# 2006 Annual Report

January 2007

Flambeau Mining Company
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Ladysmith, WI 54848

**Flambeau Mining Company**
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Kennecott
Minerals

January 31, 2007

Mr. Phil Fauble
Division of Air and Waste
Waste and Material Management
101 South Webster Street, GEF II
Madison, WI 53707

Dear Mr. Fauble:

The Flambeau Mining Company (Flambeau) is submitting one copy of the attached 2006 Annual Report pursuant to Part 1-8 of the Flambeau Mine Permit (Docket No. IH-89-14). An additional fourteen copies of the report will be submitted separately. This submittal also addresses other requirements of the Mining Permit and associated approvals.

If you have any comments or questions regarding this submittal, please contact me at (715)532-6690 Ext. 2 or murphyj@kennecott.com.

Sincerely,

Jana E. Murphy

Jana E. Murphy
Environmental & Reclamation Manager

## Distribution

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# FLAMBEAU MINING COMPANY
# 2006 ANNUAL REPORT

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## APPENDICES

## 1 Purpose and Need

This report serves to document the work that was done at the Flambeau Mine site in 2006 and to satisfy the requirements of the Mining Permit (MP).

**Mining Permit, Part 1, Condition 8:**

> *In accordance with sec. 144.89, Stats., Flambeau shall submit a report annually to the Department summarizing the activities which took place on the mining site during the year and shall include other additional information specified in this permit and associated plan approvals.*

**Mining Permit, Part 2, Condition 4:**

> *The annual report required under sec. 144.89, Stats., shall include discussion of all modifications received during the previous year and shall include an inventory of all modifications received subsequent to permit issuance. The annual report shall also discuss deviations from the approved Mining Plan as a result of final engineering refinements of subsequent plan approvals if these deviations do not require modifications, under Part 2, Conditions 2 and 3.*

**Mining Permit, Part 2, Condition 6:**

> *Flambeau shall keep a log of all incidents, such as spills, pond overflows and embankment failure or leakage, reported to its environmental compliance staff. This log shall, at all reasonable times, be available for inspection by any duly authorized Department employee. A summary of incidents subject to various Department reporting requirements shall be included in the annual report required under sec. 144.89, Stats.*

**Mining Permit, Part 2, Condition 7 (Excerpt):**

> *The annual report required under sec. 144.89, Stats, shall include a summary of all exploration drilling activities conducted on the mining site during the previous year.*

**Mining Permit, Part 4, Condition 9:**

> *Monitoring data and results shall be submitted to the Department within 30 days after completion of the required analyses. The annual report required in this permit shall summarize the year's monitoring activities and any observed trends in the monitoring data.*

**Water Withdrawal Approval, Condition 1 (Excerpt):**

*Flambeau Mining Company shall maintain records which document the withdrawal. At a minimum, such information shall include the dates and duration of withdrawal, approximate pumping rate and approximate volume of water withdrawn. Monthly summaries shall be submitted to the department for those months in which a withdrawal occurs. This information shall be available for department review in a separate file at the Flambeau Mining Company office and shall also be summarized in the annual report submitted as a condition of the mining permit.*

The location of the information which fulfills the requirements of the above conditions is referenced in Table 1-1.

**TABLE 1-1**

**Location Information Key**

| Condition No. | Location of Information |
|---|---|
| MP, Part 1-8 | Section 2 and 3 |
| WWA, Condition 1 | Section 2.6.2 |
| MP, Part 2-4 | Section 2.8 |
| MP, Part 2-6 | Section 2.10 |
| MP, Part 2-7 | Section 2.11 |
| MP, Part 4-9 | Section 4 and Appendix A, B, C, D, E and F |

## 2 2006 Summary

### 2.1 Introduction

On January 14, 1991, after an exhaustive permitting process including extensive opportunity for public input, the Flambeau Mining Company (Flambeau), wholly owned by Kennecott Minerals Company, received from the Wisconsin Department of Natural Resources (Department) eleven permits to operate an open pit copper mine in Rusk County, Wisconsin. Over the life of the mine (1993 – 1997), 181,000 tons of copper, 3.3 million ounces of silver, and 334,000 ounces of gold were mined.

Backfilling of the open pit began in earnest in early 1997. Waste rock and soils were replaced to their approximate original location in the open pit. Over 30,000 tons of limestone were added to the sulfide-bearing waste rock to neutralize and buffer the groundwater as it resaturated the backfilled materials.

In 1998, the surface reclamation of the mine site began by returning the land surface to its approximate original contour. Stockpiled topsoil was spread across the site where grasslands and woodlands were created. Hydric (wetland) soils had been stockpiled as well and were used to create over ten acres of wetlands. Reclamation activities since 1998 have included seeding, plug planting, tree planting, erosion control, mowing, invasive species control, trail construction, and prescribed burning. During 2001, Flambeau completed the planting plan and submitted the Notice of Completion (NOC) to the Department. Concurrent with the submittal of the NOC, the reclaimed Flambeau Mine nature trails were opened to the public for non-motorized recreational activities. The City of Ladysmith had partnered with Flambeau to develop the four-mile nature trail system.

During 2006, monitoring of the reclaimed mine site documented the continued development of high quality native grassland, woodland and wetland communities. Ecological monitoring has documented that 272 native plant species are established on the site. Fifty-two bird species were found to be using the reclaimed mine site and 33 bird species were recorded as nesting on the site.

Continued protection of the Flambeau River, located 140 feet from the backfilled pit, has been documented by extensive monitoring. Throughout each phase of the project, samples have been collected from the Flambeau River and include water quality, sediments, fish, and macroinvertebrates. Habitat characterizations were performed annually through 1998 as required along the east bank of the river to document conditions of the river substrate. Flambeau continues to voluntarily monitor river water quality semi-annually to provide further documentation that the Flambeau River remains fully protected.

## 2.2 Groundwater Quality Assessments

Assessments of the backfill groundwater quality have been routinely performed with the most recent being completed in January 2007. The assessments show that the regional groundwater flow, including backfill water, is flowing toward the Flambeau River as was predicted during permitting; all acidity in the backfill has been neutralized by the limestone; sulfate concentrations in the majority of the backfill are now controlled by gypsum precipitation and dissolution; and concentrations of solutes in the backfill are stable and should not significantly increase in the future and, in fact, many are showing a decreasing trend.

During January 2001, Flambeau installed an additional monitoring well nest, MW-1015A and MW-1015B, approximately 1000 feet northwest of the backfilled pit. The MW-1015 well nest is located closer to the compliance boundary than already previously installed monitoring wells. Existing groundwater monitoring well nests located between the backfilled pit and the compliance boundary show Flambeau to be in full compliance with permit standards. The monitoring wells closer to the compliance boundary provide additional information regarding baseline groundwater quality near the compliance boundary and provide further documentation of Flambeau's continued compliance with groundwater permit standards. Beginning in April 2001, monthly baseline monitoring data was collected from the MW-1015 wells and continued for twelve months. Following collection of the monthly baseline data, the monitoring schedule for well nest MW-1015 was consistent with the quarterly schedule of monitoring prescribed in the approved monitoring plan. In a document dated August 10, 2004, Flambeau provided to the Department a review of water quality in well MW-1015B. Iron and manganese concentrations in well MW-1015B had shown an increase beginning in October 2002 through 2003 and have since shown decreasing trends. The iron and manganese changes at MW-1015B are not due to flow from the backfill because they do not carry an increase in sulfate that would be expected due to the sulfate concentrations in the backfill. The iron and manganese changes are consistent with localized redox (not backfill) induced changes.

## 2.3 Notice of Completion/Certificate of Completion

Data obtained during monitoring of the reclaimed vegetation during 2000 documented that Flambeau met the vegetative performance standards for Notice of Completion (NOC). Flambeau met all reclamation vegetation standards. Prior to submitting the NOC, Flambeau was required to decommission electrical service to the former west wall and remove the perimeter security fence. During Spring 2001, the aboveground electrical line serving the area of the former west wall and the perimeter fence surrounding the site were removed. During August 2001, collection of biomass samples required at the time of the NOC was completed. Biomass at the time of NOC has been compared to 2005 and 2006 biomass for the Certificate of Completion (COC).

During September 2001, Flambeau submitted the NOC to the Department and the Department recognized that Flambeau had met the requirements for NOC and deferred acceptance until Flambeau had documented that the vegetative performance standards had been met in 2001. The 2001 Annual Reclamation Report submitted to the Department in November 2001 provided the documentation that Flambeau had met the vegetative performance standards for two consecutive years.

In a letter dated March 8, 2002, the Department accepted Flambeau's NOC. The four-year monitoring period prior to COC began November 19, 2001. For Flambeau to receive the COC, the performance standards are to be met during the final year of the 4-year monitoring period. The final year of the 4-year monitoring period was 2005. The 2005 Annual Reclamation Report, submitted to the Department November 15, 2005, documents that Flambeau met the performance standards during 2005. All performance standards were met in 2005 and again in 2006 even during extreme regional climatic conditions such as the regional drought experienced in 2005 and 2006. The 2006 Annual Reclamation Report, submitted to the Department November 14, 2006, documents that performance standards continue to be met. On January 9, 2007, Flambeau Mining Company petitioned the Department for Certificate of Completion.

## 2.4 Industrial Outlot

### 2.4.1 Reuse of Industrial Outlot Facilities

On January 8, 1998 Flambeau submitted a request for modification of the Mining Permit and Reclamation Plan. The requested modifications included modification of the final land use for 32 acres of the mining site to allow for alternative use of the on-site buildings and related ancillary facilities, railroad spur and a portion of the former Type II waste rock stockpile area by the Ladysmith Community Industrial Development Corporation (LCIDC).

On July 30, 1998 the Department approved the request for modification of the final land use for the 32 acre industrial outlot with the following condition: "If the portion of the site covered by the lease agreement with the LCIDC has not been put to an acceptable alternative use by the end of 2004, the site shall be reclaimed in a manner consistent with reclamation of the remainder of the mining site. Any demolition waste resulting from such reclamation shall be disposed of in a properly licensed solid waste facility."

A long-term lease agreement exists between Flambeau and the LCIDC, where the LCIDC leases a 32-acre portion of the former mine site referred as the industrial outlot. The 32-acre area includes the former administration building now occupied by the Ladysmith Department of Natural Resources Service Center; the former Water Treatment Plant (WTP) building now occupied by Xcel Energy and the Department; the railspur for which the LCIDC has installed major improvements and purchased adjacent property outside of the mine project area; an approximate eight-acre area north of the railspur in the former Type II stockpile area; and a 0.9-acre biofilter constructed in 1998 to reduce suspended solids and other contaminants resulting from precipitation runoff from the industrial outlot.

During 2000, the LCIDC completed renovations on the administration building, now serving as the Department's Ladysmith Service Center, and WTP building, now housing Xcel

Energy's line maintenance shop and the Department's equipment storage area. In addition, the LCIDC constructed another building for the Department between the Service Center and the former WTP to house additional Department equipment. The Department and Xcel Energy continue to occupy the former mine buildings.

During 2003, the LCIDC submitted a request to the Department for the retention of the rail spur located east of Highway 27 as part of the communities' on-going efforts to increase industrial development. The LCIDC had committed to remove and reclaim about 200 feet of the rail spur east of Highway 27. In a letter dated June 12, 2003, the Department stated that it "...is satisfied that the portion of the rail spur east of the highway is being used for alternate purposes. Therefore, the rail spur east of Highway 27 will not need to be removed and revegetated..."

During early 2004, the Flambeau Riders, Inc. (Riders) approached Flambeau about the possibility of developing non-motorized trails on property owned by Flambeau south of the Industrial Outlot and east and south of the Flambeau River. In addition, the Riders inquired about using a portion of the west rail spur area and northern eight-acre area within the Industrial Outlot as driveway access off Highway 27 and as an equestrian trailhead, respectively. In a document dated May 19, 2004, Flambeau proposed to the Department an alternate use plan for Flambeau's former rail spur area west of Highway 27 and the eight-acre area north of the west rail spur area within the Industrial Outlot as a driveway and equestrian trailhead.

Upon further review, Flambeau reconsidered the proposed use of the west rail spur area since there would be impacts to adjacent wetlands during construction and concerns regarding highway safety associated with multiple driveways within relatively close proximity. As a result, Flambeau provided a submittal to the Department dated May 28, 2004, that provided details regarding the reclamation of the west and east rail spur areas in a manner consistent with the previous October 23, 2003 submittal regarding reclamation of the west rail spur area. The May 28 submittal replaced the submittal dated May 19.

Flambeau continued to consider the Riders proposal of non-motorized trail development for equestrian use on Flambeau property south of the Industrial Outlot and the associated trailhead and trailhead access within the Industrial Outlot. During 2004, a Community Advisory Group was formed to advise Kennecott Minerals on development of a land use management plan for the 2177 acres owned by Flambeau as of year end 2004. The Advisory Group is represented by Rusk County, City of Ladysmith, Town of Grant, Ladysmith Area Trails Association, Flambeau Riders, LCIDC and the Department's Northern Rivers Initiative. During a late December 2004 meeting, the Advisory Group agreed that the expansion of trails south of the reclaimed mine site and using a portion of the Industrial Outlot as an equestrian trailhead were acceptable and beneficial uses of the property. The access to the trailhead was proposed to follow Copper Park Lane west and turn north along the eastern edge of the Service Center parking lot crossing the reclaimed west rail spur area. It was agreed to formalize the agreement with 1) a Trail Easement & License between Flambeau and the City of Ladysmith and 2) a Sublease between the LCIDC and the City of

Ladysmith. Fully executed documents, Trail Easement & License and Sublease, dated January 1, 2005 are in place.

In a letter to the Department dated December 30, 2004, Flambeau provided notice that the 32 acre industrial outlot has met the condition of "acceptable alternative use."

The Department responded in a letter dated February 18, 2005 that the only portion of the industrial outlot for which an acceptable alternate use had not been designated was the section lying north of the railspur in the area of the former Type II waste rock stockpile. The Department conceptually found the proposed use as an equestrian trail head acceptable, but required further details to review and approve the proposed construction plans.

In a submittal dated March 1, 2005, Flambeau provided to the Department drawings showing the proposed equestrian trailhead and access via Copper Park Lane. Also included with the March 1 submittal were copies of 1) the sublease between the LCIDC and the City of Ladysmith for the area within the industrial outlot proposed for construction of the parking area and 2) the Easement and License Agreement between Flambeau and the City of Ladysmith for the development of trails on property located south of the industrial outlot.

In a letter dated March 12, 2005, the Department requested further detail on construction of the equestrian trailhead and access to the trailhead. Flambeau provided the additional detail in a submittal dated July 21, 2005. The Department provided approval subject to provisions for the construction of the equestrian trailhead in a letter dated July 28, 2005.

A part of the equestrian trail project was the relocation of the foot bridge from the reclaimed mine site to the designated trail crossing on Intermittent Stream C. A General Permit Application for a clear span bridge was submitted to the Department on July 20, 2005. Flambeau received the General Permit which was in effect July 21, 2005 through November 1, 2006. The footbridge was relocated during late August 2005 using small equipment to minimize disturbance to the former bridge location site and the site of the Intermittent Stream C crossing.

The construction of the equestrian trailhead initiated on August 11, 2005 with the removal of trees and an electrical panel to allow construction of the access road. Prior to the start of grading in the trailhead area, silt fence was installed in the southeast corner of the trailhead area to minimize impacts to wetlands and Intermittent Stream C. As the project progressed, additional erosion control including silt fence, straw bales, riprap, seeding and straw mulch were installed. The trailhead area was seeded with a low-grow fescue seed mix comprised of creeping red fescue (30%), hard fescue (25%), chewings fescue (20%), slender creeping fescue (15%), and sheep fescue (10%). The fescue seed mix was seeded at an approximate rate of 220 pounds per acre and followed by a chopped straw mulch. The area along the access road was seeded with oats and a permanent native seeding will take place in Spring 2006. The trailhead construction was complete by September 8, 2005.

On September 10, 2005 Flambeau held an open house event to celebrate the grand opening of the equestrian trails and the successful reclamation of the mine site. Self-guided audio tours, horse trail rides, wildflower tours, community fair and lunch were well received by over 600 visitors.

During 2006 the City of Ladysmith received a matching funds grant from the Department to install a bridge crossing for Meadowbrook Creek located south of the former mine site. The bridge crossing will allow the expansion of the Copper Park Equestrian Trails to the south and along the Flambeau River on Flambeau owned property.

### 2.4.2 Rail Spur Reclamation

During Spring 2003, Flambeau and the LCIDC agreed that the Wisconsin Department of Transportation should remove the rail crossing as part of the renovation of Highway 27 during 2004. In addition, storm water sampling had measured copper concentrations entering the 0.9-acre biofilter that may have been associated with the west rail spur area. Consequently, Flambeau began planning for the 2003 removal of the rail spur west of Highway 27. On July 9, 2003, Flambeau submitted to the Department a workplan for soil sampling at the west rail spur area to delineate and characterize the soils previously subjected to ore handling activities. In a letter dated July 18, 2003, the Department provided comments based upon the review of the sampling plan. On July 24, 2003, a Foth & Van Dyke representative collected soil samples for off-site laboratory analyses to determine the extent of soil removal and ultimate disposal of the soils.

A report dated October 20, 2003 was submitted to the Department and contained the final soil sampling results and remediation plan for the rail spur west of Highway 27. The plan called for excavating two feet below the existing rail spur grade west of Highway 27 to remove gravel and ballast impacted by ore handling activities.

Waste Management's Timberline Landfill located west of Bruce, WI agreed to accept the non-hazardous materials for road building within the boundary of the landfill's disposal areas. In a letter dated October 24, 2003, the Department agreed with Flambeau's proposal to remove the upper two feet of material present on the rail spur and properly dispose of it in a licensed facility. The Department provided comments regarding installation of appropriate erosion control, requirement for more detail regarding subgrade preparation, topsoil handling and seeding, timing of topsoil application and seeding, continued monitoring of the nearby biofilter and Stream C, and schedule of excavation.

Volkmann Railroad Builders, Menomonee Falls, WI, removed the rail spur line, ties and all associated hardware during mid-October 2003. During early November 2003, Thompson Excavating, Ladysmith, WI excavated 7400 tons of ballast and gravel and hauled the excavated materials to the Timberline Landfill. Erosion control included installation of silt fence to minimize impacts to Intermittent Stream C and establishing drainage to the 0.9-acre biofilter. Application of topsoil and seeding was deferred until Spring 2004.

A submittal dated May 28, 2004 included details of the proposed reclamation of the west and east rail spur areas. Details of reclamation covered excavation of ballast from the east rail spur area, topsoil application, seeding, fertilizing, mulching and erosion control. The Department provided a conditional approval dated June 2, 2004.

The reclamation of the rail spur areas began on June 2, 2004 with the installation of silt fence to minimize erosion until the disturbed areas were stabilized. The east rail spur area was prepared to receive topsoil with the removal of approximately 322 yards of fractured rock ballast. Prior to and during ballast excavation and removal, the ballast was continually observed to segregate and remove sulfide rock material. An insignificant quantity of sulfide rock material (one or two pieces measuring less than three inches) was observed in the ballast and removed for proper disposal. The ballast was relocated to Russ Thompson Excavating's Rock House pit located a short distance north of Ladysmith. The ballast was temporarily stockpiled until it was crushed with pit run from the Rock House pit during September. The crushed material (ballast and pit run) totaling 2000 yards is to be used in local construction projects.

Topsoil relocation took place over the course of five days. Approximately 2760 yards (184 truck loads at 15 yards per truck) of topsoil were removed from the approximate 12,000 yard stockpile. The topsoil was spread to an approximate depth of 12 inches across the rail spur areas with the exception of thinner topsoil where tying into existing contours.

Hand seeding, fertilizing and mulching began on June 8 and was complete by June 18. Seeding, fertilizing and mulching took place over the course of five days.

The approved Industrial Outlot seed mix is composed of four native species (two forbs and two grasses). Flambeau proposed increasing the native species diversity for reclamation of the rail spur areas to 24 native species (17 forbs and seven grasses) which the Department approved.

Following hand broadcast seeding, fertilizer was mechanically applied by a hand operated broadcaster. Straw mulch was mechanically chopped and applied at a rate consistent with past practices. As a result of high winds occurring prior to completion of straw mulch crimping, small areas of chopped straw were relocated exposing seed to drying conditions and consumption by birds. The stabilization of the soil was not affected. Remedial seeding in these small areas was completed in late October as a dormant fall seeding. The spot seeding was conducted in a manner consistent with the seeding completed in June.

Observation of the rail spur areas during the growing season showed evidence of abundant native plant seedlings and substantial vegetative cover providing stabilization.

Storm water runoff within the eight-acre undeveloped parcel north of the west rail spur area and within the Industrial Outlot drains toward two manholes connected to the 0.9-acre biofilter. The open manholes were a safety concern and the May 28 submittal proposed abandonment by plugging with concrete. While preparing the manholes for abandonment, it was realized that an alternate plan would still make the manholes safe and allow them to serve as part of the storm water management within the Industrial Outlot. The Department agreed with Flambeau's plan to cut the HDPE extending above ground, fill the manholes with large (> 8-inch) fractured rock, and fill the voids around and top off the large rock with 1.5-inch fractured rock. The manholes were filled with off-site rock during mid-June 2004.

A submittal, Rail Spur Reclamation Documentation, dated November 10, 2004 was made to the Department and included a topographic drawing showing the east and west reclaimed rail spur areas and details regarding the reclamation of the rail spur areas.

Further detail on reclamation of the east and west rail spur areas was provided to the Department in the 2004 Annual Reclamation Report.

### 2.4.3 Intermittent Stream C

The Flambeau Mine remains committed to the protection of water quality in the Flambeau River. Since final reclamation in 1999, Flambeau has continued its monitoring of water quality in the Flambeau River as well as surface runoff into the Flambeau River. This monitoring indicates that the water quality of the Flambeau River remains fully protected.

Copper and zinc concentrations have been measured in offsite background storm water runoff and in runoff from the Industrial Outlot located on the reclaimed mine site. The non-point sources of runoff from the Industrial Outlot are being passively treated by the 0.9-acre biofilter that substantially reduces the concentrations of metals before flowing into Intermittent Stream C that eventually discharges to the Flambeau River. The biofilter itself supports populations of aquatic biota, including fish and frogs.

A proposed expanded surface runoff monitoring program including a bioassessment of the intermittent stream was submitted to the Department for review in a document dated August 5, 2004. The purpose of the work plan was to:

- Evaluate the biological conditions within Stream C;
- Evaluate areas of the Stream C watershed that may be contributing to the water in Stream C;
- Evaluate aspects of the industrial outlot bio-filter that may influence copper levels that are discharged from the bio-filter to Stream C; and
- Evaluate the hydrology and water quality within Stream C.

In a letter dated September 15, 2004 the Department provided the results of their review of Flambeau's proposed expanded monitoring program.

Blue Iris Environmental, Inc. completed a late summer biological assessment on August 17 and 18, 2004. Representatives of the Department and the Great Lakes Indian Fish and Wildlife Commission were present in the field during assessment activities on the 18th of August. Sediments from the 0.9-acre biofilter were collected by Foth and Van Dyke on September 10, 2004. Water quality samples were collected by Flambeau on September 15-

16, 2004 and October 22-24, 2004.

In a submittal dated January 20, 2005, Flambeau provided a memorandum prepared by Foth & Van Dyke that summarized and assessed the data that was collected in 2004.

In summary, Stream C is an intermittent stream with poor aquatic habitat that lacks aquatic vegetation and aquatic macroinvertebrates. As a result of the poor habitat and very limited food source, no fish were observed in the stream during the 2004 biological assessment. Stream C does not possess the types of characteristics that are needed for it to support any type of fishery. The sediment sampling of the biofilter indicates that it is functioning as designed. This is supported by the fish and amphibians that have been observed in the biofilter. (The surface water sampling that has been completed within the watershed of Stream C suggests that some areas, particularly those affected by highway runoff, may naturally exhibit elevated copper levels in the water.) In addition, the sampling indicates that there appear to be localized areas at the Industrial Outlot that may be contributing elevated copper levels to storm water that passes through the biofilter. Based on this last point, Foth and Van Dyke advised that Flambeau may want to consider implementing measures to minimize storm water contacting the localized areas that may be contributing to the elevated copper levels.

In a letter dated March 22, 2005 the Department responded to the submittal of the 2004 surface runoff monitoring results with the requirement of additional sampling including increased frequency for biofilter sediment sampling and surface runoff sampling. During April 2005, the surface runoff monitoring program resumed and continued through the summer.

A spring biological assessment was conducted by Blue Iris Environmental, Inc. on May 24 and 25, 2005. Sediments from the Industrial Outlot biofilter were collected by Foth & Van Dyke on April 26, June 29, August 9, and September 9, 2005. Water quality samples were collected by Flambeau on April 6, April 25-26, May 13, June 7-9, August 26-27, and September 19-20, 2005.

In a document dated October 24, 2005, Flambeau submitted to the Department the results of the 2005 surface runoff monitoring program. The 2005 results were consistent with the 2004 results.

