APPENDIX G – FLINT CREEK TMDL PLANNING AREA NUTRIENT SOURCE REVIEW, TASK 1: DISCRETE SOURCE CHARACTERIZATION, GRANITE AND DEER LODGE COUNTIES

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ACRONYMS

Acronym	Definition
ARM	Administrative Rules of Montana
BOD	Biochemical Oxygen Demand
DEQ	Department of Environmental Quality (Montana)
ECHO	Enforcement Compliance History Online
EPA	Environmental Protection Agency (U.S.)
GIS	Geographic Information System
MCA	Montana Code Annotated
MGWPCS	Montana Ground Water Pollution Control System
MPDES	Montana Pollutant Discharge Elimination System
NPDES	National Pollutant Discharge Elimination System
NRIS	Natural Resource Information System (Montana)
SWAT	Soil & Water Assessment Tool
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
WWTP	Wastewater Treatment Plant

G1.0 INTRODUCTION

G1.1 BACKGROUND

The Flint Creek watershed is located in the northern Rocky Mountains of southwestern Montana. The watershed covers an area of approximately 500 square miles, from Georgetown Lake to the Clark Fork near the city of Drummond, as shown in **Figure GA-1.** An inter-basin diversion from the East Fork Rock Creek Reservoir also contributes flow to Flint Creek through its tributary, Trout Creek. Land use in the Flint Creek watershed is primarily forest and grazing, with agriculture in the valleys. Philipsburg is the only urban area, but other communities are found scattered throughout the watershed especially at lower elevations. Historically, the Flint Creek watershed had considerable mining activity, some of which continues to the present.

Water quality sampling of streams in the Flint Creek watershed has shown that several waterbodies are not meeting designated uses and are considered impaired for excess nutrients, as shown in **Table G1-1**. Nutrient sources in the watershed include natural, wastewater, mining, and various agricultural-related activities, but their effect on stream conditions has not been quantified. As a result, a Total Maximum Daily Load (TMDL) study is being developed for area.

Table G1-1. Streams in the Flint Creek Watershed Listed as Impaired for Nutrients

Stream Name	Waterbody ID	Impairment
Barnes Creek	MT76E003_070	Nitrite + Nitrate, Ammonia + Organic Nitrogen, Total Phosphorus
Douglas Creek	MT76E003_020	Nitrates
Flint Creek	MT76E003_012	Total Nitrogen and Total Phosphorus
Princeton Gulch	MT76E003_090	Nitrates
Smart Creek	MT76E003_110	Total Phosphorus

As part of this TMDL and in an effort to better understand the water quality of the watershed, the Montana Department of Environmental Quality (DEQ) is developing a Soil & Water Assessment Tool (SWAT) model of the Flint Creek watershed. For this model, DEQ needs accurate and timely information on the sources and quantities of nutrients being transported through the Flint Creek watershed. DEQ also needs information to understand how land use, water use, and related factors influence water quality.

G1.2 PURPOSE AND SCOPE

The purpose of this report is to characterize the discrete sources of nutrients, primarily nitrogen and phosphorus, entering the streams and groundwater in the Flint Creek watershed. These sources include surface water discharges that are also called “point sources”. Also considered in this document are discrete sources to groundwater that are permitted by the State of Montana, but at a watershed scale are not point sources to impaired streams. The information provided will be used to assist in constructing a nutrient-based TMDL for the area’s impaired stream reaches. A companion report is being prepared to characterize the nutrients derived from nonpoint sources (Houston Engineering, Inc., 2011). Impairments caused by other factors, such as elevated trace-element concentrations, are not considered in this scope of work; atmospheric nutrient contributions are also not reviewed in this document. Much of the data used to quantify the nutrient point sources are documented as part of the Montana Pollutant Discharge Elimination System (MPDES) permitting process. Additional information

was determined from other sources, or interpolation and/or extrapolation from sources, as described in the text.

This report contains a summary of each permitted nutrient point source, including Wastewater Treatment Plants (WWTPs), industrial sources, and mining. Source summaries include information on the source location and associated receiving water. Information is also given on permit limits and the reported source discharge and effluent concentrations. Past and projected changes in the quantity of nutrient loads are evaluated when possible. Reported discharge/effluent values are summarized in a user-friendly format for easy conversion into the required format for entry into the SWAT watershed loading model.

G1.3 INFORMATION SOURCES

Much of the data used to characterize the nutrient point sources of the watershed were obtained from the Montana Natural Resource Information System (NRIS). NRIS, organized under the Montana State Library, is a repository and clearing house for much of the state's Geographic Information System (GIS), water resources, and natural heritage information. NRIS was the primary source used for GIS data, including basic watershed and stream information. The NRIS was also relied upon as the most current repository for public water supply systems resulting from the Source-Water Protection program.

Most of the water quality data provided in this report was obtained from the Integrated Compliance Information System. The U.S. Environmental Protection Agency's (EPA) Enforcement Compliance History Online (ECHO) website was consulted to verify or supplement data obtained from NRIS and other state and local agencies. Additional data was supplied by the City of Philipsburg via additional voluntary monitoring efforts undertaken by the community and provided to the State of Montana.

DEQ also provided other information related to the Flint Creek watershed including numerous references, reports pertaining to the watershed and paper copies of the existing MPDES permits in the area (Kron, Darrin, personal communication 2010). Other DEQ permit information included MPDES Statement of Basis reports and EPA National Pollutant Discharge Elimination System (NPDES) compliance reports. Except where noted, in the case of discrepancies between sources, the information provided directly by DEQ and other state and local agency personnel was considered to be the most accurate and is included in the report.

G2.0 NUTRIENT POINT SOURCES

G2.1 PERMITTED SURFACE WATER DISCHARGES

The NPDES program requires that all point sources have a permit to discharge into waters of the state. In Montana, the State has regulatory authority for implementing the NPDES program and all sources discharging into state or federal waters must obtain and comply with a MPDES permit from the State of Montana. A MPDES permit, which is equivalent to an NPDES permit for surface water dischargers or a Montana Ground Water Pollution Control System (MGWPCS) permit (not an NPDES permit), is required from DEQ to construct, modify or operate a disposal system or to construct or use any outlet for discharge of sewage, industrial, or other wastes into state surface water or groundwater. A permit is not required for the discharge of certain wastes under specific circumstances (see Administrative Rules of Montana (ARM) 17.30.1310, 75-5- 401(1)(b) and 75-5-401(5), Montana Code Annotated (MCA)).

Six MPDES-permitted sites are located in the Flint Creek watershed and may be potential nutrient point sources to the area. Three of the six permitted sites are permitted to discharge into surface waters. The remaining three sites are permitted to discharge to groundwater with one site having a permit for two outfalls. In addition to these permits, the watershed also contains six Stormwater Construction or Temporary Turbidity permits. Locations of all permitted surface and groundwater dischargers can be found in **Figure GA-2**.

G2.1.1 Treated Wastewater Sources

The Town of Philipsburg owns and operates the only WWTP in the study watershed. The plant is a two-cell facultative lagoon with no disinfection and a continuous discharge. It was built in 1961 and upgraded in the early 1990s. The plant discharges directly to Flint Creek via a single outfall location (at the end of ditch) and has a 300 foot mixing zone. With a maximum design flow of 0.16 million gallons per day (mgd), the WWTP serves 520 hookups (over 900 citizens) from the Town of Philipsburg.

Prior to September 2004, the Town of Philipsburg WWTP had an individual permit for a minor facility. This permit (MTG580005) was issued under the MPDES General Discharge Permit for domestic wastewater lagoons. Monthly nutrient monitoring was required by this permit. A letter from DEQ in 1998 stated that nutrient monitoring was no longer required. As the permit expired in September 2004, DEQ determined, under ARM 17.30.1341(4), the facility no longer qualified for authorization under the Domestic Sewage Treatment General Permit. A new permit (MT0031500) was issued to comply with stated limit effluents for discharging into waters of the state.

Discharge and water quality data associated with the WWTP was provided by DEQ from MPDES Discharge Monitoring Reports and the ECHO website (*i.e.,* Integrated Compliance Information System). **Table G2-1** displays information associated with the WWTP's most current permit, issued in August 2007.

Table G2-1. Wastewater Treatment Plant within the Flint Creek TMDL Planning Area

NPDES Number	Outfall Number	Name	Description	Receiving Waterbody	Permit Expiration Date	Design Flow (mgd)
MT0031500	001	Town of Philipsburg Wastewater Treatment Plant	Wastewater Treatment Plant	Flint Creek	07/31/2012	0.16

Per the August 2007 MPDES permit renewal, the WWTP is required to monitor and report the quantity of their effluent five times per week. The effluent's quality is to be monitored and reported anywhere from once a week to once a quarter, depending on the parameter. Nutrient concentrations are required to be monitored and reported every month. Discharge data was retrieved from 2000 to the present. Phosphorus and nitrogen have been sampled from June 2005 to the present, while ammonia, total kjedhal nitrogen, and nitrate + nitrite have been sampled from August 2007 to the present. Data from 2007 to the present was obtained from the Integrated Compliance Information System database, while data preceding this time frame were provided directly from DEQ. **Table G2-2** summarizes the permitted nutrient effluent load limitations that pertain to the existing permit. Per the 2007 Statement of Basis for proposed permit limits (Permit MT0031500), the nutrient load limits are set upon a nondegradation basis. No specific nutrient effluent concentration limits were set in the permit.

Table G2-2. Nutrient Effluent Limits for Phillipsburg Wastewater Treatment Plant

MPDES Number	Total Phosphorus (lb/day)	Total Nitrogen (lb/day)
MT0031500	10.2	40.8

Monthly effluent data for the Philipsburg WWTP was available from January 2000 through March 2010 and is shown in **Figure G2-1**. According to this data, the plant's overall mean discharge rate during this time is 0.115 mgd. From November 2004 through December 2006, the reported average monthly discharges are 2-3 times greater than previous average monthly discharges. In January 2007, discharge rates returned to pre-November 2004 levels. This jump in flow readings is likely due to the replacement of a corroded outflow flume in November 2004. The installation of the new flume likely had an effect on the accuracy of the readings and thus during 2005 and 2006 discharges appear elevated. Furthermore, in December 2006, a broken sanitary sewer service line was identified and repaired. The broken sewer line was allowing Camp Creek water to enter the sanitary sewer system and, therefore, the WWTP (Hoehne, Dick, personal communication 2010). These repairs reduced the volume of water discharging from the plant, as shown in **Figure G2-1**. Future discharges from the plant are expected to follow recent trends. This expectation is based on the fact that the population of Philipsburg has remained constant since at least 1990 (United States Census Bureau,2012); using that data, no appreciable population growth or new hookups are expected. However, if the city's population increases, there would be an expected associated increase in discharge rate. Discharge data for the Philipsburg WWTP can be found in **Attachment GB, Table GB-1**.

