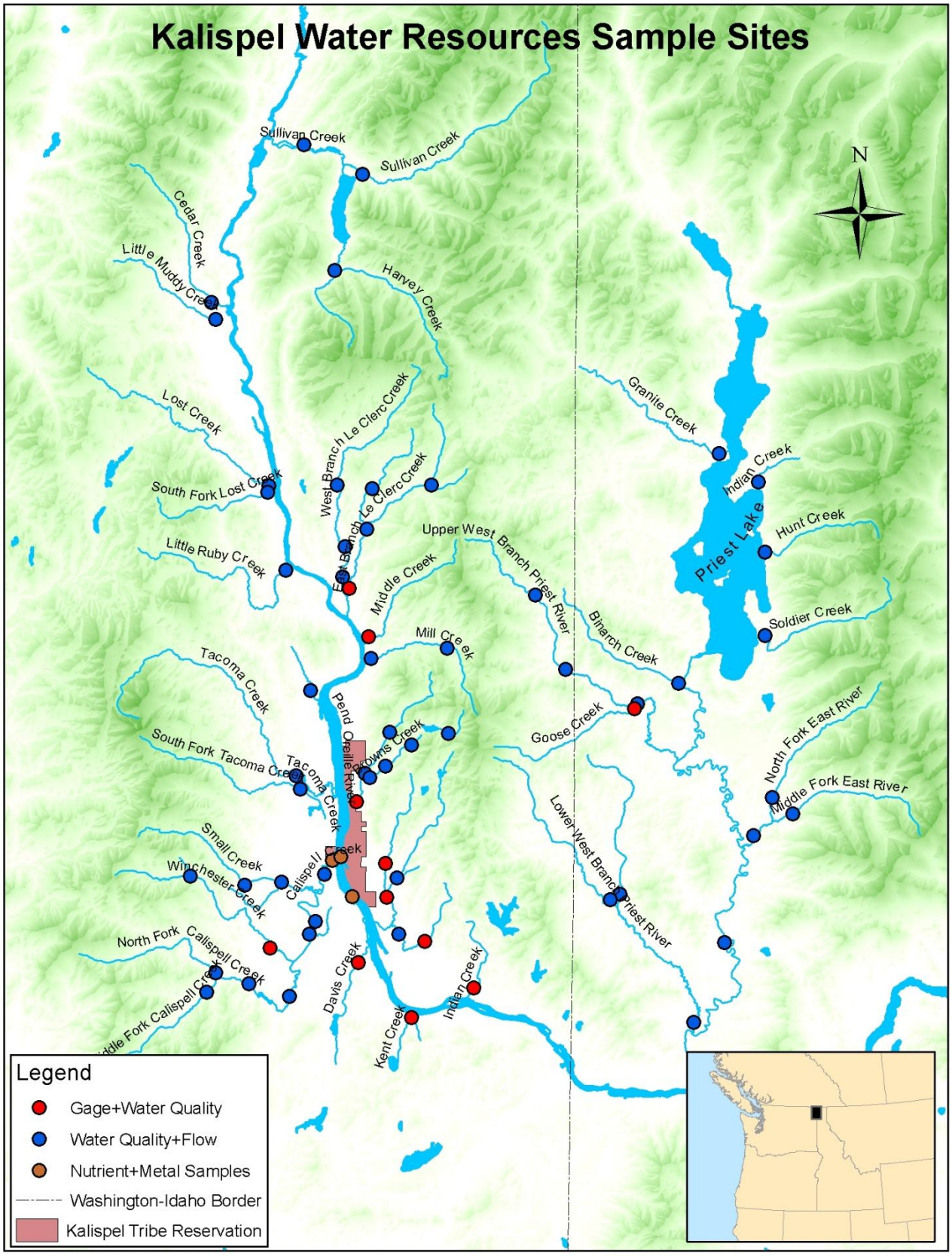
Monitoring priorities will be reevaluated annually by the Water Resources Program staff to update and meet changing environmental priorities and to reassess WQ monitoring designs.

