TMDL Project Plan: Otter Creek Watershed (Final Version 5-15-13)

Project ID: (Y16-TMDL-01)

Pollutant Types: Salinity (EC/TDS), Sediment, Metals

Completion Schedule: February 2014

DEQ Pollutant Project Managers:

Salinity Project Manager	Erik Makus
Sediment Project Manager	Kristy Fortman
Metals Project Manager	Kristy Fortman
DEQ TMDL Coordinator	Christina Staten

BASIC TMDL SCOPE:

Pollutant Type	Number of Impaired Waterbody – Pollutant Combinations (WBPCs)
Sediment	1 (Otter Creek; MT42C002_020)
Metal	1 (Otter Creek; MT42C002_020)
Salinity	1 (Otter Creek; MT42C002_020)

APPROVALS:

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PROJECT BASIS

This project plan is for TMDL development within the Otter Creek TMDL project area. This section provides an overview of the legal driver for TMDLs and the steps involved in TMDL development and how this project plan is used for quality control purposes during the TMDL process.

In 1972, the U.S. Congress passed the Water Pollution Control Act, more commonly known as the Clean Water Act (CWA). The CWA's goal is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA requires each state to designate uses of their waters and to develop water quality standards to protect those uses. Each state must monitor their waters to track if they are supporting their designated uses.

Montana's water quality designated use classification system includes the following uses:

- aquatic life
- wildlife
- recreation
- agriculture
- industry
- drinking water

Each waterbody has a set of designated uses. Montana has established water quality standards to protect these uses. Waterbodies that do not meet one or more standards are called impaired waters. Every two years DEQ must file a Water Quality Integrated Report (IR), which lists all impaired waterbodies and their identified impairment causes. Impairment causes fall within two main categories: pollutant and non-pollutant.

Montana's biennial IR identifies the state's known impaired waterbody segments. All waterbody segments within the IR are indexed to the National Hydrography Dataset (NHD). The 303(d) list portion of the IR includes all of those waterbody segments impaired by a pollutant, which require a TMDL. TMDLs are not required for non-pollutant impairments.

Both Montana state law (Section 75-5-701 of the Montana Water Quality Act) and section 303(d) of the federal CWA require the development of total maximum daily loads for all impaired waterbodies when water quality is impaired by a pollutant. A TMDL is the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

Developing TMDLs and water quality improvement strategies includes the following components:

- Determining measurable target values to help evaluate the waterbody's condition in relation to the applicable water quality standards
- Quantifying the magnitude of pollutant contribution from their sources
- Determining the TMDL for each pollutant based on the allowable loading limits for each waterbody-pollutant combination
- Allocating the total allowable load (TMDL) into individual loads for each source

In Montana, restoration strategies and monitoring recommendations are also incorporated in TMDL documents to help facilitate TMDL implementation.

TMDL Development Quality Assurance requirements are obtained via the TMDL Project Planning process, which is consistent with the WQPB Quality Management Plan. This process includes the development of a TMDL Project Plan project as a first tier. The TMDL project plan justifies the need for a data collection and source assessments that typically involve the development of one or more Sampling and Analysis Plans (SAPs) or modeling project plans as a second tier of quality assurance planning. This tiered process is a logical approach for a large and complex environmental project, such as TMDL development, that may involve several separate sampling and source assessment tasks. These unique monitoring and assessment tasks are often implemented over a two to three year period and are all are integrated within the larger TMDL project via the TMDL project plan. This approach improves efficiency and quality by providing an effective and timely way to integrate improved assessment or sampling methods during the TMDL project implementation period.

SECTION ONE – BASIC SCOPE AND PROJECT MANAGEMENT

1.1 INTRODUCTION

This document presents a plan for completing salinity, sediment and iron TMDLs for the Otter Creek Project Area. It also provides DEQ management, the DEQ QA officer, WMS staff, and watershed stakeholders with an understanding of the basic approach and schedule for completing these TMDLs. The plan specifies the project goals and objectives, and defines the project scope in terms of the study area boundaries, waterbodies to be addressed, and pollutant groups to be considered. The project scope is built upon the project definition as defined by DEQ management. The TMDL-development-approaches and specific tasks that will need to be conducted in order to complete the TMDLs are briefly described. Because each successive task will build upon the results of the previous tasks, it is important to note that the scope of work and schedule does evolve over time. Future modifications/updates will be presented in **Section 9** as amendments to this document.

1.2 PROJECT AREA

The Otter Creek Project Area is located in southeastern Montana within the Yellowstone River watershed (**Figure 1-1**). It is located within Powder River, Rosebud, and Big Horn counties in Montana.

The Otter Creek TMDL Project Area includes the entire Otter Creek watershed. The Otter Creek watershed is approximately 454,000 acres (709 square miles or about 1,833 square kilometers) and is located within Lower Tongue Hydrologic Unit Code # 10090102. Otter Creek originates near the Montana – Wyoming border and flows approximately 103 miles to its confluence with the Tongue River at Ashland, MT. The Tongue River enters the Yellowstone River near Miles City 118.2 river miles downstream from Ashland. **Figure 1-2** shows the extent of the project area.