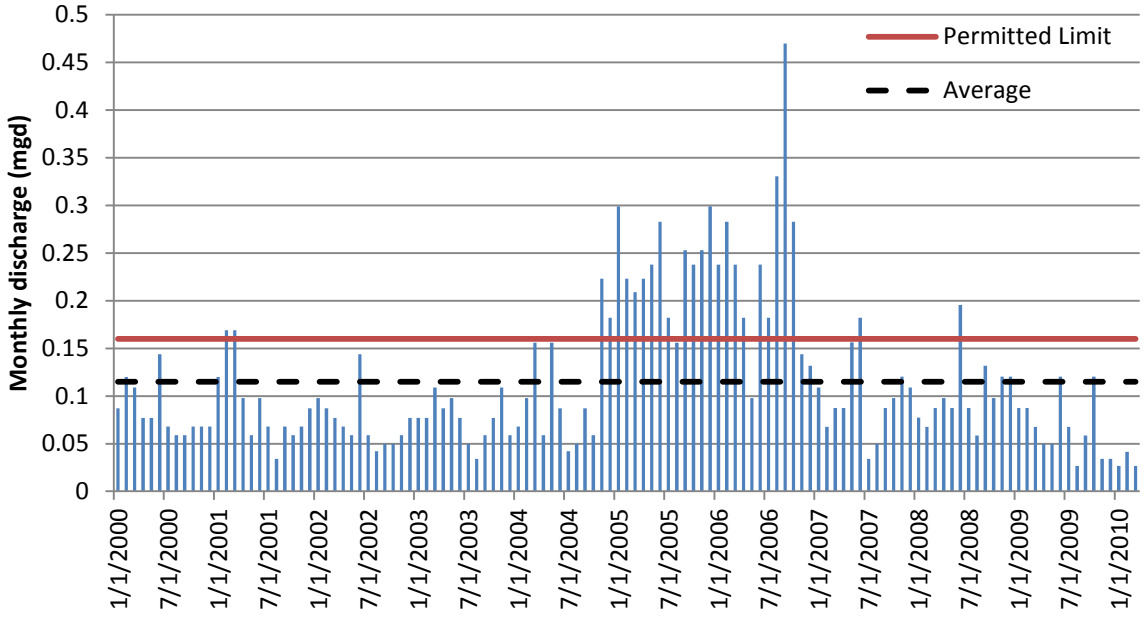
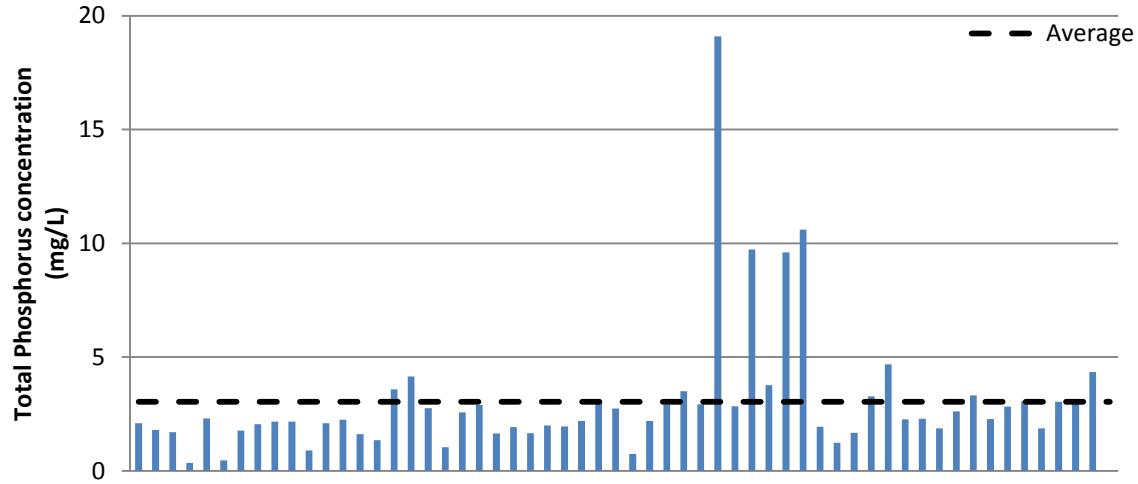


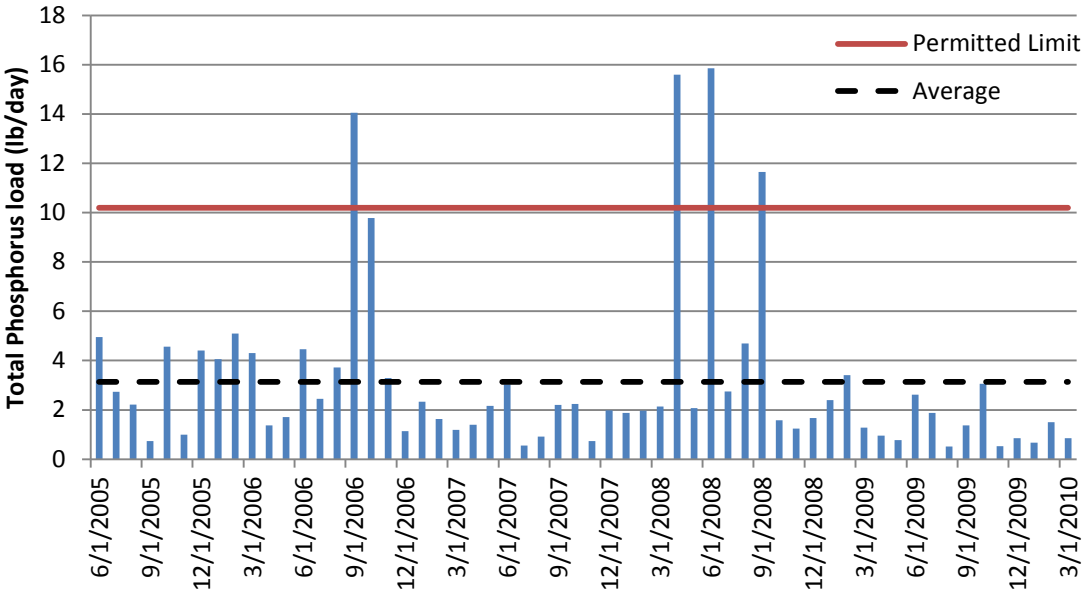
Figure G2-1. Philipsburg Wastewater Treatment Plant Effluent Discharge (mg/d) from January 2000 through March 2010

Total phosphorus (TP) and total nitrogen (TN) data are available for the Philipsburg WWTP from June 2005 through March 2010. Data were retrieved from DEQ and the Integrated Compliance Information System database. TP concentrations range from 0.35-19.10 mg/L with an average of 3.04 mg/L, as shown in **Figure G2-2**. Summertime (July-September) TP concentration averages are 3.33 mg/L. Similarly, TP loads range from 0.51-15.85 lb/day with an average of 3.14 lb/day. The summertime average is 3.49 lb/day. Since June 2005, TP effluent has exceeded the permitted limit four times with

three of these times being in the fall of 2008. Past trends showed no distinct seasonal fluxes and little fluctuation occurs from month to month. Monthly average TN concentrations range from 2.03-24.10 mg/L with an average of 10.34 mg/L and show relatively little change throughout this timeframe (**Figure G2-3**). Average summertime TN concentrations are 7.56 mg/L. TN loads range from 1.10-38.19 lb/day with an average of 10.68 lb/day and a summertime average of 9.20 lb/day. No clear pattern in TN concentrations/loads exists. Nutrient data can be found in **Attachment GB, Table GB-1.**

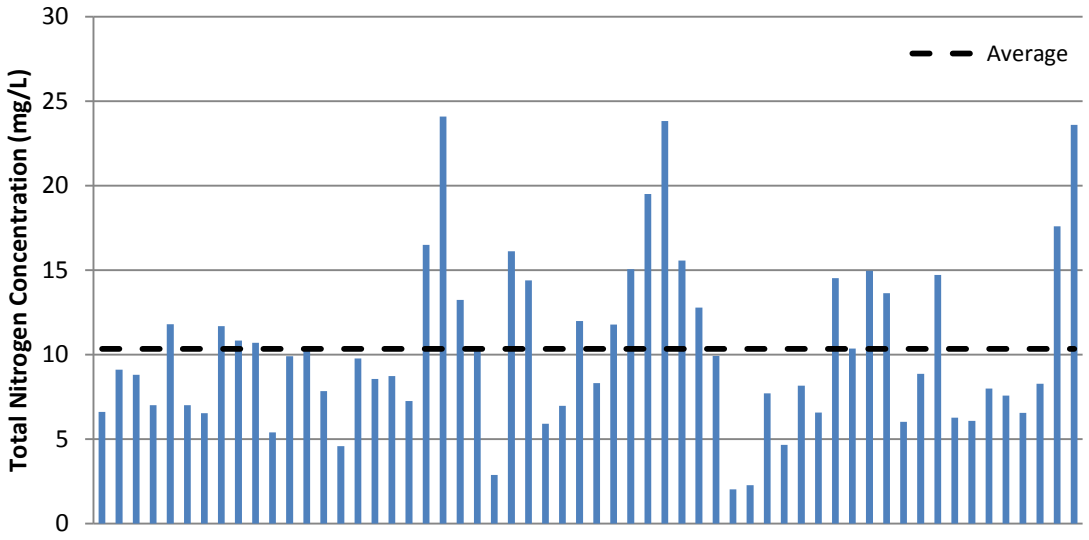


(a) Total Phosphorus Concentration (mg/L)

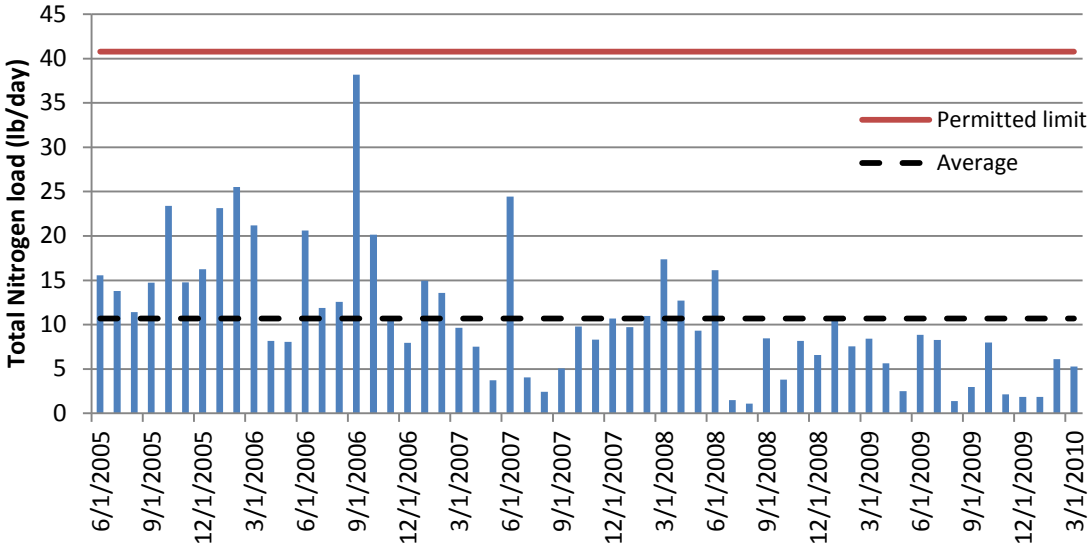


(b) Total Phosphorus Load (lb/day)

Figure G2-2. Philipsburg Wastewater Treatment Plant Total Phosphorus Concentration (mg/L) and load (lb/day) from June 2005 through March 2010



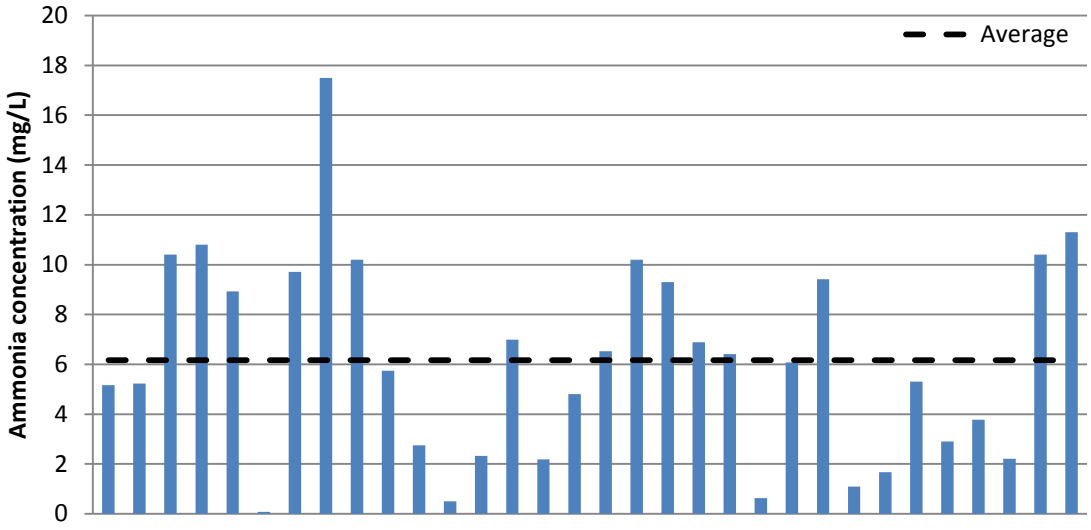
(a) Total Nitrogen Concentration (mg/L)



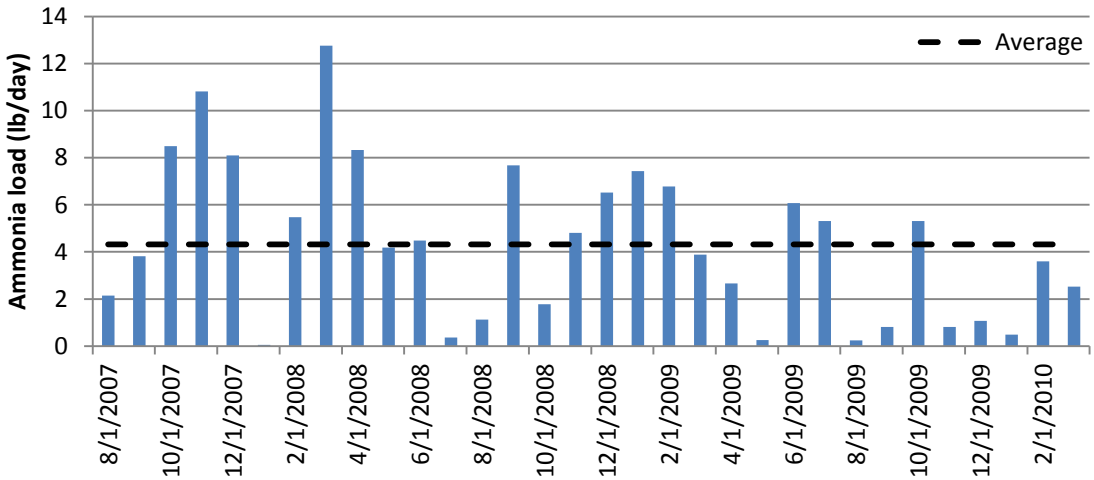
(b)Total Nitrogen Load (lb/day)