Monitoring of the surface water at the site since the completion of reclamation has indicated that the Industrial Outlot biofilter is working well in lowering copper levels of surface water runoff flowing from the Outlot area. The biofilter typically removes 95 percent of the copper when biofilter inlet and outlet surface water samples are compared. During 2003 and 2004 the former rail spur was reclaimed in an effort to reduce the concentration of copper in surface water runoff. During 2006, Flambeau further reduced sources of copper from the Outlot area to the biofilter.

On behalf of Flambeau, Foth & Van Dyke submitted to the Department an Industrial Outlot action plan dated November 22, 2005. The work plan addressed additional measures proposed to be implemented in the Industrial Outlot area such that copper levels in runoff to the biofilter were further reduced. The workplan proposed a combination of grading, select removal of surficial materials, replacement limestone fill and replacement of the collection ditch.

In a letter dated December 2, 2005, Flambeau provided an amended action plan to the Department. The amended action plan proposed, rather than a select removal of surficial materials, a removal in all areas of surficial material that are currently gravel around the buildings of the Industrial Outlot. The entire area of excavation around the buildings and within drainage ways was calculated as approximately 10,500 square yards. In addition, asphalt installation in select areas was proposed as determined by the Industrial Outlot tenants' needs. Water quality sampling to evaluate effectiveness in reducing the source of copper to the biofilter was proposed to follow the completion of the action plan.

The Department responded in a letter dated December 6, 2005 stating that the proposed excavation work is a positive additional step in addressing the continuing issue of elevated copper concentration in site runoff and the biofilter. The Department found the action plan presented in the November 22 and December 2 letters generally acceptable.

Unseasonably cold winter temperatures prevented the initiation of the action plan during 2005 due to frozen ground conditions. The action plan was deferred until Spring 2006.

In a letter dated March 30, 2006, Foth & Van Dyke provided to the Department further detail for the action plan and monitoring. The Department received the Final Work Plan dated May 2, 2006 which superceded the March 30 submittal and incorporated additional information.

The May 2, 2006 document included results of additional soil surface samples collected April 5, 2006 on the ground access road leading from the southwest corner of the outlot to the reclaimed mine site to the north. There were no elevated copper concentrations at any of the sampled locations.

Additional surface soil samples and surface water samples were also collected on April 5, 2006. The locations of these samples were along Highway 27 to the north and south of the mine site. A total of eight soil samples and three surface water samples were obtained. The top four inches of soil ranged in copper concentrations from 12 to 85 mg/kg. The surface water ranged from 30 to 35 ug/l.

In a letter dated May 4, 2006 the Department found the May 2 Work Plan generally acceptable subject to recommendations including removal of additional material based upon visual observations, collection of soil samples following excavation at three specified locations, and timing collection of surface water samples in order to establish that long-term, stable conditions have been achieved.

Foth & Van Dyke oversaw the design and implementation of the workplan. The workplan was implemented starting May 18, 2006 and complete by June 21, 2006. The work consisted of excavation of approximately 900 linear feet of the existing drainage ditch collecting storm water runoff from the area around the Copper Park buildings and replacement of the cobbled drainage way with limestone cobbles. Approximately 2.2 acres of gravel parking lot was excavated to a minimum depth of four inches. Soil sampling was conducted following completion of excavation. The average copper concentration of the exposed subgrade after removal was approximately 38 mg/kg (ppm).Crushed limestone gravel was placed as subgrade material and the parking lot was paved with three inches of bituminous concrete (asphalt). A non-woven geotextile fabric was placed in the exposed subgrade of all excavated areas within the area of asphalt and the drainage ditch prior to backfilling. All excavated material (2300 cubic yards) was appropriately disposed at the licensed Timberline Trail Landfill.

Rainfall events occurred on July 26, 2006 and August 3, 2006 providing a set of storm water samples to obtain "immediate, post construction" data. The initial data indicated a marked reduction in copper concentrations in storm water reaching the biofilter.

A report prepared by Foth & Van Dyke titled Construction Documentation Report – Flambeau Industrial Outlot was submitted to the Department on September 12, 2006. Included with the report were results of soil sampling following excavation. The report provides further detail on the completion of the workplan.

On January 12, 2007, the Biofilter Management Plan was submitted to the Department. The report presents recent surface water data (post 2006 construction) which documents a dramatic reduction in copper loading to the biofilter. The report also presents a biofilter management plan including monitoring of the biofilter. The plan is currently being reviewed by the Department.

## 2.5 Community Involvement

Flambeau's involvement with the surrounding communities has included promotion of community activities, partnering with the communities, economic development, promoting tourism, enhancing communication, restoration projects, and maintaining an open door policy.

The major achievements for 2006 are set forth below:

- The Flambeau Community Advisory Group formed during 2004 continued to advise Kennecott Minerals on the development of a land use management plan related to the 2177 acres owned by Flambeau.

- Flambeau's partnership with the City of Ladysmith and Flambeau Riders, Inc. continued with plans to expand the non-motorized multi-use recreational trails south of the reclaimed mine site. These trails, the Copper Park Equestrian Trails and Trailhead, were opened to the public in September 2005. During 2006 the City was awarded a matching funds grant from the Department to install a bridge crossing on Meadowbrook Creek.

- In early May 2006 the Deertail 4-H Club planted approximately 150 wildflower and grass seedlings in two large planters constructed to separate the Ladysmith Service Center parking area from the access road to the Copper Park Equestrian Trailhead.

- The Reclaimed Flambeau Mine nature recreation trails were open to the public for the fifth entire year. In addition, through a cooperative effort, the Hunt Hill Audubon Nature Center, Department's Ladysmith Service Center, Bluebird Restoration Assoc. of Wisconsin – Rusk Co. Chapter and Flambeau held a birding workshop and nature hike on July 5, 2006 on the reclaimed mine site with about 50 residents in attendance.

- A local geocache enthusiast established geocache sites on Flambeau property in 2005. Geocache sites can be searched out along the Reclaimed Flambeau Mine Nature Trails, Copper Park Equestrian Trails and Sisters Farm Trails. During 2006 many geocachers visited the reclaimed mine site. Details on geocache sites can be found at www.geocaching.com.

- On July 29, 2006, the reclaimed mine site was one of many stops at garden tours being held in the community as part of the 2nd Annual Conference in the Garden.

- The UW-Extension's Healthy Lifestyles for Rusk County held their second annual community walk on the reclaimed Flambeau Mine nature trails on September 9, 2006. Nearly 100 individuals participated in the event.

- On September 23, 2006 as part of the Leaf it to Rusk Fall Festival, the Reclaimed Flambeau Mine hosted trail rides on the Copper Park Equestrian Trails and a trivia scavenger hunt along the Reclaimed Flambeau Mine Nature Trails. Over 50 community members turned out for the event.

- Costumed children gathered at the reclaimed mine site on October 28, 2006 as part of a Halloween Hunt hosted by Flambeau.

- Flambeau continued its open door policy and upon request conducted tours of the mine site.

## 2.6 Water Management

### 2.6.1 Precipitation Runoff

During the first two years of surface stabilization of the reclaimed mine site, Flambeau had approval to pump runoff from the 1.7-acre biofilter to the south gravel pit to minimize impacts to the Flambeau River. During 1999, the Department agreed that the site had become sufficiently stabilized to discontinue this practice. During 2000 the reclaimed mine site continued to be stabilized and pumping of water before it reached the river was discontinued. Since 2000, the reclaimed mine site surface remains stabilized by vegetative growth and there is minimal evidence of erosion. Aerial photographs (color and infrared) taken during August 2006 document that the surface stabilization of the reclaimed mine site is functioning as planned. Where are photos ?

Flambeau River water quality samples were collected upstream (SW-1) and downstream (SW-2) from the reclaimed mine site during August and November. Comparing analytical results, there was no notable difference between downstream and upstream samples and this further confirms that the reclaimed site is stable and functioning as designed. A summary of Flambeau River water quality results is found in Section 4.2.2.1.

### 2.6.2 River Water Withdrawal

On May 5, 1998 the Department approved Flambeau's application to withdraw water from the Flambeau River for use on site. The Department's approval requires submittal of monthly summaries for months during which a withdrawal occurs. The irrigation pump system is operated with a portable generator since electrical supply had been removed during 2001. During 2006 water withdrawn from the Flambeau River for irrigation totaled 1,039,000 gallons.

Wetland 1 is located immediately west of the reclaimed mine site. During permitting, it was recognized that groundwater seeps within Wetland 1 had a high probability of being impacted by groundwater drawdown associated with the development of the open pit. During mining, it was noted that these seeps did cease to produce water. With the backfilling of the open pit being complete in 1997, the groundwater table has recovered significantly and Wetland 1 has been documented to be notably moister with groundwater seeps again flowing.

During 2006, Flambeau continued to monitor the staff gauge within Wetland 1 and maintain the ability to add mitigation water to the wetland. A regional drought during 2005 and 2006 resulted in lowering of water levels of wetlands located in the region including Wetland 1. As a result of Wetland 1's dryer condition resulting from natural causes, regional climatic conditions, mitigation water was not added during 2006 as was also the case during 2002, 2003, 2004 and 2005.

Table 2-1 contains a summary of water withdrawal from the Flambeau River during 2006.

**Table 2-1. 2006 River Water Withdrawal**

| 2006 | Reclamation Irrigation (Gallons) | Wetland Mitigation (Gallons) | Monthly Totals (Gallons) |
|---|---|---|---|
| April | 0 | 0 | 0 |
| May | 0 | 0 | 0 |
| June | 0 | 0 | 0 |
| July | 1,039,000 | 0 | 1,039,000 |
| August | 0 | 0 | 0 |
| September | 0 | 0 | 0 |
| Totals | 1,039,000 | 0 | 1,039,000 |

## 2.7 2006 Milestones

The following is a summary of significant milestones throughout the year:

**Table 2-2. 2006 Milestones**

| | Month |
|---|---|
| Seventh Year Prescribed Burn Complete | May |
| Flambeau Partnered with the Community to Host Five Events on the Reclaimed Mine Site | Summer/Fall |
| 2006 Annual Reclamation Report Documents Sustainable Site Conditions that Meet Performance Standards for COC | November |

## 2.8 Modifications & Deviations

Condition 2-4 in the Mine Permit requires an inventory of deviations and modifications to the Permit received subsequent to permit issuance. Reclamation activities during 2006 were consistent with permits, approved plans, and modifications received subsequent to permit issuance. During 2006 there were no modifications or deviations to the Permit.

## 2.9 Construction Reports

The Construction Documentation Report – Flambeau Industrial Outlot was submitted to the Department on September 18, 2006. Further detail on the Construction Documentation

Report can be found in Section 2.4.3.

## 2.10 Incident Log

Mine Permit Condition 2-6 requires a log of all incidents such as spills, pond overflow, embankment failure or leakage. This log is maintained on-site and is available for inspection. Spills are reported in accordance with Wis. Adm. Code ch. NR 706, CERCLA Reportable Quantities and SARA Section 302 Extremely Hazardous Substances Reportable Quantities.

SARA substances - ANY?

During 2006 there were no reportable or recordable incidents that occurred on the reclaimed Flambeau Mine site.

## 2.11 Drill Holes

Mine Permit Condition 2-7 requires a summary of all exploration drilling activities conducted on the mine site during the previous year. No exploration drilling activities were conducted on the reclaimed mine site during 2006.

## 3 Reclamation Activities

As required by the Mine Permit Section 3, reports on progress of reclamation activities are prepared throughout the year. An annual report is required by Condition 3-26(d). The 2006 Annual Reclamation Report dated November 14, 2006 was submitted to the Department and is incorporated by reference. Other reclamation updates submitted on January 31 and November 9, 2006 are incorporated by reference.

Reclamation activities reported in the November 2006 Annual Reclamation Report included a summary of onsite vegetation activities such as reports on monitoring of vegetation, birds and butterflies. Also reported are management activities during 2006 that included herbicide treatment of invasive species, irrigation of woodlands, mowing firebreaks and grass trails, and completion of the seventh year of the 10-year prescribed burn period.

Flambeau submitted its Notice of Completion (NOC) to the Department during September 2001. In March 2002, the Department concurred with Flambeau's NOC. The four-year monitoring period to Certificate of Completion began on November 19, 2001. The submittal of the 2005 Annual Reclamation Report completed the fourth year of the four-year monitoring period required prior to the Certificate of Completion. Flambeau completed an additional year to further document the sustainable site conditions even during extreme conditions such as the regional drought during 2005 and 2006.

Reclamation monitoring of the site was performed by Applied Ecological Services, Brodhead, WI during Spring and late Summer. Vegetation monitoring was performed in 29 permanent 50-meter transects for a total of 290 quadrants. Bird and butterfly monitoring was performed to document use of the site by wildlife. Following are highlights of the 2006 monitoring program results:

- An average of 99 percent plant cover across reclaimed site excluding wetlands and industrial outlot;
- 24 planted species were found in the grassland community, 32 in the woodlands, and 73 in the wetlands;
- woody species survival within the defined woodlands is at 100 percent;
- 52 bird species identified as using the site or immediate peripheral property; and
- 8 butterfly species recorded as using site.

A Habitat Analysis for the reclaimed mine site was submitted during October 2002. The document, Habitat Analysis (HEP) for Savanna Sparrow, Great Crested Flycatcher and Tree Swallow at the Reclaimed Flambeau Mine site, was prepared by Applied Ecological Services using the Habitat Suitability Index model developed by the U.S. Fish and Wildlife Service. The Habitat Analysis using year 2000 monitoring data found that habitat is currently being provided in the grassland for the Savanna Sparrow. The Great Crested Flycatcher will be supported in the woodland in about 20-30 years when the woodland develops. Natural habitat in the wetland communities for the Tree Swallow will also be provided in about 20 years as cavernous trees begin to provide natural nesting opportunities. The Tree Swallow is currently on site and using "bluebird" boxes for nesting. The Habitat Analysis was updated with years 2001 and 2002 monitoring data and findings were consistent with the initial analysis. The fourth and final Habitat Analysis updated with the 2003 monitoring data was submitted on November 12, 2004. The findings of the final Habitat Analysis were consistent with the previous years' Analyses.

The wetlands are highly diverse with 205 native plant species found in 2006. Seventy-three native plant species found in the wetlands were planted by Flambeau prior to the NOC. With such a diverse system, competition and environmental factors such as annual water level fluctuations can impact the occurrence of some species from year to year. The total number of native plant species found in the wetlands was 144 in 2002, 153 in 2003, 203 in 2004 and 217 in 2005. Flambeau is required to establish a minimum of 12 native planted species in the wetlands and has far exceeded this requirement.

The results of monitoring on the reclaimed Flambeau Mine site show that the site continues to track with the desired trajectory for plant community development, diversity, cover, plant frequency, productivity, and wildlife use. The reclaimed mine site continues to provide quality wildlife habitat and exhibit sound erosion control enhanced by established vegetation dominated by native species. Of the 347 plant species found on site, 79 percent are native. Monitoring in 2006 documents that Flambeau has met all the required performance standards for Certificate of Completion. On January 9, 2007 Flambeau petitioned the Department for the Certificate of Completion.

Table 3-1 summarizes the performance standards and the results of monitoring, 2000-2006.

**Table 3-1. Performance Standards and Reclaimed Flambeau Mine Site Status (2000 - 2006).**

**Total Cover (%)**

| Ecological Community | Performance Standard | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|
| Grassland | 70 | 96 | 95 | 96 | 90 | 95 | 98 | 99 |
| Woodland | 70 | 98 | 98 | 98 | 98 | 99 | 98 | 100 |
| Wetland | 70 | 100 | 100 | 100 | 92 | 95 | 83 | 98 |

**Planted Native Species Found (#)**

| Ecological Community | Performance Standard | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|
| Grassland Planted Species | | | | | | | | |
| Target | | 15 | 16 | 16 | 15 | 16 | 15 | 16 |
| Enhancement | | 6 | 4 | 6 | 10 | 5 | 5 | 8 |
| Total | 15 | 21 | 20 | 22 | 25 | 21 | 20 | 24 |
| Woodland Planted Species | | | | | | | | |
| Target | | 25 | 24 | 23 | 22 | 22 | 24 | 23 |
| Enhancement | | 10 | 11 | 8 | 7 | 9 | 9 | 9 |
| Total | 15 | 35 | 35 | 31 | 29 | 31 | 33 | 32 |
| Wetland Planted Species | | | | | | | | |
| Target | | 32 | 32 | 30 | 34 | 34 | 37 | 32 |
| Enhancement | | 35 | 32 | 37 | 33 | 41 | 40 | 41 |
| Total | 12 | 67 | 64 | 67 | 67 | 75 | 77 | 73 |

**Diversity[2] (%)**

| Ecological Community | Performance Standard | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|
| Grassland | 80 | 88 | 94 | 94 | 88 | 94 | 88 | 94 |
| Woodland | 80 | 100 | 96 | 92 | 88 | 88 | 95 | 92 |
| Wetland | 80 | 82 | 82 | 77 | 87 | 87 | 96 | 82 |

**Tree Species Survival (%)**

| Ecological Community | Performance Standard | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|
| Grassland | NA | NA[4] | NA | NA | NA | NA | NA | NA |
| Woodland | 80 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Wetland | NA | NA | NA | NA | NA | NA | NA | NA |

[1]NA = Not Applicable
[2]As compared to Target Planted Species.

# 4 Site Monitoring

Environmental monitoring at the reclaimed Flambeau Mine during 2006 included assessing the quality of groundwater, backfill pore water, surface waters including the Flambeau River, wetland water levels and fish, crayfish, macroinvertebrate and river sediment collection. All environmental monitoring continues to show that Flambeau remains in compliance with all permit standards and the Flambeau River remains fully protected. - define this

## 4.1 Groundwater Quality Sampling and Analysis

Quarterly groundwater monitoring was performed in accordance with descriptions provided in the Updated Monitoring Plan (July 1991), the Revised Mining Permit Quality Assurance/Quality Control Document (August 1991) and the Local Agreement. As a result of regulatory changes with respect to arsenic in groundwater, the Department requested that Flambeau consider analyzing groundwater samples for arsenic on a quarterly basis. In a letter dated August 5, 2004, Flambeau notified the Department that arsenic will be included in the quarterly monitoring program. Results of the monitoring were submitted to the Department Mine Reclamation Unit March 22, June 30, September 30 and December 14, 2006. Those reports are incorporated by reference.

### 4.1.1 Backfilled Pit Water Quality Assessment

As part of the permitting effort for the Flambeau project, assessments were completed to determine if the reclaimed site would comply with the permitted groundwater quality standards at the compliance boundary and protect surface water quality in the Flambeau River. The original assessment relied on predicted post-mining hydrologic conditions to conclude that the Flambeau River would act as a hydrologic boundary for the pore water migrating from the pit backfill and that backfill pore water would not migrate to the downgradient compliance boundary. In addition, the original analysis showed that the flux of backfill pore water into the river would be so small relative to the flow in the river that surface water quality would not experience a measurable change.

In a document dated August 27, 1999, Flambeau provided to the Department an evaluation of water quality data with respect to compliance with groundwater quality permit standards and the protection of water quality in the Flambeau River. The August 1999 evaluation confirmed that Flambeau remains in full compliance with groundwater quality permit conditions, that in the future, groundwater quality will not be affected at the permitted compliance boundary, and that water quality in the Flambeau River will be protected.

In a document dated October 17, 2000, Flambeau submitted to the Department another assessment of the backfilled pit water quality that was prepared by SRK Consulting and Foth & Van Dyke. The memorandum evaluated data obtained since the pit was backfilled to assess the performance of the reclaimed mine site with respect to compliance with groundwater quality permit standards and the protection of water quality in the Flambeau River. The 2000 assessment was appended to the 2000 Annual Report.

This 2000 assessment reported that neutralization of the acidity in the backfill pore water was complete, concentrations of solutes in the backfill pore water are stable, the pit backfill was not affecting water quality in the Flambeau River, and the flux of pore water from the backfill will be negligible with respect to its potential impact on water quality in the Flambeau River.

SRK Consulting performed annual assessments reviewing results from the 2001, 2002, 2003, 2004 and 2005 monitoring of pore water quality. The monitoring results and assessments confirm the findings presented in the year 2000 monitoring results assessment.

An annual assessment was again performed by SRK Consulting reviewing the results from the 2006 monitoring of pore water quality. The January 2007 memorandum, Flambeau Project – Backfilled Pit 2006 Monitoring Results is found in Appendix A. The current results are in general agreement with the results of the 2005 monitoring results assessment and are summarized as follows:

- Complete neutralization of acidity originally contained in the backfill has occurred.
- Concentrations of major ions in the pore water are stable, consistent with previous results.
- Gypsum precipitation and/or dissolution is controlling the porewater concentration of sulphate within most of the backfill.
- Isolated zones exist where the backfill contained less sulfate, and gypsum equilibrium conditions were not reached (e.g. around well MW-1014A).
- Porewater in backfill around Well MW-1014C is being flushed with groundwater inflow leading to decreasing concentrations of sulfate and other solutes.
- Approximately stable redox conditions exist in some wells (e.g. wells MW-1013C, MW-1014C and MW-1013B) but redox potentials continue to fluctuate in wells MW-1014A and MW-1014B.
- Manganese concentrations are increasing marginally in well MW-1013C, but nearly constant or slightly decreasing in the remaining wells.
- Iron concentrations have increased in well MW-1013C, and decreased in well 1014C, suggesting local variations in redox potential, groundwater flow and siderite precipitation. Iron concentrations are very low and stable in other wells.
- Equilibrium modeling suggest that iron oxy-hydroxides are converting to more stable phases such as goethite or hematite in wells MW-1013B, MW-1014A and MW-1014B, and therefore that soluble iron concentrations are unlikely to increase in the future for these wells.

### 4.1.2 Trend Analysis

Groundwater and surface water sample results collected for the 2006 monitoring program were added to the analytical monitoring historical database. These results were statistically tested and graphically displayed to determine whether any significant increasing or decreasing trends are occurring in the groundwater or surface water chemistry. Groundwater quality results, trend graphs and statistical test results are included in Appendix B as Attachment 1 for the quarterly monitoring parameters and Attachment 2 for the annual monitoring parameters. Surface water quality results, trend graphs and statistical test results are included as Attachment 3. Hydrographs are included as Attachment 4.

Intervention boundary wells included in the trend analyses are MW-1000P-R, MW-1002, MW-1002G, MW-1004P, MW-1004S, MW-1005, MW-1005P, MW-1005S, and MW-1010P. The in-pit wells included in the trend analyses are MW-1013, MW-1013A, MW-1013B, MW-1013C, MW-1014, MW-1014A, MW-1014B and MW-1014C. Wells MW-1015A and MW-1015B (also included in the analyses) were constructed in January 2001 approximately 1000 ft. northwest of the backfilled pit and adjacent to the compliance boundary.

The non-parametric Mann-Kendall test for trend was used to statistically determine existing trends in the post-mining data. This test indicates whether any general increasing or decreasing trends have occurred during this time frame. The results of the trend tests are best used in conjunction with the trend graphs of Attachments 1, 2 and 3 to properly evaluate trend conditions. It should be noted that a statistically increasing or decreasing trend does not necessarily indicate a substantial increase or decrease in actual parameter concentrations. There are situations where variation in the data is extremely small, allowing very slight consecutive concentration changes to be detected as a statistically significant trend. Although these minor trends may occur, they should not be construed as an indication of a broader impact on water quality.

In addition, since the statistical trend tests indicate whether a general trend is occurring over the entire time frame of the post-mining period, there may be cases when a short term trend conflicts with the statistical result for the general longer term trend. Therefore as stated, it is most appropriate to interpret the statistical results in conjunction visually with the trend graphs and in the context of the broader site hydrology.

The procedure for the Mann-Kendall test is given in Gilbert (1987)[1]. The Type I error for each test was set to 0.01. All non-detected values were replaced with a common value below the lowest detected value.

In the trend test results of Attachments 1, 2 and 3, a "+" indicates a statistically increasing trend and a "-" indicates a statistically decreasing trend. If neither a "+" or "-" is given, no statistically significant trend is present.

Monitoring data for each groundwater and Flambeau River monitoring site are graphed and tabulated in the Foth memorandum, *Flambeau Mining Company – 2006 Annual Report, Groundwater and Surface Water Trends* found in Appendix B. More detailed information on trend analysis and other trends are also contained in Appendix B.

Similar to past trend results, the annual groundwater parameters of arsenic, barium, cadmium, calcium, chloride, chromium, lead, magnesium, mercury, selenium and silver illustrated few statistically significant trends. Since 1999, there continue to be several decreasing trends of

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[1]Gilbert, R.O., 1987. A Statistical Methods for Environmental Pollution Monitoring@, Van Nostrand Reinhold, New York.

cadmium, calcium and magnesium in various wells. These include calcium and magnesium in MW-1000PR and MW-1014C, and cadmium and magnesium in MW-1014B. Chromium in MW-1013B and barium in MW-1015A also illustrated statistically decreasing trends, however these were due to slight consecutive decreases over already low concentrations observed between 1999 and 2001. Statistically increasing trends of barium and calcium were indicated for MW-1004S, however, as can be seen in the trend plots of Attachment 2 these also were due to slight consecutive changes over already low concentrations.