The Otter Creek watershed represents about 13% of the entire Tongue River watershed, and about 20% of the Tongue River watershed below the Tongue River reservoir. Otter Creek represents a smaller percentage of the total inflow to the Tongue River, particularly after runoff conditions when Otter Creek can go dry some years. Overall, Otter Creek represents approximately 1% of the flow within the Tongue River (measured at the Tongue River gage below Birney), although the percentage ranges from 0.4% (August) to 6.0% (April) throughout the year. Significant tributaries to Otter Creek (from upstream to downstream) include Bear Creek, Indian Creek, Taylor Creek, Fifteenmile Creek, Tenmile Creek, Threemile Creek, Home Creek, and East Fork Otter Creek. The Otter creek watershed is sparsely populated.

Figure 1-1: Location Map for the Otter Creek TMDL Project Area

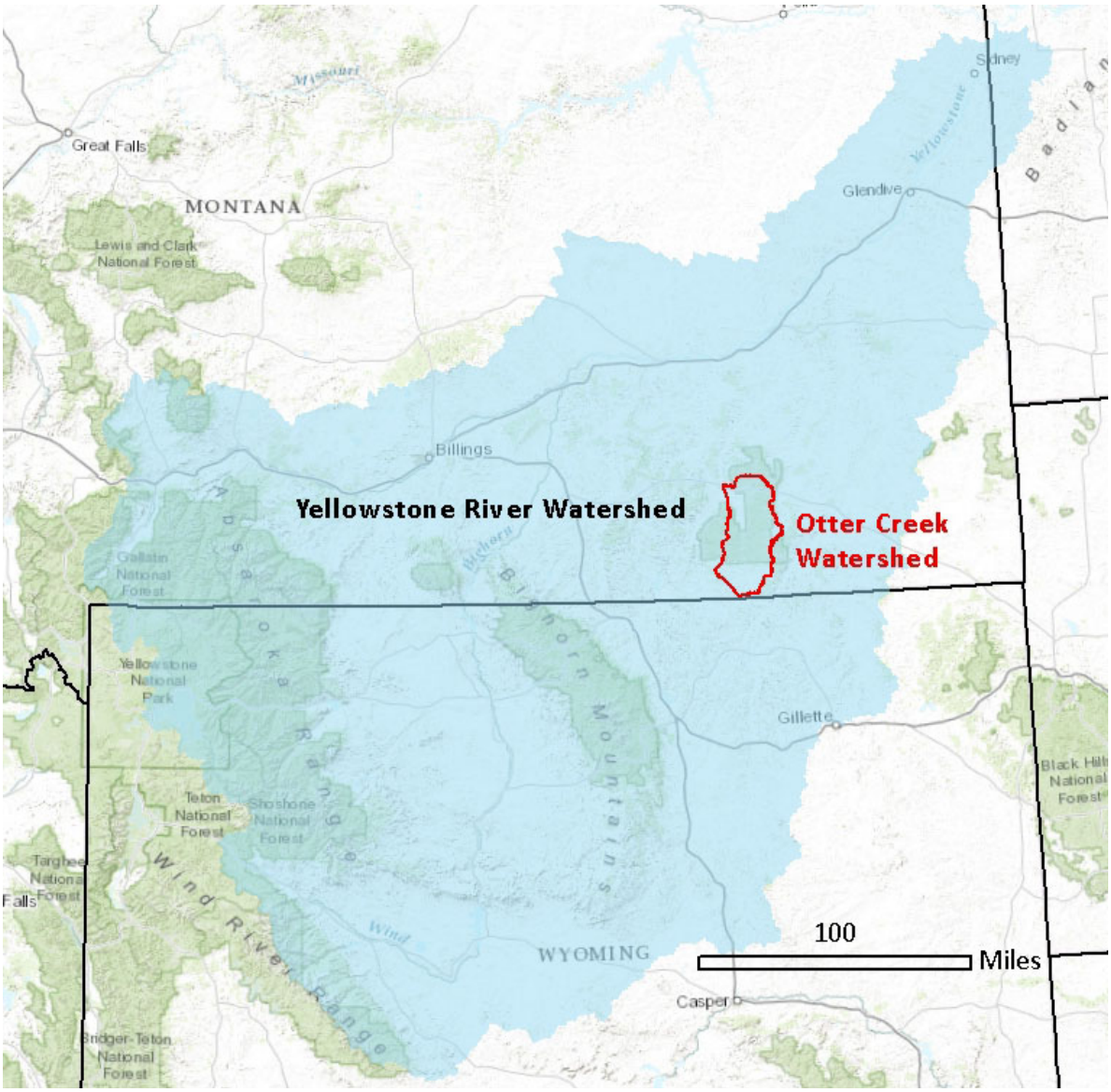

Figure 1-2: Otter Creek TMDL Project Area Map

1.3 TMDL SCOPE AND RATIONALE

TMDLs are developed for waterbody – pollutant combinations within the project area. There are three pollutant causes of impairment within the Otter Creek watershed as identified on Montana's 2012 303(d) List and within **Table 1-1** below. These three pollutant causes each represent a unique pollutant category type. The impairment cause identified as "solids (suspended/bedload)" is within the sediment impairment cause category and will be referred to as a sediment cause of impairment within this project plan, consistent with Montana's TMDL program terminology. The iron impairment cause falls within the metals pollutant category, but will be specifically discussed as iron within this project plan since it is the only metal impairment cause identified on Otter Creek. The salinity impairment cause is within the salinity pollutant group, and is intended to address both electrical conductivity (EC) and total dissolved solids (TDS).