Figure G2-3. Philipsburg Wastewater Treatment Plant Total Nitrogen Concentration (mg/L) and Load (lb/day) from June 2005 through March 2010

Ammonia, Total Kjeldahl Nitrogen (TKN), and Nitrite + Nitrate loads from the WWTP were reported from August 2007 through March 2010. No stated effluent limits were set for these parameters. As shown in **Figure G2-4**, the plant effluent's ammonia concentrations range from 0.08-17.5 mg/L (average = 6.17 mg/L) and loads range from 0.05-12.75 lb/day (average = 4.32 lb/day). Ammonia concentrations show a cyclical trend with concentrations rising and falling throughout the year. TKN concentrations range from 2.03-23.8 mg/L (average = 10.42 mg/L) while loads range from 1.03-17.34 lb/day (average = 6.86 lb/day). TKN concentrations follow a similar cyclical pattern to Ammonia (**Figure G2-5**). **Figure G2-6** shows the reported Nitrite + Nitrate concentrations which range from 0.003 – 0.79 mg/L (average = 0.20 mg/L) and loads which range from 0 – 0.33 lb/day (average = 0.08 lb/day). These concentrations and loads show no clear trends. Nutrient data can be found in **Attachment GB, Table GB-1.**

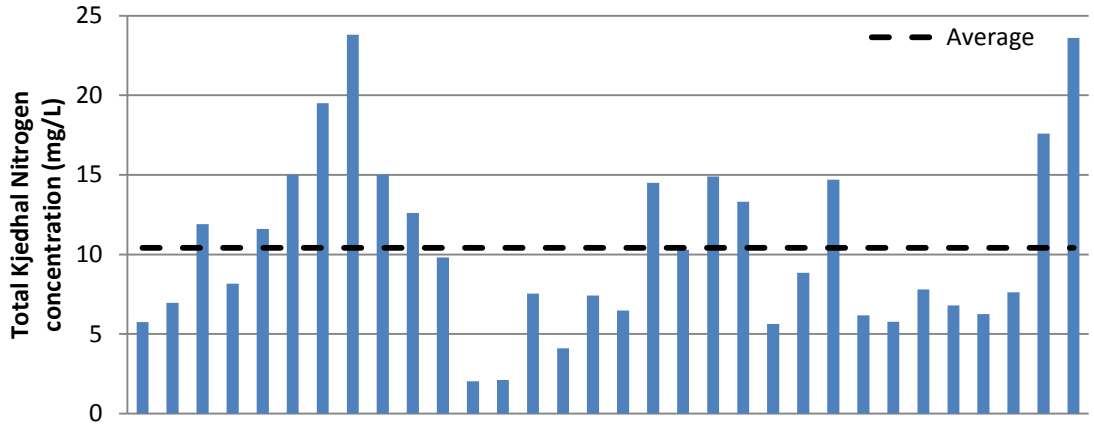


(a) Ammonia Concentration (mg/L)

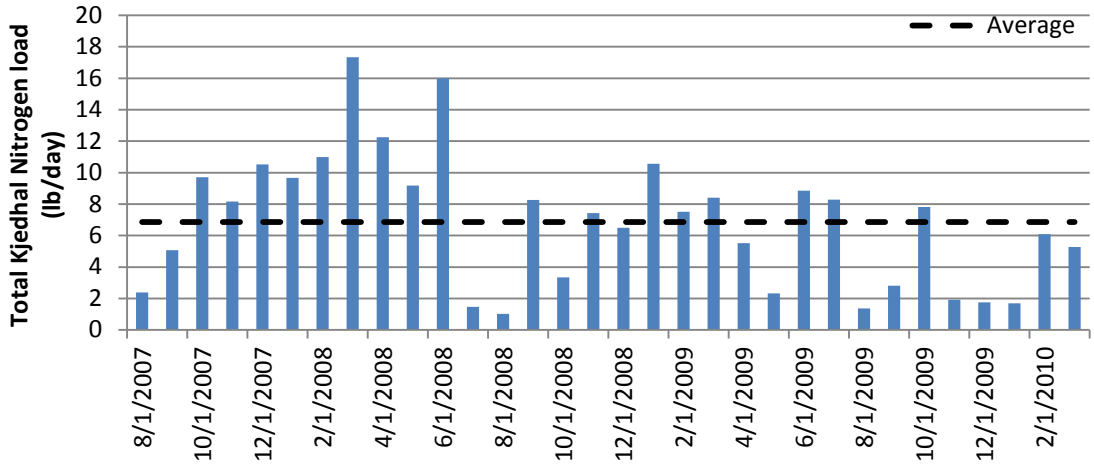


(b) Ammonia Load (lb/day)

Figure G2-4. Philipsburg Wastewater Treatment Plant Ammonia Concentration (mg/L) and Load (lb/day) from August 2007 through March 2010

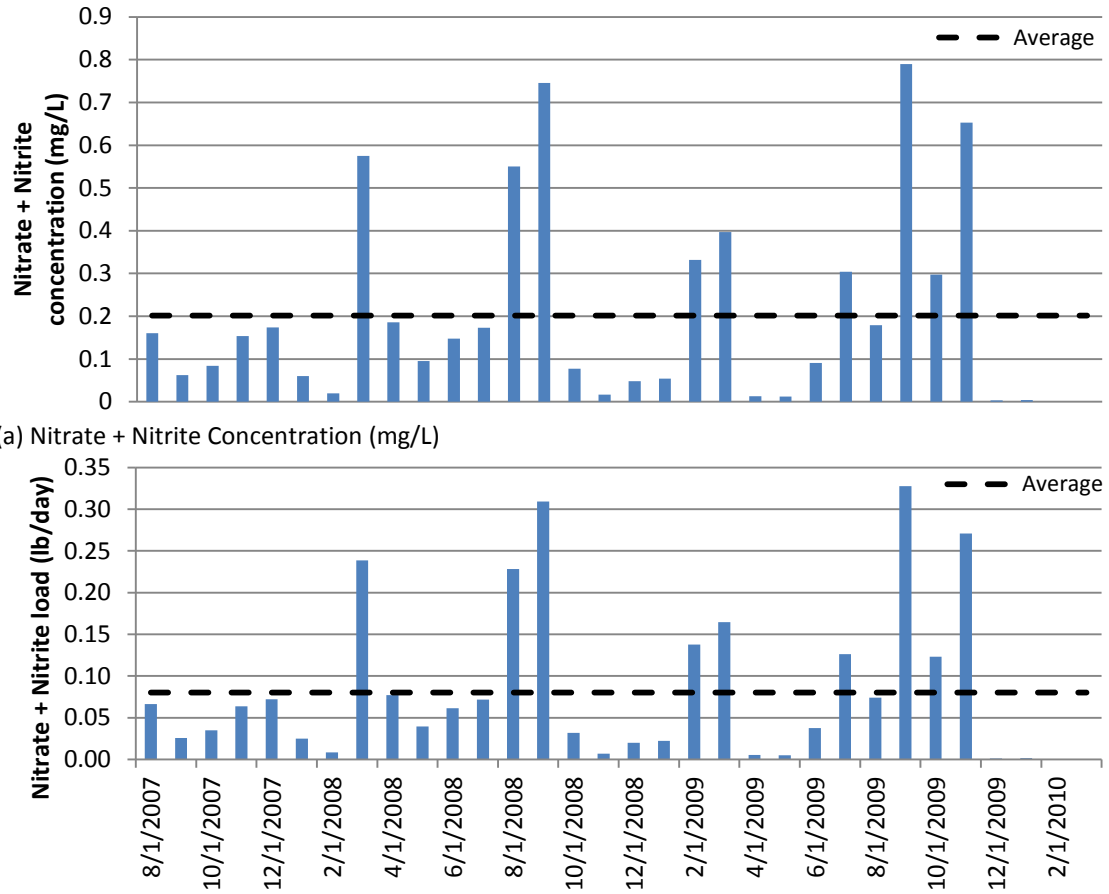


(a) Total Kjedhal Nitrogen Concentration (mg/L)



(b) Total Kjedhal Nitrogen Load (lb/day

Figure G2-5. Philipsburg Wastewater Treatment Plant Total Kjeldahl Nitrogen Concentration (mg/L) and Load (lb/day) from August 2007 through March 2010



(a) Nitrate + Nitrite Concentration (mg/L)

(b) Nitrate + Nitrite Load (lb/day)

Figure G2-6. Philipsburg Wastewater Treatment Plant Nitrate + Nitrite Concentration (mg/L) and Load (lb/day) from August 2007 through March 2010

According to their permit, Statements of Basis, and other information from DEQ and City staff (Hoehne, Dick, personal communication 2010; Kron, Darrin, personal communication 2010), the Philipsburg WWTP made minor facility upgrades in 1993, replaced a corroded outflow flume in the fall of 2004, repaired a leaking septic pipe contributing to infiltration in December 2006, and installed water meters in homes in 2009 for water conservation. According to the MPDES permit (MT0031500), future upgrades needed include removing overloaded biosolids in the lagoons and reducing inflow and infiltration in the WWTP system.

Due to numerous limit exceedances in 2008 and 2009 for Total Suspended Solids (TSS), Biochemical Oxygen Demand (BOD), and pH, the WWTP has been placed under an enforcement action with DEQ. As such, the WWTP must follow the Administrative Order on Consent (Docket No. WQ-09-10) to continue operating until the WWTP can come into compliance with the effluent limits set forth in the permit. The Administrative Order on Consent is an agreement and plan to remediate noncompliance issues for the permitted location. The Philipsburg Town Council agreed to install a *Bio Lac* system to upgrade their wastewater treatment system in April 2009. The *Bio Lac* system is an activated sludge process that will comprehensively reduce biosolids, TSS, BOD, and pH; it also has the potential to reduce nutrient effluents. The proposed *Bio Lac* system consists of an aeration basin, clarifier, and aerated sludge holding pond. The Philipsburg WWTP is primarily utilizing the *Bio Lac* system to reduce TSS, BOD, and pH

effluent and not focusing on nutrients since they are not under an enforcement action to do so (Hoehne, Dick, personal communication 2010). Stated achievements using a *Bio Lac* system include a 30-70 day sludge treatment, less than 10 mg/L BOD and TN effluent, and complete nitrification (<1 mg/L) of all sludge (Parkson Corporation, 2009). TP can be reduced using the *Bio Lac* system if it is set up using an anaerobic/aerobic system; however no specific TP achievements are stated by the Parkson Corporation. The Administrative Order on Consent compliance timeline is stated in **Table G2-3.**

Table G2-3. Remediation Timeline for Philipsburg Wastewater Treatment Plant Biosolids, Total Suspended Solids, Biochemical Oxygen Demand, pH, and Some Nutrients

Date	Compliance Action Required
July 1, 2011	Philipsburg must submit plans and specifications for the proposed *Bio Lac* system
October 1, 2012	Philipsburg must complete construction of the *Bio Lac* system
October 1, 2013	Philipsburg must ensure completeness and proper functioning of the *Bio Lac* system

The City of East Helena, Montana, WWTP has been operating a *Bio Lac* system since 2002. As such, Discharge Monitoring Report data from this facility (Permit MT0022560) was used to provide insight to possible nutrient reductions that may be achieved at the Philipsburg WWTP once the *Bio Lac* system is in use. East Helena Discharge Monitoring Report data goes back to 1997 and shows no significant reduction in TP or TN as a result of the *Bio Lac* system being installed. Given this outcome, it is therefore anticipated that the Philipsburg WWTP will see no significant impact on their effluent nutrient concentrations/loads as a result of installing the *Bio Lac* system.

The Town of Philipsburg is planning to remediate most of the known inflow and infiltration problems during the summer of 2011, when sections of the main transmission line entering the lagoons will be lined (Hoehne, Dick, personal communication 2010). Once the lining of the transmission line is complete all known significant sources of inflow and infiltration will be eliminated (Montana Department of Environmental Quality, 2009).

G2.1.2 Industrial Sources

A search of the Integrated Compliance Information System showed no industrial sites in the Flint Creek watershed. A follow-up search of the NRIS (which incorporates the Integrated Compliance Information System database) confirmed the finding.