No statistically significant trends were observed in either the upstream or downstream surface water monitoring results. Parameters currently included in the surface water monitoring are copper, hardness, iron, manganese, sulfate, zinc, pH and conductivity.

The majority of observable trends, increasing and/or decreasing, were exhibited in the groundwater results for the quarterly parameters of alkalinity, copper, hardness, iron, manganese, sulfate, TDS, zinc, pH, conductivity and redox. A number of the observed trends are similar to those noted in the previous annual report. Many of the trends indicated as statistically significant are the result of only small consecutive concentration changes over the post-mining period, with overall concentration change being very low.

Intervention Boundary Wells

- MW-1000P-R: Several parameters exhibited an immediate increase in concentrations at the beginning of the post-mining period. These are alkalinity, hardness, iron, manganese, sulfate, TDS and conductivity. While increasing trends from 1997 through 2006 are indicated by the statistical results, these increases occurred primarily following the rebound of water levels after the production period ended and have since stabilized or decreased. As can be seen in the historical trend graphs, concentration trends of hardness, manganese, sulfate, TDS and conductivity reversed in 2000 and have since been decreasing. Iron decreased in 2004. The trend of alkalinity is recently no longer increasing and has stabilized.

- MW-1002: Trends indicated by the statistical results in this well reflect small consecutive changes in actual low concentrations. These are decreasing trends in iron, sulfate and conductivity.

- MW-1002G: A statistically increasing trend is indicated for alkalinity, while decreasing trends are indicated for sulfate, TDS and conductivity. However, actual concentration changes in these parameters are small, with the trends being due to small consecutive concentration changes.

- MW-1004P: Statistically decreasing trends were noted for copper and sulfate, however these were due to small consecutive concentration changes. The increasing trend noted for manganese in 2005 is no longer indicated, with concentrations returning to very low levels.

- MW-1004S: Increasing trends continue to be noted for hardness and sulfate. Concentrations since 1997 have slowly increased a total of approximately 10 to 20 mg/L. Similarly slow increasing trends can be visually detected in the trend graphs for alkalinity and conductivity. However, levels of alkalinity, hardness and conductivity remain below levels observed historically prior to the onset of mining in 1993. A statistically decreasing trend was noted for iron, but due only to small consecutive concentration changes.

- MW-1005: Overall statistically decreasing trends of alkalinity, iron and manganese continue to be observed for the post-mining period. As can be observed in the trend graphs, hardness, iron, manganese, TDS and conductivity decreased from approximately 1994 through 2003, at which point moderate increases (still below historical levels) occurred. Concentrations have since stabilized or once again decreased.

- MW-1005P: Decreasing trends of sulfate, TDS and conductivity and redox continue. Sulfate has not been detected in this well since 1999.

- MW-1005S: A decreasing trend for conductivity and an increasing trend for manganese continue to be noted, however in each case actual concentration changes are small.

- MW-1010P: Decreasing trends of copper and TDS and increasing trends of hardness, manganese and sulfate were noted for the post-mining period. Similar to MW-1000P-R, copper concentrations were elevated from 1994 through 1999, but have since decreased to low levels. The decreasing trend of TDS, however, is due to decreases beginning in 2004. The increasing trends of alkalinity, hardness and sulfate correspond to only small concentration changes well within the historical concentration range. Manganese increased significantly during October of 2000 (however still below 1991 levels) but has since remained consistent or slightly decreased. As can be seen in the trend graphs, iron also increased during this time and has since decreased to low levels.

- MW-1015A: A statistically increasing trend was noted for alkalinity, however this reflects only small consecutive changes in actual low concentrations.

- MW-1015B: A statistically increasing trend was noted for iron. However, after increasing in 2002 to 2003, concentrations have been consistent or decreasing. The recent trend in iron is similar to recent trends at the upgradient well MW-1005P. A statistically increasing trend was also noted for redox.

<u>In-Pit Wells</u>

- MW-1013: No statistically significant trends were noted for the quarterly monitoring parameters in the available data.

- MW-1013A: No statistically significant trends were noted for the quarterly monitoring parameters in the available data.

- MW-1013B: Overall statistically increasing trends (since 1999) were noted for copper and zinc. Copper has illustrated generally increasing concentrations since 2001. The increasing trend of zinc refers to only a slowly increasing trend with small actual concentration increases just above the detection limit. Decreasing trends were noted for iron and TDS. Iron has not been detected in this well since January of 2004.

- MW-1013C: Overall statistically increasing trends continue for alkalinity, iron, manganese and conductivity. The increasing trends of alkalinity, manganese and conductivity are only moderate while the trend of iron is more significant. An overall decreasing trend is denoted for zinc.

- MW-1014: No statistically significant trends were noted for the quarterly monitoring parameters in the available data.

- MW-1014A: Statistically decreasing trends were noted for iron, manganese and TDS. Iron has not been detected since July of 2004. Statistically increasing trends were noted for alkalinity and redox, however the increasing trend for alkalinity was only small.

- MW-1014B: Overall decreasing trends were noted for hardness, manganese, TDS, zinc and conductivity.

- MW-1014C: Overall decreasing trends continue for hardness, iron, manganese, sulfate, TDS, zinc and conductivity. The most significant relative decreases in concentration occur for iron, dropping from 15 mg/L in 1999 to 6 mg/L in 2006, and for zinc, dropping from 2200 ug/L in 1999 to 470 ug/L in 2006.

As observed in the hydrographs (Attachment 4 of Appendix B), all wells illustrating significant drawdown during the production period of 1993 to 1997 now appear to be substantially stabilized. The wells include MW-1000P-R, MW-1001, MW-1001G, MW-1001P, MW-1003, MW-1003P, MW-1004, MW-1004P, MW-1004S, MW-1010P, OW-7, OW-39, OW-42, PZ-1006G, PZ-1006S, PZ-1007S, PZ-1008, PZ-1008G, PZ-1012, PZ-R1, PZ-S1, PZ-S3, ST-9-23 and ST-9-23-6.

Groundwater elevations increased steadily from 1999 through 2002 for the in-pit wells of MW-1013A, MW-1013B, MW-1013C, MW-1014, MW-1014A, MW-1014B and MW-1014C but stabilized in 2003. Elevations for MW-1013 rose through 2004 but appear to have stabilized during 2005 and 2006.

Many of the concentration trends observed during 2005 continued through 2006. Of the trend results listed above, the following are the main conclusions:

## Intervention Boundary Wells

- Several parameters in MW-1000P-R (alkalinity, hardness, iron, manganese, sulfate, TDS and conductivity) exhibited concentration increases following the rebounding of water levels after the production period ended. Of these parameters, alkalinity visually appears to have stabilized, while the remainder are decreasing.

- Iron and manganese in MW-1010P also rose following the production period, but currently have stabilized to levels observed during the pre-mining period. TDS is currently following a decreasing trend.

- Copper in both MW-1000P-R and MW-1010P, after being elevated during the production period, have continued decreasing trends, and are now at low levels.

- A rise in iron and manganese concentrations occurred during 2004 in MW-1004P, and again during January of 2006, but decreased again to very low levels.

- Alkalinity, hardness, sulfate and conductivity continue very slow but consistent concentration increases in MW-1004S. Concentrations of these parameters, however, are still quite low.

- Hardness, iron, manganese, TDS and conductivity in the upgradient well MW-1005 observed decreasing trends through the post-mining period until 2002 and 2003 at which point increases occurred. The increasing trends reversed again during 2004 and stabilized through 2006.

- MW1015B had an increase of iron and manganese during the second half of 2002. Both trends have since reversed.

## In-Pit Wells

- With the in-pit wells, increasing trends continue for copper in MW-1013B, iron and manganese in MW-1013C and redox in MW-1014A. Decreasing trends continue for iron and manganese in MW-1014A, zinc in MW-1014B, and hardness, iron, sulfate, TDS, zinc and conductivity in MW-1014C.

## Annual Groundwater Parameter

Few trends were noted for the annual groundwater parameters of arsenic, barium, cadmium, calcium, chloride, chromium, lead, magnesium, mercury, selenium and silver.

## Surface Water Parameters

No trends were observed in either the upstream or downstream surface water monitoring results of copper, hardness, iron, manganese, sulfate, zinc, pH and conductivity.

Figure 4-1 (Groundwater Potentiometric Surface Contour Map) shows the groundwater potentiometric surface using data obtained during October 2006. Figure 4-2 (Mine Pit Cross section A-A') shows a profile of hydraulic head along the cross section through the pit backfill. The potentiometric surface map shows that the horizontal direction of groundwater flow is consistent with historical data, i.e., westward towards the Flambeau River. The hydraulic cross section displayed in Figure 4-2 continues to show a predominant pattern of downward groundwater movement at the pit backfill wells with convergent flow toward the Flambeau River.

## 4.2 Surface Water

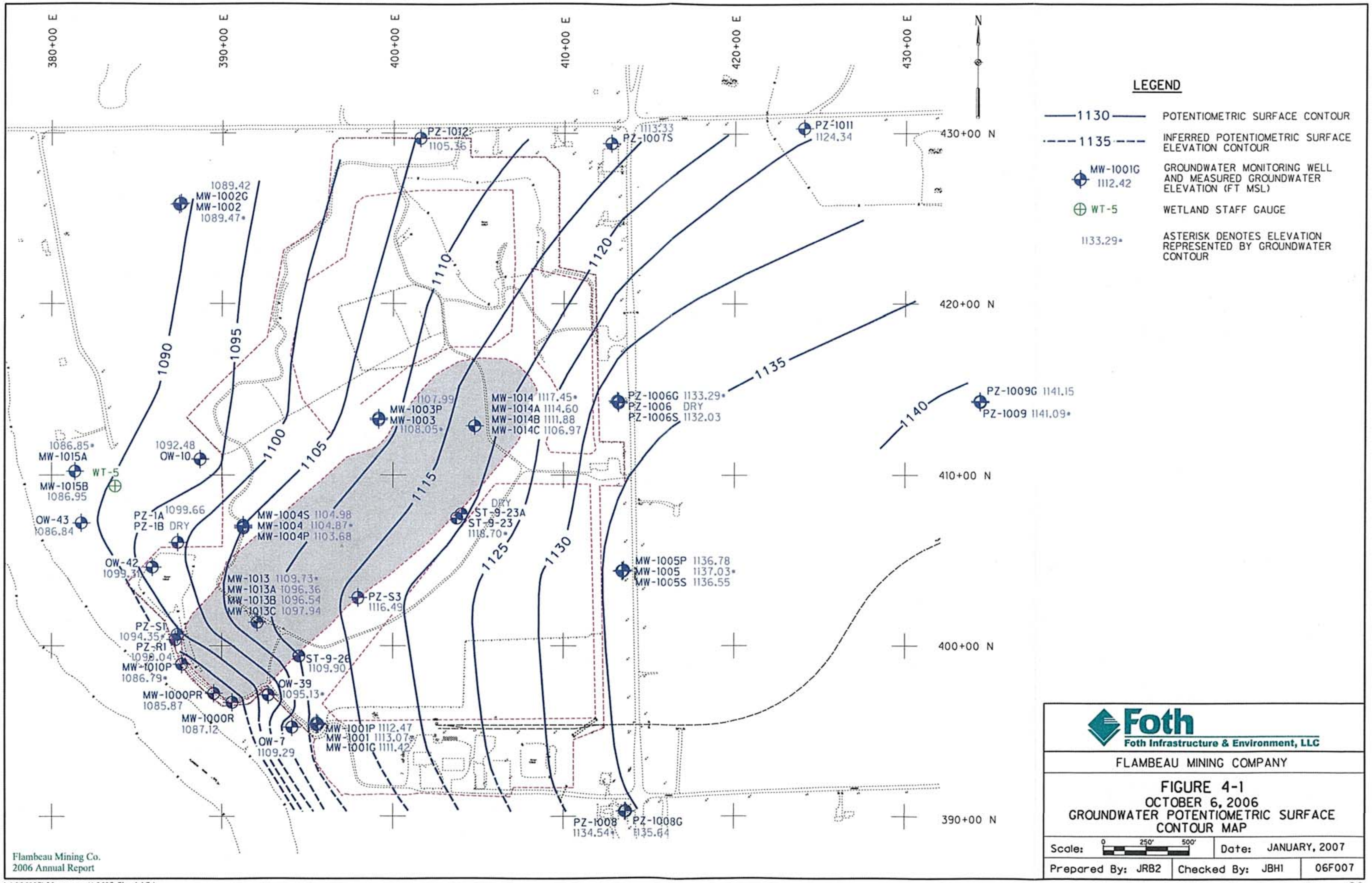
The 2006 surface water monitoring program included sampling and analyses of the following elements: surface water quality, wetland surface flows, and river studies including macroinvertebrate collection and fish, crayfish and sediment sampling. The Revised Mining Permit Quality Assurance/Quality Control Document (August 1991) specifies that an annual surface water monitoring report will be prepared and submitted to the Department in March of each year. This portion of the 2006 Annual Report meets this requirement.

In accordance with the Updated Monitoring Plan, after discharges from the wastewater treatment facilities ceased, which they did in 1998, sediments, crayfish and fish were collected once each year for two years. With the collection of sediments, crayfish and fish in 1999 and 2000, Flambeau has met this requirement. The Updated Monitoring Plan prescribes that during the third year after cessation of wastewater discharges and for each year thereafter, until Notice of Completion (NOC) of reclamation is issued by Flambeau, crayfish will be sampled and analyzed.

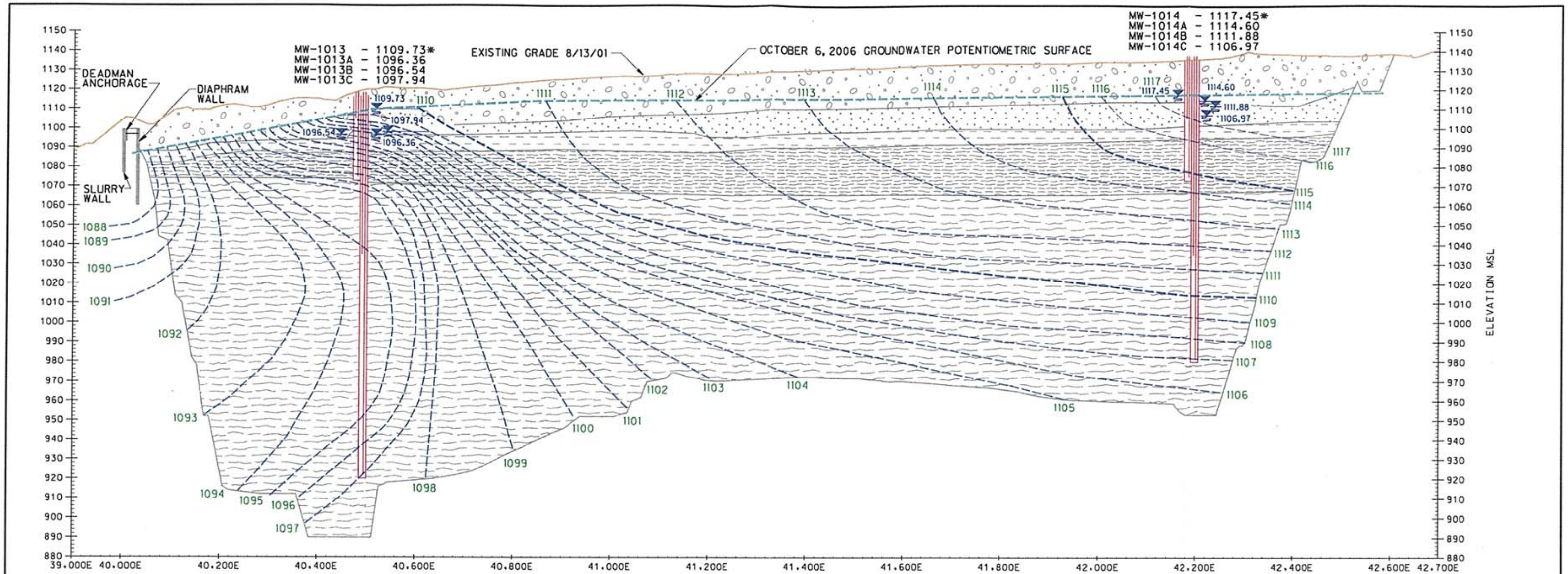
Given Flambeau's submittal of NOC during September 2001, 2001 was the last year that crayfish sampling was required. However, during 2004 and 2006 Flambeau voluntarily conducted crayfish sampling and macroinvertebrate collections. Sediment sampling was voluntarily conducted in 2006 as well. Fish were sampled during 2005 and 2006.

The Updated Monitoring Plan requires that during the two years following the cessation of wastewater discharge, three surface water samplings will be made. Two of these samplings were to occur at the time of spring runoff during each of these years. One additional sample was to be taken during a storm water runoff event so that the downstream sample taken in the Flambeau River includes runoff from the reclaimed mine site. Flambeau collected surface water samples on March 23, 1999, April 8, 1999, November 1, 1999, June 1, 2000 and November 16, 2000. Flambeau has met the requirement for collecting surface water samples in accordance with the approved monitoring plan. On its own initiative, Flambeau's intends to continue sampling the Flambeau River at SW-1 and SW-2 twice each year for copper, conductivity, iron, manganese, pH, sulfate and zinc to document the continued protection of the Flambeau River.

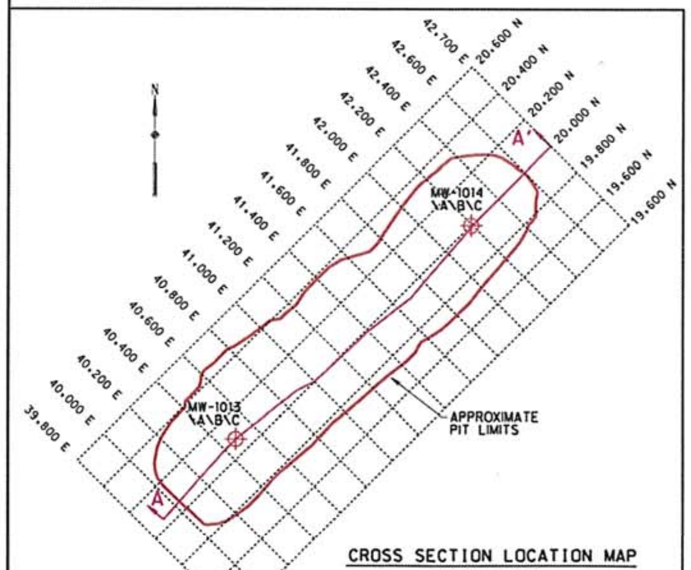
Figure 4-3 shows the sampling locations for sediment, macroinvertebrates, fish and surface water quality of the Flambeau River.




L:\06f007\06 mon rpt\6f07 Fig 4-1.3d

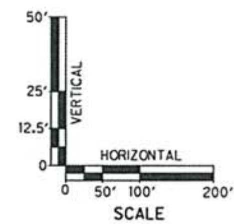



MINE PIT COORDINATES
SECTION A - A'




CROSS SECTION LOCATION MAP
SCALE: 1" = 600'

Flambeau Mining Co.
2006 Annual Report




## LEGEND

- TILL
- SANDSTONE
- SAPROLITE
- TYPE I MATERIAL
- TYPE II MATERIAL
- 1096.36* ASTERISK INDICATES LEVEL WAS USED TO DEVELOP OCTOBER 6, 2006 GROUNDWATER POTENTIOMETRIC SURFACE
- LINE OF EQUIPOTENTIAL

Foth
Foth Infrastructure & Environment, LLC

FLAMBEAU MINING COMPANY

FIGURE 4-2
MINE PIT CROSS SECTION A - A' WITH IN-PIT GROUNDWATER MONITORING WELLS

| | | | |
|---|---|---|---|
| Scale: SEE BAR SCALE | | Date: JANUARY, 2007 | |
| Prepared By: JRB2 | Checked By: JBH1 | | 06F007 |

L:\06F007\06 mon rpt\6f07 Fig4-2.3d
1/30/2007

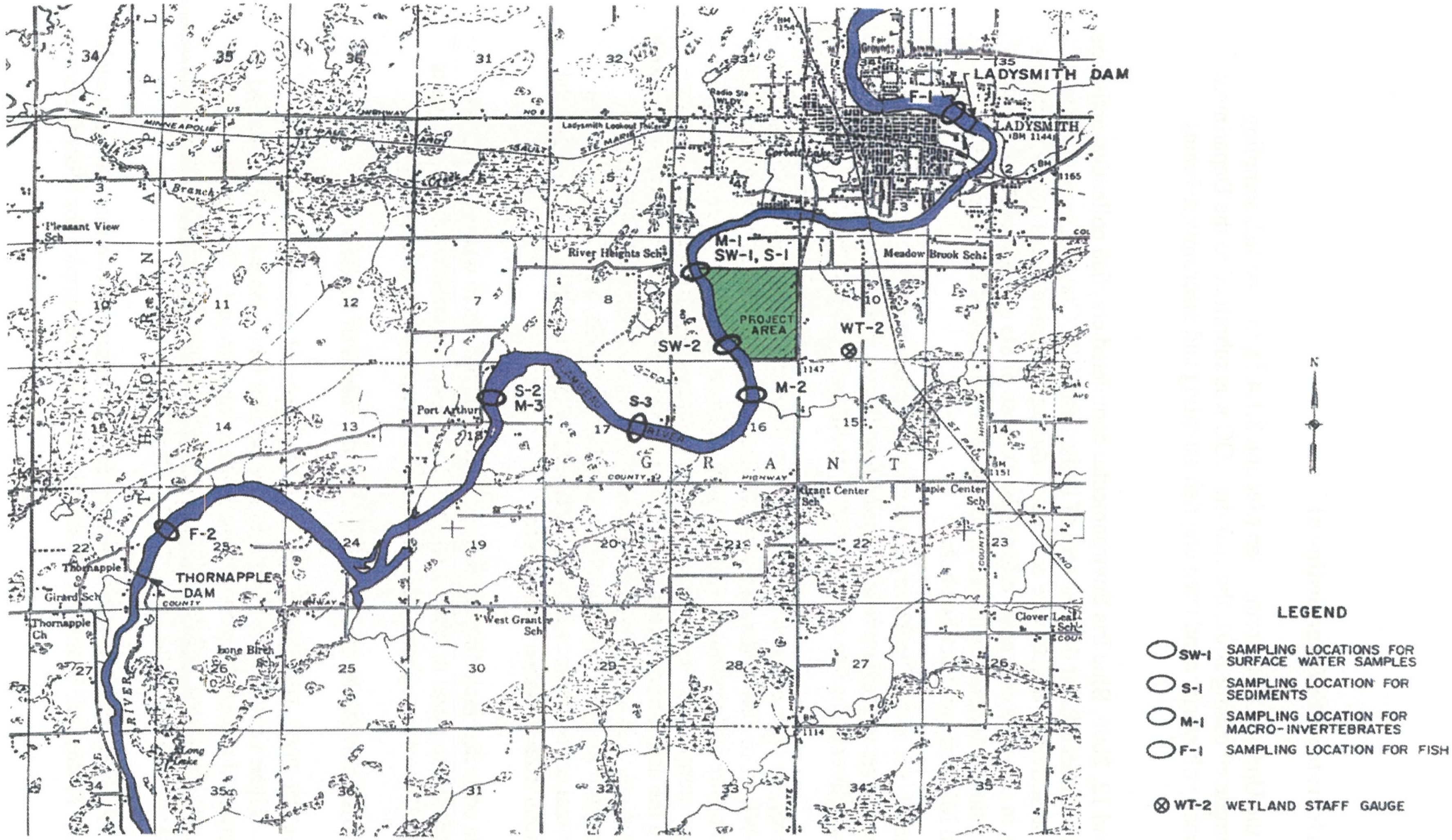



Figure 4-3. Surface Water Monitoring Site Locations
Flambeau Mining Company

### 4.2.1 Macroinvertebrates/Fish/River Sediment

In accordance with the Updated Monitoring Plan (Section 3.1.4.1), the crayfish sampling requirement was completed during 2001, the year the NOC was submitted to the Department. During 2006 Flambeau voluntarily conducted crayfish sampling and macroinvertebrates collection.

On September 11 and 12, 2006, Blue Iris Environmental completed crayfish collection activities at three sites on the Flambeau River downstream of Ladysmith, WI. Crayfish were collected similarly to collection activities which were conducted during the active phase of the Flambeau Mine operation. As in previous collection efforts, the purpose of the crayfish collection was to conduct metals analysis of crayfish at selected sites upstream and downstream of the now reclaimed Flambeau Mine site as described below:

- The Flambeau River at the Blackberry Lane access (upstream site);
- The Flambeau River at Meadowbrook Creek (downstream site); and
- The Flambeau River at the site of the former Port Arthur Dam (downstream site).

Twenty-five to 30 crayfish were composited for each site for metal analysis by Northern Lake Services, Crandon, WI. A review of the data indicates that no relative difference in parameter concentrations from upstream locations to downstream locations is evident. Data for the three sites are similar when compared to each other and, are also comparable to results which were obtained both during the active mine operations and the years during and immediately following the mine site reclamation. It is noted that in 2001 concentrations of metal for cadmium, chromium, and aluminum for all locations, upstream and downstream, were elevated but in 2004 and 2006 all metal concentrations for each of these sites were observed to be within the range of concentrations from previous work efforts.