Otter Creek is identified on the 2012 303(d) List as Category 5,2B. The "5" means that one or more causes are impaired by a pollutant and a TMDL is required. The "2B" means available data and/or information indicate that a water quality standard is exceeded due to an apparent natural source in the absence of any identified anthropogenic sources. Evaluation of natural conditions on a pollutant by pollutant basis is an inherent component of this TMDL project.

Water quality pollution can be linked to both pollutants, which typically require TMDL development, and non-pollutants which do not require TMDL development. In addition to the three pollutant causes of impairment, Otter Creek is also identified as impaired for one non-pollutant impairment cause defined as *alteration in stream-side or littoral vegetative covers*. This non-pollutant cause of impairment does not require TMDL development. Nevertheless, evaluation of stream-side vegetative covers will likely be integrated into the Otter Creek TMDL development scope because of the relationship between riparian health, sediment loading and sediment transport capabilities.

DEQ's assessment files note that there was insufficient information to fully evaluate this stream in recent years. This means that pre-2000 assessments and resulting impairment causes have remained for Otter Creek. Thus, the three pollutant impairment causes discussed above date back to the 1996 303(d) List.

None of the tributaries to Otter Creek have been assessed for impairment. Tributary assessment and TMDLs are beyond the scope of this document. Nevertheless, the nature of TMDL development typically involves assessment of pollutant loading at the watershed scale and development of TMDL allocations throughout the contributing watershed, including all tributary areas. Furthermore, given the importance of ground water, particularly during baseflow conditions within Otter Creek, assessment of ground water quality impacts on surface water can be an inherent component of TMDL development.

Table 1-1: 2012 303(d) List Pollutant Impairments for the Otter Creek Watershed

Water Body Description	Assessment Unit ID	Impairment Cause
Otter Creek (headwaters to mouth)	MT42C002_020	Salinity
Otter Creek (headwaters to mouth)	MT42C002_020	Iron
Otter Creek (headwaters to mouth)	MT42C002_020	Solids (Suspended/Bedload)

1.4 TMDL DOCUMENTATION

TMDLs from this project are scheduled for completion in 2013. All TMDLs will be contained within one final Otter Creek TMDL document. The DEQ TMDL project identification number is Y16-TMDL-01, and the DEQ TMDL document identification number is Y16-TMDL-01a

SECTION TWO –TMDL PROJECT CONSIDERATIONS

This section of the project plan provides basic project considerations that can influence overall project scope as well as specific planning details.

2.1 LINKAGE TO OTHER TMDLS AND IMPAIRMENT CONDITIONS

The Otter Creek Watershed is a portion of the Tongue TMDL Planning Area (TPA). TMDL support work has been underway for the Montana portion of the Tongue River watershed for several years. This TMDL support work includes significant source assessment work and associated sampling and modeling activity for Otter Creek. No previous TMDLs have been completed for Otter Creek, and no TMDLs have been completed for any of the other streams within the Montana portion of the Tongue River watershed. Nor have any TMDLs been completed for the Yellowstone River downstream from the Tongue River confluence.

Otter Creek flows into the Tongue River assessment unit segment (MT42C001_0140) that flows from Beaver Creek to Twelve Mile Dam. This segment of the Tongue River has two pollutant impairment causes: iron and solids (suspended/bedload). The Tongue River segment (MT42C001_ below the Twelve Mile Dam to the mouth) is identified as impaired for salinity, sediment, and several metals including iron.

2.2 PROJECT COORDINATION AND STAKEHOLDER OUTREACH

DEQ anticipates that there will be a high level of stakeholder interest in Otter Creek TMDL development. For several years, DEQ and EPA have been involved with TMDL and other water quality outreach within the Tongue River watershed. TMDL outreach for this project will involve many of the same individuals involved with previous outreach, although there will likely be a smaller number of individual stakeholders given the size and location of Otter Creek relative to the whole Tongue River watershed, much of which originates within Wyoming. The DEQ project coordinator will facilitate formation of an Otter Creek TMDL Watershed Advisory Group (WAG) and an Otter Creek TMDL Technical Advisory Group (TAG). Section 6 of this project plan provides additional detail regarding TMDL project management structure and stakeholder outreach.

2.3 WATERBODY TYPE AND CLASSIFICATION

Otter Creek is classified as C-3 within Montana's Water Quality Standards. The designated uses of a C-3 stream are described within Montana's water quality as follows: *"Waters classified C-3 are to be maintained suitable for bathing, swimming, and recreation, and growth and propagation of non-salmonid fishes are associated aquatic life, waterfowl, and furbearers. The quality of these waters is naturally marginal for drinking, culinary, and food processing purposes, agriculture, and industrial water supply. Degradation which will impact established beneficial uses will not be allowed."* Surface waters, often surface runoff, within the Otter Creek drainage are currently used for irrigation purposes when salinity levels are deemed acceptable by irrigators.

2.4 POTENTIAL RESOURCE CONSIDERATIONS

During snowmelt and other runoff conditions, water from Otter Creek and tributaries to Otter Creek is used to irrigate crops that mostly consist of grass hay and alfalfa. Most irrigation is linked to direct capture of runoff waters from hillslopes or via tributary diversions prior to the runoff or tributary water entering Otter Creek. Check dams are common along Otter Creek to facilitate sub-irrigation via increased water table elevations or to allow irrigation water diversion,

although the use of irrigation water directly from Otter Creek is significantly limited due to naturally elevated levels of salinity.