G2.1.3 Mining Sources

Mining operations permitted to discharge wastewater into surface waters of the state were identified using the Integrated Compliance Information System database and DEQ hardfiles. **Table G2-4** summarizes the permitted mining operations within the Flint Creek watershed.

Table G2-4. Permitted Mines within the Flint Creek TMDL Planning Area

NPDES Number	Outfall Number	Permittee	Description	Receiving Water	Permit Expiration Date
MTR300080	001	Asarco Inc.	Stormwater - Mining and Oil	Smart Creek	9/30/2013
MTR300080	002	Asarco Inc.	Stormwater - Mining and Oil	South Fork Lower Willow Creek	9/30/2013
MT0031569	---	Teras Resources Inc. - Golden Jubilee Mine	None found; permit pending. Suspect mining wastewater	Integrated Compliance Information System-provided map suggests drainage to stream draining Fred Burr Lake to Flint Creek	Unknown

Permit MTR300080 is issued to Asarco, Inc. for stormwater related to mining and oil at the Black Pine Mine. The facility is located approximately 12 miles southwest of Philipsburg and is permitted to drain stormwater at two outfalls. Outfall 001 is a pipe emptying into a constructed basin. Water discharges from the basin via a channel on the downgradient end and into Smart Creek. Outfall 002 is a small ditch system created to collect and direct water away from waste rock piles. A pipe discharges water directly into the South Fork Lower Willow Creek.

The pertinent flow and nutrient concentration data for the Black Pine Mine was provided via Discharge Monitoring Reports by DEQ. The Discharge Monitoring Reports show effluent discharge measurements on a semi-annual basis. The flow rate at Outfall 001 was reported eight times between December 2003 and December 2009 with an average rate of 4.19 gpm (**Figure G2-7**). Outfall 002 had no reported discharge flow rates during the same timeframe. When no discharge occurred at an outfall during a reporting period the permittee provided a description in the Discharge Monitoring Reports of "No Discharge" or "Analysis not conducted/No sample." See **Attachment GB, Table GB-2** for discharge data.

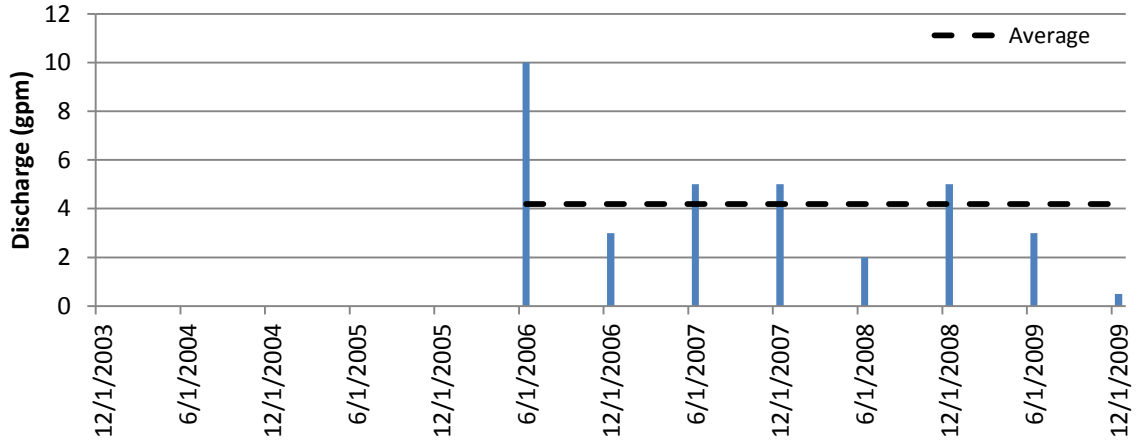


Figure G2-7. Black Pine Mine Outfall 001 (Asarco Inc.) Bi-Annual Effluent Discharges (gpm) from December 2003 through December 2009

Nitrite + Nitrate values were reported three times at Outfall 001 and two times at Outfall 002 from June 1994 through June 2010. Ammonia and TP were both reported once at Outfall 001 and twice at Outfall 002 between June 1994 and December 2002. Due to the majority of sampling periods reporting "No Discharge" for nutrient data, trends were not able to be assessed for either outfall from this facility. Effluent limits for all nutrient parameters are listed in **Table G2-5** for Permit MTR300080 (Cleary, Devin, personal communication 2010). All nutrients are listed in **Attachment GB, Table GB-2.**

Table G2-5. Nutrient Effluent Limits for Permit MTR300080

Nutrient Parameter	Effluent Limit
Nitrite + Nitrate	0.68 mg/L
Total Phosphorus	2.0 mg/L
Ammonia	19 mg/L

Asarco Inc. filed for bankruptcy on 08/09/2005. After court proceedings were finalized on 12/09/09, the deed to the Black Pine Mine was turned over to the Montana Environmental Trust Group LLC, a subsidiary of the Greenfield Environmental Trust Group (Byron, 2009). The land is being held in trust for the State and Montana and, under DEQ's supervision, the Black Pine Mine is now being remediated for

mining contaminants (Cleary, Devin, personal communication 2010). The permit remains active in the event it is needed during the cleanup efforts. Technically, Permit MTR300080 has been in noncompliance since the property was turned over to Montana Environmental Trust Group LLC due to failure to report Discharge Monitoring Reports. No formal enforcement actions have been brought against Montana Environmental Trust Group LLC for the noncompliance issues.

Permit MT0031569, is currently in the process of being issued to Teras Resources, Inc. for the Golden Jubilee Mine. The permit application was received without a fee in 2007 and Teras Resources, Inc. has not pursued the permit any further since then. As such, no nutrient data, discharge data, or conditions were applicable for this permit. The map provided through Integrated Compliance Information System by the OTIS (On-line Tracking Information System) suggests that the site is in the Fred Burr Creek sub-watershed. They are currently still under a small miners exclusion permit for exploration work, which exempts the need for an NPDES permit. This mining operation may need an industrial stormwater permit in the future if it produces a certain amount of ore.

G2.2 GROUNDWATER SOURCES

Permitted groundwater sources are those that discharge directly to groundwater, via percolation or direct injection, that will not become part of the surface water flow and nutrient budget until (or if) the groundwater discharges via dispersed flow to a surface water. Direct discharge to groundwater requires an individual state-issued permit (non-NPDES). Dischargers must obtain and comply with a MGWPCS permit to discharge wastewater to the groundwater either directly or via percolation. A permit is not required for the discharge of certain wastes to groundwater under specific circumstances (see ARM 17.30.1310, 75-5- 401(1)(b) and 75-5-401(5), MCA). Location of all permitted groundwater sources can be found in **Figure GA-2**.

G2.2.1 Montana Ground Water Pollution Control System Permitted Groundwater Discharges

There are three MGWPCS-permitted discharges to the sub-surface waters of the Flint Creek watershed. These dischargers are summarized in **Table G2-6**; a figure of all groundwater discharging facilities can be found in **Figure GA-2**.

Table G2-6. Montana Ground Water Pollution Control System-Permitted Dischargers within the Flint Creek TMDL Planning Area

MGWPCS Number	Outfall Number	Permittee	Description	Receiving Water (Closest Waterbody)	Permit Expiration Date
MTX000002	002-A	Contact Mining Company	Ore mining	Groundwater (Douglas Creek)	7/31/2015
MTX000002	003-A	Contact Mining Company	Ore mining	Groundwater (Douglas Creek)	7/31/2015
MTX000134	001	Sugar Loaf Wool Carding Mill	Wool processing	Groundwater (Spring Creek)	7/31/2015
MTX000201	001	Georgetown Development, LLC	Single family home development	Groundwater (Georgetown Lake)	9/30/2013

Permit MTX000002, issued to Contact Mining Company, is for the stated purpose of producing lead, silver, copper, and gold ores. The facility originally had an administrative order against it that included

unreported discharge of mine drainage, ineffective or lacking best management practices, and ineffective capture of subsurface mine drainage, and thereafter became a groundwater permitted facility. This facility is a custom mill site and operates intermittently when ore processing can be contracted. The facility sits on top of prior mill tailings from the Granite Mill site; a larger historic and abandoned operation. Wastewater from Contact Mill operations is pumped into tailings impoundments and discharged by leakage/infiltration. Primary settling is the treatment method for wastewater outfalls at this facility. Outfall 002-A pertains to East tailings impoundment, Outfall 003-A is the West impoundment and Site MW1-A is the pump house (not an outfall) prior to distribution into the tailings impoundments.

The August 2010 MGWPCS permit requires the Contact Mining Company to monitor their effluent flow rate on a continuous basis and report the data monthly. Ammonia and Nitrate + Nitrite values are required to be monitored every week with monthly reporting. No other nutrient monitoring is required. Applicable permit limits for this site are shown in **Table G2-7**. In addition to monitoring the characteristics of their effluent, Contact Mining is also required to monitor and report on the Ammonia and Nitrite + Nitrate levels in their groundwater on a quarterly basis; however, there is no groundwater quality data available because the originally completed monitoring wells were dry when drilled to the bedrock interface and therefore monitoring has not occurred. DEQ is requiring installation of new monitoring wells and groundwater monitoring during the current permit cycle. Contact Mining Company is currently processing ore from the Drumlummon Mine near Marysville, Montana.

Table G2-7. Nutrient Effluent Limits for Individual Groundwater Discharge Permits

MGWPCS Number	Total Phosphorus		Total Nitrogen		Ammonia	Nitrate + Nitrite	Nitrate	Total Kjeldahl Nitrogen	Effluent Flow Rate
	mg/L	lb/d	mg/L	lb/d	mg/L	mg/L	mg/L	mg/L	gpd
MTX000002	-	-	TNL	-	TNL	-	-	-	TNL
MTX000134	-	-	7.5	-	-	-	TNL	TNL	165
MTX000201	10.0	0.46	25.7	1.18	TNL	TNL	TNL	TNL	5,550

TNL = Tested but no limit set
"-" = Not required to test

The MTX000002 Discharge Monitoring Reports for Outfall 002-A show monthly monitoring from October 2002 through September 2009 (**Attachment GB, Table GB-3**). However, most of these values were blank and some had descriptions such as: "No Discharge", "Conditional Monitoring - Not Required This Period", "Operation Shutdown", and "Below Detection Limit/No Detection". "Operation Shutdown" was reported monthly starting during 2008 and continuing through 2009, with no subsequent reports provided. Much of the past decade, the facility was intermittently operated and therefore had no discharge to monitor. Only trace element concentrations and specific conductance were reported, flow and nutrient concentrations were not. As such, no trends were able to be discerned for flow or nutrient concentrations due to lack of numeric information.

Discharge from MTX000002 Outfall 003-A was also reported monthly from October 2002 through September 2009. A table reporting Nitrite + Nitrate nitrogen concentrations was provided, but Discharge Monitoring Report values were blank with the same descriptions as Outfall 002-A. Monitoring Site MW1-A (the pump house) was also listed, but the report was similar to the other sites, with no information concerning discharge flows or nutrient concentrations. Previous and future trends were not able to be discerned due to lack of numeric information.

Permit MTX000134 is issued to Sugar Loaf Wool Carding Mill to discharge industrial wastewater into a sub-surface drainfield. As per the 2010 MGWPCS permit, Nitrate and TKN are to be sampled quarterly, while flow is to be sampled continuously. All effluent data must be reported quarterly. TP is not monitored because a breakthrough analysis showed non-significant degradation.

No water quality data was available for July 2003 through June 2008 for this permit because Sugar Loaf Wool Carding Mill did not collect and analyze the required samples. Limited data was available from July 2008 to the present; this data included four sampling periods (**Attachment GB**, **Figure GB-4**). Due to limited data, no discharge or nutrient trends were able to be discerned for this facility.

The discharge system is designed to handle an average of 165 gallons per day (gpd) and 250 gpd during peak flows. Administrative orders pertaining to the facility include an order to collect and analyze the stated effluent parameters and an order to complete Discharge Monitoring Reports on a regular basis. No historic or future changes in discharge practices were found in the reviewed information. Applicable permit limits are found in **Table G2-7**.

Permit MTX000201 is issued to Georgetown Development, LLC for the Lakeside at Georgetown home development project. The development is permitted to discharge residential strength wastewater, at a rate of up to 5,550 gpd, from a wastewater treatment system single zone drainfield. The facility has effluent limits on both TP and TN, as shown in **Table G2-7**. According to their October 2008 MGWPCS permit, Georgetown Development is supposed to monitor their effluent flow rate (prior to reaching the drainfield) on a daily basis and report the data quarterly; water quality data should be monitored/ reported quarterly. In addition to their effluent monitoring, the development is also required to monitor the quality of their groundwater quarterly.