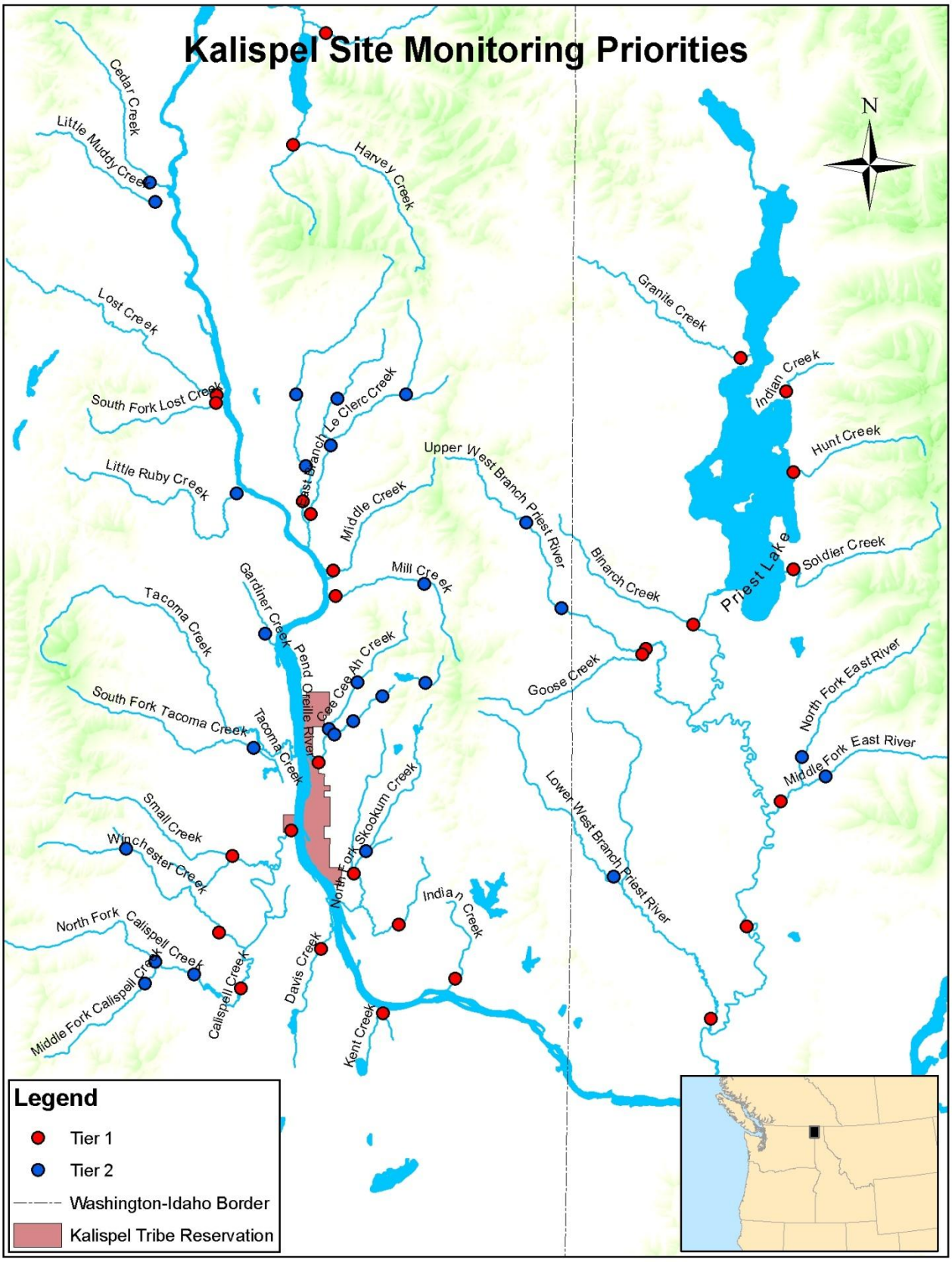
III. Monitoring Design

The water quality monitoring design is essentially the same as originally established in 2002 with reductions from the initial amount of laboratory analyses. The program currently monitors about 54 sites. In some cases monitoring frequency is dependent on seasonal access (see maps).