Otter Creek and tributaries are also an important source of livestock watering. Livestock are generally located along the mainstem Otter Creek and lower tributaries during winter months, and then grazed in the upland areas of the watershed generally from mid-April through mid-October.

Large coal reserves exist within the Otter Creek watershed, and mining activity is proposed in upland areas along Otter Creek approximately from Fifteenmile Creek to Home Creek reach. There is also significant potential for coal bed methane (CBM) production throughout portions of the watershed.

Otter Creek is rated as a fishery of substantial resource value from river mile 0.0 to 21.6, and moderate resource value from river mile 21.6 to 102.4 (MFISH, 2007).

2.5 Permitted Surface and Ground Water Discharges

As of March, 2013 the only existing MPDES permitted point sources for surface water discharge within the Otter Creek watershed are two construction stormwater permits linked to ongoing highway construction work near the lower reach. An MPDES discharge permits are anticipated for proposed coal mining activity (Arch Coal). These permits would cover stormwater and anticipated surface discharge outfalls from storage ponds. Discharges would be to Otter Creek and/or Otter Creek tributaries. Also, CBM production could result in future MPDES surface water discharge permits.

No existing MPDES ground water permits have been identified in the Otter Creek watershed.

2.6 Significant Data Collection and Studies

There are several relevant ongoing and previous data collection activities, reports and studies for Otter Creek. Many of these overlap in that the data collected from one activity may have been used for multiple studies or reports. These include:

1. **USGS gaging station data collection**
   There are 5 existing or historic USGS gage station locations within the Otter Creek drainage. These include:
   - MT 06307665 (Otter Creek near Otter)
   - MT 06307717 (Otter Creek below Fifteenmile Creek near Otter)
   - MT 06307725 (Otter Creek above Tenmile Creek near Ashland)
   - MT 06307735 (Home Creek near Ashland)
   - MT 06307740 (Otter Creek at Ashland)

   Most sites have been retired in recent years with the Otter Creek at Ashland site being used the most in recent years. Recent increased interest in data collection has led to sample re-activation for the Otter Creek site below Fifteenmile Creek.

2. **Water Quality Assessment for the Tongue River Watershed, Montana (EPA, 2007).**
   This water quality report was developed to assist with impairment cause determinations and TMDL development for the Tongue River Watershed within Montana. It includes a summary of water quality data as well as source inventories and limited pollutant loading source quantifications for Otter Creek.

3. **Characterization of Suspended-Sediment Transport Conditions for Stable, "Reference" Streams in Selected Ecoregions of EPA Region 8 (Klimetz, Simon and Schwartz, 2009)**
   This study evaluated channel conditions and analyzed suspended sediment loading at USGS gage stations throughout several Level III ecoregions. Four sites, located in the vicinity of the USGS gage stations, were evaluated on Otter Creek. Sediment rating curves for stable and unstable sites were developed for streams within each ecoregion. Fish inventory results were used to define fish functional traits and to evaluate potential impacts linked to excess sediment. Ecoregion 43, which includes the Otter Creek watershed, was analyzed in greater detail than other ecoregions because of the large number of USGS sites with useful sediment and flow data.

4. **Collection of Biological Data**
   Fish and macroinvertebrate data have been collected by the Montana Natural Heritage Program for Otter Creek and tributaries to Otter Creek, including recent (2011) biological data collection for baseline surveys in the vicinity of proposed coal mining. Additional baseline data collection is planned for 2013.

5. **Stream Habitat and Geomorphology Data Collection**
   Studies to assess stream habitat and geomorphology include:
   - 2001 – 2002 NRCS Stream Corridor Assessment: This work includes rapid aerial assessments and NRCS physical habitat assessments along 10 Otter Creek sites for which NRCS assigned scores to various channel characteristics to classify each site as Sustainable, At Risk, or Not Sustainable.
   - DEQ EMAP assessment: One site on Otter Creek was assessed in 2002 as part of DEQ's EMAP assessment project.
   - Rapid Geomorphic Assessment (RGA): Rapid geomorphic assessments were performed at the 4 USGS gage stations as part of the Klimetz et al 2009 study identified above.

6. **Salinity Data Collection** Various agencies have been collecting EC and SAR data in the watershed since the late 1970s. This includes hundreds of grab samples as well as continuous daily EC monitoring for several time periods (1981 to 1985, 2004 to 2006, and 2013 to present).

7. **DEQ and EPA Salinity Model Development**
   In the mid-2000s, EPA contracted with Tetra Tech to develop a salinity and water quality model for the entire Tongue River watershed using the modeling platform LSPC (Loading Simulation Program in C++). This model was used as the basis for the Otter Creek model, and updated with more recent weather and land use data and re-calibrated to a smaller scale watershed.

2.7 SOURCE INVENTORY AND SOURCE COMPLEXITY

Existing pollutant loading sources within the watershed are predominately linked to natural background and agricultural activities (crop production, livestock grazing). Below is a discussion of the existing sources and pathways by pollutant.