Based on all the data collected including the data collected in 2006, there was no observed impact to crayfish relative to metal uptake whether looking at upstream/downstream effects or effects due to time (active mining phase, mine site reclamation, or post-reclamation).

Appendix C contains a report on the crayfish collection and results of analysis.

On September 11 and 12, 2006, Blue Iris Environmental completed macroinvertebrate collection activities. These activities were conducted in similar locations and fashion as had previously been completed during the active phase of the mining project. The sample locations were at the same general locations as the crayfish sampling locations, Blackberry-upstream, Meadowbrook Creek-downstream, and Port Arthur Dam-downstream.

In-stream sampling methods consisted of kick seining for approximately two man-hours at each sample location. Ken Tennesson, Wautoma, Wisconsin received the samples for identification and enumeration.

In general, specimens collected represent most of the major groups of macroinvertebrates expected to be observed. There are a fair number of representatives of Ephemeroptera (mayflies) which is indicative of good water quality. Other major groups that were well represented included the Tricoptera (caddisfly) and Diptera (flies). All three groups were well represented in all sampling efforts since the beginning of the Flambeau Mining Project in 1991.

Appendix D contains a report on macroinvertebrate collection, identification and enumeration.

Fish sampling was also completed during September 2006. On September 12 and 13, 2006, EA Associates, Deerfield, IL and Blue Iris Environmental, Inc. electroshocked two impoundments on the Flambeau River located above (Ladysmith Flowage) and below (Thornapple Flowage) the Flambeau Mine site. Metals analysis of walleye tissue was conducted on samples collected upstream and downstream from the reclaimed mine site.

A review of historical information (data from 1991 to 2005) suggests that relative values for copper in walleye liver from the Thornapple Flowage and from the Ladysmith Flowage are consistent. Moreover, it is observed that year-to-year increases and decreases in concentrations of copper in the liver of walleye are comparable from the upstream flowage to the downstream flowage. Since 1996 copper levels in both upstream and downstream samples have remained stable if not decreasing.

Mercury levels in fish tissue have decreased since 1991 in both upstream and downstream samples. It is noted that beginning in about 1997 there is an increase in the number of values reported that fell between the level of quantitation (LOQ) and level of detection (LOD) and that the frequency of such data becomes more common through 2005. This occurrence is due to the use of more sophisticated mercury testing and greater emphasis on the use of low level mercury techniques in the lab. Values for 2006 reflect the lower level testing.

Based on review of the data, it is concluded that the operation of the mine, including the time window when reclamation and habitat restoration activities were being conducted, has had no impact on the concentration of metals which are observed in the liver or tissue of walleye.

A memorandum, Report on Activities Associated with 2006 Fish Sampling, can be found in Appendix E.

In accordance with the Updated Monitoring Plan, Flambeau had completed requirements for river sediment sampling in 2000. In 2006, Flambeau voluntarily completed sediment sampling.

On June 29, 2006, Bill West of Blue Iris Environmental, Inc. installed two sets of sediment traps in the Flambeau River south of Ladysmith, Wisconsin. This activity was part of routine monitoring of the Flambeau River. Sediment traps were located both upstream and downstream of the former Flambeau Mine.

Data from the years of sediment analysis indicate that, in general, no increase or decrease in parameter concentration in sediments is occurring. Moreover, downstream samples continue to compare favorably with upstream sediment samples indicating no impacts due to mine activities during the closure time window.

A memorandum, Report on Activities Associated with 2006 Sediment Sampling, Flambeau River, Ladysmith, Wisconsin, can be found in Appendix F.

### 4.2.2 Surface Water Quality

During 2006, samples were collected in accordance with procedures described in the Updated Monitoring Plan (July 1991) and the Revised Mine Permit Quality Assurance/Quality Control Document (August 1991).

#### 4.2.2.1 Flambeau River

The sample identified as SW-1 is upstream of the reclaimed mine site; SW-2 is downstream of the reclaimed mine site. Figure 4-3 shows the locations of the surface water sampling. Results of sampling were submitted to the Department on September 12, 2006 and December 7, 2006. The submittals are incorporated by reference.

A summary of the 2006 surface water quality results is included in Table 4-1. The results from 2006 are generally consistent with data collected from the same locations in 1992-2005 and 1991 during baseline data collections. No significant difference in parameter concentrations is evident when comparing downstream water quality to upstream water quality; and there are no trends in surface water quality results. Trend graphs of surface water quality results and statistical trend analysis are contained in Appendix B.

**Table 4-1. 2006 SURFACE WATER QUALITY DATA**

| | SW-1 (Upstream) | | SW-2 (Downstream) | |
|---|---|---|---|---|
| | Aug-06 | Nov-06 | Aug-06 | Nov-06 |
| Copper (ug/l) | 1.9 | <1.3 | 1.5 | <1.3 |
| Lab Conductivity (uS/cm) | 89 | 124 | 91 | 126 |
| Field Conductivity (uS/cm) | 80 | 113 | 78 | 113 |
| Hardness (mg/l) | 45 | 54 | 45 | 52 |
| Iron (mg/l) | 0.45 | 0.35 | 0.47 | 0.34 |
| Manganese (ug/l) | 120 | 45 | 120 | 44 |
| pH (lab) | 7.3 | 8.0 | 7.38 | 6.7 |
| pH (field) | 6.3 | 8.6 | 6.0 | 8.6 |
| Sulfate (mg/l) | 4.7 | 8.1 | 4.3 | 8.1 |
| Zinc (ug/l) | 7.3 | 7.1 | 6.9 | 7.8 |

### 4.2.2.2 Wetlands, Biofilters and Streams

Wetland water quality samples are collected from onsite constructed wetlands and biofilters, Intermittent Stream C receiving flows from the 0.9-acre industrial outlot biofilter, and a recovering groundwater seep in Wetland 1 to provide baseline data. During 2006, the drought prevented collection of flows from the 8.5-acre wetland and 1.7-acre biofilter. The Wetland 1 groundwater seep was sampled in November 2006 and the results of the analyses submitted to the Department on December 14, 2006. Table 4-2 summarizes the analytical results from the 8.5-acre wetland, 1.7-acre biofilter, and Wetland 1.

Analytical results from the 2005 monitoring of the 8.5-acre wetland and 1.7-acre biofilter are generally consistent with previous years' results. The exception being manganese reported at a concentration of 310 ug/l for the 1.7-acre biofilter. Manganese is a common element in soils and is biogeochemically cycled through wetlands so variability could be expected. Monitoring of OW-10, a piezometer located within the 1.7-acre biofilter, indicates a separation of the surface water and groundwater table and therefore hydraulic gradients are vertically downward. This biofilter is fed primarily by storm water runoff from the reclaimed mine site and should not be under any influence of the backfilled pit pore water quality. Any groundwater contributions from shallow aquifers could reflect water quality similar to the shallow background/upgradient monitoring well MW-1005 which is twenty feet deep and located in a wetland area. Historical manganese concentrations at MW-1005 have ranged from 280 ug/l to 1400 ug/l.

The analytical results of the 2006 monitoring of the Wetland 1 seep are also generally consistent. At the time of sample collection, the water level observed in the area of the Wetland 1 seep was extremely low as compared to recent years. The drought's impact on the groundwater seeps is evident. These atypical conditions may have resulted in the increased iron concentration as compared to concentrations since 1999. There was not a significant increase in any other parameter analyzed.

Discussion of Intermittent Stream C and the Industrial Outlot biofilter can be found in Section 2.4.3 of this report, the 2006 Annual Report.

### 4.2.3 Wetland Surface Flows

In May 2001, Flambeau submitted a Wetland Area Hydrographic Assessment prepared by Foth & Van Dyke evaluating the wetland water elevations and recommending cessation of monitoring of wetland surface water elevations, with the exception of Wetland 1, in accordance with the Updated Monitoring Plan. Based upon the Wetland Area Hydrographic Assessment, Flambeau requested the Department's approval of cessation of monitoring wetland surface water elevations for Wetlands 5C, 6C, 7 and 10A. During April 2002, the Department concurred with Flambeau's request to decrease the extent of wetland water level monitoring.

In accordance with Section 3.1.4.3 of the Updated Monitoring Plan, Flambeau monitors water level measurements at least three times per year (spring, summer, and autumn). Water levels in Wetland 1 (Staff Gauge WT-5) were measured three times during 2006, late spring, summer and fall. Figure 4-1 shows the staff gauge location.

## Table 4-2. Summary of Surface Water Quality Results from Wetland 1, 8.5-Acre Wetland & 1.7-Acre Biofilter (1999 – 2006)

| Wetland 1 Seep Water Quality | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Cond, Lab | Cond, Field | Copper | Hardness | Iron | Manganese | pH, Lab | pH, Field | Sulfate | Zinc |
| | (umho) | (umho) | (ug/L) | (mg/L) | (mg/L) | (ug/L) | (s.u.) | (s.u.) | (mg/L) | (ug/L) |
| Nov-99 | NA | 180 | <0.47 | 62 | 0.028 | 8.8 | 7.4 | 6.4 | 9.8 | <12 |
| Nov-00 | NA | 122 | 5.9 | 50 | 0.024 | 3.1 | 6.6 | 6.3 | 8.8 | <12 |
| Apr-01 | 130 | 117 | <2.7 | 49 | 0.011 | <2 | 6.4 | 6.0 | 12 | <12 |
| Jun-02 | 97 | 78 | <2.7 | 36 | 0.0096 | <2.0 | 6.5 | 6.0 | 11 | <10 |
| May-03 | 140 | 127 | 2.0 | 55 | <0.010 | <2.0 | 6.3 | 6.2 | 19 | 36 |
| Apr-04 | 131 | 124 | 4.6/4.5 | 59 | 0.028 | 9.4 | 6.3 | 6.6 | 19 | 22 |
| Jun-05 | 141 | 118 | <1.3 | 57 | <0.033 | 5.0 | 7.5 | 7.3 | 21 | 16 |
| Nov-06 | 172 | 121 | 7.9 | 54 | 0.13 | 7.5 | 7.3 | 7.9 | 16 | 12 |
| **8.5-Acre Wetland Water Quality** | | | | | | | | | | |
| | Cond, Lab | Cond, Field | Copper | Hardness | Iron | Manganese | pH, Lab | pH, Field | Sulfate | Zinc |
| | (umho) | (umho) | (ug/L) | (mg/L) | (mg/L) | (ug/L) | (s.u.) | (s.u.) | (mg/L) | (ug/L) |
| Nov-99 | NA | 114 | <0.47 | 34 | 0.018 | 6.1 | 7.5 | 7.2 | <5.0 | <12 |
| Nov-00 | NA | 89 | 12 | 28 | 0.050 | 2.4 | 7.3 | 7.4 | <5.0 | <12 |
| Apr-01 | 76 | 62 | <2.7 | 17 | 0.36 | 8.8 | 7.2 | 6.7 | <5 | <12 |
| Jun-02 | 62 | 51 | <2.7 | 15 | 1.0 | 4.2 | 6.8 | 6.4 | <5.0 | 38 |
| May-03 | 92 | 65 | 6.5 | 24 | 0.081 | 19 | 6.9 | 7.0 | <5.0 | 33 |
| Apr-04 | 61 | 54 | 14/17 | 13 | 0.640 | 27 | 6.6 | 6.8 | <2.5 | 37 |
| Jun-05 | 68 | 56 | 3.8 | 22 | 0.56 | 55 | 7.4 | 7.1 | <2.5 | 15 |
| | | | | | | | | | | |
| **1.7-Acre Biofilter Water Quality** | | | | | | | | | | |
| | Cond, Lab | Cond, Field | Copper | Hardness | Iron | Manganese | pH, Lab | pH, Field | Sulfate | Zinc |
| | (umho) | (umho) | (ug/L) | (mg/L) | (mg/L) | (ug/L) | (s.u.) | (s.u.) | (mg/L) | (ug/L) |
| Nov-99 | NA | 87 | 1.1 | 25 | 0.038 | 17 | 7.4 | 7.8 | <5.0 | <12 |
| Nov-00 | NA | 73 | 12 | 22 | 0.17 | 2.4 | 6.8 | 7.2 | <5.0 | <12 |
| Apr-01 | 54 | 47 | <2.7 | 18 | 0.24 | 2.8 | 6.7 | 6.7 | <5.0 | <12 |
| Jun-02 | 41 | 37 | <2.7 | 14 | 1.6 | 3.9 | 7.6 | 6.2 | <5.0 | 42 |
| May-03 | 82 | 70 | 4.1 | 30 | 0.92 | 15 | 6.6 | 7.0 | <5.0 | 28 |
| Apr-04 | 75 | 44 | 12/12 | 17 | 0.78 | 12 | 6.7 | 6.9 | <2.5 | 35 |
| Jun-05 | 57 | 48 | <2.7 | 26 | 1.1 | 310 | 7.3 | 6.8 | <2.5 | 18 |
| NA=Not Analyzed | | | | | | | | | | |

Measurements from Wetland 1 were provided to the Department on December 14, 2006; the reports are incorporated by reference. Table 4-3 summarizes the wetland water elevations for Wetland 1.

During years without drought, Wetland 1 exhibits wet conditions with flowing groundwater seeps and large areas of standing water evident. During 2006, Flambeau continued to monitor the staff gauge within Wetland 1 and maintain the ability to add mitigation water to the wetland. A regional drought during 2005 and 2006 resulted in lowering of water levels of wetlands located in the region including Wetland 1. As a result of Wetland 1's dryer condition resulting from natural causes, regional climatic conditions, mitigation water was not added during 2006 as was also the case during 2002, 2003, 2004 and 2005.

## 4.3 Surface Subsidence

Pursuant to Section 3.1.7 of the Updated Monitoring Plan (July 1991), with 2001 being the third year after reclamation activities were performed in the area of the pit, a review of the surface topography in the area of the pit was performed and compared to the 1998 aerial mapping topography determined immediately after completion of reclamation activities. The general subsidence across the site was less than a half a foot which is within the accuracy of the mapping technique. The largest settlement observed in isolated areas by mapping was 1.5 feet. This amount of settlement was much less than the "less than 5%" (approximately 12 feet) anticipated in the Mine Permit Application (December 1989) (MPA, Section 5.7.2.3). This is due primarily to Flambeau's aggressive quality control procedures for compaction used during pit backfilling.

Subsequent subsidence surveys are to occur in the tenth (2008), twentieth (2018) and fortieth (2038) year after reclamation activities in the area of the pit are completed.

## TABLE 4-3. WETLAND STAFF GAUGE READING SUMMARY

Staff Gauge Location/Water Level (MSL)

WETLAND 1

(WT-5)

| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN | -- | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NR | NR | NR | NR | NR | NR |
| FEB | -- | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NR | NR | NR | NR | NR | NR |
| MAR | -- | 1102.32 | NRT | NRT | NRT | NRT | NRT | 1101.92 | NRT | NRT | NR | NR | NR | NR | NR | NR |
| APR | -- | 1102.29 | 1102.49 | 1102.18 | 1101.93 | 1102.06 | 1101.91 | NSW | 1101.89 | 1101.92 | NR | NR | NSW | NSW[1] | 1102.25 | NR |
| MAY | 1102.35 | 1102.25 | 1102.03 | NSW | NSW | NSW | NSW | 1101.84 | NSW | 1101.93 | 1102.06 | 1101.92 | NR | NR | 1102.11 | NR |
| JUN | 1102.28 | 1102.26 | NSW | NSW | NSW | NSW | NSW | NSW | NSW | 1102.01 | NR | NR | NR | NR | NR | NSW |
| JUL | 1102.23 | 1101.90 | NSW | NSW | NSW | NSW | NSW | NSW | NSW | NSW | NR | NSW | NSW | NSW[1] | NSW | NSW |
| AUG | NSW | 1102.21 | NSW | NSW | NSW | NSW | NSW | NSW | 1102.09 | NSW | NSW | NR | NR | NR | NR | NR |
| SEP | 1102.33 | 1102.46 | 1101.92 | NSW | NSW | NSW | NSW | NSW | NSW | NSW | NR | NR | NR | NR | NR | NR |
| OCT | 1102.32 | 1102.37 | NSW | NSW | 1101.97 | NSW | NSW | NSW | NSW | NSW | 1101.91 | 1102.01 | NSW | NSW[1] | 1102.03 | NSW |
| NOV | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NSW | NSW | NSW | NR | NR | NR | NR | NR | NR |
| DEC | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NRT | NR | NR | NR | NR | NR | NR |

NRT = No Reading Taken Due to Frozen Conditions
NSW = No Standing Water NSW[1]=Saturated soils; low water levels not measurable
NR= Not Required

## 4.4 Aerial Photography (Color and Infrared)

In accordance with Section 3.1.6 of the Updated Monitoring Plan (July 1991), aerial and color infrared photography has been completed in the late summer for four consecutive years following completion of closure and will continue every five years throughout the long-term care and maintenance period to monitor success of revegetation. Year 2005 was the fourth year of the four consecutive years for aerial and color infrared photography since the submittal of the NOC in 2001. Aerial and color infrared photography was completed on August 3, 2006 for a fifth additional year.

In the November 7, 2002 submittal of the 2002 Aerial and Color Infrared Photography, Flambeau requested a reduction of the area of coverage for the photography based upon the substantial rebound of groundwater around the reclaimed mine site. Flambeau proposed that the photography cover the reclaimed mine site and 500 feet beyond the site's perimeter including the area of Wetland 1. In a letter dated July 9, 2003, the Department authorized Flambeau to reduce the breadth of the aerial and color infrared photography as requested.

In a submittal dated September 12, 2006, the Department received aerial and color infrared photography of the reclaimed Flambeau Mine including the adjoining areas. The review of the photographs confirm that the entire reclaimed mine site remains stable and well covered with productive vegetation despite the previous years' (2005 and 2006) extreme drought conditions. The photographs also indicate that the vegetation cover and productivity on site is at least as great as similar areas offsite (e.g. grassland/pasture) not impacted by mining operations. Results of monitoring during 2006 show that the three general plant communities created on site, woodland, upland grassland, and wetland, have total plant cover of 100 percent, 99 percent, and 98 percent, respectively.

The 2006 photographs show that the entire reclaimed mine site is very well vegetated, and the three plant communities, woodland, upland grassland, and wetland, are easily found in appropriate locations according to the reclamation plan.

A memorandum prepared by AES, Aerial photography correlation with vegetation monitoring data on the reclaimed Flambeau Mine site, was included at an attachment to the 2006 Annual Reclamation Report.

**REFERENCES**


| | |
|---|---|
| 2000 Annual Report | January 2001 |
| 2005 Annual Report | January 2006 |
| 2001 Annual Reclamation Report | November 2001 |
| 2004 Annual Reclamation Report | November 2004 |
| 2005 Annual Reclamation Report | November 2005 |
| 2006 Annual Reclamation Report | November 2006 |
| Biofilter Management Plan | January 2007 |
| Construction Documentation Report – Flambeau Industrial Outlot | September 2006 |
| Local Agreement | August 1988 |
| Mine Permit Application | December 1989 |
| Mining Permit | January 1991 |
| Revised Mining Permit Quality Assurance/Quality Control Plan | August 1991 |
| Updated Monitoring Plan | July 1991 |

## SUBMITTALS

| DOCUMENT | DATE | DEPARTMENT SUBMITTEE |
|---|---|---|
| **Section 2.0 Operating Activities** | | |
| 2005 Annual Report | January 2006 | Larry Lynch (1) |
| Flambeau Industrial Outlot | March 2006 | Ken Markart (1) |
| Flambeau Industrial Outlot Workplan | May 2006 | Ken Markart (1) |
| Construction Documentation Report – Flambeau Industrial Outlot | September 2006 | Joanie Burns (1) |
| July 2006 Surface Water Withdrawal | October 2006 | Phil Fauble (1) |
| Clear Span Bridge – General Permit Application | October 2006 | Jon Kleist (2) |
| Biofilter Management Plan | January 2007 | Joanie Burns (1) |
| **Section 3.0 Reclamation Activities** | | |
| List of Anticipated 2006 Reclamation Activities | January 2006 | Larry Lynch (1) |
| Prescribed Burning on Reclaimed Flambeau Mine | April 2006 | Tom Portle (1) |
| 2006 Aerial and Color Infrared Photography | September 2006 | Phil Fauble (1) |
| Mid-Summer Progress Report, 2006 | November 2006 | Phil Fauble (1) |
| 2006 Annual Reclamation Report | November 2006 | Phil Fauble (1) |
| Certificate of Completion Petition | January 2007 | Chuck Hammer (3) |

## SUBMITTALS (CONT'D)

| DOCUMENT | DATE | DEPARTMENT SUBMITTEE |
|---|---|---|
| **Section 4.0 Site Monitoring** | | |
| Environmental Monitoring (First Quarter 2006), Groundwater | March 2006 | Ken Markart (1) |
| Environmental Monitoring (Second Quarter 2006), Groundwater | June 2006 | Terry Koehn (1) |
| Surface Water Quality Results – Summer 2006 | September 2006 | Phil Fauble (1) |
| Environmental Monitoring (Third Quarter 2006), Groundwater | September 2006 | Phil Fauble (1) |
| Surface Water Quality Results – Fall 2006 | December 2006 | Phil Fauble (1) |
| Wetland 1 Baseline Monitoring – Fall 2006 | December 2006 | Phil Fauble (1) |
| Environmental Monitoring (Fourth Quarter 2006), Groundwater | December 2006 | Phil Fauble (1) |

1 Wisconsin Department of Natural Resources
Division of Air & Waste
Waste & Materials Management

2 Wisconsin Department of Natural Resources
Division of Water
Watershed Management

3 Wisconsin Department of Natural Resources
Bureau of Legal Services

# Appendix A

# Backfilled Pit Water Quality Assessment

SRK Consulting
Engineers and Scientists

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# Memorandum

| | | | |
|---|---|---|---|
| **To:** | Jim Hutchison<br>Foth and Van Dyke, Green Bay | **Date:** | January 22, 2007 |
| **cc:** | | **From:** | John Chapman<br>Daryl Hockley |
| **Subject:** | FLAMBEAU PROJECT<br>Backfilled Pit 2006 Monitoring Results | **Project #:** | 1UF001.008 |

## 1 Introduction

Waste rock produced at the Flambeau Mine was amended with limestone and backfilled to the Flambeau open pit. The chemistry of the pore water in the backfill has been monitored since February 1999 and the results have been reviewed annually by SRK to assess geochemical interactions between re-saturating water and the backfill. Groundwater elevation data are reviewed by staff at Foth & Van Dyke and are excluded from this review.

For ease of comparison with past assessments, this memorandum retains the format that was established in previous memoranda.

As reported in the SRK Memorandum dated January 27, 2006, the water quality monitoring results through the end of 2005 in general were consistent with previous years and indicated that:

- Complete neutralization of acidity originally contained in the backfill has occurred.
- Concentrations of major ions in the pore water are stable, consistent with previous results.
- Gypsum precipitation and/or dissolution is controlling the porewater concentration of sulfate within most of the backfill.
- Isolated zones exist where the backfill contained less sulfate, and gypsum equilibrium conditions were not reached (e.g. around well MW-1014A).
- Porewater in backfill around Well MW-1014C is being flushed with groundwater inflow leading to decreasing concentrations of sulfate and other solutes.
- Approximately stable redox conditions exist in some wells (e.g. wells MW-1013C, MW-1014C and MW-1013B) but redox potentials continue to fluctuate in wells MW-1014A and MW-1014B.
- Manganese concentrations are increasing marginally in well MW-1013C, but nearly constant or slightly decreasing in the remaining wells.
- Iron concentrations have increased in well MW-1013C, and decreased in well 1014C, suggesting local variations in redox potential, groundwater flow and siderite precipitation. Iron concentrations are very low and stable in other wells.
- Equilibrium modeling suggest that iron oxy-hydroxides are converting to more stable phases such as goethite or hematite in wells MW-1013B, MW-1014A and MW-1014B, and therefore that soluble iron concentrations are unlikely to increase in the future for these wells.

## 2 Summary of Data Collected In 2006

The monitoring wells located in the backfill comprise MW-1013, MW-1013A MW-1013B, MW-1013C; MW-1014, MW-1014A, MW-1014B, and MW-1014C. Water levels in all wells have recovered sufficiently and were sampled during 2006.

MW-1005P is located upgradient of the backfill. Well locations, and sampling procedures and analytical methods were previously presented in the SRK memorandum dated January 15, 2001 and are not repeated herein.

The routine monitoring program for the backfill is shown in Table 1. The variances from the routine monitoring program that occurred during the 2006 monitoring period were as follows:

- January 2006: (quarterly program): Arsenic included as a parameter in the monitoring program for all wells located in the backfill and for the up-gradient well MW-1005P.
- April 2006 (quarterly program): With the excepting of sodium and potassium the annual monitoring program was undertaken for the wells located in the backfill; arsenic was included in the quarterly program for the up-gradient well MW-1005P.
- July 2006 (annual program): no variation from the standard program.
- October 2006 (quarterly program): Arsenic included as a parameter in the monitoring program for all wells located in the backfill and for the up-gradient well MW-1005P.