Monitoring Design					
Program Area	**Design**	**# Sites**	**Frequency**	**Resources**	**Brief Program Description**
Overall Water Quality	Fixed station network with limited targeted design	Tier 1 (Core) 28 sts. WQ+flow	Once a month	Annual Avg. of 2 FTEs	Started in 2002. Plan to continue monitoring strategies as long as resources allow to support TMDLs and native trout restoration
		Tier 2 (Core Seasonal) 26 sts. WQ+flow	Once a month when access		
		WQ - Nutrients & metals– 3 sts.	Monthly select core sites		
		Thermographs–50	Continuous		
Water Quality Status & Trends	Same as above	Same as above	Same as above	Same as above	Same as above
NPS Effectiveness Monitoring	Same as above	Same as above	Same as above	Same as above	Same as above

This monitoring design will be reviewed with the Water Resources Program staff at the end of the water year 2012. At that time, staff will assess making changes in monitoring strategies, if necessary, to achieve tribal water quality standards. Additionally, the department intends to study relationships between stream flow and native fish habitat, assess the abundance of invasive aquatic plant species, and to develop additional capacity for statistical analysis. These projects will be dependent on funding to cover project designs and implementation costs.


Kalispel Water Resources Sample Sites
N
Sullivan Creek
Sullivan Creek
Cedar Creek
Little Muddy Creek
Harvey Creek
Lost Creek
West Branch Le Clerc Creek
South Fork Lost Creek
Le Clerc Creek
Little Ruby Creek
East Branch
Middle Creek
Upper West Branch Priest River
Mill Creek
Tacoma Creek
Pend Oreille River
Browns Creek
South Fork Tacoma Creek
Tacoma Creek
Small Creek
Calispell Creek
Winchester Creek
North Fork Calispell Creek
Davis Creek
Indian Creek
Kent Creek
Granite Creek
Indian Creek
Priest Lake
Hunt Creek
Soldier Creek
Bharch Creek
Goose Creek
North Fork East River
Middle Fork East River
Lower West Branch Priest River
Legend
Gage+Water Quality
Water Quality+Flow
Nutrient+Metal Samples
Washington-Idaho Border
Kalispel Tribe Reservation


Kalispel Site Monitoring Priorities
N
Cedar Creek
Little Muddy Creek
Harvey Creek
Lost Creek
South Fork Lost Creek
Little Ruby Creek
East Branch Le Clerc Creek
Middle Creek
Mill Creek
Gardiner Creek
Pend Oreille River
Tacoma Creek
South Fork Tacoma Creek
Tacoma Creek
See Cee Ah Creek
Small Creek
Winchester Creek
North Fork Skookum Creek
North Fork Calispell Creek
Middle Fork Calispell Creek
Calispell Creek
Davis Creek
Indian Creek
Kent Creek
Granite Creek
Indian Creek
Hunt Creek
Upper West Branch Priest River
Priest Lake
Soldier Creek
Bitterroot Creek
Goose Creek
Lower West Branch Priest River
North Fork East River
Middle Fork East River
Legend
Tier 1
Tier 2
Washington-Idaho Border
Kalispel Tribe Reservation

IV. Core and Supplemental Water Quality Indicators

The water quality parameters chosen for consistent monitoring were based on getting the most information for the least cost. Chemical analysis involving laboratory work-up has been reduced from original monitoring efforts because they became cost prohibitive. However, as of June 2010, the water quality department reassessed the criteria being used to quantify sample values. After coordinating with our contract laboratory, we began assessing values for metals, ammonia and nitrogen, that fall between detection limit and reporting limit criteria. It is our intent to use these estimated value samples, along with those samples that occur above the reporting limit values to reassess water quality within the reservation waters. We will be using the most appropriate statistical methods for the treatment of this censored data.