Salinity

The Otter Creek watershed, like many eastern Montana watersheds, has high natural background salinity loading in the form of total dissolved solids (TDS) and electrical conductivity (EC). This salinity loading occurs from both surface runoff and via ground water. A major human related source of salinity loading within the Otter Creek watershed is the application of water to agricultural fields. As evapotranspiration occurs, the salt remains in the fields, and is either

carried by runoff into Otter Creek, or the increased water infiltration through the fields can increase the leaching of dissolved solids through the soils, which can then reach a stream at concentrations elevated above normal background levels. Future coal mining and CBM production have the potential to also influence salinity loading. Both of these industries produce very saline water, and loading can occur through direct discharge from surface water, as well as via ground water pathways.

The sodium adsorption ratio (SAR) is typically around 5 to 7 on Otter Creek throughout most of the year. Sources of elevated SAR are similar to the above salinity sources. Future coal mining and CBM production have the potential to influence SAR levels. Both of these industries discharge groundwater to the surface and/or expose sub-surfaces to surface runoff. Both this runoff and groundwater typically contains SAR values much higher than that found on the surface.

Sediment

The Otter Creek watershed, like many eastern Montana watersheds, has high natural background sediment loading. Many human related sources of sediment loading to the stream are relatively easy to identify and can be evaluated via simple (non-calibrated) modeling. The linkages between aquatic life impacts, land uses, sediment loading, and stream geomorphology add additional complexity.

A review of aerial photography shows agricultural fields near many of the lower reaches of Otter Creek as well as along portions of some of the Otter Creek tributaries. There is a history of cattle grazing within the watershed which appears to have influenced sediment loading via riparian degradation and associated stream geomorphic impacts. Grazing in uplands areas also has the potential for increased erosion, although this has not been previously documented as a concern. Initial development of the agricultural fields, along with historical grazing impacts, may have influenced Otter Creek geomorphology and associated sediment production. Additionally, there is an unpaved road network within Otter Creek that represents another potential sediment loading source. Coal mining and CBM production represent potential future sediment loading sources.

The Otter Creek channel, as well as several Otter Creek tributaries, exhibit significant sinuosity. Historical channel migration patterns are evident in the aerial photos, although it appears that floodplain access is limited relative to historic levels. Recent rapid geomorphic assessment results indicate that the Otter Creek channel is relatively stable, consistent with undisturbed conditions in some upstream locations while consistent with an incised channel that has recovered to a more “stable” form in other locations (Klimetz, Simon and Schwartz, 2009). NRCS evaluations also support the apparent historical stream incision, noting subsequent, but not full, recovery. This is consistent with recent DEQ field reconnaissance, where it appears the stream has not reached its full habitat recovery potential in flowing (non-dammed) reaches. This reduced potential could be influencing sediment deposition, percent fines concentrations, and formation of pools and overall habitat complexity in some reaches of Otter Creek.

Iron

Iron loading to many eastern Montana streams is naturally high due to naturally elevated levels of iron within soils. The naturally elevated levels of iron can often exceed the water quality criteria (1,000 ug/l) that the numeric iron water quality standard is based on, as could be the situation for Otter Creek. Montana’s water quality standard for iron is based on a total recoverable form, which typically results in increasing iron concentrations with increasing concentrations of suspended sediment or suspended solids. There is potential for human influence if a significant portion of increased suspended sediment concentration is linked to human activities lacking appropriate sediment control practices.

There will also be a level of natural background loading of iron to Otter Creek via ground water. This loading would normally be in the dissolved form of iron, which is a component of total recoverable iron. Subsurface disturbances or

influences from coal mining or CBM have the potential to increase iron loading via ground water and/or surface water loading pathways. Existing data shows relatively low levels of dissolved iron, suggesting that current iron sources are predominately via surface water pathways.

There are over 50 abandoned mines identified on the abandoned mines GIS layer. Most or all are linked to historic coal mining activities and are linked to insignificant levels of disturbance. None of these mines are identified as priority abandoned mines and there is no information suggesting adit flows in the few locations where adits are identified. The available information suggests low potential for significant iron loading from these sites.

SECTION THREE – LEVEL OF TMDL DETAIL

The level of (TMDL) detail can, and often does, vary by pollutant type even for the same streams within a TMDL project area. The level of TMDL detail generally defines the extent of source assessment work and associated data collection. Level of detail normally increases with increased source complexity, but should be balanced by the need to distinguish loading contributions between source types for the purpose of TMDL allocations or implementation planning. Complex source loading with apparent simple solutions that can be attributed to one land use category and grouped into one composite allocation can justify simpler TMDL approaches, even where there is significant stakeholder interest and significantly important water resources to protect. In addition to source assessment considerations, target development for narrative water quality standards often increases the required level of TMDL detail, as do situations involving elevated natural background concentrations.

Salinity: A high level of detail is proposed for salinity, generally based on the desire to develop a calibrated model for salinity source assessment, MPDES permit development, and overall evaluation of the EC standard for Otter Creek. The potential salinity effects from future coal mining and CBM sources within Otter Creek also justify a high level of detail. A calibrated modeling effort has been ongoing for the Tongue watershed as a whole, and this modeling effort will be focused toward the Otter Creek watershed in support of this project. Important source assessment aspects include a determination between natural background salinity loads and concentrations independent of human influences, as well as a determination of whether or not reductions from agricultural sources are practical from the perspective of reasonable land, soil and water conservation practices. These results will help define TMDL targets and application of the EC and SAR standards within Otter Creek. SAR standards will be tied into the EC standards.