The complete data sets for all the wells located in the backfill, as well as the up-gradient well, are provided in Attachment 1.

## 3 Results and Discussion

### 3.1 Alkalinity

The time series plots provided in Figures 1 and 2 indicate that the alkalinity results for 2006 were within the concentration ranges observed for each of the wells in the preceding two to three years.

As shown in Figure 1, alkalinity concentrations in MW-1013 appear to be elevated when it is considered that the well is screened within till and is the shallowest (least head) of the series. The alkalinity concentrations within this well correlate with the results for MW-1013B and MW-1013C which suggests it may be affected by limestone that may have been placed locally within this area. The alkalinity concentrations in MW-1013A, located within Type I waste rock backfill, are decreasing and approaching the background concentration observed in MW-1005P.

The sample depth for well MW-1014 coincides with sandstone backfill. The alkalinity in this well is slightly below the background level, which is consistent with expectation for sandstone backfill. As noted for previous years, the results for Well MW-1014B appear to be slightly more variable than in the remaining wells, the results remain however, within the range of previous data. As discussed in the next section, sampling, sample handling and sample storage prior to analysis may contribute to the variability, in particular for samples with high dissolved carbon dioxide.

### 3.2 Estimation of Carbon Dioxide Partial Pressure

The initial monitoring results for the backfill indicated lower than predicted pH conditions and higher than expected alkalinity concentrations. An assessment of the prevailing conditions attributed this to the entrapment of carbon dioxide generated from limestone reacting with the acidity contained in the backfill. The entrapment is believed to have been caused by the rapid inundation of the backfill which occurred more rapidly than expected and the neutralization reactions occurring after saturated conditions developed. The carbon dioxide partial pressure was measured and found to support this conclusion.

As discussed previously (see SRK memorandum, dated, January 2002), the dissolved carbon dioxide concentrations in the backfill pore water and the corresponding carbon dioxide concentrations in a gas in equilibrium with the dissolved carbon dioxide can be estimated from the alkalinity measurements.

The calculated carbon dioxide results for the July 2006 samples together with the results from previous years are provided in Table 2. Time series plots of estimated carbon dioxide concentrations are illustrated in Figures 3 and 4 for wells MW-1013 and MW-1014 respectively, with the estimates for the up-gradient well, WM-1005P, included for reference. (Note that because only one data point is available for MW-1013, MW-1013A and MW-1014 respectively they were not included in the plots.)

As shown in the July 2006 estimate for Well MW-1013B is down from that observed in 2005, but remains elevated above that of MW-1013C. (However, as noted in previous assessments, care should be taken when evaluating the estimated carbon dioxide concentrations because they are back-calculated from the alkalinity results. Because the samples are taken from depth below the water table (i.e. at a pressure above atmospheric conditions) and brought to surface, the change in pressure can result in the loss of some carbon dioxide to the atmosphere before the sample is analyzed for alkalinity. The loss of carbon dioxide will affect the alkalinity measurement and the back calculated estimate of the *in situ* carbon dioxide concentration.) The results for MW-1013C have remained approximately constant and is similar to those observed for MW-1014C, which suggest stable conditions at depth.

The results for Wells MW-1014A and –B similarly indicate some variability within the range of previous results, while results for the deeper well MW-1014C indicate stable conditions have been reached at depth within the backfill.

## 3.3 Major Ions

Ion balance and total dissolved solids calculations were completed to check the internal consistency for each of the July 2006 data sets. Total alkalinity was entered as $CaCO_3$ eq. and the pH was fixed at the measured (laboratory) value. The calculations showed that the ion balances of all the samples were within 3 %, except for samples MW-1014B with an error of 7.67 % (anion deficient) and MW-1014C with an error of 5.16 % (anion deficient). By convention, the ionic imbalance observed for these samples are considered within an acceptable range.

The sample from MW-1005P up-gradient of the backfill classifies as a Ca-Mg-$CO_3$ water, as does the sample from MW-1013. The sample from MW-1013A classifies as a Ca-Mg-$CO_3$-$SO_4$ water. The remainder of the backfill pore water samples continue to classify as Ca-Mg-$SO_4$-$CO_3$ water.

Following the previously established protocol, the geochemical equilibrium model PHREEQ-C was used to compare the solution compositions from the July 2006 samples to solubility limits for expected mineral phases. All runs were completed using the laboratory measured alkalinity and pH data and the field measured temperature and redox potential conditions. Complete results are included in Attachment 2.

The calculated saturation indices of key secondary mineral phases are provided in Table 3. (A saturation index greater than zero indicates super-saturation of a mineral phase, an index below zero indicates under-saturation, and an index near zero indicates the reported water chemistry is at or near equilibrium with the mineral phase.) The saturation index does not indicate the abundance of the mineral nor does it account for any kinetic constraints that may prevent the mineral from forming or dissolving. Time series plots of the saturation indices presented in Table 3 are shown in Figures 5 through 10.

Table 3 indicates that the July 2006 saturation indices for calcite/aragonite and gypsum in samples MW-1013, MW-1013A and MW-1014 are reasonably consistent with those for the background well MW-1005P. It is however noted that MW-1013 and MW-1013A are supersaturated with respect to rhodocrosite and siderite (i.e. saturation indices are above zero). However only one set of results has been obtained thus far for these wells and no trend is indicated as yet. The results for the remainder of the samples are consistent with the conclusions from previous assessments, i.e. most of the backfill samples are at or near equilibrium with gypsum, and close to saturation with calcite (or aragonite, a similar calcium carbonate phase). Also consistent with previous observations, the gypsum saturation indices for samples from well MW-1014A (see Figure 7) and well MW-1014C (see Figure 9) remain below zero. The calculated saturation index for gypsum for MW-1014C continues to decline which, as concluded in previous assessments, indicates that the pore water in the backfill in the vicinity of this well is being replaced slowly by groundwater inflow (Figure 17 shows the change in the sulfate concentration over time).

Conditions in equilibrium with calcite (or aragonite) and gypsum indicate that acidity (from sulfide oxidation) that was present in the backfill has been neutralized. Near-equilibrium conditions with calcite are also consistent with the excess limestone that was used to amend the backfill.

### 3.4 Redox Potential, Iron and Manganese

Measured redox potentials as a function of time are illustrated in Figures 11 and 12 for wells MW-1013 and MW-1014 respectively, together with the results for the up-gradient well for comparison.

The redox potential in the up-gradient well (MW-1005P) appears to have stabilized at about 0 mV; the variability is considered to be within the expected analytical variance for field measurement of redox potential.

The redox potentials in wells MW-1013C and MW-1014C vary within the region of 50 mV and appear to have stabilized. The redox potential in well MW-1013B however appears to have increased from the initial steady range of about 200 to about 300 mV. The limited results to date for MW-1013 and MW-1013A indicate redox values between the upper and lower range in the backfill.

The redox potential in wells MW-1014A and MW-1014B showed an increase during 2005, but has decreased since to values corresponding to the range observed prior to this increase. The results to date for MW-1014 appear to replicate the results for wells MW-1014A and MW-1014B.

Time series plots of dissolved manganese concentrations are shown in Figures 13 and 14. The results are also presented in Table 4 as average annual concentrations.

The manganese results for Well MW-1013B continue to vary with time, but average annual concentrations suggest that the concentration has decreased during 2006 as shown in Table 4. The manganese concentration in well MW-1013C appears to have stabilized, with no change in the annual average concentration between 2005 and 2006. Manganese concentrations in the remaining wells located within the backfill continue to decrease or remain stable.

The wells that were sampled for the first time in October 2005 show manganese concentrations in each location. The manganese concentration in well MW-1013 was in the same concentration range as well MW-1013B, and remained in that range through 2006. The manganese concentration in well

MW-1013A has decreased marginally during 2006. In Well MW-1014 the manganese concentration slightly decreased during 2006.

The manganese concentration in the background well MW-1005P continues to fluctuate, but remains within the range of historic values.

Calculated saturation indices for rhodochrosite ($MnCO_3$) are presented in Table 3 for the July 2006 results and time series plots for the saturation indices are illustrated in Figures 5 to 10. In general, the results indicate super-saturation of rhodochrosite. In wells where the manganese concentration in the pore water is decreasing, slow rhodochrosite formation remains a possible explanation. It should however be noted that the manganese concentration in well MW-1014C is decreasing at the same rate that sulfate is decreasing, which is consistent with pore water displacement by groundwater flow rather than rhodochrosite formation (see Figure 17).

Dissolved iron concentrations are shown in Figures 15 and 16 for wells MW-1013 and MW-1014, respectively, and annual average concentrations are summarized in Table 4.

Iron concentrations in the shallower wells in the backfill, i.e. wells MW-1013B, MW-1014A and MW-1014B remained within the historical range of concentrations and were similar to concentrations detected in the up-gradient well, well MW-1005P. It is noted that these wells all have sample elevations at or above the up-gradient sample elevation, and, comparatively, their redox potentials are elevated. The $Fe(OH)_3$ saturation indices calculated for these wells from the 2006 results appear to have decreased from estimates recorded for 2005 and have in general returned to historical values. It should however be noted that the iron concentrations in these wells in 2005 were below detection. When calculating the saturation indices, the iron concentrations were set equal to the detection limit. The 2005 saturation indices clearly were overestimated and were not indicative of a change in conditions in the backfill pore water.

As shown in Figure 15, the dissolved iron concentration in Well MW-1013C appears to continue to increase slightly, with an annual average concentration of about 8.2 mg/L in 2006 compared to 8.1 mg/L in 2005. The iron concentration remains slightly above equilibrium with siderite.

In contrast the iron concentration in well MW-1014C continues to decrease. The annual average concentration has decreased from about 6.8 mg/L in 2005 to about 6.1 mg/L in 2006. Figure 18 shows that the rate of decrease in the iron concentration is marginally more rapid than the rate of decrease in the sulfate concentration (unlike for manganese as discussed above). This is consistent with simultaneous pore water displacement and iron precipitation, likely as siderite (based on the calculated saturation indices).

The iron concentration measured in the October 2005 sample from well MW-1013 was 22 mg/L, but although the concentration varied between about 2.2 and 12 mg/L, it decreased during 2006 to an average of about 6.3 mg/L. Iron remained below the detection limit in the samples from wells MW-1013A and MW-1014.

# 4 Summary

The results from the 2006 monitoring period generally are in agreement with the results from previous years and support the conclusions previously identified. In general the results indicate:

- Complete neutralization of acidity has occurred.
- Concentrations of major ions in the pore water are stable, consistent with previous results;
- Gypsum precipitation and/or dissolution is controlling the concentration of sulfate within most of the backfill.

- Isolated zones exist where the backfill contained less sulfate and gypsum equilibrium conditions were not reached (e.g. around well MW-1014A).
- Porewater in backfill around Well MW-1014C is being flushed with groundwater inflow leading to decreasing sulfate and other solute concentrations.
- Approximately stable redox conditions are observed in some wells (e.g. wells MW-1013C, MW-1014C and MW-1013B) but redox potentials continue to fluctuate in wells MW-1014A and MW-1014B.
- Manganese concentrations are increasing marginally in well MW-1013C, but nearly constant or slightly decreasing in the remaining wells.
- Iron concentrations have increased in well MW-1013C, and decreased in well 1014C, suggesting local variations in redox potential, groundwater flow and siderite precipitation. Iron concentrations are very low and stable in other wells.
- Equilibrium modeling suggest that iron oxy-hydroxides are converting to more stable phases such as goethite or hematite in wells MW-1013B, MW-1014A and MW-1014B, and therefore that soluble iron concentrations are unlikely to increase in the future for these wells.

## 5 Recommendations

The results for a number of the deeper wells within the backfill indicate stable conditions may have been reached at depth in the backfill. However, the shallow wells MW-1013, MW-1013A and MW-1014 have only recently recovered sufficiently to allow sampling and monitoring. Since the results for these shallow wells to date cover only a short period and remain variable over time, no trends in the water quality results can as yet be established. SRK therefore recommends that monitoring of groundwater within and around the backfilled pit should be continued. An annual review of the data should be included in the project's annual report to determine if the conclusions reached in this memorandum remain consistent.

# TABLE 1
## Summary of Routine Pore Water Monitoring Parameters

| Parameter | Units | Quarterly | Annual |
|---|---|---|---|
| Alk | (mg/l) | x | x |
| As | (µg/l) | | x |
| Ba | (µg/l) | | x |
| Cd | (µg/l) | | x |
| Ca | (mg/l) | | x |
| Cl | (mg/l) | | x |
| Cr | (µg/l) | | x |
| Cu | (µg/l) | x | x |
| Hardness | (mg/l) | x | x |
| Fe | (mg/l) | x | x |
| Pb | (µg/l) | | x |
| Mg | (mg/l) | | x |
| Mn | (µg/l) | x | x |
| $CO_2$ | (µg/l) | | |
| Hg | (µg/l) | | x |
| Field pH | (s.u.) | x | x |
| Lab pH | (s.u.) | x | x |
| K | (mg/l) | | x |
| Se | (µg/l) | | x |
| Ag | (µg/l) | | x |
| Na | (mg/l) | | x |
| TDS | (mg/l) | x | x |
| Sulfate | (mg/l) | x | x |
| Zn | (µg/l) | | x |
| Color | (After Filter) | x | x |
| Field Cond | (µmho) | x | x |
| Redox Potential | (mV) | x | x |
| Odor | | x | x |
| Turbidity | (Purging) | x | x |
| Ground Water | El (Feet) | x | x |

Notes: from Table 2 of the October 12, 2000 Foth & Van Dyke memorandum

Prepared by: JTC
Checked by: CL

## TABLE 2
## Estimates of Carbon Dioxide Gas in Equilibrium with July 2006, July 2005, July 2004, July 2003, July 2002, April 2001 and April 2000 Samples

| Well | Sample Date | $H_2CO_3$* (mmol/L) | $K_H$[1] (mol/atm) | $pCO_2$ (atm) | Head on Sample (feet) | $P$[2] (atm) | Mole Fraction $CO_2$ in gas |
|---|---|---|---|---|---|---|---|
| MW-1013 | Jul-06 | 12.9 | -16.9 | 0.20 | 15 | 1.44 | 13.8% |
| MW-1013A | Jul-06 | 3.7 | -16.9 | 0.057 | 22 | 1.65 | 3.5% |
| MW-1013B | Jul-06 | 15.0 | -16.9 | 0.23 | 57 | 2.67 | 8.7% |
| MW-1013C | Jul-06 | 8.9 | -16.9 | 0.14 | 174 | 6.14 | 2.2% |
| MW-1014 | Jul-06 | 2.5 | -16.9 | 0.04 | 13 | 1.37 | 2.8% |
| MW-1014A | Jul-06 | 5.7 | -16.9 | 0.088 | 34 | 1.99 | 4.4% |
| MW-1014B | Jul-06 | 11.2 | -16.9 | 0.17 | 72 | 3.13 | 5.5% |
| MW-1014C | Jul-06 | 4.6 | -16.9 | 0.072 | 120 | 4.55 | 1.6% |
| MW1005P | Jul-06 | 1.1 | -16.9 | 0.016 | 82 | 3.41 | 0.5% |
| MW-1013B | Jul-05 | 20.3 | -16.9 | 0.31 | 57 | 2.69 | 11.7% |
| MW-1013C | Jul-05 | 9.1 | -16.9 | 0.14 | 174 | 6.13 | 2.3% |
| MW-1014A | Jul-05 | 7.3 | -16.9 | 0.11 | 34 | 2.00 | 5.6% |
| MW-1014B | Jul-05 | 16.9 | -16.9 | 0.26 | 72 | 3.14 | 8.3% |
| MW-1014C | Jul-05 | 6.0 | -16.9 | 0.092 | 121 | 4.56 | 2.0% |
| MW-1005P | Jul-05 | 0.9 | -16.9 | 0.014 | 83 | 3.46 | 0.4% |
| MW-1013B | Jul-04 | 10.3 | -16.9 | 0.16 | 58 | 2.72 | 5.9% |
| MW-1013C | Jul-04 | 8.9 | -16.9 | 0.14 | 175 | 6.17 | 2.2% |
| MW-1014A | Jul-04 | 4.7 | -16.9 | 0.07 | 34 | 2.02 | 3.6% |
| MW-1014B | Jul-04 | 15.0 | -16.9 | 0.23 | 74 | 3.18 | 7.3% |
| MW-1014C | Jul-04 | 6.1 | -16.9 | 0.094 | 122 | 4.61 | 2.0% |
| MW-1005P | Jul-04 | 0.7 | -16.9 | 0.010 | 84 | 3.49 | 0.3% |
| MW-1013B | Jul 03 | 9.3 | -16.9 | 0.160 | 58 | 2.62 | 6.1% |
| MW-1013C | Jul 03 | 5.9 | -16.9 | 0.138 | 175 | 6.01 | 2.3% |
| MW-1014A | Jul 03 | 4.1 | -16.9 | 0.073 | 29 | 1.85 | 4.0% |
| MW-1014B | Jul 03 | 10.7 | -16.9 | 0.232 | 73 | 3.06 | 7.6% |
| MW-1014C | Jul 03 | 5.0 | -16.9 | 0.094 | 122 | 4.63 | 2.0% |
| MW-1005P | Jul 03 | 0.5 | -16.9 | 0.010 | 86 | 3.36 | 0.3% |
| MW-1013B | Jul 02 | 6.5 | -16.9 | 0.105 | 58 | 2.62 | 4.0% |
| MW-1013C | Jul 02 | 4.9 | -16.9 | 0.079 | 175 | 6.01 | 1.3% |
| MW-1014A | Jul 02 | 3.5 | -16.9 | 0.056 | 29 | 1.85 | 3.0% |
| MW-1014B | Jul 02 | 6.4 | -16.9 | 0.104 | 73 | 3.06 | 3.4% |
| MW-1014C | Jul 02 | 3.3 | -16.9 | 0.053 | 122 | 4.63 | 1.1% |
| MW-1005P | Jul 02 | 0.6 | -16.9 | 0.010 | 86 | 3.36 | 0.3% |
| MW-1013B | Apr-01 | 9.3 | -16.9 | 0.144 | 55 | 2.62 | 5.5% |
| MW-1013C | Apr-01 | 5.9 | -16.9 | 0.092 | 170 | 6.01 | 1.5% |
| MW-1014A | Apr-01 | 4.1 | -16.9 | 0.063 | 29 | 1.85 | 3.4% |
| MW-1014B | Apr-01 | 10.7 | -16.9 | 0.165 | 70 | 3.06 | 5.4% |
| MW-1014C | Apr-01 | 5.0 | -16.9 | 0.077 | 123 | 4.63 | 1.7% |
| MW-1005P | Apr-01 | 0.5 | -16.9 | 0.008 | 80 | 3.36 | 0.3% |
| MW-1013B | Apr-00 | 7.7 | -17.8 | 0.138 | 55 | 2.62 | 5.2% |
| MW-1013C | Apr-00 | 5.6 | -17.8 | 0.100 | 171 | 6.04 | 1.7% |
| MW-1014A | Apr-00 | 2.9 | -19.2 | 0.055 | 28 | 1.83 | 3.0% |
| MW-1014B | Apr-00 | 10 | -20.5 | 0.211 | 68 | 3.01 | 7.0% |
| MW-1014C | Apr-00 | 3.6 | -19.7 | 0.071 | 116 | 4.42 | 1.6% |
| MW-1005P | Apr-00 | 0.8 | -16.2 | 0.013 | 83 | 3.45 | 0.4% |

Notes:
$H_2CO_3* = CO_2(aq) + H_2CO_3$
1 Corrected for sample temperature.
2 Absolute pressure at sample depth.

Prepared by: JTC
Checked by: CL

# TABLE 3
## Summary of PHREEQ-C Runs to Check Saturation of Calcite and Gypsum

| Date | Sample Data Set | Conditions | | | Saturation Index | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | T (°C) | pH | pE | Calcite/ Aragonite | Gypsum | $Fe(OH)_3$ (am) | Siderite | Rhodocrosite |
| Jul 2006 | MW-1013 | | 6.4 | 2.9 | -0.36 / -0.51 | -1.69 | -0.74 | 0.07 | 1.13 |
| Jul 2006 | MW-1013A | 13.2 | 6.7 | 2.7 | -0.39 / -0.54 | -1.17 | -1.03 | -0.8 | 0.18 |
| Jul 2006 | MW-1013B | 13.6 | 6.4 | 4.2 | 0.00 / -0.15 | -0.04 | -0.72 | -1.12 | 1.2 |
| Jul 2006 | MW-1013C | 14.7 | 6.7 | 0.9 | 0.25 / 0.10 | -0.05 | -1.69 | 0.05 | 0.92 |
| Jul 2006 | MW1014 | 12.1 | 6.6 | 2.9 | -0.89 / -1.04 | -1.32 | -1.02 | -1.11 | -0.37 |
| Jul 2006 | MW-1014A | 12.8 | 6.7 | 3.2 | -0.05 / -0.20 | -0.38 | -0.8 | -0.88 | 0.03 |
| Jul 2006 | MW-1014B | 13.7 | 6.4 | 3.8 | -0.10 / -0.25 | -0.16 | -0.97 | -1.09 | 0.75 |
| Jul 2006 | MW-1014C | 13.0 | 6.6 | 1.1 | -0.31 / -0.46 | -1.01 | -1.63 | 0.39 | 0.18 |
| Jul 2006 | MW-1005P | 14.7 | 7.1 | 0.02 | -0.35 / -0.50 | -3.3 | -2.1 | -0.12 | -0.7 |
| Jul 2005 | MW-1013B | 15.8 | 6.4 | 4.0 | 0.04 / -0.11 | 0.01 | -0.76 | -1.11 | 1.24 |
| Jul 2005 | MW-1013C | 14.1 | 6.6 | 0.3 | 0.08 / -0.07 | -0.01 | -2.47 | 0.4 | 0.79 |
| Jul 2005 | MW-1014A | 14.1 | 6.8 | 4.7 | 0.11 / -0.05 | -0.35 | 1.18 | -0.76 | 0.16 |
| Jul 2005 | MW-1014B | 15.0 | 6.5 | 5.2 | 0.05 / -0.10 | -0.06 | 0.77 | -1.05 | 0.95 |
| Jul 2005 | MW-1014C | 15.0 | 6.9 | 1.0 | -0.04 / -0.19 | -0.90 | -0.76 | 0.69 | 0.46 |
| Jul 2005 | MW-1005P | 13.3 | 7.4 | -0.02 | -0.08 / -0.23 | -3.23 | -1.8 | -0.47 | -0.53 |
| Jul 2004 | MW-1013B | 13.3 | 6.3 | 3.2 | -0.06 / -0.21 | -0.03 | -1.77 | -1.18 | 0.96 |
| Jul 2004 | MW-1013C | 14.9 | 6.5 | 0.8 | 0.09 / -0.06 | -0.11 | -2.35 | 0.35 | 0.76 |
| Jul 2004 | MW-1014A | 17.1 | 6.7 | 2.9 | 0.04 / -0.11 | -0.39 | -0.80 | -0.69 | 0.27 |
| Jul 2004 | MW-1014B | 14.3 | 6.4 | 3.2 | -0.11 / -0.26 | -0.15 | -1.52 | -1.15 | 0.79 |
| Jul 2004 | MW-1014C | 15.5 | 6.6 | 0.5 | -0.32 / -0.47 | -0.92 | -2.13 | 0.42 | 0.20 |
| Jul 2004 | MW-1005P | 11.4 | 7.2 | -0.1 | -0.25 / -0.40 | -3.25 | -2.11 | -0.21 | -0.63 |
| Jul 2003 | MW-1013B | 14.9 | 6.8 | 3.5 | 0.49 / 0.34 | -0.02 | 0.18 | -0.40 | 1.67 |
| Jul 2003 | MW-1013C | 14.6 | 6.5 | 0.5 | 0.06 / -0.09 | -0.03 | -2.90 | 0.07 | 0.71 |
| Jul 2003 | MW-1014A | 12.0 | 6.6 | 3.5 | -0.10 / -0.26 | -0.34 | -0.46 | -0.75 | 0.53 |
| Jul 2003 | MW-1014B | 12.6 | 6.2 | 4.2 | -0.30 / -0.45 | -0.11 | -1.23 | -1.40 | 0.63 |
| Jul 2003 | MW-1014C | 13.0 | 6.6 | 0.7 | -0.26 / -0.41 | -0.83 | -1.94 | 0.48 | 0.25 |
| Jul 2003 | MW-1005P | 13.4 | 7.0 | -0.1 | -0.41 / -0.56 | -3.25 | -2.24 | 0.02 | -0.88 |
| Jul 2002 | MW-1013B | 16.1 | 6.4 | 3.5 | 0.14 / -0.01 | -0.08 | -1.00 | -0.70 | 1.32 |
| Jul 2002 | MW-1013C | 16.5 | 6.4 | 0.9 | 0.05 / -0.10 | -0.08 | -2.68 | 0.04 | 0.71 |
| Jul 2002 | MW-1014A | 15.1 | 6.5 | 3.1 | -0.07 / -0.22 | -0.37 | -1.20 | -0.86 | 0.60 |
| Jul 2002 | MW-1014B | 14.1 | 6.3 | 4.3 | -0.16 / -0.31 | -0.10 | -1.27 | -1.59 | 0.80 |
| Jul 2002 | MW-1014C | 17.2 | 6.6 | 0.8 | -0.17 / -0.32 | -0.84 | -1.71 | 0.61 | 0.34 |
| Jul 2002 | MW-1005P | 13.6 | 7.2 | 0.5 | -0.23 / -0.38 | -2.97 | -2.12 | -0.74 | -0.71 |
| Oct 2001 | MW-1013B | 14.4 | 6.1 | 3.4 | -0.30 / -0.45 | -0.04 | -1.99 | -1.10 | 0.90 |
| Oct 2001 | MW-1013C | 12.6 | 6.2 | 0.4 | -0.33 / -0.48 | -0.05 | -4.11 | -0.47 | 0.32 |
| Oct 2001 | MW-1014A | 14.3 | 6.3 | 2.6 | -0.38 / -0.53 | -0.36 | -1.76 | -0.56 | 0.33 |
| Oct 2001 | MW-1014B | 13.4 | 6.1 | 3.7 | -0.40 / -0.55 | -0.08 | -2.35 | -1.78 | 0.59 |
| Oct 2001 | MW-1014C | 12.2 | 6.2 | 0.9 | -0.68 / -0.83 | -0.75 | -2.91 | 0.13 | -0.10 |
| Jul 2001 | MW-1005P[5] | 9.9 | 6.6 | 0.1 | -0.86 / -1.01 | -2.98 | -3.52 | -0.59 | -1.28 |
| April 2000 | MW-1013B[1] | 8.7 | 6.63 | 4.1 | 0.24 / 0.08 | -0.03 | -0.23 | -1.01 | 1.36 |
| April 2000 | MW-1013C[2] | 8.5 | 6.73 | 3.1 | 0.15 / 0.00 | -0.01 | -0.08 | -0.25 | 0.73 |
| April 2000 | MW-1014A | 11.2 | 6.87 | 2.9 | 0.13 / -0.02 | -0.36 | -0.23 | -0.49 | 0.91 |
| April 2000 | MW-1014B[3] | 14.2 | 6.43 | 5.1 | -0.02 / -0.17 | -0.07 | -0.34 | -1.16 | 0.99 |
| April 2000 | MW-1014C | 11.9 | 6.65 | 1.6 | -0.02 / 0.17 | -0.64 | -0.82 | 0.76 | 0.49 |
| April 2000[4] | MW-1005P[4] | 15.9 | 6.91 | 1.1 | -0.37 / -0.52 | -2.83 | -2.66 | -1.24 | -1.00 |

Notes:
1. April 2000 data with sulfate adjusted upwards to 1500 mg/L to improve ion balance.
2. April 2000 data with calcium adjusted upwards to 290 mg/L to improve ion balance.
3. In the April 2000 data, the iron detection limit was anomalously high (0.15 mg/L). In the PHREEQ runs, the iron concentration was set to 0.06 mg/L, as measured in other samples from this well.
4. Combination of analytical data from the July 1999 sample with Eh and alkalinity data from the April 2000 sample.
5. July 2001 data.