Indicator Sampled by Water Resource Type and Program Area									
Water Resource Type and/or CWA Program Area and/or Monitoring Objectives	DO	Temp	pH	Turbidity	Nutrients (TP/ TN)	Habitat	Macro inverts.	Pathogen	Flow
Overall Water Quality	X	X	X	X	X	Stream habitat surveys by Fisheries Program	Original survey done in 1999 and then few select locations in 04',08' 09'	X	X
Water Quality Status & Trends	X	X	X	X	X			X	X
NPS Effectiveness Monitoring	X	X	X	X	X			X	

The Kalispel Tribe is in the process of drafting a comprehensive natural resources management plan. In that plan, the surveying of aquatic invasive plant species has been identified as a work product, with the overall intent being to reduce their abundance. As of now, however, it does not rank as a priority for the department. This is a function of restraint, due to existing human resource capacity. As for completing assessments of macro invertebrates as biological indicators, the department has dropped its intent to sample for them. Primarily this is because the restoration of a keystone fish species important to the tribe, anadromous and resident bull trout (*Salvelinus confluentus*), is the most appropriate indicator for validating that the watershed is properly functioning and healthy.

V. Quality Assurance

Quality Assurance Documents			
Type	**Title**	**Completion Date**	**EPA Approval/Date**
QAPP	Sampling and Water Quality Assessment of Streams & Rivers (updated earlier QAPP)	September 6, 2002	September 29. 2003
SOP	Field Procedures Manual	Updated June 2010	N/A

The SOPs for field and lab procedures have been updated and are in the process of being reviewed and formally adopted into an updated QAPP. Generally, these updated standards fall into three categories: calibration procedures for field equipment, collection standards and field form updates, and data input standardization.

The department, in an ongoing effort to ensure that high quality data is being collected, revisited the calibration procedures for all parameters being investigated for each piece of field equipment. New standards were written in-house for our water quality probes, to account for updated equipment. For our Troll 9500 this included new dissolved oxygen and turbidity calibration procedures. Also, our procedure for thermograph calibration has been updated and includes an archival tool for water quality personnel to store calibration datasets. This became a necessity to account for the number of thermographs being deployed annually in the watersheds, and our belief that temperature datasets will likely be intensely scrutinized, in the future. We also purchased a NIST-certified thermometer to account and or verify drift in thermographs once retrieved from a deployment.

Field collection standards developed and adopted include new wading protocols for the entire resource department. This was in reaction to the abundant literature that exists regarding the spread of fish diseases from felt-soled boot waders. Standards at this time consist of treatment of waders through disinfection, but will also include a ban to all felt sole waders by the 2011 field season. Thermograph downloads for field staff has been modified in an effort to collect more intact datasets. We now download data quarterly, as this necessitates verification that the instruments have not been vandalized, that they remain properly situated in the thalweg of the stream, have not been lost due to stream flow processes and to guard against instrument malfunction. Data downloads from our water quality meters also are being conducted on a quarterly basis in an attempt to minimize overwriting of files, and loss due to instrument failure. This includes datasets from our 11 pressure transducers that are used for generating the department flow rating curves. Field forms modified include chain of custody forms, USGS flow, and water quality forms. Changes were minor in most instances, and all updated field forms are present in Appendix D. of the Kalispel Tribe QAPP.

Data input and storage QA/QC procedures have been extensively modified. Fidelity of site nomenclature, electronic filing regimes, and period of record information for spatial identification and analysis has been standardized. These actions were taken to rectify redundant information, and reduce error in data storage and retrieval. For instance, water temperature data, collected over a decade, throughout sites in north Idaho and northeastern Washington has been normalized. Although not an overly technical process, temperature data spanning many years and multiple spreadsheets for a single site have been condensed into single file structures. The next step in this process will be to import this data into our natural resources spatial database that is under construction. Once completed, we will be able to summarize and report on data sets rapidly with few quality control issues. The department is also using a trial version of USGS approved software for generating, storing, and tracking rating curves. We expect that if purchased, the software will help us understand hydrology in the watersheds to an even greater degree, while supplying us with a quality control component at the same time.

VI. Data Management

The Kalispel Tribe Water Resources Program of the Natural Resources Department is responsible for the water data management for the Tribe.