Sediment: A medium level of detail is proposed for Otter Creek sediment TMDL development. This is based on application of non-calibrated source assessment approaches and evaluation of potential sediment influences on in-stream habitat and geomorphic conditions. The limited extent of sediment TMDL development for eastern Montana prairie streams adds complication to the sediment TMDL work. This complication is offset by the significant amount of sediment and habitat information collected for Otter Creek, particularly regarding suspended sediment transport and availability of potential reference conditions for Ecoregion 43 (Klimetz, Simon and Schwartz, 2009). Furthermore, the 2007 EPA report provides initial, sediment source loading estimates. Although course in nature, these loading estimates provide a baseline for more detailed source assessment work consistent with previous sediment TMDL development in other watersheds.

Iron: A medium level of detail is proposed for iron. Additional water chemistry sampling is proposed to help identify potential areas within the watershed where elevated iron loading may originate. A determination between natural background iron loads and concentrations independent of human influences is an objective. Nevertheless, the existence of a numeric water quality standard for iron makes for relatively easy TMDL target development. Also, sediment source

assessment can probably be linked to iron source assessment because of the potential linkage between high levels of iron and elevated sediment loading.

SECTION FOUR – BASIC STRATEGY FOR TMDL PROCESS

This section provides the TMDL development strategy to define data collection and assessment requirements and to develop a detailed schedule. Each pollutant is discussed separately, although there will be overlapping data collection and analyses. The basic TMDL tasks are presented in reverse order since the collection of data must support the target development and source assessment requirements, which in turn should be consistent with the proposed TMDL and allocation approach.

4.1 SALINITY

1. TMDL and Allocations: The salinity TMDL will be expressed as a daily load and will be based on an interpretation of the site specific EC standards for Otter Creek. There will likely be one composite load allocation for naturally occurring loads. This allocation could include agricultural activities where all reasonable land, soil and water conservation practices are in place.

   Composite wasteload allocations (WLA) will be developed for existing and future MDT and other similar construction activities requiring a MPDES general stormwater permit. This WLA will be based on adequate performance of erosion prevention activities as required by each MPDES permit.

   A WLA will also be developed to address the anticipated coal mine MPDES stormwater permit and any mine related discharges requiring a surface water discharge permit. Because salinity loading can occur via ground water pathways, an additional coal mine load allocation, separate from the wasteload allocations, could be required.

2. Source assessment: DEQ is modeling salinity within the Otter Creek watershed. A primary goal is to evaluate non-human loading sources as well as inputs from agricultural activities. The results from this work will be used to evaluate the extent to which salinity loading (EC concentrations) could be reduced within the watershed while taking into account irrigation and other agricultural requirements. Additional loading estimates linked to proposed coal mining will also be evaluated within the context of the model.

3. Target development: The EC numeric standards will be used to develop the TMDL target(s).

4. Data collection and compilation: Significant EC, SAR, flow and other data has been - and continues to be - collected to evaluate watershed conditions, support modeling work, and define baseline conditions in the area of proposed coal mining. Data collection includes both surface and ground water sampling. Additional sampling to support the TMDL work and baseline condition development will continue through 2013 and is being coordinated between DEQ, Hydrometrics (representing Otter Creek Coal, LLC), the USGS, and several other stakeholders involved with sampling in the watershed.

4.2 SEDIMENT

1) TMDL and Allocations: Sediment TMDLs for cold water streams in Montana have generally been expressed as a percent reduction in yearly sediment loading. The reductions are based on simple sediment loading models where existing conditions are compared to conditions where appropriate best management practices are in place. The existence of sediment rating curves for stable Ecoregion 43 streams provides an approach for expressing the Otter Creek sediment TMDL in multiple ways including mean annual suspended-sediment yield. Load allocations will be developed to address agricultural and natural background sediment loading. The TMDL and allocations will account for the fact that, per Montana's water quality standards, agricultural activities that incorporate all reasonable land, soil and water conservation practices fall within the definition of "naturally occurring".

   A composite wasteload allocation (WLA) will be developed for existing and future MDT and other similar construction activities requiring a MPDES general stormwater permit. This WLA will be based on adequate performance of erosion prevention activities as required by each MPDES permit. A WLA will also be developed to address the anticipated coal mine MPDES stormwater permit and any mine related discharges. The type and details of the MPDES stormwater permit will likely influence the WLA since it is often assumed that the permit conditions will require application of all reasonable land, soil and water conservation practices. WLAs linked to surface water discharges will be based on adherence to Montana's turbidity standard at a minimum.

2) Source assessment: DEQ will build upon the existing EPA 2007 and other source assessment work with additional bank erosion source quantification. This bank erosion information will be collected during proposed sediment and habitat assessment work. The extent to which additional source assessment work will be pursued will depend upon the nature of sediment loading sources and impairment conditions.

3) Target development: Sediment targets may include TSS loading levels using existing Ecoregion 43 "reference" results. Targets may also include geomorphology and stream substrate indicators. The application of these targets will depend on the sediment and habitat field assessment results and potential harm to aquatic life use linkages.