Prepared by: JTC
Checked by: CL

# Table 4
## Summary of Annual Average Concentrations

| | Dissolved Manganese (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** |
| MW-1005P | 47 | 60 | 46 | 44 | 77 | 61 | 58 | 60 |
| MW-1013 | - | - | - | - | - | - | - | 21,200 |
| MW-1013A | - | - | - | - | - | - | - | 2,725 |
| MW-1013B | 28,000 | 32,750 | 36,000 | 36,250 | 36,125 | 32,500 | 30,125 | 26,500 |
| MW-1013C | 7,450 | 7,925 | 8,600 | 9,233 | 9,625 | 9,738 | 10,375 | 10,375 |
| MW-1014 | - | - | - | - | - | - | - | 1,030 |
| MW-1014A | - | 7,000 | 6,150 | 5,900 | 4,275 | 2,670 | 1,725 | 1,455 |
| MW-1014B | 23,000 | 21,000 | 18,750 | 17,750 | 17,750 | 15,967 | 16,000 | 13,750 |
| MW-1014C | 4,200 | 3,375 | 2,975 | 2,625 | 2,425 | 2,244 | 2,175 | 1,975 |

| | Dissolved Iron (mg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** |
| MW-1005P | 0.28 | 0.17 | 0.1 | 0.13 | 0.84 | 0.35 | 0.29 | 0.33 |
| MW-1013 | - | - | - | - | - | - | - | 6.3 |
| MW-1013A | - | - | - | - | - | - | - | < 0.33 |
| MW-1013B | 0.33 | 0.47 | 0.67 | 0.48 | 0.6 | < 0.64 | < 0.33 | < 0.33 |
| MW-1013C | 1.1 | 1.7 | 2.7 | 4.2 | 5.1 | 6.6 | 8.1 | 8.2 |
| MW-1014 | - | - | - | - | - | - | - | < 0.33 |
| MW-1014A | - | 0.9 | 0.93 | 0.53 | 0.62 | 0.42 | < 0.33 | < 0.33 |
| MW-1014B | 0.04 | 0.23 | 0.2 | 0.15 | 0.26 | < 0.28 | < 0.33 | < 0.33 |
| MW-1014C | 14.3 | 12.5 | 10.9 | 9.2 | 8.1 | 7.1 | 6.8 | 6.1 |