This development is still in the process of being constructed and no current data exists for this permit. A groundwater monitoring location is being developed at this time. No administrative orders or future upgrade conditions were found for this facility due to the fact that it is not functional at this time.

Two other multi-family wastewater treatment systems exist within the watershed: the Rising Sun Estates and Elk Meadows Phase 2 housing complexes. These two systems are located near Georgetown Lake (**Figure GA-2**). Neither of these housing complexes have an MPDES permit to discharge to groundwater and thus are outside the scope of this report.

G2.2.2 Small Individual / Shared Subsurface Sewage Treatment Systems

An accurate count of Subsurface Sewage Treatment Systems, or septic systems, is difficult to accurately obtain. Individual septic systems are differentiated from multi-user or municipal wastewater treatment systems in that they are independent systems serving single housing structures. DEQ, using Geographic Information System (GIS) layers of structures within Granite and Deer Lodge Counties, estimated there are 1,623 small septic systems within the watershed (Regensburger et al., 2010). Since the number of individual septic systems increases with human population, areas with higher population densities also contain the highest septic system concentrations. As such, septic systems in the Flint Creek watershed are mainly concentrated near Georgetown Lake, while moderately concentrated septic systems are near Philipsburg, Lower Flint Creek, and Boulder Creek. Other areas of the watershed have low septic system densities (Regensburger et al., 2010). **Figure GA-3** was created with information provided as part of DEQ's septic system study and shows the locations of individual septic systems in the study area.

As part of their septic system report, DEQ estimated nutrient loadings at drainfields and to surface waters. The GIS-based assessment using soil properties and distance to surface water estimated that on average 64% of Nitrate and 85% of TP entering the drainfields is treated before entering surface waters. They also estimated that septic system loading occurs at 30.5 lb/year/home for nitrate and 6.44 lb/year/home for TP. Based on those assumptions, the estimated total nitrate and TP loading into the Flint Creek watershed's surface waters from septic systems is 17,860 and 1,575 lbs/year, respectively (Regensburger et al., 2010).

Detailed information regarding septic systems within the Flint Creek watershed can be found in DEQ's subsurface wastewater treatment report (Regensburger et al., 2010). Results from DEQ's subsurface wastewater treatment report (Regensburger et al., 2010) effort will provide a basic estimate in which the SWAT septic source assessment routines will be compared during calibration. The method of simulating septic systems in the SWAT model (and data for entry into the model) will be determined by DEQ.

G2.3 STORMWATER FACILITIES

Table G2-8 lists the MPDES-permitted sites that are not considered elsewhere in this report as mining-related or wastewater, or that are listed as terminated or expired. The three sites listed are in sub-watersheds that are tributary to Georgetown Lake. These are the construction permits for the Georgetown Development - Lakeside at Georgetown Subdivision (Permit MTR103118), Hutton Fine Builders - Bobak Residence (Permit MTR103475), and Mungas Co. Inc - Southern Cross Reclamation (Permit MTR101311). These three sites are covered by the general permit for stormwater discharges associated with construction activities. Facilities covered under this general permit are required to implement BMPs and conduct regular inspections but are not typically required to conduct water quality monitoring.

Table G2-8. Permitted Stormwater Dischargers Associated with Construction Activities

NPDES Number	Permitee	Description	Receiving Waterbody	Permit Expiration Date	Permit Status	Outfall Location
MTR103118	Georgetown Development - Lakeside at Georgetown Subdivision	Stormwater Construction	Georgetown Lake	12/31/2011	Effective	Latitude: 46.171550 Longitude: -113.288100
MTR103475	Hutton Fine Builders - Bobak Residence	Stormwater Construction	Georgetown Lake	12/31/2011	Effective	Latitude: 46.191944 Longitude: -113.306944
MTR101311	Mungas Co. Inc - Southern Cross Reclamation	Stormwater Construction - Excavation Work	Drainage To North Fork Flint Creek	12/31/2011	Effective	Latitude: 46.195833 Longitude: -113.240278

Permit MTR103118, issued to Georgetown Development – Lakeside at Georgetown subdivision, is for the stormwater runoff at the construction site of condominiums and homes.

Permit MTR103475, issued to Hutton Fine Builders, is for home building sites on a 1.8 acres disturbed area. This area has a moderate soil-erodability factor (K) of 0.25. This means the soils are moderately susceptible to being picked up in runoff and moving downgradient. To prevent the soil from reaching Georgetown Lake, a silt fence was installed around the construction site with a 75 foot natural grass buffer between the construction site and Georgetown Lake.

Permit MTR101311, issued to Mungas Company Inc., is in the process of constructing a quarter-mile road leading to a building. To reduce sediment transported via runoff, silt fencing was installed (Kron, Darrin, personal communication 2010).

Stormwater runoff from urban surfaces is commonly transported through Municipal Separate Storm Sewer Systems (MS4s), from which it is often discharged untreated into local surface waters. To prevent harmful pollutants from being washed or dumped into an MS4, operators must obtain a NPDES permit and develop a stormwater management program. Philipsburg, the largest town in the Flint Creek watershed evaluated for this report, and other municipalities in the watershed are not presently required to obtain a permit under the MS4 program due to their small population size and will be treated as nonpoint source urban runoff.

G2.4 OTHER FACILITIES

Active permitted mines are discussed above, but there are many mines throughout the watershed that are abandoned or inactive. While not explicitly addressed above, these mines may pose a threat to environmental health. NRIS provided information and GIS coverages for three abandoned-mine data bases originating from: 1) The Montana Bureau of Mines and Geology; 2) The Montana State Library, incorporating data from the U.S. Bureau of Mines Mineral Information Locator Service; and 3) DEQ's Abandoned Mines Bureau. All abandoned mine locations in the Flint Creek watershed are shown in **Figure GA-4** with no attempt to sort out duplicate entries, resulting in many overprinted identifiers. These mines and waste pile areas often are a source of water discharge because they intercept groundwater aquifers or expose crushed rock weathering conditions. Because mines expose material to weathering that might otherwise remain harmlessly bound in the rocks, discharge water or diffuse groundwater may carry a broad assortment of contaminants (particularly acidic waters with elevated trace elements which are beyond the scope of this data compilation). Also carried with the water may be small concentrations of nutrient compounds, although this probably is not a significant source. Residues of explosives used during mining often contain substantial quantities of nitrogen compounds. Because most of these nitrogen-based compounds are very water soluble, they probably have long since been washed away or degraded.

Phosphate had been actively mined in many parts of the northern Rocky Mountains, and the Flint Creek drainage is no exception. The abandoned mines where phosphate was mined (often with other products that also were mined) are shown in **Figure GA-4**. A literature review was performed to determine whether residues or other exposed material from phosphate mining leads to detrimental levels of phosphorus in waters downstream. No evidence of any direct effect was identified although several discussions dealt with collateral effects including increased sediment transport, changes in flow volumes, and concerns about elevated concentrations of co-occurring contaminants.

According to DEQ records the Philipsburg landfill (license #265) was in operation as early as 1966 and may have existed prior to that time. It was officially closed by the state in 1995. The site was located

approximately 1 mile north of Philipsburg in the northwestern quadrant of section 24, Township 7N, Range 14W. It was licensed as a class II landfill, which means it was licensed to accept general household waste. Class II landfills are not allowed to accept septic tank waste or other semi-liquids or liquids without an exemption - the DEQ file does not indicate an exemption to accept those wastes was ever granted. Records indicate the dump did not have a liner. Due to the type of waste disposed there appears to be a low risk of significant nutrient impacts to the groundwater.

According to DEQ records the Charles Park landfill near Drummond (license #267) was licensed and in operation between 1985 and 1992 when it was officially closed by the state. The site was located 2.5 miles south and 1.5 miles east of Drummond in the southwestern quadrant of section 8, Township 10N, Range 12W. It was licensed as a class II landfill, which means it was licensed to accept general household waste. Class II landfills are not allowed to accept septic tank waste or other semi-liquids or liquids without an exemption - the DEQ file does not indicate an exemption to accept those wastes was ever granted. Due to the type of waste disposed there appears to be a low risk of significant nutrient impacts to the groundwater.

G3.0 SUMMARY

The purpose of this report is to characterize the point sources and permitted groundwater discharge facilities that may influence nutrients in the Flint Creek watershed. Information put forth in this report will support the creation of a SWAT watershed loading model, which DEQ plans to construct as part of a TMDL study. Various sources of data were used to gather and report information on the area's nutrient source locations and operations, associated receiving water, permitted limits and reporting requirements, and past and projected changes in the quantity of nutrient loads (when possible).

The Flint Creek watershed contains six permitted nutrient sources which discharge directly to either surface or groundwater. Three permitted sources discharge to surface waters and three discharge to groundwater. In addition to these permitted sites, the watershed also contains three Stormwater Construction permits. The locations of all these sites are shown in a series of attached maps.

Various qualities of monitoring data were available for these facilities/sources. The Phillipsburg WWTP had the most comprehensive record of flow and water quality data with ten years of reported monthly flow data and 6 years of reported monthly nutrient values. Most facilities had little to no data available because the facilities have either had few discharge events or are not required to conduct water quality monitoring. No flow or water quality data were available for the permitted stormwater construction sites. **Attachment GB** summarizes the reported flow and nutrient water quality data available for each permitted facility.

G4.0 REFERENCES

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ATTACHMENT GA - MAPS

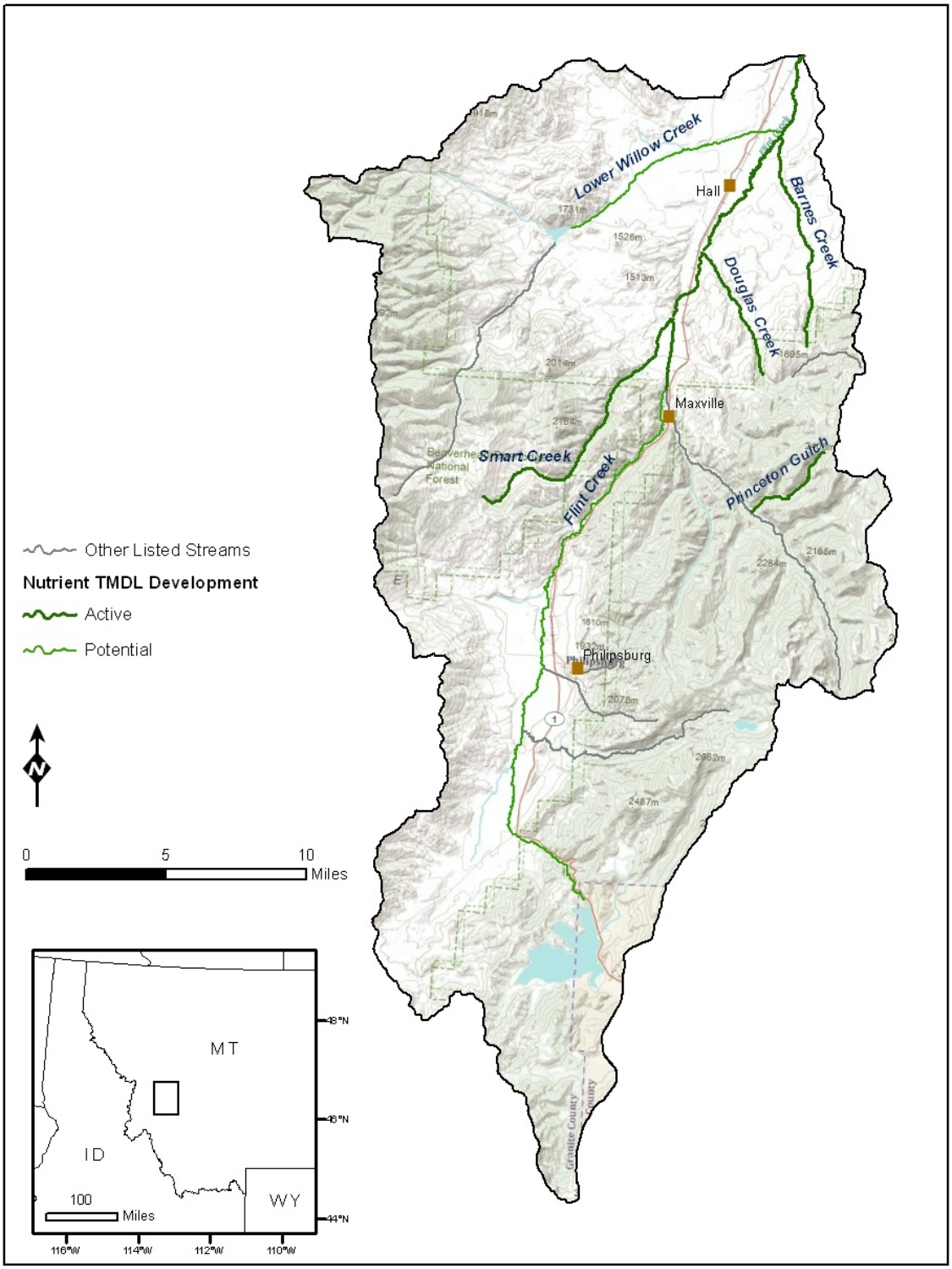

Figure GA-1. Impaired and Potentially Impaired Streams within the Flint Creek Watershed, Montana