Data Management				
Water Resource Type and/or CWA Program Area and/or Monitoring Objectives	**Data Mgmt –on site**	**Storet**	**Land use data**	**Geo-referencing**
Overall Water Quality	Data is entered into MS Excel and MS Access Files are backed-up daily	All data will be exported into STORET using WEBSIM New staff will need trained on STORET Data is not being entered into Ecology EIM database to reduce redundancy and effort.	Yes there is land use data Managed by the KNRD GIS Administrator 1:24,000 scale	Yes
Water Quality Status & Trends	Same as above	Same as above	Same as above	Same as above
NPS Effectiveness Monitoring	Same as above	Same as above	Same as above	Same as above

VII. Data Analysis/Assessment

The Tribe uses MS Excel and WQ Stats Plus to analyze data for WQ Annual Assessment Reports. We also use data from USGS, Army COE, WA Dept. of Ecology, ID DEQ, Tri-State Water Quality Council, WA Fish and Wildlife. Our analytical capabilities could be enhanced by developing a good understanding of the best statistical methods to use (non-parametric or parametric) and a statistical software package with better graphics capability. We are in the process of using a trial version of a USGA approved software package (Aquarius), for analyzing flow rating curves, database utilities, and tracking of parent files.

The tribe's water resources staff, believe that formal training, using EPA recommended statistical analyses specific to trend analyses of water quality data and project design, would help build capacity in the department. Part of the training could incorporate training with preferred statistical software packages generally used for these analyses. The Tribe currently does not have a documented method for assessing attainment of water quality standards, but would be open to guidance on how to develop that product as part of formal training.

VIII. Reporting

Tribal Reports			
Report	**Timeframe**	**Entities receiving copies of the report**	**Comments**
Annual WQ Assessment Rpt. - EPA	Annually by Oct 30	EPA KNRD Exec. Dir Posted on KNRD Website for public	Summary of WQ data with comparisons to WQ criteria
Quarterly WQ Monitoring Progress Report - EPA	Quarterly	EPA	Same Above
Tribal Water Resources Award Project Report	Project specific	US Bureau of Reclamation	Summary of water monitoring efforts

IX. Programmatic Evaluation

The Tribe has begun working on developing a formal process for reviewing existing monitoring efforts. This process has already addressed programmatic coordination opportunities for effectiveness monitoring and assessments. The department has also identified several data needs and gaps in monitoring strategies. We will continue to examine monitoring these priorities, as emerging issues and changing program objectives occur. This has become part of a continuous evaluation and improvement process of the monitoring program. The Kalispel Natural Resources Department is also developing a new database with the goals to consolidate all natural resources data accumulated over the past several years

The Tribe looks forward to working with EPA in the furtherance of these endeavors and plans to capitalize on any available technical assistance provided by EPA.

X. General Support and Infrastructure

Objectives	Staffing	Training	Equipment	Lab resources
Existing Provide Water Quality monitoring and continuity with past monitoring efforts	2.8 FTEs Program Manager Project and Data Management and Reporting Field Biological and Hydrologic Technician	The new staff brings a lot of WQ experience including designing WQ studies and reporting Technicians are highly competent in sampling and flow measurements	2 vehicles 2 Data Sondes 4 Current Meters w/ Bridge board & type A reel 2 lap-top, 2 old desk-top computers Kemmerer Water Sampler 12 Pressure Transducer/logger Old GPS	Water samples requiring analyses go to commercial lab including bacteria No biological monitoring is currently being performed
Future Reassess Monitoring Priorities and design Incorporate biological monitoring	2.8 FTEs Program Mgr Project Mgr Field Biological and Hydrologic Technician	Data management – STORET Stats/software for WQ monitoring program Biological Monitoring methods ARC-HYDRO GIS	ARC-HYDRO and Updated WQ statistical software 1 Vehicle replace Seasonal use boat Lap-top and desk-top comp. replace 4 transducer replacements 2 new flow meters Camera New GPS w/ map	Expanded budget for biological analyses