Prepared by: JTC
Checked by: CL

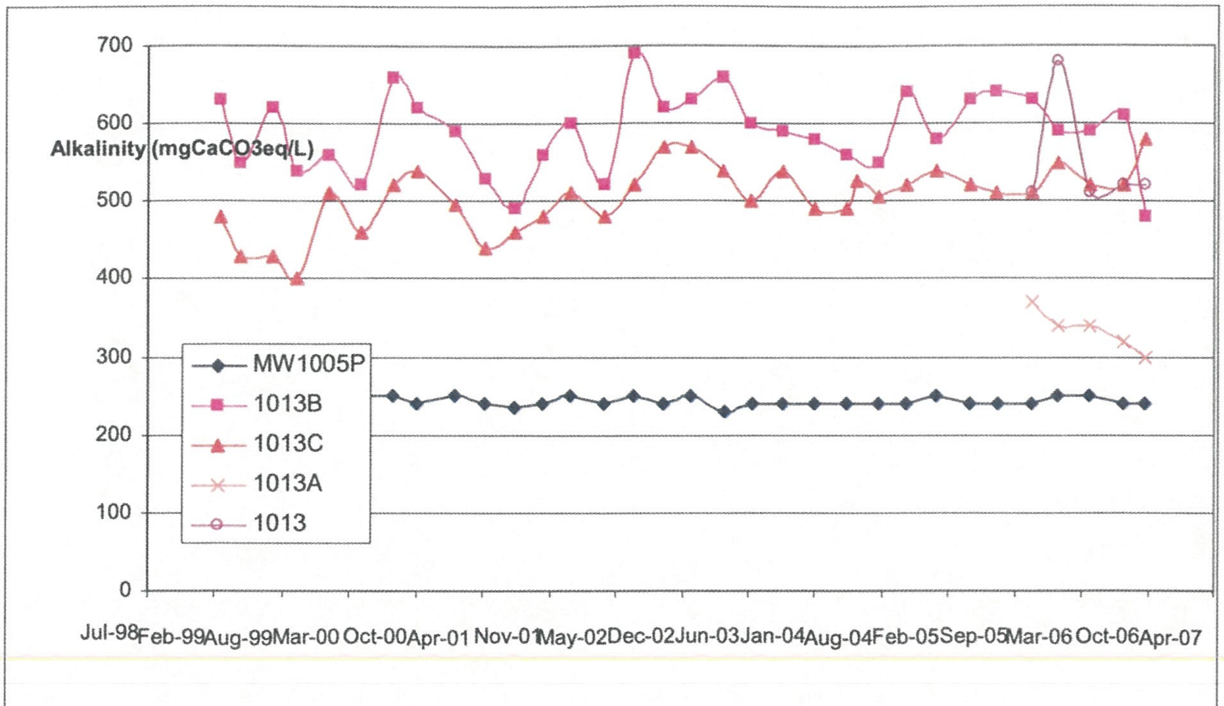


**Figure 1. Dissolved Alkalinity in MW-1013 Well Nest**

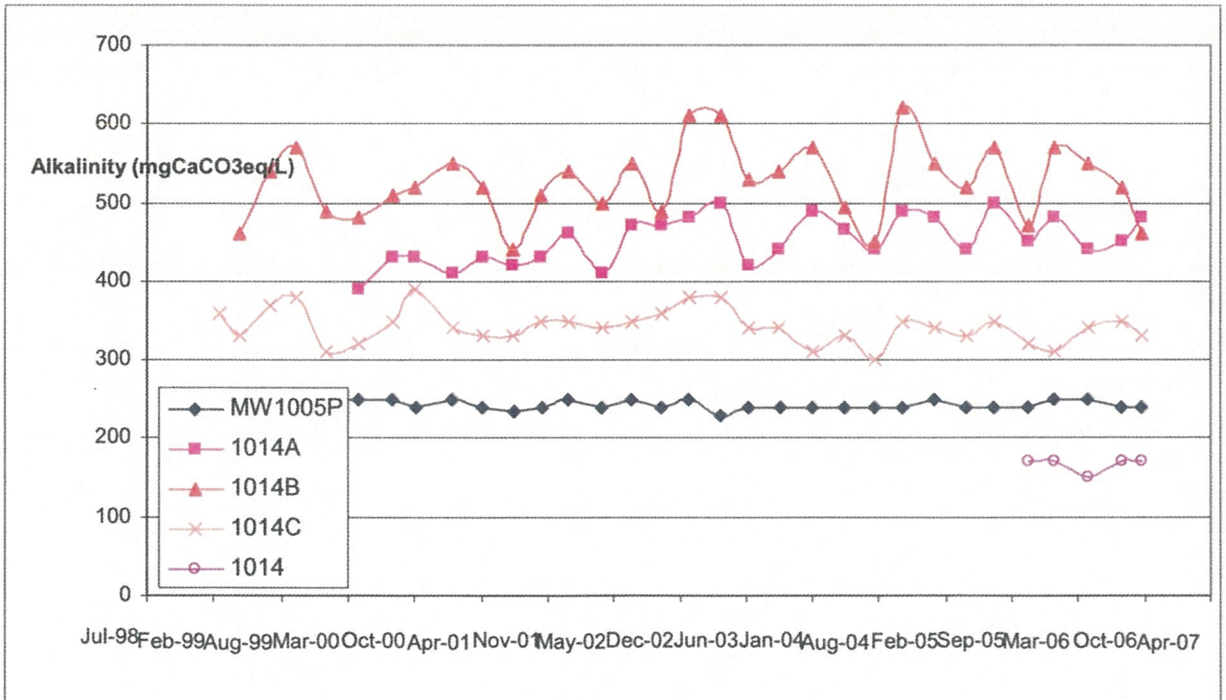


**Figure 2. Dissolved Alkalinity in MW-1014 Well Nest**

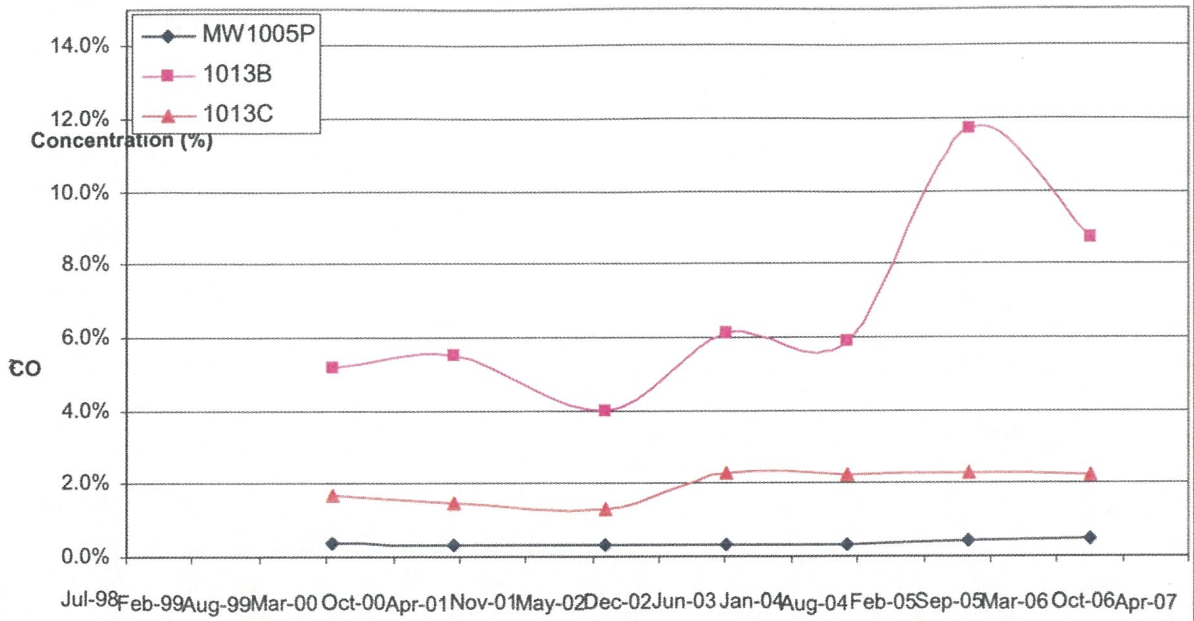


**Figure 3. Estimated Carbon Dioxide in MW-1013B and C**

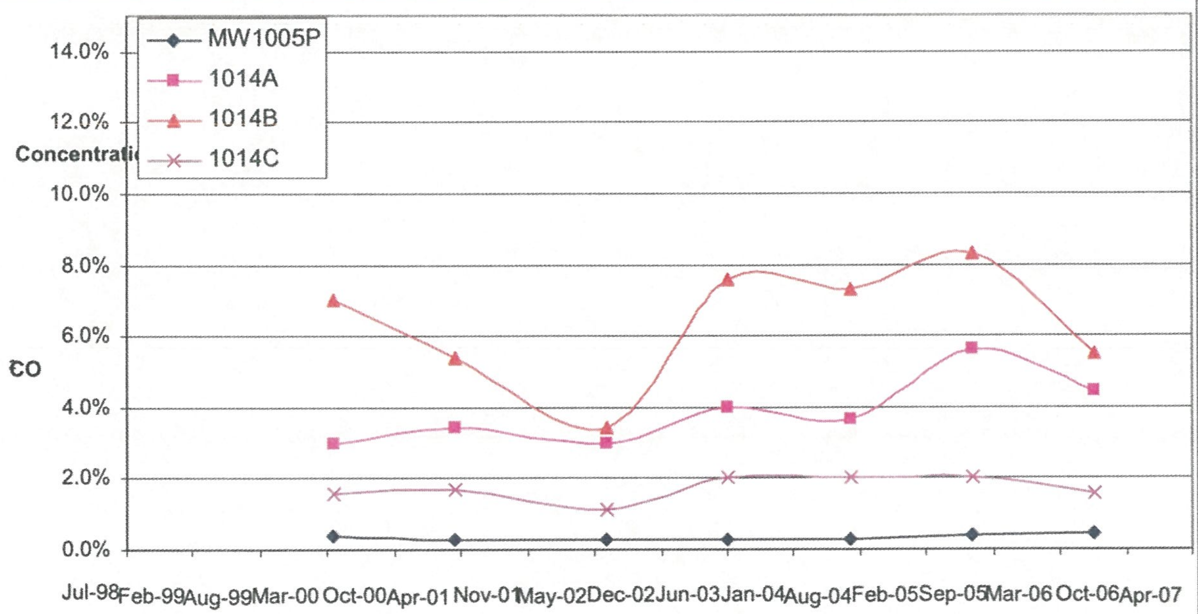


**Figure 4. Estimated Carbon Dioxide in MW-1014A, B and C**

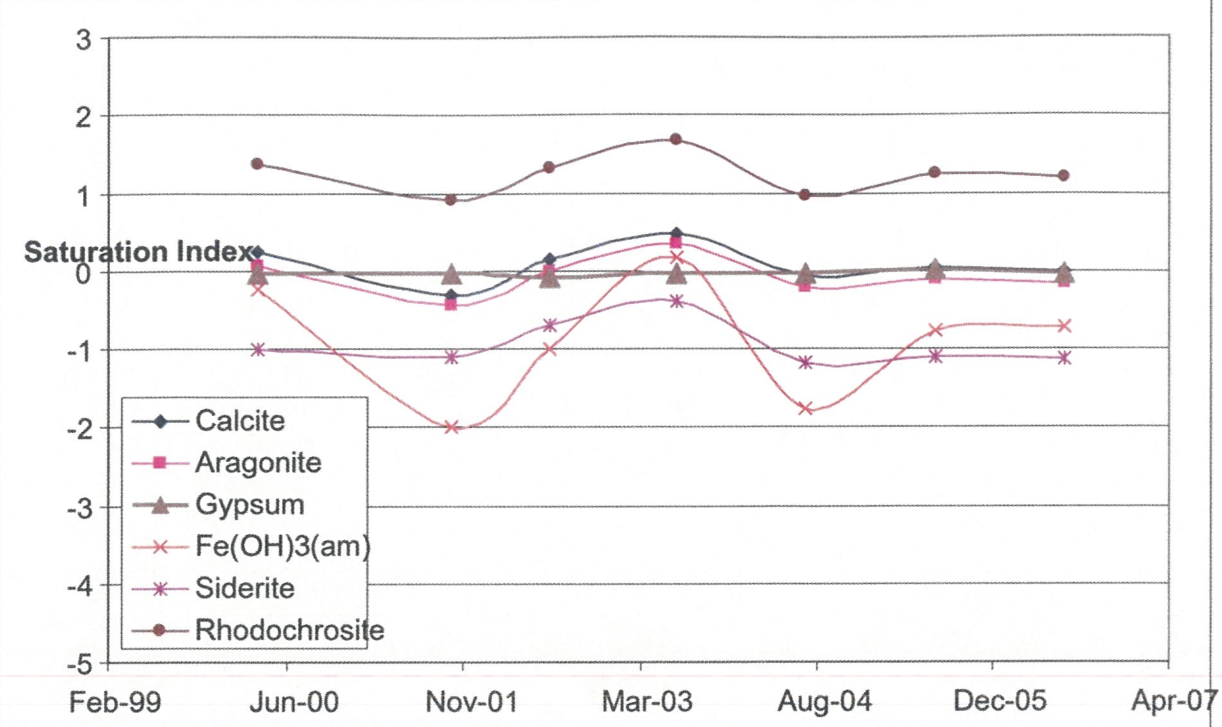


**Figure 5. Saturation Indices Calculated for MW1013B**

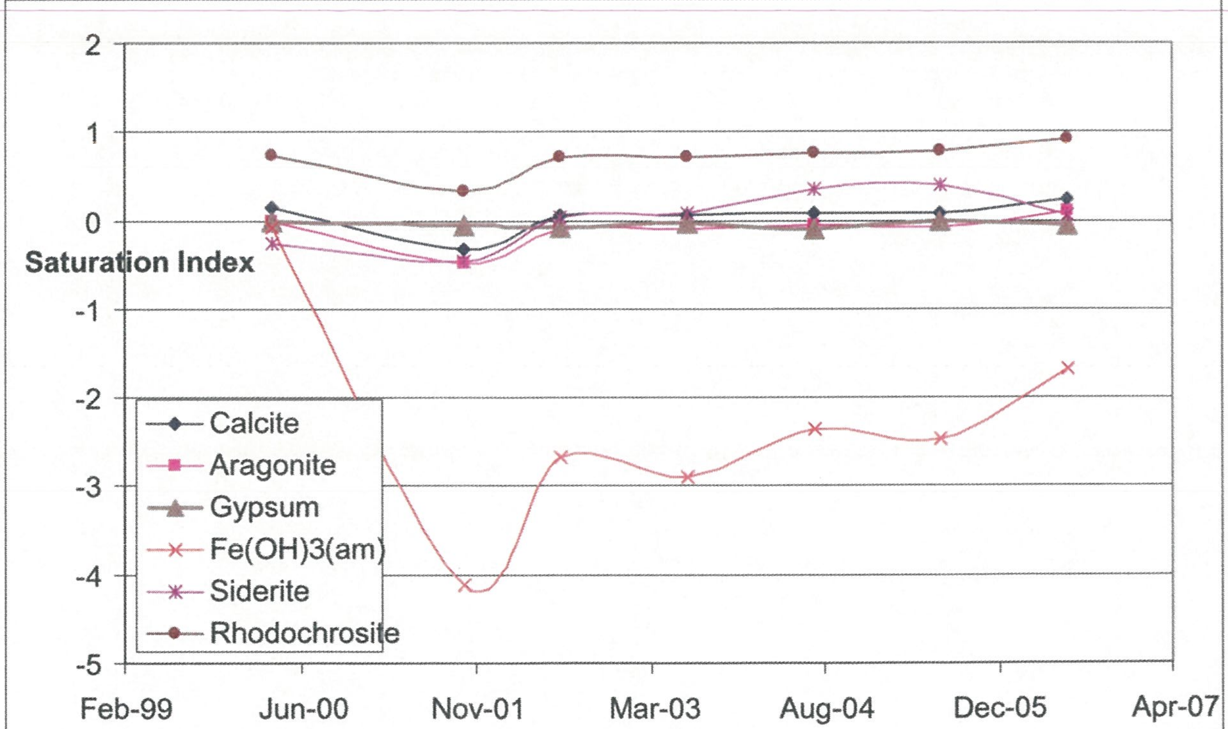


**Figure 6. Saturation Indices Calculated for MW1013C**

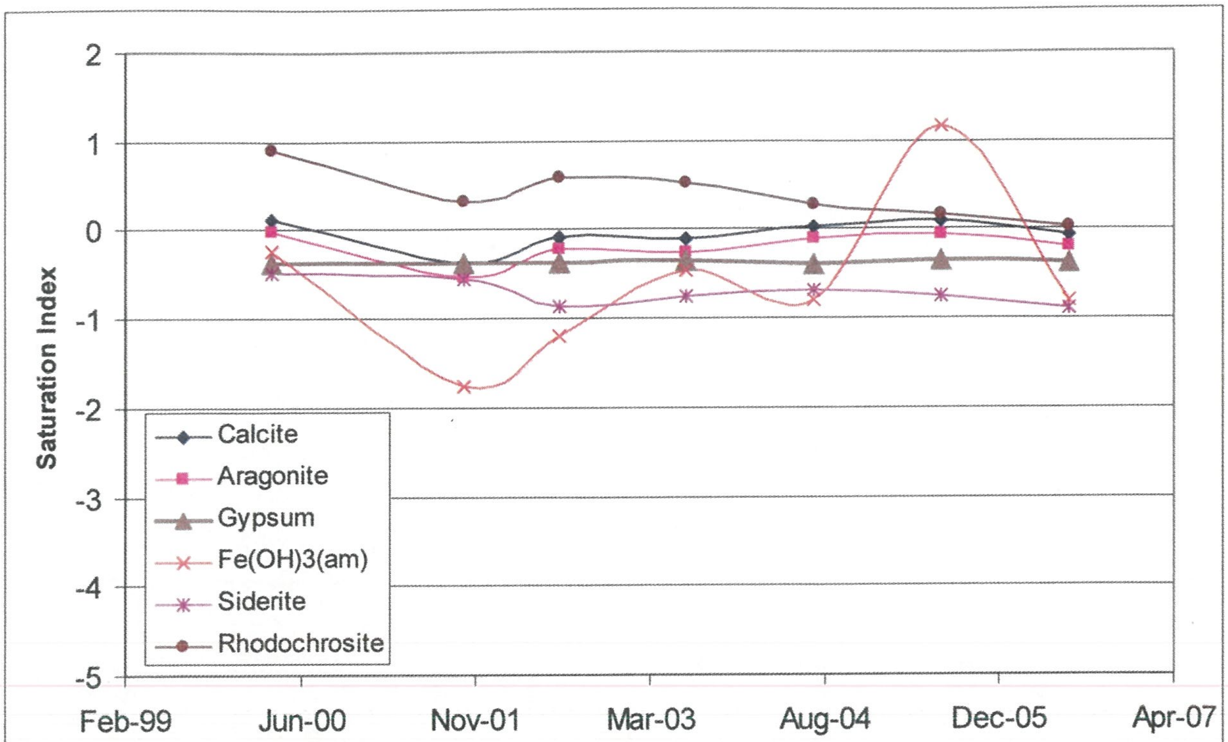


**Figure 7. Saturation Indices Calculated for MW1014A**

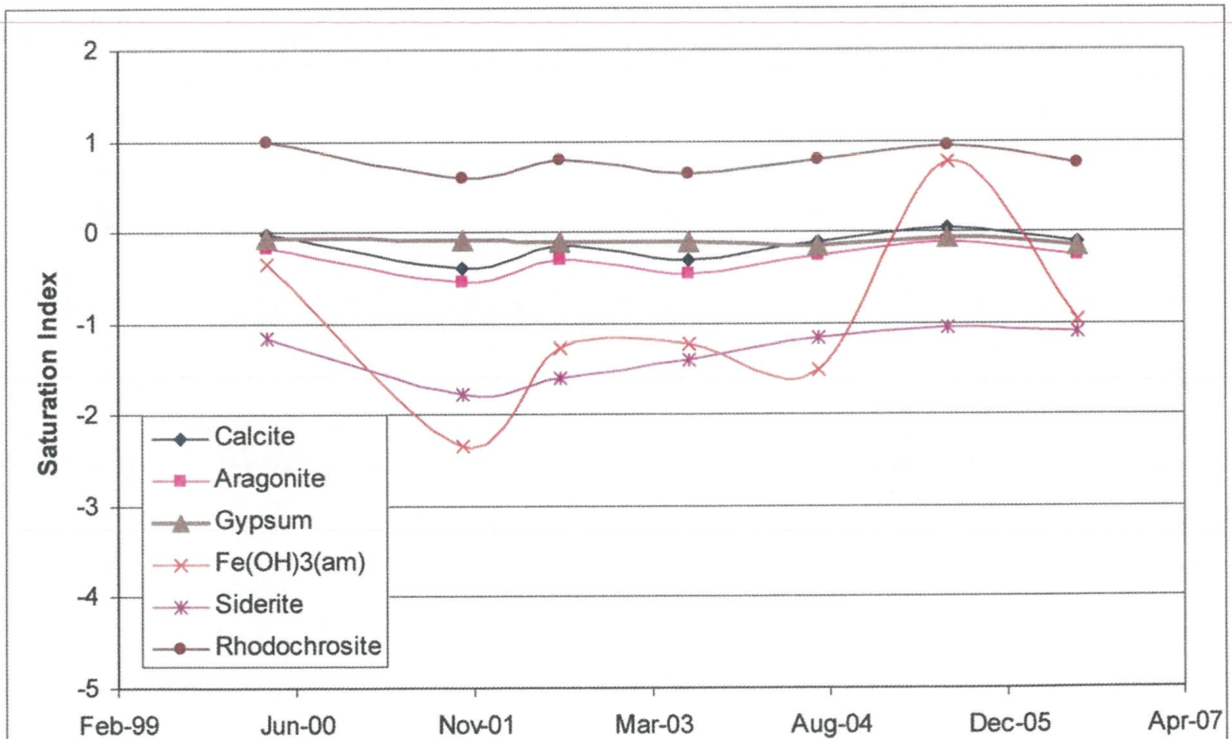


**Figure 8. Saturation Indices Calculated for MW1014B**

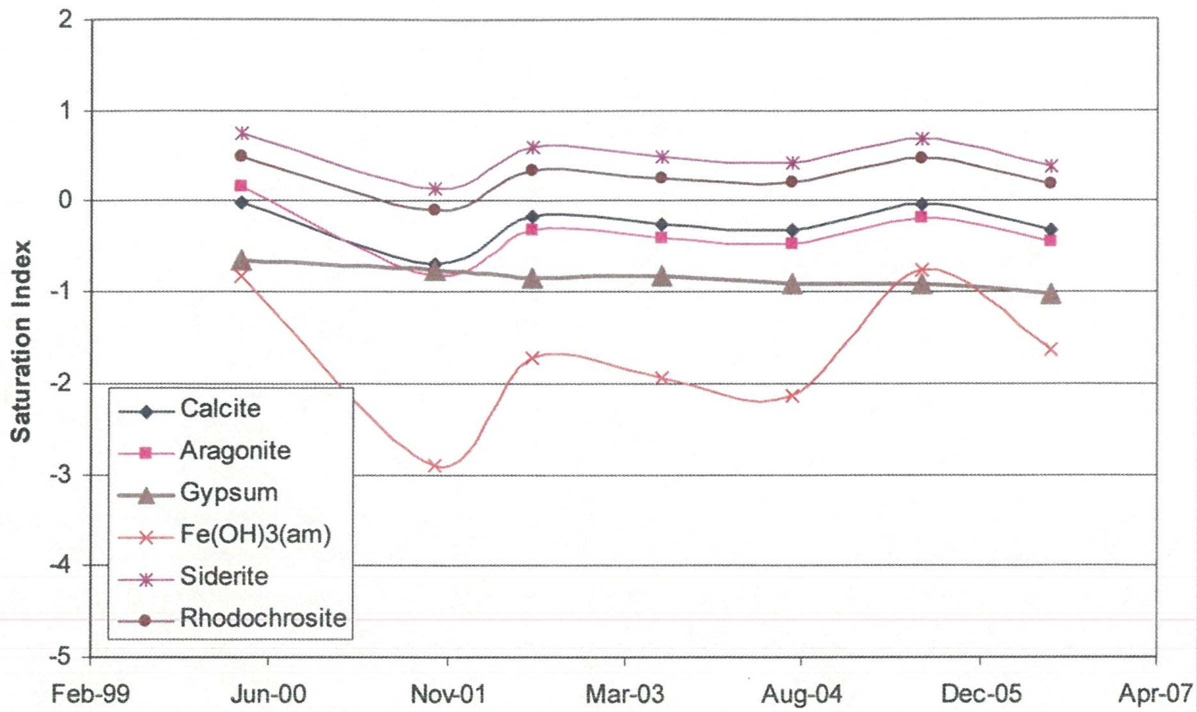


**Figure 9. Saturation Indices Calculated for MW1014C**

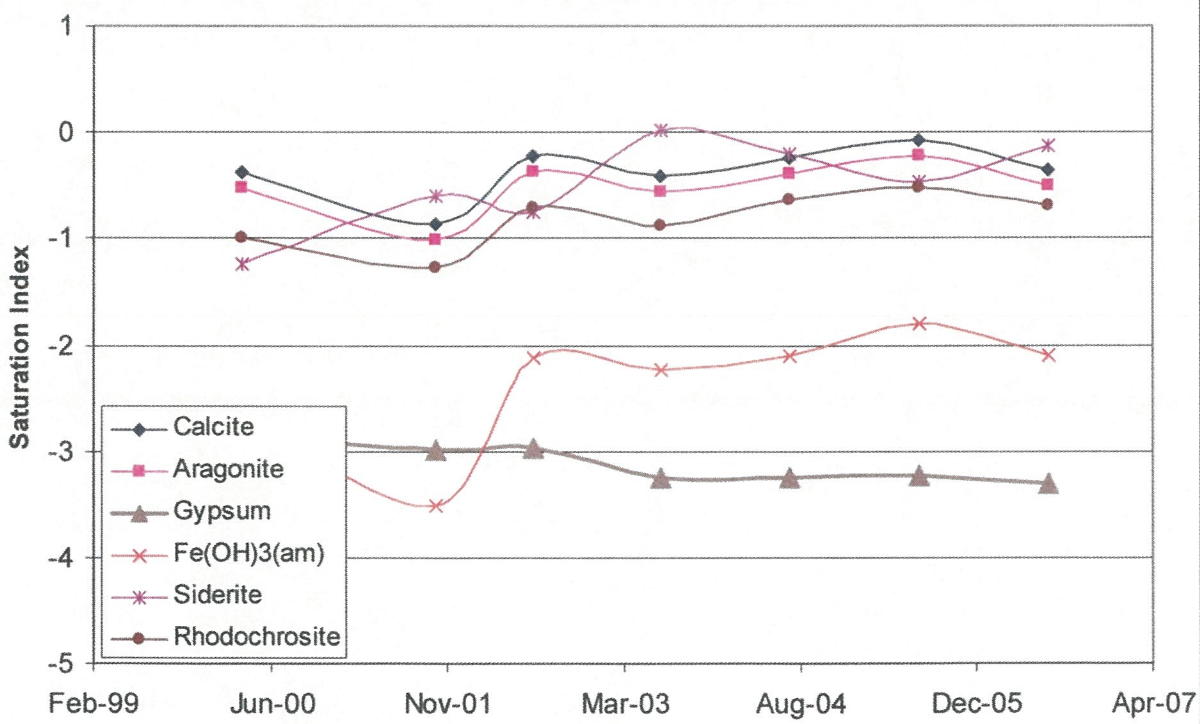


**Figure 10. Saturation Indices Calculated for MW1005P**

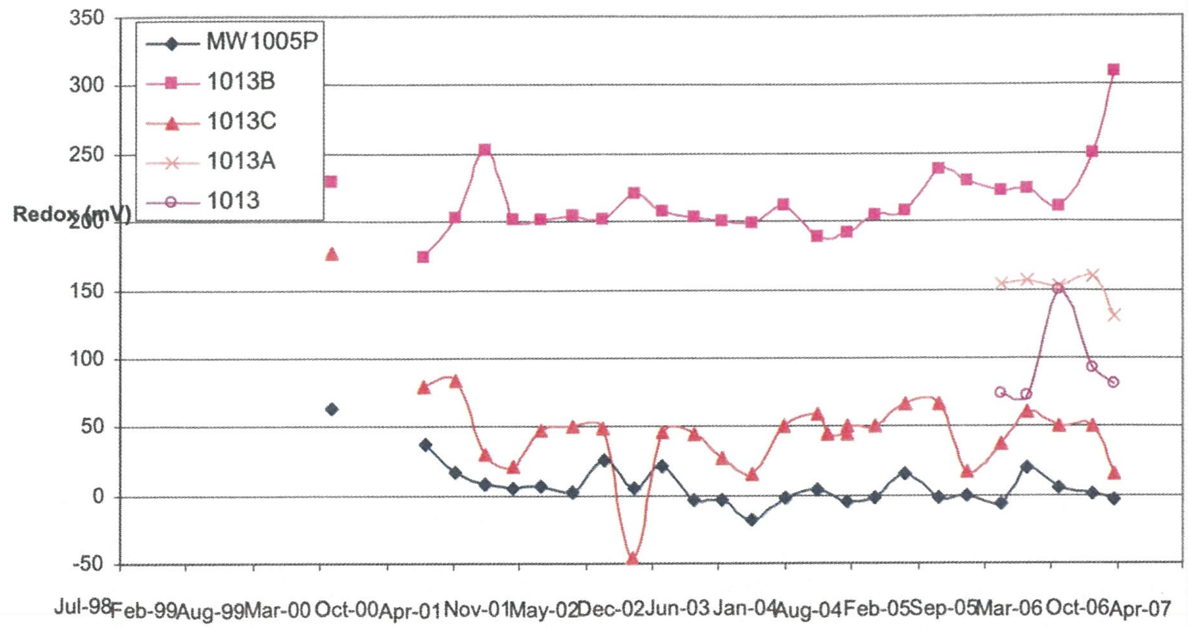


**Figure 11. Redox Measured in MW-1013 Well Nest**

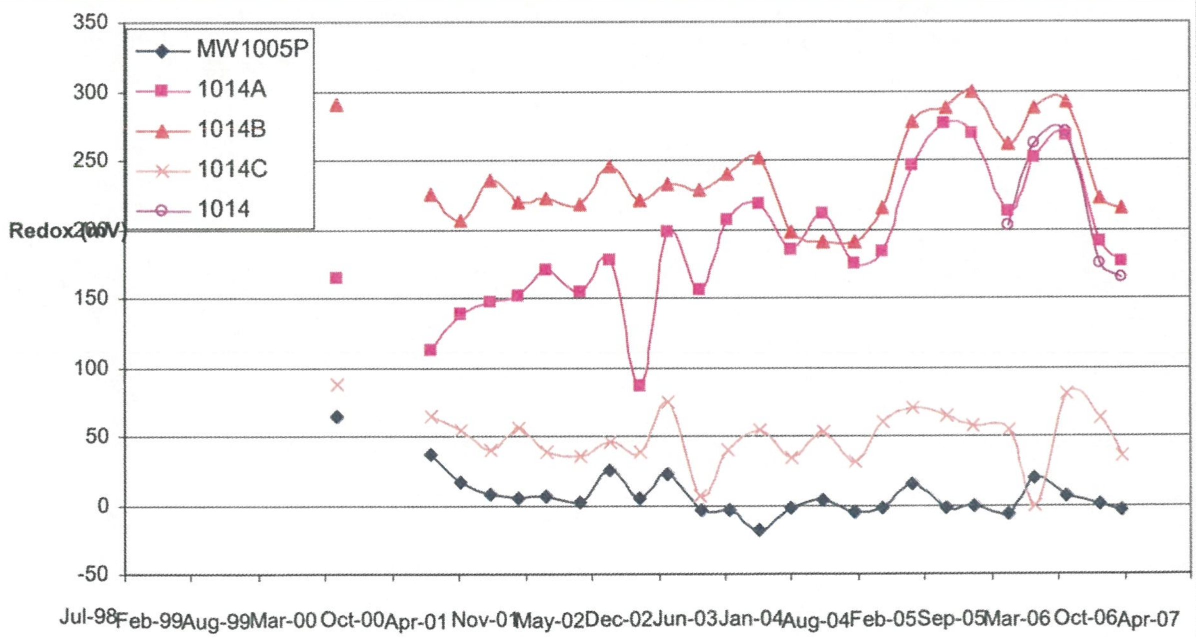


**Figure 12. Redox Measured in MW-1014 Well Nest**

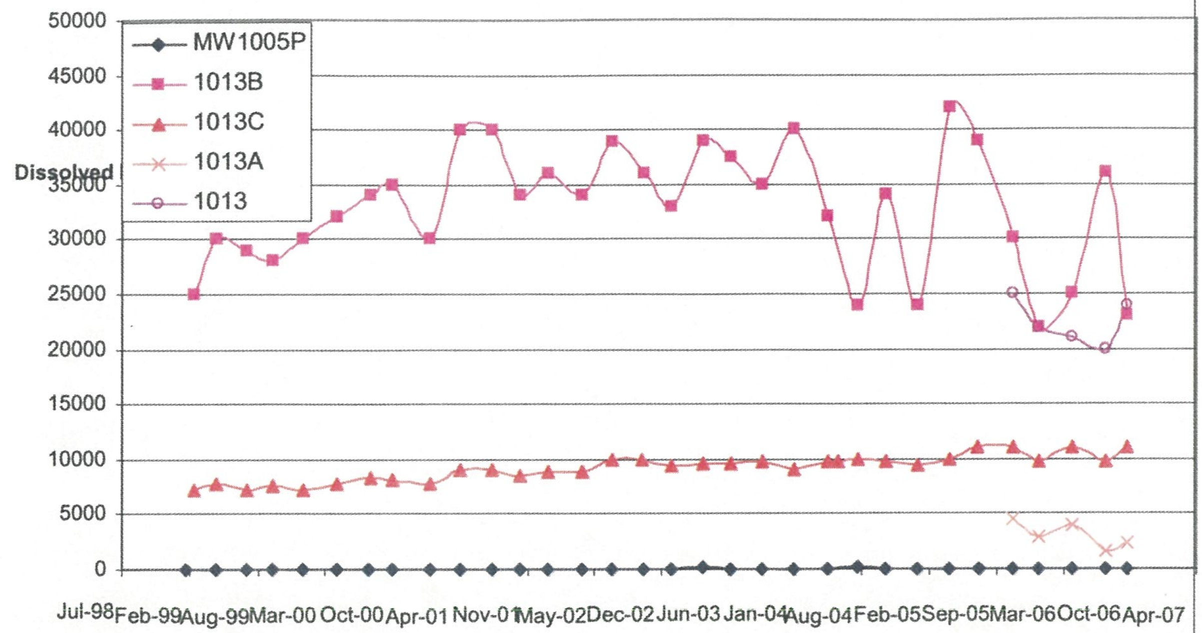


**Figure 13. Dissolved Manganese in MW-1013 Well Nest**

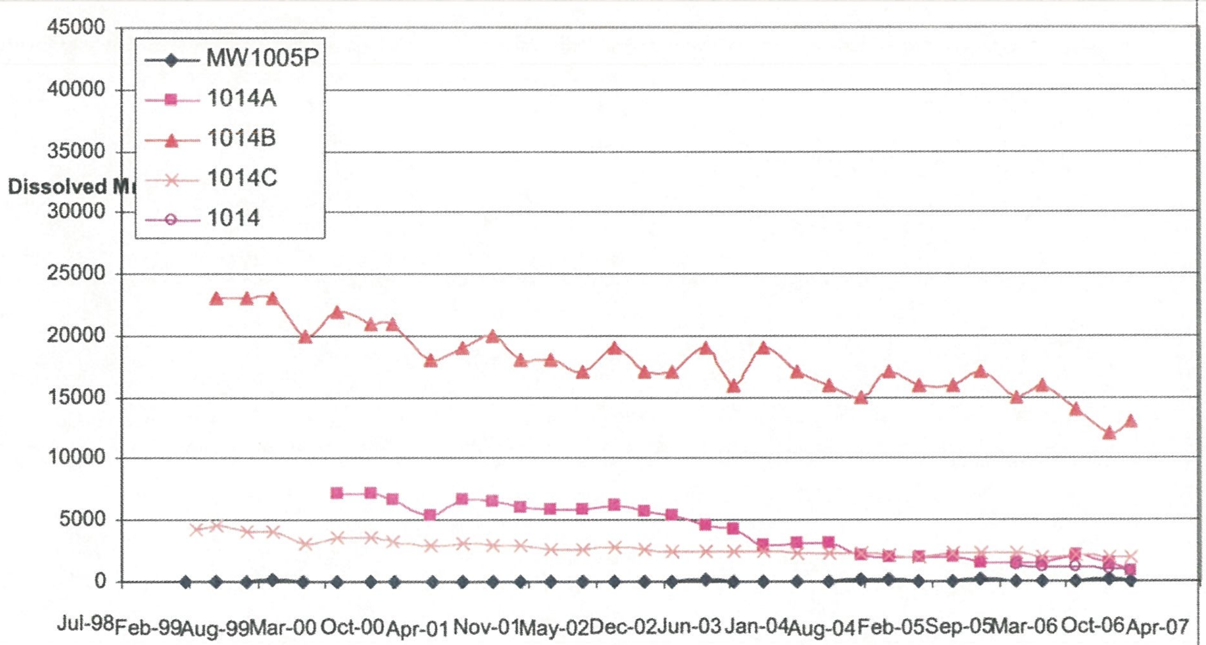


**Figure 14. Dissolved Manganese in MW-1014 Well Nest**

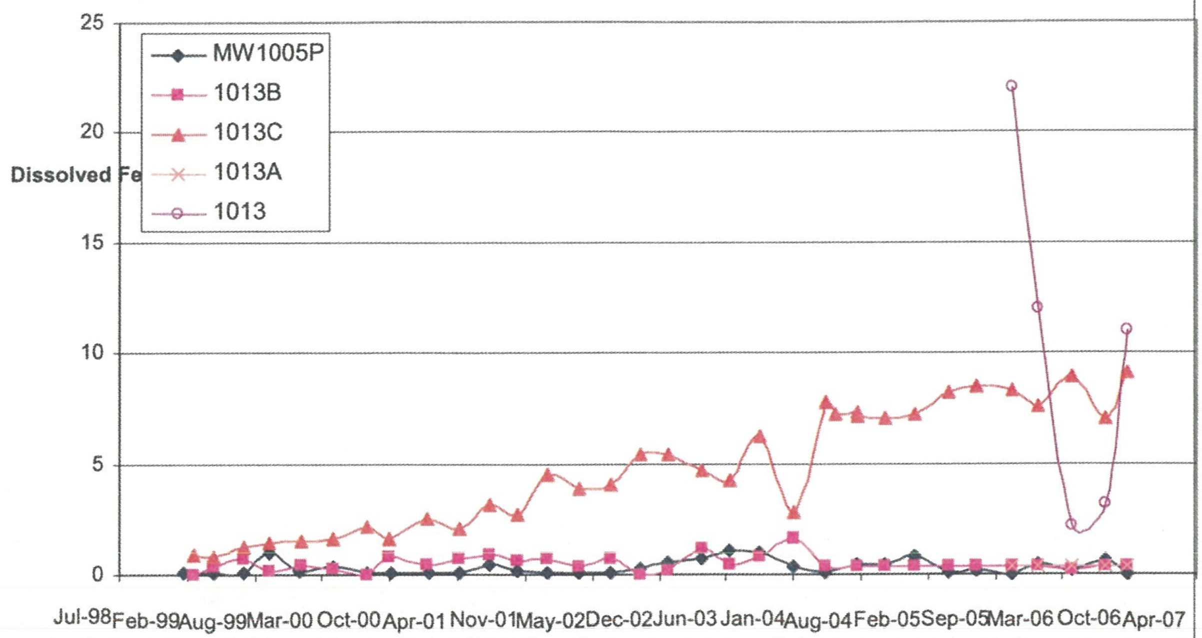


**Figure 15. Dissolved Iron in MW-1013 Well Nest**

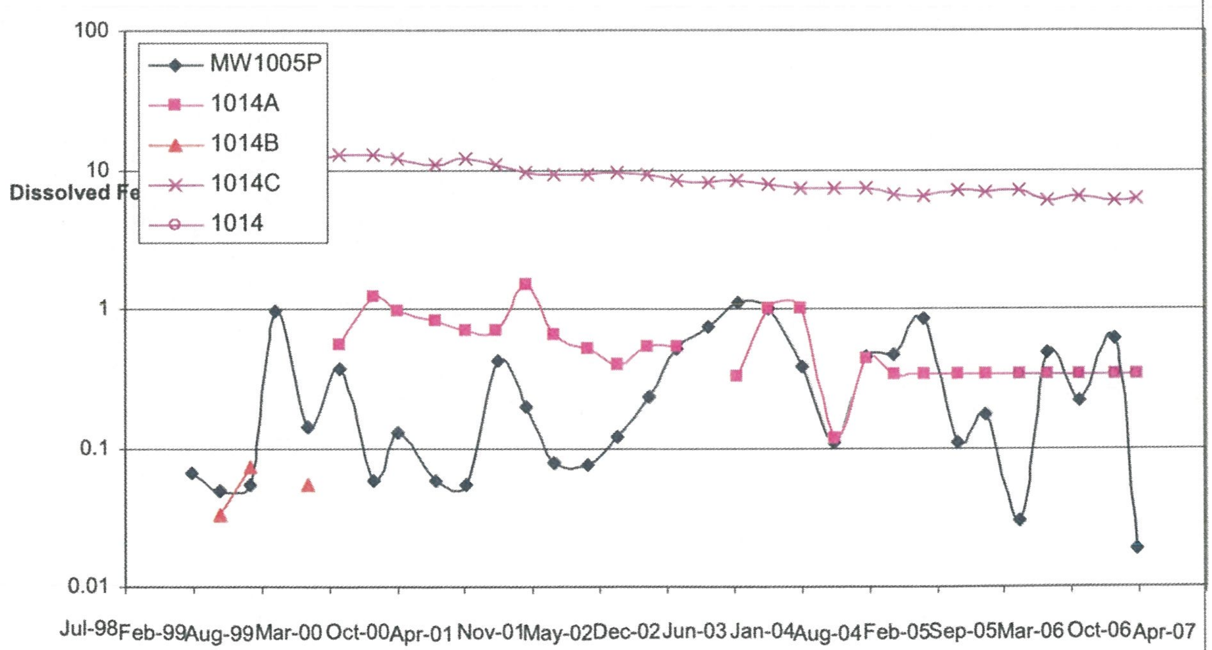


**Figure 16. Dissolved Iron in MW-1014 Well Nest**

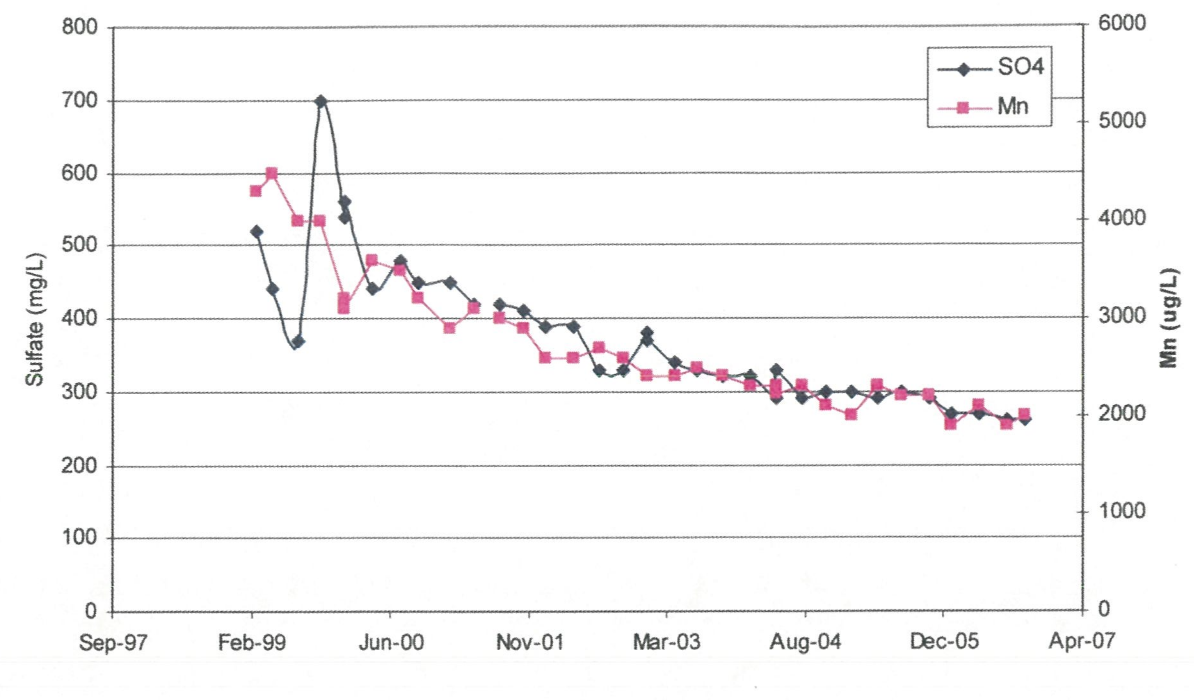


**Figure 17. Comparison of Sulfate and Manganese Decrease in Well MW-1014C**

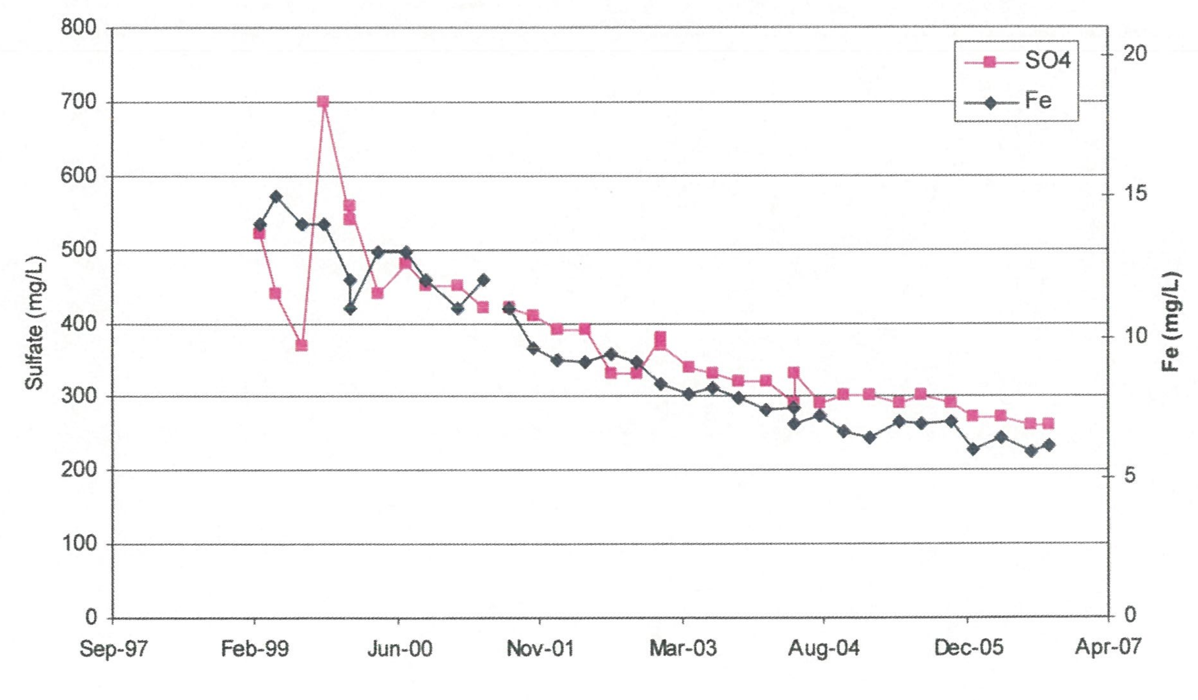


**Figure 18. Comparison of Sulfate and Iron Decrease in Well MW-1014C**

# ATTACHMENT 1
# MONITORING RESULTS

MW1004S

| Well MW-1004S Original Well Depth: 38.02' 1998 Adj. Depth: 27.0' | | Alk | As | Ba | Cd | Ca | Cl | Cr | Cu | Hard | Fe | Pb | Mg | Mn | Hg | Ni | Field pH | Lab pH | K | Se | Ag | Na | TDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (mg/l) | (ug/l) | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (ug/l) | (mg/l) | (ug/l) | (ug/l) | (ug/l) | (s.u.) | (s.u.) | | (ug/l) | (ug/l) | (mg/l) | (mg/l) |
| Permit Standard | | | 50 | 1000 | 10 | | 250 | 50 | 1000 | | 0.30 | 50 | | 360 | 2 | | | | | 10 | 50 | | 500 |
| ACL | | No ACLs for this well. | | | | | | | | | | | | | | | | | | | | | |
| Apr-91 | | | | | | | | | | | | | | | | | | | | | | | |
| Jul-91 | | 50 | | | | | | | <14 | 60 | <0.055 | | | <4.0 | | | | 6.7 | | | | | 160 |
| Oct-91 | | 49 | | | | | | | <14 | 60 | <0.055 | | | <4.0 | | | | 6.9 | | | | | 170 |
| Jan-92 | | 27 | | | | | | | <14 | 62 | <0.055 | | | <4.0 | | | | 6.5 | | | | | 95 |
| Apr-92 | | 60 | | | | | | | <14 | 72 | <0.055 | | | <4.0 | | | | 7.2 | | | | | 100 |
| Jul-92 | | 74 | | | | | | | <14 | 150 | <0.055 | | | <4.0 | | | | 6.8 | | | | | 110 |
| Oct-92 | | 100 | | | | | | | <14 | 110 | <0.055 | | | <4.0 | | | | 7.0 | | | | | 220 |
| Jan-93 | | 73 | | | | | | | <14 | 92 | <0.055 | | | <4.0 | | | | 6.5 | | | | | 95 |
| Apr-93 | | 51 | | | | | | | <10 | 70 | <0.010 | | | <4.0 | | | | 6.0 | | | | | 120 |
| Jul-93 | | 24 | | | | | | | <12 | 56 | <0.015 | | | <4.0 | | | | 6.0 | | | | | 110 |
| Oct-93 | | 32 | | | | | | | <12 | 46 | <0.015 | | | <4.0 | | | 7.4 | 6.4 | | | | | 98 |
| Jan-94 | | 42 | | | | | | | 16 | 44 | <0.015 | | | <4 | | | 7.0 | 6.4 | | | | | 74 |
| Apr-94 | | 38 | | | | | | | <12 | 51 | <0.015 | | | <4 | | | 7.8 | 6.4 | | | | | 100 |
| Jul-94 | | 140 | | | | | | | <12 | 52 | <0.015 | | | <4 | | | 6.8 | 6.3 | | | | | 100 |
| Oct-94 | | 44 | | | | | | | <1.6 | 54 | 0.0064 | | | <0.47 | | | 6.7 | 6.4 | | | | | 150 |
| Jan-95 | | 100 | | | | | | | 1.1 | 57 | 0.0049 | | | 3.4 | | | 6.2 | 6.5 | | | | | 140 |
| Apr-95 | | 55 | | | | | | | 7.0 | 45 | 0.0087 | | | 0.87 | | | 6.7 | 6.5 | | | | | 150 |
| Jul-95 | | 50 | | | | | | | 6.6 | 50 | 0.0031 | | | 0.5 | | | 6.9 | 6.2 | | | | | 110 |
| Oct-95 | | 79 | | | | | | | 7.6 | 59 | 0.0040 | | | 1.3 | | | 6.3 | 6.6 | | | | | 110 |
| Jan-96 | | 50 | | | | | | | 3.4 | 54 | 0.0038 | | | 1.1 | | | 6.6 | 5.9 | | | | | 120 |
| Apr-96 | | 61 | | | | | | | 2.6 | 52 | 0.0048 | | | 0.32 | | | 5.8 | 6.8 | | | | | 130 |
| Jul-96 | | 55 | | | | | | | 3.9 | 46 | 0.0023 | | | 0.72 | | | 6.3 | 6.3 | | | | | 130 |
| Oct-96 | | 66 | | | | | | | 1.8 | 59 | 0.0049 | | | 0.29 | | | 6.3 | 6.5 | | | | | 100 |
| Jan-97 | | 61 | | | | | | | 5.1 | 62 | 0.0061 | | | 0.25 | | | 7.0 | 6.4 | | | | | 150 |
| Apr-97 | | 60 | | | | | | | 1.8 | 59 | 0.0049 | | | 0.72 | | | 6.5 | 6.9 | | | | | 110 |
| Jul-97 | | 55 | | | | | | | 2.0 | 64 | 0.0091 | | | 0.38 | | | 6.4 | 5.9 | | | | | 130 |
| Oct-97 | | 58 | | | | | | | 1.6 | 75 | 0.0057 | | | 0.93 | | | 6.1 | 6.0 | | | | | 100 |
| Jan-98 | | 48 | | | | | | | 1.6 | 58 | 0.0027 | | | 0.30 | | | 6.6 | 6.3 | | | | | 120 |
| Apr-98 | | 47 | | | | | | | 0.9 | 60 | 0.0049 | | | 0.52 | | | 8.0 | 6.5 | | | | | 140 |
| Jul-98 | | 40 | | | | | | | 1.4 | 60 | 0.0054 | | | 0.29 | | | 6.5 | 6.4 | | | | | 140 |
| Oct-98 | | 48 | | | | | | | 1.1 | 60 | 0.0029 | | | 0.45 | | | 6.3 | 7.1 | | | | | 98 |
| Feb-99 | | 44 | | | | | | | 0.60 | 59 | 0.0050 | | | 0.62 | | | 6.6 | 6.6 | | | | | 120 |
| Apr-99 | | 46 | | | | | | | 1.7 | 60 | 0.0037 | | | 0.87 | | | 6.1 | 6.8 | | | | | 82 |
| Jul-99 | | 40 | <4.2 | <5.0 | <2.1 | 15 | 4.4 | <0.42 | <6.9 | 59 | 0.0068 | <1.4 | 5.6 | 2.3 | <0.050 | | 5.9 | 6.5 | <1.1 | <1.3 | <0.45 | 3.6 | 100 |
| Oct-99 | | 41 | <4.2 | <5.0 | 0.38 | 15 | 4.4 | 0.88 | 0.83 | 57 | 0.0089 | <1.4 | 4.9 | 0.63 | <0.050 | | 6.5 | 6.5 | 1.1 | <1.3 | <0.45 | 7.7 | 84 |
| Jan-00 | | 43 | | | | | | | <0.47 | 59 | 0.0051 | | | 0.65 | | | 6.7 | 6.4 | | | | | 110 |
| Apr-00 | | 42 | | | | | | | 1.3 | 56 | 0.0027 | | | <0.41 | | | 6.9 | 6.1 | | | | | 98 |
| Jul-00 | | 41 | <1.7 | <5.0 | <0.21 | | | 1.0 | 1.2 | 61 | <0.0050 | <1.4 | | <2.0 | <0.050 | | 6.6 | 6.2 | | 1.7 | <0.55 | | 100 |
| Oct-00 | | 35 | | | | | | | 1.0 | 58 | <0.0050 | | | <2.0 | | | 6.0 | 6.7 | | | | | 130 |
| Jan-01 | | 39 | | | | | | | <0.53 | 56 | <0.0050 | | | <2.0 | | | 5.9 | 6.4 | | | | | 100 |
| Apr-01 | | 35 | | | | | | | <2.7 | 60 | <0.005 | | | <2 | | | 5.5 | 6.3 | | | | | 73 |
| Jul-01 | | 34 | <2.3 | <5.0 | <0.23 | 16 | | 1.4 | <2.7 | 60 | <0.0050 | <0.92 | 5.1 | <2.0 | <0.050 | | 5.6 | 6.4 | | <1.6 | <0.56 | | 96 |
| Oct-01 | | 34 | <2.3 | <5.0 | <0.23 | 13 | | 0.83 | <2.7 | 51 | <0.0050 | <0.92 | 4.4 | <2.0 | <0.050 | | 5.7 | 6.3 | | <1.6 | <0.56 | | 110 |
| Oct-01 | D | 33 | <2.3 | <5.0 | <0.23 | 13 | | 0.68 | <2.7 | 50 | <0.0050 | <0.92 | 4.3 | <2.0 | <0.050 | | | 6.2 | | 2.2 | <0.56 | | 110 |
| Jan-02 | | 34 | | | | | | | <2.7 | 53 | <0.0050 | | | <2.0 | | | 5.9 | 6.9 | | | | | 140 |
| Apr-02 | | 37 | | | | | | | <2.7 | 58 | <0.0050 | | | <2.0 | | | 5.9 | 6.5 | | | | | 120 |
| Jul-02 | | 38 | <2.6/<2.7 | <5.0 | <0.23 | | | 0.59 | <2.7 | 62 | <0.0050 | <0.92 | | <2.0 | <0.050 | | 6.3 | 6.5 | | <2.5 | <0.47 | | 140 |
| Oct-02 | | 39 | | | | | | | <2.7 | 61 | <0.0050 | | | <2.0 | | | 6.3 | 6.8 | | | | | 140 |
| Jan-03 | | 40 | | | | | | | <2.7 | 59 | <0.0050 | | | <2.0 | | | 6.2 | 6.3 | | | | | 110 |
| Apr-03 | | 41 | | | | | | | <1.3 | 62 | <0.010 | | | <2.0 | | | 6.0 | 6.3 | | | | | 120 |
| Jul-03 | | 42 | <1.2 | 4.3 | <0.17 | 18 | | 0.88 | <1.3 | 69 | <0.0050 | <0.94 | 5.9 | <1.0 | <0.025 | | 6.4 | 6.4 | | <2.0 | <0.40 | | 110 |
| Oct-03 | | 42 | | | | | | | <1.3 | 62 | <0.0050 | | | 5.4 | | | 6.3 | 6.9 | | | | | 120 |