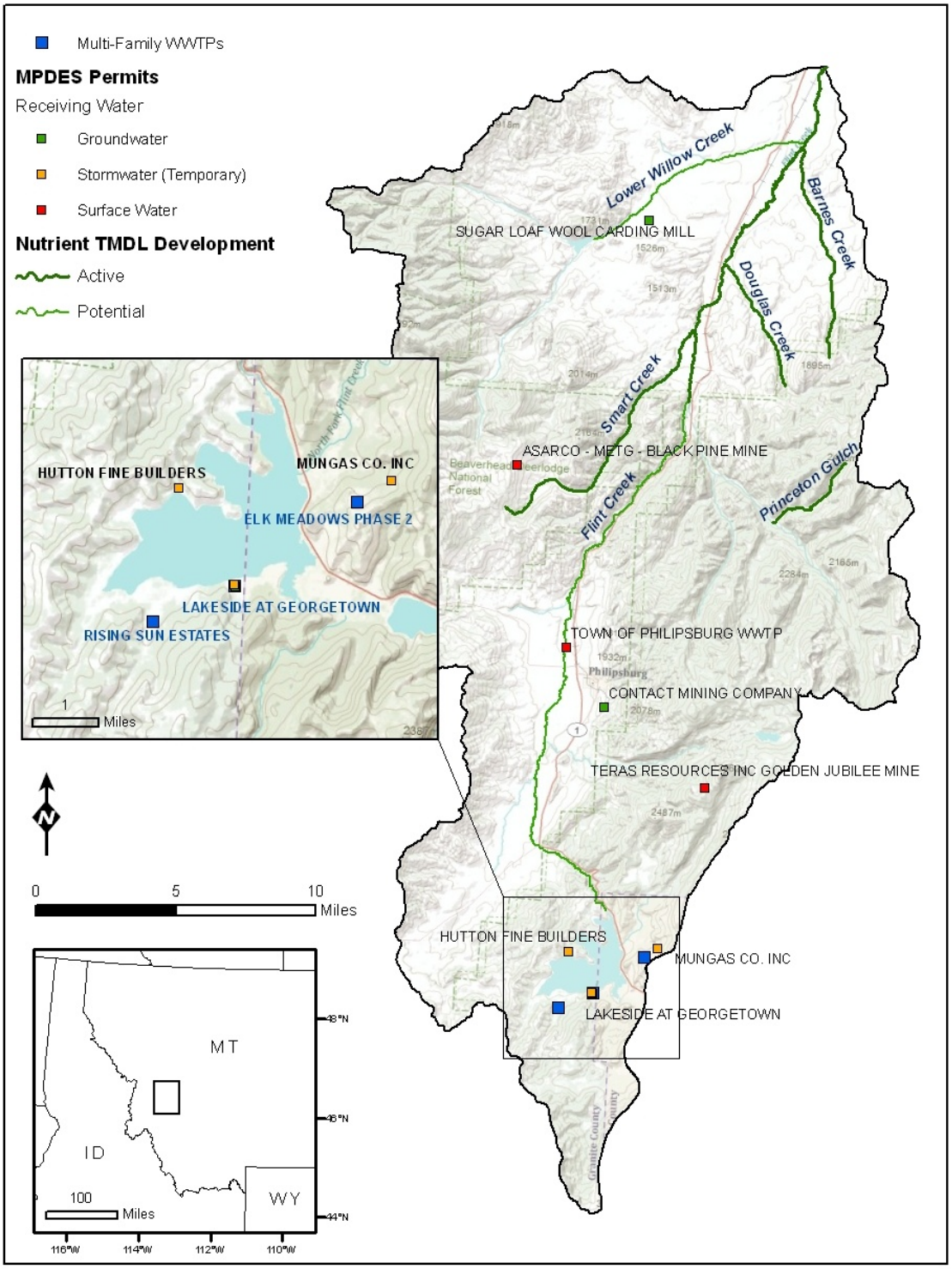

Figure GA-2. Locations of Permitted and Non-Permitted Wastewater Dischargers in the Flint Creek Watershed, Montana

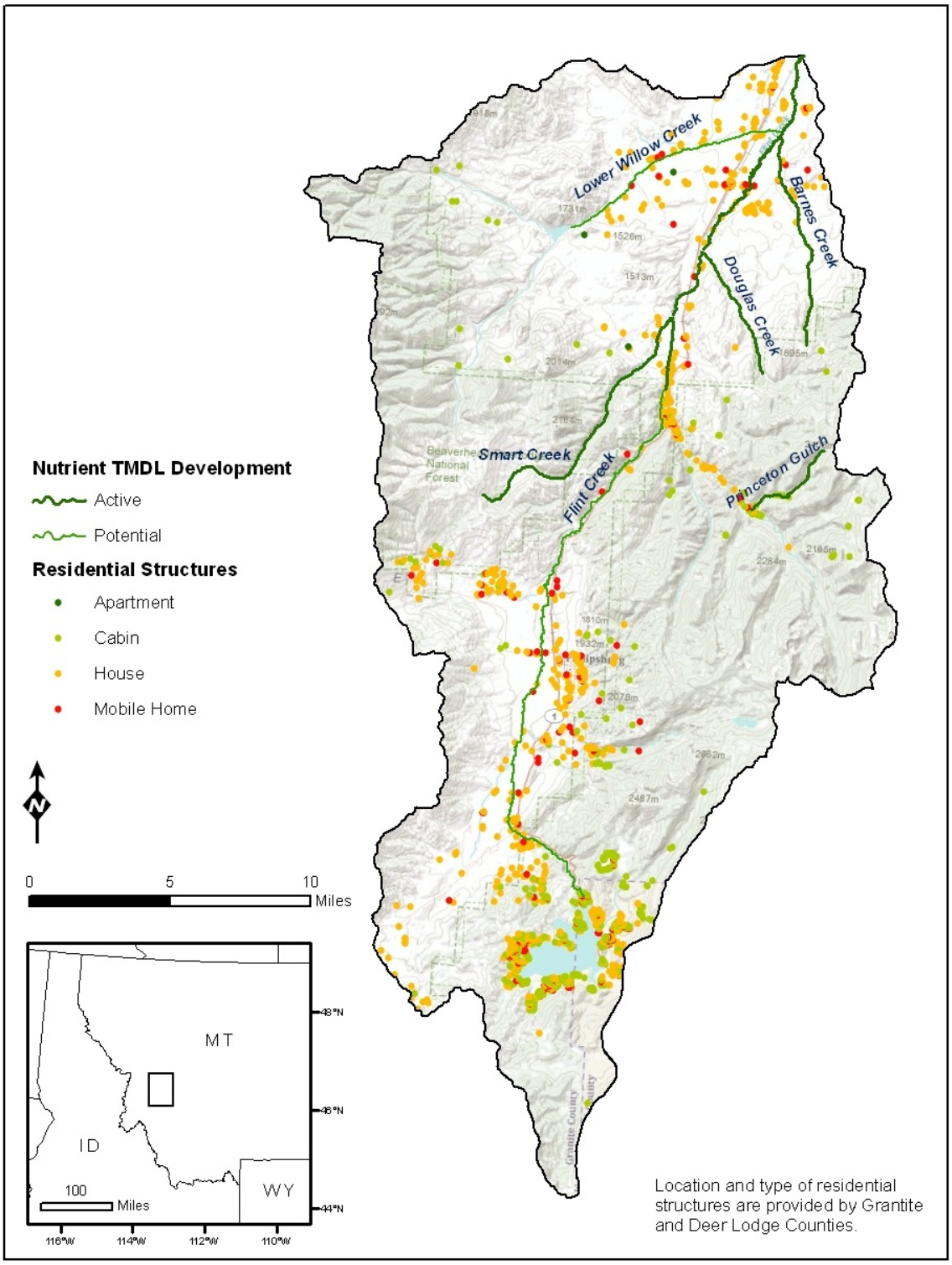

Figure GA-3. Locations of Individual Septic Systems in the Flint Creek Watershed, Montana

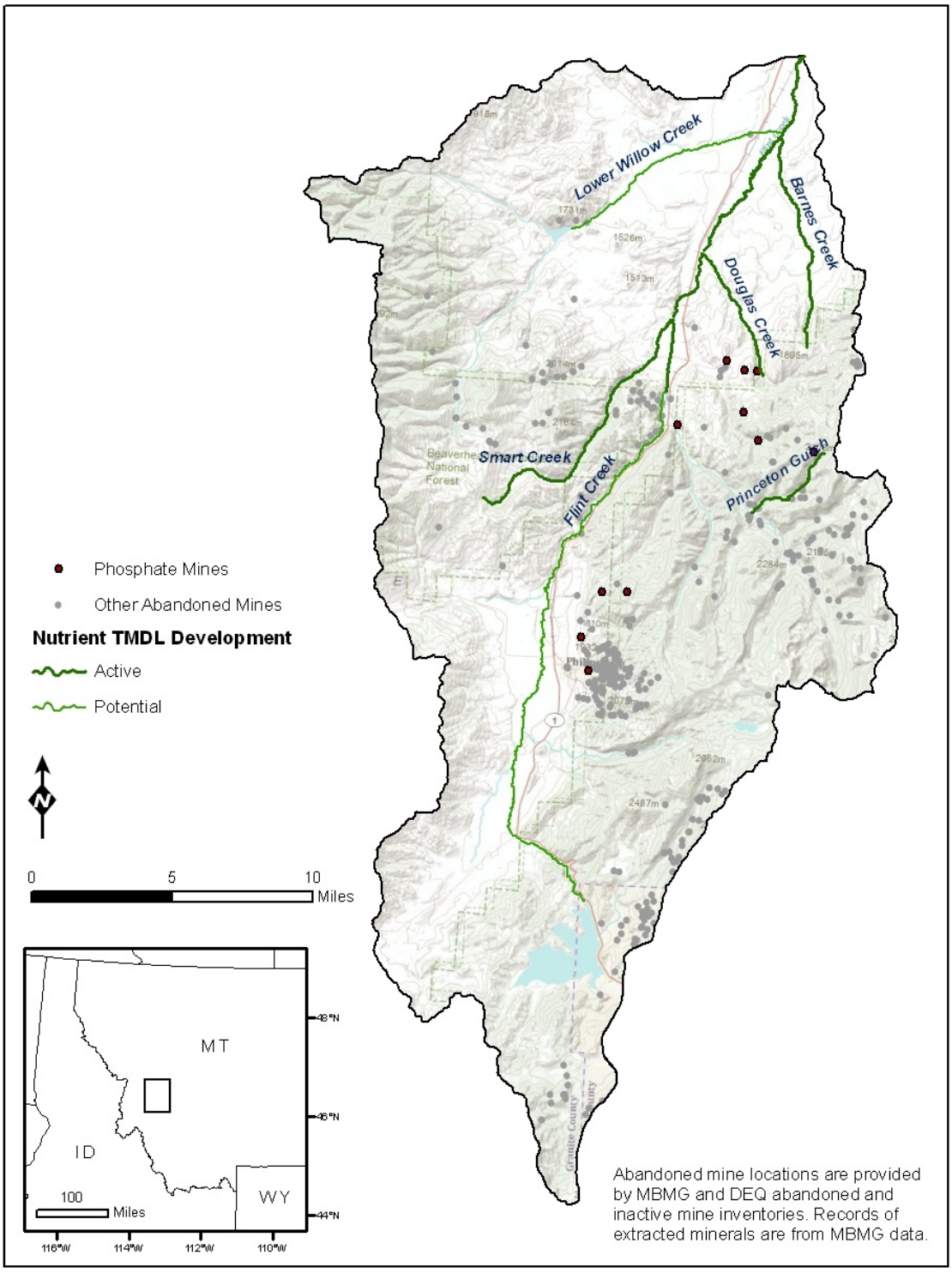

Figure GA-4. Locations of Abandoned Mines within the Flint Creek Watershed, Montana