4) Data collection and compilation: Approximately 10 sediment and habitat assessment sites will be identified and field data collection will take place during the early summer of 2013. Sites will be based on apparent healthy and impacted locations, and will avoid ponding locations associated with check dams. A Sampling and Analysis Plan will be developed for this work, which will be based on DEQ's current sediment and habitat procedure with minor modifications to address any unique conditions associated with a plains stream like Otter Creek. This work will be closely coordinated with DEQ Monitoring and Assessment work planned for Tongue River watershed.

4.3 IRON

1. TMDL and Allocations: The metals TMDL for iron varies by flow. As flow increases, the allowable loading increases, and the TMDL is expressed as a daily load via an equation of flow multiplied by the numeric standard.

   The allocations for existing nonpoint sources and natural background conditions will be determined after completion of source assessment sampling. Composite wasteload allocations (WLA) will be developed for existing and future MDT and other similar construction activities requiring a MPDES general stormwater permit.

This WLA will be based on adequate performance of erosion prevention activities as required by each MPDES permit.

A WLA will also be developed to address the anticipated coal mine MPDES stormwater permit and any mine related discharges that would require an MPDES surface water permit. Because iron loading can occur via ground water pathways, an additional coal mine load allocation, separate from the wasteload allocations, is anticipated.

2. Source assessment: There are a significant number of iron samples for Otter Creek, although most are apparently from the USGS gage station near the mouth of Otter Creek. Additional iron samples will be collected throughout the watershed to identify potential areas of significant iron loading and to establish baseline conditions in areas of future coal mining. This additional sampling includes:
    a. surface and ground water baseline characterization sampling in the area of proposed coal mining (Otter Creek Coal, LLC contract with Hydrometrics);
    b. surface water characterization at USGS gaging stations (DEQ contract with USGS); and
    c. surface water characterization directed via DEQ (to be completed by Hydrometrics) to fill in spatial data gaps and help identify whether or not there are areas of elevated iron loading; whether from natural background or other human activities such as abandoned mines.

3. Target development: The numeric water quality standard of 1,000 ug/l will be the TMDL target.

4. Data collection and compilation: There is sufficient data for the impairment determination. Data collection will be used for source assessment purposes as defined above. There are already sampling activities underway and additional sampling planned to help fulfill this goal.

SECTION FIVE – DOCUMENT COMPLETION TASKS & SCHEDULE

The below information summarizes several of the major document completion tasks and associated schedule information. Refer to Attachment I: Otter Creek Watershed TMDL Schedule (5/14/13) for a more comprehensive schedule presentation.

1. Salinity TMDL Tasks
    a. Data collection and compilation - complete
    b. Model Development & Source Assessments September 2013
    c. Target development - September 2013
    d. TMDLs and allocations - October 2013
    e. Final stakeholder reviews - November 2013
2. Sediment TMDL Tasks
    a. Data collection and compilation: August 2013
    b. Source assessments – September 2013
    c. Target development - September 2013
    d. TMDLs and allocations – October 2013
    e. Final stakeholder reviews - November 2013
3. Iron TMDL Tasks
    a. Data collection and compilation: August 2013

b. Source assessments – September 2013
c. Target development - September 2013
d. TMDLs and allocations – October 2013
e. Final stakeholder reviews - November 2013

4. Final Draft TMDL document compilation – December 2013
5. Public comment period – January 2014
6. EPA Submittal of TMDL Document – February 2014

SECTION SIX – TMDL PROJECT MANAGEMENT FRAMEWORK AND OUTREACH STRATEGY

6.1 DEQ'S TMDL PROJECT MANAGEMENT FRAMEWORK

Each TMDL project area has an internal DEQ TMDL development team. The TMDL development team includes one TMDL planner designated as the DEQ project coordinator (PC) and one or more senior TMDL planner designated as the DEQ project manager (PM) for each pollutant category. The PC helps ensure a consistent stakeholder outreach approach and consistency where there is overlap in pollutant assessment methods. The PM is responsible for technical and administrative aspects of TMDL development for the assigned pollutant category including strategy implementation, stakeholder relations, and final TMDL document content and production. The Otter Creek project is unique in that the salinity modeling lead is also assigned as the salinity project manager

The core project management team structure for the Otter Creek project is as follows:

Project Coordinator	Christina Staten
Project Manager – Salinity	Erik Makus
Project Manager – Sediment and Iron	Kristy Fortman

Other DEQ personnel have important coordination and additional project management roles. These include coal permit personnel and monitoring and assessment staff. Both the TMDL Section Manager, Dean Yashan and the modeling staff supervisor, Michael Pipp are included as members of the project team because of the accelerated schedule for this work, the level of stakeholder interest, high level of required coordination, and unique technical and regulatory complexities.

Additional Project Personnel

DEQ Personnel	DEQ Program/Section	Project Role
Mark Bostrom	Water Quality Planning Bureau	Bureau Chief, Project Sponsor
Dean Yashan	TMDL Section	Section Supervisor
Michael Pipp	Modeling Program	Program Supervisor
Darrin Kron	Monitoring & Assessment Section	Section Supervisor
Coal Mine Permitting Staff	Coal & Uranium Mining Program	Coal mine permit coordination with TMDL work
Eric Urban	Water Quality Standards Section	Section Supervisor
Eric Sivers	TMDL Section	Provide watershed description section of TMDL document, and general technical support
Mindy McCarthy	Quality Assurance Program	Quality Assurance Officer,

		Administrative Support Supervisor

6.2 STAKEHOLDER AND OUTREACH STRATEGY

DEQ will pursue implementation of the stakeholder and public involvement strategy as defined below. Spreadsheets identifying watershed advisory group (WAG) members, technical advisory group (TAG), and interested parties will be maintained by DEQ. WAG and TAG information will be available on the DEQ TMDL project website (wiki) at http://montanatmdlflathead.pbworks.com.

Watershed Advisory Group (WAG) – Representatives of applicable interest groups will be requested to work with the DEQ and the Powder River and Rosebud Conservation Districts (CDs) in an advisory capacity consistent with State Law (75-5-703 & 704 Montana Code Annotated). Comment opportunities will be obtained from the WAG at varying stages of TMDL development, including opportunities for review of the draft TMDL document prior to the public comment period. During TMDL development, meetings and other forms of interaction will be pursued when appropriate to obtain timely WAG advice and comments. The DEQ Project Coordinator, Christina Staten, is responsible for WAG formation, and is the primary DEQ contact regarding WAG meeting coordination.

Because the WAG provides a consultation role to DEQ, there is no need for a WAG chairman or similar formalities.

Technical Advisory Group (TAG) – The TAG will be comprised of individuals with intimate knowledge about scientific issues, processes, and sampling design, as well as familiarity with the Otter Creek watershed project area or Otter Creek TMDL work. Individuals may include representatives from State and Federal agencies, local resource professionals, or members of local government, including CD members. The DEQ Project Coordinator and DEQ Project Managers, will work together to coordinate all TAG interactions and meetings during TMDL development. There may be some variances of TAG members for each pollutant category (salinity, metals, and sediment).

The TAG provides technical advice and comment during TMDL development for components such as TMDL target values, water quality assessments, source assessments, and sampling designs. The DEQ maintains responsibility for technical decisions applied toward TMDL development.

Interested Parties - Interested parties have requested to be informed and/or involved in the TMDL process. The DEQ Project Coordinator will add them to a distribution list to be kept informed of public meetings. Interested parties will also receive general TMDL schedule updates to be kept aware of project progress and completion status.

Anyone interested in the Otter Creek TMDLs may request to be added to the interested parties list by contacting the DEQ Project Coordinator or Project Managers, or via the DEQ Otter Creek TMDL project site (wiki).

Public Meeting
For all TMDLs developed, a public meeting will be held during the public comment period of document completion. All advisory group members, CD representatives, and interested parties will be notified of this meeting via email or postal service. A public notice will also be posted in local newspapers, on the DEQ website, and DEQ's Otter Creek TMDL project site.

SECTION SEVEN – IMPLEMENTATION DETAILS

This section lists the anticipated planning documents for the project. Planning documents include this plan, modeling reports and sampling and analysis plans (SAP). The status of each item, at the time of this project plan approval, is also noted.

1. Water Quality Assessment for the Tongue River Watershed, Montana (Final Draft completed August 2, 2007 via Environmental Protection Agency). This document provides salinity modeling information, source assessment information, and data compilations that provide a foundation for continued TMDL work in Otter Creek.
2. USGS monitoring of water quality, specific conductance, and streamflow on Otter Creek: contract between DEQ and USGS finalized March 2013.
3. Otter Creek Water Chemistry Monitoring Sampling and Analysis Plan (Final Draft). This iron sampling provides additional spatial characterization not covered by ongoing USGS and baseline characterization work for the proposed coal mine. Sampling will be performed by Hydrometrics using DEQ standard operating procedures and application of standard DEQ quality assurance requirements.
4. Otter Creek Sediment and Habitat Sampling and Analysis Plan (Initial Draft; sampling possibly performed by Heritage Program personnel in conjunction with DEQ staff)
5. Final Otter Creek Watershed TMDL Document (developed per this project plan)

SECTION EIGHT – QUALITY ASSURANCE REPORTING

This section describes quality assurance (QA) measures and reporting for each pollutant. The primary focus of the data quality analysis will be to ensure the data has sufficient quality to minimize errors in decision making.

All sampling and analysis plans (SAPs) address the appropriate QA and quality control (QC) measures identified under the Bureau's Quality Management Plan (DEQ 2008). QA/QC methods are consistent with those defined in the Water Quality Management Bureau's Quality Assurance Project Plan (QAPP) for Sampling and Water Quality Assessment of Streams and Rivers in Montana (DEQ 2005) and are approved and tracked by the QA Officer. All SAPs describe their data quality objectives and data quality indicators and include measures for assessing them.

Laboratory analysis for nutrient and metal samples is completed by State-approved labs adhering to DEQ protocols and reporting requirements for analytical data (DEQ 2009). QA/QC reviews are included as part of all sediment, temperature, nutrient, and metal SAPs, modeling efforts, and respective scopes of work. DEQ Project Managers review all field and laboratory data, QA/QC reports, data quality summaries, modeling outputs, and final reports for quality and usability of data, accuracy, and completeness. All SAPs are tracked by the Bureau's Quality Assurance Program. Laboratory data is stored within EPA's National STORET data system.

SECTION NINE – PLAN MODIFICATION SUMMARY

This section will be used to document future plan modifications if needed.