ATTACHMENT GB – POINT SOURCE DISCHARGE MONITORING REPORTS

Table GB-1. Philipsburg WWTP

Permit: MT0031500													
	Discharge			Total Phosphorus		Total Nitrogen		Ammonia		TKN		Nitrate + nitrite	
Date	mgd average	mgd max	m3/d	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
1/31/2000	0.09		329.30										
2/29/2000	0.12		454.20										
3/31/2000	0.11		412.57										
4/30/2000	0.08		291.45										
5/31/2000	0.08		291.45										
6/30/2000	0.14		545.04										
7/31/2000	0.07		257.38										
8/31/2000	0.06		223.32										
9/30/2000	0.06		223.32										
10/31/2000	0.07		257.38										
11/30/2000	0.07		257.38										
12/31/2000	0.07		257.38										
1/31/2001	0.12		454.20										
2/28/2001	0.17		639.67										
3/31/2001	0.17		639.67										
4/30/2001	0.10		370.93										
5/31/2001	0.06		223.32										
6/30/2001	0.10		370.93										
7/31/2001	0.07		257.38										
8/31/2001	0.03		128.69										
9/30/2001	0.07		257.38										
10/31/2001	0.06		223.32										
11/30/2001	0.07		257.38										
12/31/2001	0.09		329.30										
1/31/2002	0.10		370.93										
2/28/2002	0.09		329.30										
3/31/2002	0.08		291.45										
4/30/2002	0.07		257.38										
5/31/2002	0.06		223.32										
6/30/2002	0.14		545.04										
7/31/2002	0.06		223.32										
8/31/2002	0.04		158.97										
9/30/2002	0.05		189.25										
10/31/2002	0.05		189.25										
11/30/2002	0.06		223.32										
12/31/2002	0.08		291.45										
1/31/2003	0.08		291.45										
2/28/2003	0.08		291.45										
3/31/2003	0.11		412.57										
4/30/2003	0.09		329.30										
5/31/2003	0.10		370.93										

Table GB-1. Philipsburg WWTP

Permit: MT0031500													
	Discharge			Total Phosphorus		Total Nitrogen		Ammonia		TKN		Nitrate + nitrite	
Date	mgd average	mgd max	m3/d	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
6/30/2003	0.08		291.45										
7/31/2003	0.05		189.25										
8/31/2003	0.03		128.69										
9/30/2003	0.06		223.32										
10/31/2003	0.08		291.45										
11/30/2003	0.11		412.57										
12/31/2003	0.06		223.32										
1/31/2004	0.07		257.38										
2/29/2004	0.10		370.93										
3/31/2004	0.16		590.46										
4/30/2004	0.06		223.32										
5/31/2004	0.16		590.46										
6/30/2004	0.09		329.30										
7/31/2004	0.04		158.97										
8/31/2004	0.05		189.25										
9/30/2004	0.09		329.30										
10/31/2004	0.06		223.32										
11/30/2004	0.22		844.06										
12/31/2004	0.18		688.87										
1/31/2005	0.30		1131.72										
2/28/2005	0.22		844.06										
3/31/2005	0.21		791.07										
4/30/2005	0.22		844.06										
5/31/2005	0.24		900.83										
6/30/2005	0.28		1071.16	2.10	4.95	6.60	15.55						
7/31/2005	0.18		688.87	1.80	2.73	9.10	13.79						
8/31/2005	0.16		590.46	1.70	2.21	8.80	11.43						
9/30/2005	0.25		957.61	0.35	0.74	7.00	14.75						
10/31/2005	0.24		900.83	2.30	4.56	11.80	23.39						
11/30/2005	0.25		957.61	0.47	0.99	7.01	14.77						
12/31/2005	0.30		1131.72	1.77	4.41	6.53	16.26						
1/31/2006	0.24		900.41	2.05	4.06	11.68	23.14						
2/28/2006	0.28		1071.00	2.16	5.09	10.83	25.52						
3/31/2006	0.24		900.41	2.17	4.30	10.69	21.18						
4/30/2006	0.18		689.48	0.90	1.37	5.39	8.18						
5/31/2006	0.10		370.85	2.10	1.71	9.90	8.08						
6/30/2006	0.24		900.41	2.25	4.46	10.40	20.60						
7/31/2006	0.18		689.48	1.61	2.44	7.84	11.89						
8/31/2006	0.33		1251.41	1.35	3.72	4.57	12.58						
9/30/2006	0.47		1777.92	3.59	14.04	9.76	38.19						
10/31/2006	0.28		1071.00	4.15	9.78	8.55	20.15						
11/30/2006	0.14		544.71	2.75	3.30	8.73	10.46						
12/31/2006	0.13		499.15	1.04	1.14	7.24	7.96						
1/31/2007	0.11		412.16	2.57	2.33	16.50	14.96						

Table GB-1. Philipsburg WWTP

Permit: MT0031500													
	Discharge			Total Phosphorus		Total Nitrogen		Ammonia		TKN		Nitrate + nitrite	
Date	mgd average	mgd max	m3/d	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day	mg/L	lb/day
2/28/2007	0.07		256.44	2.90	1.64	24.10	13.60						
3/31/2007	0.09		331.11	1.64	1.19	13.23	9.64						
4/30/2007	0.09		331.11	1.92	1.40	10.33	7.53						
5/31/2007	0.16		591.91	1.66	2.16	2.86	3.73						
6/30/2007	0.18		689.48	2.00	3.03	16.12	24.45						
7/31/2007	0.03		128.41	1.96	0.55	14.38	4.06						
8/31/2007	0.05	0.08	188.49	2.20	0.91	5.90	2.45	5.16	2.14	5.74	2.38	0.16	0.07
9/30/2007	0.09	0.27	331.19	3.02	2.20	6.97	5.08	5.23	3.81	6.96	5.07	0.06	0.03
10/31/2007	0.10	0.14	370.93	2.74	2.24	11.98	9.78	10.40	8.49	11.90	9.71	0.08	0.03
11/30/2007	0.12	0.27	454.96	0.74	0.74	8.31	8.32	10.80	10.81	8.16	8.17	0.15	0.06
12/31/2007	0.11	0.17	412.19	2.19	1.99	11.77	10.68	8.93	8.10	11.60	10.52	0.17	0.07
1/31/2008	0.08	0.12	292.96	2.91	1.88	15.06	9.71	0.08	0.05	15.00	9.67	0.06	0.02
2/29/2008	0.07	0.09	256.24	3.50	1.97	19.50	10.99	9.71	5.47	19.50	10.99	0.02	0.01
3/31/2008	0.09	0.12	331.19	2.93	2.14	23.82	17.36	17.50	12.75	23.80	17.34	0.58	0.24
4/30/2008	0.10	0.17	370.93	19.10	15.59	15.58	12.71	10.20	8.32	15.00	12.24	0.19	0.08
5/31/2008	0.09	0.24	331.19	2.84	2.07	12.79	9.32	5.74	4.18	12.60	9.18	0.10	0.04
6/30/2008	0.20	0.31	740.35	9.73	15.85	9.92	16.15	2.75	4.48	9.82	16.00	0.15	0.06
7/31/2008	0.09	0.22	331.19	3.77	2.75	2.03	1.48	0.50	0.36	2.03	1.48	0.17	0.07
8/31/2008	0.06	0.20	221.80	9.61	4.69	2.26	1.10	2.32	1.13	2.11	1.03	0.55	0.23
9/30/2008	0.13	0.47	499.24	10.60	11.64	7.70	8.46	6.99	7.68	7.53	8.27	0.75	0.31
10/31/2008	0.10	0.13	370.93	1.94	1.58	4.65	3.80	2.18	1.78	4.10	3.35	0.08	0.03
11/30/2008	0.12	0.25	454.96	1.24	1.24	8.17	8.17	4.80	4.80	7.42	7.43	0.02	0.01
12/31/2008	0.12	0.17	454.96	1.67	1.67	6.56	6.57	6.52	6.53	6.48	6.49	0.05	0.02
1/31/2009	0.09	0.17	331.19	3.28	2.39	14.52	10.58	10.20	7.43	14.50	10.57	0.05	0.02
2/28/2009	0.09	0.17	331.19	4.68	3.41	10.35	7.54	9.30	6.78	10.30	7.51	0.33	0.14
3/31/2009	0.07	0.12	256.24	2.26	1.27	14.95	8.43	6.88	3.88	14.90	8.40	0.40	0.16
4/30/2009	0.05	0.13	188.49	2.29	0.95	13.63	5.65	6.41	2.66	13.30	5.52	0.01	0.01
5/31/2009	0.05	0.16	188.49	1.87	0.78	6.03	2.50	0.63	0.26	5.63	2.33	0.01	0.00
6/30/2009	0.12	0.36	454.96	2.62	2.62	8.85	8.86	6.07	6.08	8.84	8.85	0.09	0.04
7/31/2009	0.07	0.13	256.24	3.32	1.87	14.71	8.29	9.42	5.31	14.70	8.29	0.30	0.13
8/31/2009	0.03	0.28	101.44	2.28	0.51	6.27	1.40	1.09	0.24	6.18	1.38	0.18	0.07
9/30/2009	0.06	0.20	221.80	2.82	1.38	6.07	2.96	1.67	0.81	5.77	2.82	0.79	0.33
10/31/2009	0.12	0.25	454.96	3.06	3.06	7.99	8.00	5.31	5.32	7.81	7.82	0.30	0.12
11/30/2009	0.03	0.06	128.31	1.87	0.53	7.58	2.14	2.90	0.82	6.79	1.92	0.65	0.27
12/31/2009	0.03	0.06	128.31	3.03	0.86	6.55	1.85	3.78	1.07	6.25	1.76	0.00	0.00
1/31/2010	0.03	0.06	101.44	3.00	0.67	8.27	1.85	2.21	0.49	7.62	1.70	0.00	0.00
2/28/2010	0.04	0.07	157.46	4.34	1.50	17.60	6.10	10.40	3.60	17.60	6.10	0.00	0.00
3/31/2010	0.03	0.06	101.44	3.81	0.85	23.60	5.27	11.30	2.52	23.60	5.27	0.00	0.00

Table GB-2. Asarco - Black Pine Mine

Permit: MTR300080				
	Outfall 001-A		Outfall 002-A	
Date	DMR value	Description	DMR value	Description
Flow rate - Effluent Gross - Gallons per minute				
12/31/2003		No discharge		No Discharge
6/30/2004		No discharge		No Discharge
12/31/2004		No discharge		Analysis Not Conducted/No Sample
6/30/2005		No discharge		No Discharge
12/31/2005		No discharge		No Discharge
6/30/2006	10			No Discharge
12/31/2006	3			No Discharge
6/30/2007	5			No Discharge
12/31/2007	5			No Discharge
6/30/2008	2			No Discharge
12/31/2008	5			No Discharge
6/30/2009	3			No Discharge
12/31/2009	0.5			
6/30/2010	Property turned over to Montana Environmental Trust Group			
Nitrite + nitrate total 1 det. (as N) Effluent gross - mg/L				
6/30/1994	0.01		.01	
12/31/1994				
6/30/1995		No discharge		No Discharge
12/31/1995				
6/30/1996		No discharge		No Discharge
12/31/1996		No discharge	.29	
6/30/1997		No discharge		No Discharge
12/31/1997		No discharge		No Discharge
6/30/1998		No discharge		No Discharge
12/31/1998		No discharge		No Discharge
6/30/1999		No discharge		No Discharge
12/31/1999		No discharge		No Discharge
6/30/2000		No discharge		No Discharge
12/31/2000		No discharge		No Discharge
6/30/2001		No discharge		No Discharge
12/31/2001		No discharge		No Discharge
6/30/2002		No discharge		
12/31/2002		No discharge		
1/1/2003 - 12/31/2008		Conditional monitoring - not required this period		
6/30/2009	0.34			
12/31/2009	3.22			
6/30/2010	Property turned over to Montana Environmental Trust Group			
Nitrogen, ammonia total (as N) Effluent gross - mg/L				
6/30/1994	0.44		.44	
12/31/1994				
6/30/1995		No Discharge		No Discharge
12/31/1995				
6/30/1996		No discharge		No Discharge

Table GB-2. Asarco - Black Pine Mine

Permit: MTR300080				
	Outfall 001-A		Outfall 002-A	
Date	DMR value	Description	DMR value	Description
12/31/1996		No discharge	1.9	
6/30/1997		No discharge		No Discharge
12/31/1997		No discharge		No Discharge
6/30/1998		No discharge		No Discharge
12/31/1998		No discharge		No Discharge
6/30/1999		No discharge		No Discharge
12/31/1999		No discharge		No Discharge
6/30/2000		No discharge		No Discharge
12/31/2000		No discharge		No Discharge
6/30/2001		No discharge		No Discharge
12/31/2001		No discharge		No Discharge
6/30/2002		No discharge		
12/31/2002		No discharge		
TP - effluent gross, mg/L				
6/30/1994	.06		.06	
12/31/1994				
6/30/1995		No Discharge		No Discharge
12/31/1995				
6/30/1996		No Discharge		No Discharge
12/31/1996		No Discharge	4.21	
6/30/1997		No Discharge		No Discharge
12/31/1997		No Discharge		No Discharge
6/30/1998		No Discharge		No Discharge
12/31/1998		No Discharge		No Discharge
6/30/1999		No Discharge		No Discharge
12/31/1999		No Discharge		No Discharge
6/30/2000		No Discharge		No Discharge
12/31/2000		No Discharge		No Discharge
6/30/2001				No Discharge
12/31/2001				No Discharge
6/30/2002				
12/31/2002				

Table GB-3. Contact Mining Company

Permit: MTX000002									
Outfall 002-A				Outfall 003-A				Outfall MW1-A	
Nitrite plus nitrate total 1 det. (as N) - mg/L									
Monitoring Period End Date	Maximum DMR Value	Description		Monitoring Period End Date	Maximum DMR Value	Description		Monitoring Period End Date	Maximum DMR Value	Description
10/31/2002				10/31/2002				10/31/2002		
11/30/2002				11/30/2002				11/30/2002		
12/31/2002		No Discharge		12/31/2002		No Discharge		12/31/2002		Insufficient Flow for Sampling
1/31/2003		Conditional		1/31/2003		No		1/31/2003		Conditional

Table GB-3. Contact Mining Company

Permit: MTX000002									
Outfall 002-A			Outfall 003-A			Outfall MW1-A			
Nitrite plus nitrate total 1 det. (as N) - mg/L									
Monitoring Period End Date	Maximum DMR Value	Description	Monitoring Period End Date	Maximum DMR Value	Description	Monitoring Period End Date	Maximum DMR Value	Description
		Monitoring - Not Required This Period			Discharge			Monitoring - Not Required This Period
2/28/2003		Conditional Monitoring - Not Required This Period	2/28/2003		No Discharge	2/28/2003		Conditional Monitoring - Not Required This Period
3/31/2003		No Discharge	3/31/2003		No Discharge	3/31/2003		No Discharge
4/30/2003		Conditional Monitoring - Not Required This Period	4/30/2003		No Discharge	4/30/2003		Conditional Monitoring - Not Required This Period
5/31/2003		Conditional Monitoring - Not Required This Period	5/31/2003		No Discharge	5/31/2003		Conditional Monitoring - Not Required This Period
6/30/2003		No Discharge	6/30/2003		No Discharge	6/30/2003		No Discharge
7/31/2003		Operation Shutdown	7/31/2003		No Discharge	7/31/2003		Operation Shutdown
8/31/2003		Operation Shutdown	8/31/2003		No Discharge	8/31/2003		Operation Shutdown
9/30/2003		Operation Shutdown	9/30/2003		No Discharge	9/30/2003		Operation Shutdown
10/31/2003		No Discharge	10/31/2003		No Discharge	10/31/2003		No Discharge
11/30/2003		No Discharge	11/30/2003		No Discharge	11/30/2003		No Discharge
12/31/2003		No Discharge	12/31/2003		No Discharge	12/31/2003		No Discharge
1/31/2004		Conditional Monitoring - Not Required This Period	1/31/2004		Conditional Monitoring - Not Required This Period	1/31/2004		Conditional Monitoring - Not Required This Period
2/29/2004		Conditional Monitoring - Not Required This Period	2/29/2004		Conditional Monitoring - Not Required This Period	2/29/2004		Conditional Monitoring - Not Required This Period

Table GB-3. Contact Mining Company

Permit: MTX000002									
Outfall 002-A			**Outfall 003-A**			**Outfall MW1-A**			
Nitrite plus nitrate total 1 det. (as N) - mg/L									
Monitoring Period End Date	**Maximum DMR Value**	**Description**	**Monitoring Period End Date**	**Maximum DMR Value**	**Description**	**Monitoring Period End Date**	**Maximum DMR Value**	**Description**
3/31/2004		No Discharge	3/31/2004		No Discharge	3/31/2004		No Discharge
4/30/2004		Conditional Monitoring - Not Required This Period	4/30/2004		Conditional Monitoring - Not Required This Period	4/30/2004		Conditional Monitoring - Not Required This Period
5/31/2004		Conditional Monitoring - Not Required This Period	5/31/2004			5/31/2004		Conditional Monitoring - Not Required This Period
6/30/2004		Operation Shutdown	6/30/2004		Operation Shutdown	6/30/2004		Operation Shutdown
7/31/2004		Conditional Monitoring - Not Required This Period	7/31/2004		Conditional Monitoring - Not Required This Period	7/31/2004		Conditional Monitoring - Not Required This Period
8/31/2004		Conditional Monitoring - Not Required This Period	8/31/2004		Conditional Monitoring - Not Required This Period	8/31/2004		Conditional Monitoring - Not Required This Period
9/30/2004		Operation Shutdown	9/30/2004		Operation Shutdown	9/30/2004		Operation Shutdown
10/31/2004		Conditional Monitoring - Not Required This Period	10/31/2004		Conditional Monitoring - Not Required This Period	10/31/2004		Conditional Monitoring - Not Required This Period
11/30/2004			11/30/2004			11/30/2004		
12/31/2004		Operation Shutdown	12/31/2004		Operation Shutdown	12/31/2004		Operation Shutdown
1/31/2005			1/31/2005			1/31/2005		
2/28/2005			2/28/2005			2/28/2005		
3/31/2005		Operation Shutdown	3/31/2005		Operation Shutdown	3/31/2005		Operation Shutdown
4/30/2005			4/30/2005			4/30/2005		
5/31/2005			5/31/2005			5/31/2005		
6/30/2005		Operation Shutdown	6/30/2005		Operation Shutdown	6/30/2005		Operation Shutdown
7/31/2005		No Discharge	7/31/2005		No Discharge	7/31/2005		No Discharge

Table GB-3. Contact Mining Company

Permit: MTX000002									
Outfall 002-A			Outfall 003-A			Outfall MW1-A			
Nitrite plus nitrate total 1 det. (as N) - mg/L									
Monitoring Period End Date	Maximum DMR Value	Description	Monitoring Period End Date	Maximum DMR Value	Description	Monitoring Period End Date	Maximum DMR Value	Description
8/31/2005		No Discharge	8/31/2005		No Discharge	8/31/2005		No Discharge
9/30/2005		No Discharge	9/30/2005		No Discharge	9/30/2005		No Discharge
10/31/2005		No Discharge	10/31/2005		No Discharge	10/31/2005		No Discharge
11/30/2005		Operation Shutdown	11/30/2005		Operation Shutdown	11/30/2005		Operation Shutdown
12/31/2005		Operation Shutdown	12/31/2005		Operation Shutdown	12/31/2005		Operation Shutdown
1/31/2006			1/31/2006			1/31/2006		
2/28/2006			2/28/2006			2/28/2006		
3/31/2006		Operation Shutdown	3/31/2006		Operation Shutdown	3/31/2006		Operation Shutdown
4/30/2006		No Discharge	4/30/2006		No Discharge	4/30/2006		No Discharge
5/31/2006		No Discharge	5/31/2006		No Discharge	5/31/2006		No Discharge
6/30/2006		No Discharge	6/30/2006		No Discharge	6/30/2006		No Discharge
7/31/2006		No Discharge	7/31/2006		No Discharge	7/31/2006		No Discharge
8/31/2006		No Discharge	8/31/2006		No Discharge	8/31/2006		No Discharge
9/30/2006		No Discharge	9/30/2006		No Discharge	9/30/2006		No Discharge
10/31/2006			10/31/2006			10/31/2006		
11/30/2006			11/30/2006			11/30/2006		
12/31/2006		No Discharge	12/31/2006		No Discharge	12/31/2006		No Discharge
1/31/2007			1/31/2007			1/31/2007		
2/28/2007			2/28/2007			2/28/2007		
3/31/2007		No Discharge	3/31/2007		No Discharge	3/31/2007		No Discharge
4/30/2007			4/30/2007			4/30/2007		
5/31/2007			5/31/2007			5/31/2007		
6/30/2007		No Discharge	6/30/2007		No Discharge	6/30/2007		No Discharge
7/31/2007		No Discharge	7/31/2007		No Discharge	7/31/2007		No Discharge
8/31/2007			8/31/2007			8/31/2007		
9/30/2007			9/30/2007			9/30/2007		
10/31/2007		No Discharge	10/31/2007		No Discharge	10/31/2007		No Discharge

Table GB-3. Contact Mining Company

Permit: MTX000002									
Outfall 002-A			Outfall 003-A			Outfall MW1-A			
Nitrite plus nitrate total 1 det. (as N) - mg/L									
Monitoring Period End Date	Maximum DMR Value	Description	Monitoring Period End Date	Maximum DMR Value	Description	Monitoring Period End Date	Maximum DMR Value	Description
11/30/2007		No Discharge	11/30/2007		No Discharge	11/30/2007		No Discharge
12/31/2007		No Discharge	12/31/2007		No Discharge	12/31/2007		No Discharge
1/31/2008			1/31/2008			1/31/2008		
2/29/2008			2/29/2008			2/29/2008		
3/31/2008		Operation Shutdown	3/31/2008		Operation Shutdown	3/31/2008		Operation Shutdown
4/30/2008		No Discharge	4/30/2008		No Discharge	4/30/2008		No Discharge
5/31/2008		No Discharge	5/31/2008		No Discharge	5/31/2008		No Discharge
6/30/2008		No Discharge	6/30/2008		No Discharge	6/30/2008		No Discharge
7/31/2008		Operation Shutdown	7/31/2008		Operation Shutdown	7/31/2008		Operation Shutdown
8/31/2008		Operation Shutdown	8/31/2008		Operation Shutdown	8/31/2008		Operation Shutdown
9/30/2008		No Discharge	9/30/2008		No Discharge	9/30/2008		No Discharge
10/31/2008		Operation Shutdown	10/31/2008		Operation Shutdown	10/31/2008		No Discharge
11/30/2008		Operation Shutdown	11/30/2008		Operation Shutdown	11/30/2008		Operation Shutdown
12/31/2008		Operation Shutdown	12/31/2008		Operation Shutdown	12/31/2008		Operation Shutdown
1/31/2009		Operation Shutdown	1/31/2009		Operation Shutdown	1/31/2009		Operation Shutdown
2/28/2009		Operation Shutdown	2/28/2009		Operation Shutdown	2/28/2009		Operation Shutdown
3/31/2009		Operation Shutdown	3/31/2009		Operation Shutdown	3/31/2009		Operation Shutdown
4/30/2009		Operation Shutdown	4/30/2009		Operation Shutdown	4/30/2009		Operation Shutdown
5/31/2009		Operation Shutdown	5/31/2009		Operation Shutdown	5/31/2009		Operation Shutdown
6/30/2009		Operation Shutdown	6/30/2009		Operation Shutdown	6/30/2009		Operation Shutdown
7/31/2009		Operation Shutdown	7/31/2009		Operation Shutdown	7/31/2009		Operation Shutdown
8/31/2009		Operation Shutdown	8/31/2009		Operation Shutdown	8/31/2009		Operation Shutdown
9/30/2009		Operation Shutdown	9/30/2009		Operation Shutdown	9/30/2009		Operation Shutdown

Table GB-3. Contact Mining Company

Permit: MTX000002									
Outfall 002-A			Outfall 003-A			Outfall MW1-A			
Nitrite plus nitrate total 1 det. (as N) - mg/L									
Monitoring Period End Date	Maximum DMR Value	Description	Monitoring Period End Date	Maximum DMR Value	Description	Monitoring Period End Date	Maximum DMR Value	Description
10/31/2009			10/31/2009			10/31/2009		
11/30/2009			11/30/2009			11/30/2009		
12/31/2009			12/31/2009			12/31/2009		
1/31/2010			1/31/2010			1/31/2010		
2/28/2010			2/28/2010			2/28/2010		
3/31/2010			3/31/2010			3/31/2010		
4/30/2010			4/30/2010			4/30/2010		
5/31/2010			5/31/2010			5/31/2010		
6/30/2010			6/30/2010			6/30/2010		
7/31/2010			7/31/2010			7/31/2010		
8/31/2010			8/31/2010			8/31/2010		
9/30/2010			9/30/2010			9/30/2010		
10/31/2010			10/31/2010			10/31/2010		
11/30/2010			11/30/2010			11/30/2010		

Table GB-4. Sugar Loaf Wool Carding Mill

Permit: MTX000134					
	Discharge	Nitrate + nitrite	Total Kjeldahl Nitrogen	Total Nitrogen	Total Phosphorus
	mgd	mg/L	mg/L	mg/L	mg/L
5/22/2008		0.49	11.1	11.59	
8/2/2008		0.49	11.1	11.59	
11/2/2008					
3/9/2009		0.07	49	49.07	
3/2/2010		<0.05	54.4		2.5