| Jan-04 | | 42 | | | | | | | <1.3 | 62 | <0.0050 | | | <1.0 | | | 6.2 | 6.6 | | | | | 170 |
| Apr-04 | | 43 | | | | | | | 6.4 | 64 | <0.0050 | | | <1.0 | | | 6.6 | 6.4 | | | | | 66 |
| Jul-04 | | 44 | <1.8 | 4.8 | <0.16 | 18 | 6.5 | 1.2 | <1.3 | 71 | <0.0050 | <1.0 | 6.1 | <1.0 | <0.025 | | 6.3 | 6.5 | 0.96 | <2.1 | <0.67 | 4.9 | 100 |
| Oct-04 | | 46 | <1.8 | | | 17 | | | <1.3 | 65 | <0.0050 | | 5.6 | 1.3 | | | 6.7 | 6.5 | | | | | 76 |
| Jan-05 | | 46 | <0.73 | | | | | | <1.3 | 65 | <0.0050 | | | <1.0 | | | 6.5 | 7.3 | | | | | 110 |
| Jan-05 | D | 46 | <0.73 | | | | | | <1.3 | 65 | <0.0050 | | | <1.0 | | | | 6.9 | | | | | 79 |
| Apr-05 | | 46 | <0.66 | | | | | | <1.3 | 69 | <0.0050 | | | <1.0 | | | 6.2 | 7.5 | | | | | 45 |
| Jul-05 | | 47 | <0.66 | 4.9 | <0.17 | 20 | | <0.55 | 2.0 | 77 | <0.0050 | <1.2 | 6.9 | <1.0 | <0.025 | 2.2 | 6.3 | 6.6 | | <2.0 | <0.47 | | 100 |
| Jul-05 | D | 47 | <0.66 | 4.8 | <0.17 | 20 | | 1.3 | 2.8 | 78 | <0.0050 | <1.2 | 6.9 | <1.0 | <0.025 | 1.3 | | 6.5 | | <2.0 | 0.95 | | 260 |
| Oct-05 | | 49 | <0.66 | | | | | | <2.7 | 75 | 0.0080 | | | <1.0 | | | 7.2 | 7.2 | | | | | 150 |
| Jan-06 | | 48 | <0.66 | | | | | | <2.7 | 58 | <0.0050 | | | 1.0 | | | 7.0 | 6.7 | | | | | 75 |
| Apr-06 | | 49 | <0.57 | | | | | | <2.7 | 78 | <0.0080 | | | 2.6 | | | 5.9 | 6.3 | | | | | 63 |
| Jul-06 | | 50 | <0.57 | 5.3 | <0.17 | 19 | 5.6 | <0.88 | 8.9 | 77 | <0.0050 | <1.3 | 6.8 | <1.0 | <0.025 | | 7.1 | 6.6 | 0.87 | <1.8 | <1.1 | 5.1 | 93 |
| Oct-06 | | 51 | <0.57 | | | | | | <2.7 | 87 | <0.0050 | | | <1.0 | | | 6.8 | 6.9 | | | | | 83 |

D = Field Duplicate

Flambeau Mining Company
1/30/2007
SRK Att 1.xls

MW1004S

| | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | 250 | 5000 | | | | | | | | |
| ACL | | | | | | | | | | |
| Apr-91 | | | | | | | | | | |
| Jul-91 | <10 | | | | | | | | | |
| Oct-91 | 10 | | | | | | | | | |
| Jan-92 | 11 | | | | | | | | | |
| Apr-92 | 12 | | | | | | | | | |
| Jul-92 | <10 | | | | | | | | | |
| Oct-92 | <10 | | | | | | | | | |
| Jan-93 | <10 | | | | | | | | | |
| Apr-93 | 11 | | | | | | | | | |
| Jul-93 | 11 | | | | | | | | | |
| Oct-93 | 9 | | | 186 | | | | | | 1099.82 |
| Jan-94 | 10 | | | 123 | | | | | | 1097.96 |
| Apr-94 | 8 | | | 109 | | | | | | 1097.72 |
| Jul-94 | 8 | | | 200 | | | | | | 1097.66 |
| Oct-94 | 9 | | None | 124 | | | None | None | | 1097.75 |
| Jan-95 | 7 | | None | 142 | | | None | None | | 1096.59 |
| Apr-95 | 8 | | None | 131 | | | None | None | | 1096.68 |
| Jul-95 | 6 | | None | 126 | | | None | None | | 1096.28 |
| Oct-95 | 9 | | None | 145 | | | None | None | | 1097.49 |
| Jan-96 | 6 | | None | 145 | | | None | None | | 1095.89 |
| Apr-96 | 6 | | None | 168 | | | None | None | | 1096.23 |
| Jul-96 | 7 | | None | 154 | | | None | None | | 1096.12 |
| Oct-96 | 7 | | None | 160 | | | None | None | | 1095.43 |
| Jan-97 | 7 | | None | 164 | | | None | None | | 1095.33 |
| Apr-97 | 8 | | None | 166 | | | None | None | | 1096.67 |
| Jul-97 | 8 | | None | 202 | | | None | None | | 1096.13 |
| Oct-97 | 15 | | None | 201 | | | None | None | | 1097.72 |
| Jan-98 | 11 | | None | 140 | | | None | None | | 1099.89 |
| Apr-98 | 10 | | None | 165 | | | None | None | | 1103.49 |
| Jul-98 | 13 | | None | 162 | | | None | None | | 1104.89 |
| Oct-98 | 14 | | None | 324 | | | None | None | | 1104.57 |
| Feb-99 | 11 | | None | 142 | | | None | None | 9.3 | 1103.70 |
| Apr-99 | 10 | | None | 157 | | | None | None | 12.1 | 1105.50 |
| Jul-99 | 10 | <12 | None | 158 | | | None | None | 11.8 | 1107.29 |
| Oct-99 | 15 | <12 | None | 160 | | | None | None | 10.5 | 1106.69 |
| Jan-00 | 16 | | None | 160 | | | None | None | 11.8 | 1104.64 |
| Apr-00 | 15 | | None | 156 | | | None | None | 8.8 | 1104.96 |
| Jul-00 | 16 | <12 | None | 150 | 160 | | None | None | 13.1 | 1106.70 |
| Oct-00 | 18 | <12 | None | 134 | 130 | | None | None | 11.4 | 1105.87 |
| Jan-01 | 19 | <12 | None | 139 | 160 | 180 | None | None | 11.0 | 1104.73 |
| Apr-01 | 19 | <12 | None | 130 | 150 | 230 | None | None | 10.3 | 1110.93 |
| Jul-01 | 22 | <12 | None | 122 | 160 | 196 | None | None | 11.8 | 1109.33 |
| Oct-01 | 23 | <12 | None | 121 | 150 | 198 | None | None | 12.1 | 1107.06 |
| Oct-01 | 23 | <12 | | | 150 | | | | | |
| Jan-02 | 22 | <12 | None | 124 | 150 | 207 | None | None | 12.9 | 1107.79 |
| Apr-02 | 22 | <10 | None | 129 | 160 | 223 | None | None | 12.7 | 1108.04 |
| Jul-02 | 19 | <10 | None | 138 | 160 | 209 | None | None | 12.2 | 1109.07 |
| Oct-02 | 20 | <10 | None | 136 | 150 | 168 | None | None | 12.2 | 1110.88 |
| Jan-03 | 22 | <10 | None | 208 | 160 | 205 | None | None | 11.4 | 1107.52 |
| Apr-03 | 20 | <10 | None | 137 | 160 | 213 | None | None | 11.2 | 1107.39 |
| Jul-03 | 20 | <5.0 | None | 142 | 160 | 186 | None | None | 11.7 | 1109.16 |
| Oct-03 | 17 | <5.0 | None | 143 | 156 | 167 | None | None | 11.0 | 1106.29 |
| Jan-04 | 19 | | None | 134 | 152 | 208 | None | None | 9.6 | 1105.62 |
| Apr-04 | 19 | | None | 143 | 159 | 156 | None | None | 10.5 | 1105.94 |
| Jul-04 | 21 | <5.0 | None | 152 | 162 | 184 | None | None | 11.1 | 1108.33 |
| Oct-04 | 19 | | None | 146 | 179 | NS | None | None | 9.8 | 1106.13 |
| Jan-05 | 19 | | None | 146 | 157 | 187 | None | None | 9.2 | 1106.02 |
| Jan-05 | 19 | | | | 154 | | | | | |
| Apr-05 | 21 | | None | 148 | 164 | 202 | None | None | 9.2 | 1106.28 |
| Jul-05 | 24 | <5.0 | None | 158 | 178 | 211 | None | None | 12.7 | 1106.10 |
| Jul-05 | 24 | <5.0 | | | 179 | | | | | |
| Oct-05 | 23 | | None | 162 | 182 | 186 | None | None | 10.2 | 1107.58 |
| Jan-06 | 23 | | None | 165 | 183 | 175 | None | None | 10.1 | 1106.51 |
| Apr-06 | 25 | | None | 162 | 182 | 176 | None | None | 9.6 | 1107.08 |
| Jul-06 | 26 | <5.0 | None | 165 | 174 | 199 | None | None | 12.3 | 1105.22 |
| Oct-06 | 26 | | None | 185 | 185 | 181 | None | None | 10.4 | 1104.98 |

Flambeau Mining Company
1/30/2007
SRK Att 1.xls

MW1004P

D = Field Duplicate

Well MW-1004P Original Well Depth: 89.34' 1998 Adj. Depth: 75.9'

| | | Alk (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | Hg (ug/l) | Ni (ug/l) | Field pH (s.u.) | Lab pH (s.u.) | K | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | | | 50 | 1000 | 10 | | 250 | 50 | 1000 | | | 50 | | 230 | 2 | | | | | 10 | 50 | | 500 |
| ACL | | | | | | | | | | | 0.6 | | | | | | | | | | | | |
| Apr-91 | | | | | | | | | | | | | | | | | | | | | | | |
| Jul-91 | | 160 | | | | | | | <14 | 150 | 0.33 | | | 130 | | | | 6.9 | | | | | 210 |
| Oct-91 | | 170 | | | | | | | <14 | 170 | 0.22 | | | 130 | | | | 7.4 | | | | | 310 |
| Jan-92 | | 160 | | | | | | | <14 | 150 | 0.32 | | | 120 | | | | 6.7 | | | | | 160 |
| Apr-92 | | 170 | | | | | | | <14 | 160 | 0.37 | | | 140 | | | | 7.0 | | | | | 180 |
| Jul-92 | | 160 | | | | | | | <14 | 170 | 0.38 | | | 130 | | | | 7.0 | | | | | 180 |
| Oct-92 | | 190 | | | | | | | <14 | 180 | 0.32 | | | 130 | | | | 7.8 | | | | | 260 |
| Jan-93 | | 170 | | | | | | | <14 | 160 | 0.39 | | | 140 | | | | 7.4 | | | | | 160 |
| Apr-93 | | 170 | | | | | | | <10 | 160 | <0.010 | | | <4 | | | | 6.5 | | | | | 160 |
| Jul-93 | | 170 | | | | | | | <12 | 150 | 0.042 | | | 22 | | | | 6.6 | | | | | 180 |
| Oct-93 | | 170 | | | | | | | <12 | 160 | 0.048 | | | 40 | | | 7.6 | 7.3 | | | | | 230 |
| Jan-94 | | 140 | | | | | | | <12 | 150 | <0.015 | | | 20 | | | 7.3 | 7.3 | | | | | 160 |
| Apr-94 | | 160 | | | | | | | 15 | 150 | 0.033 | | | 45 | | | 7.4 | 7.3 | | | | | 180 |
| Jul-94 | | 160 | | | | | | | <12 | 150 | 0.024 | | | 28 | | | 7.1 | 7.2 | | | | | 190 |
| Oct-94 | | 170 | | | | | | | <1.6 | 160 | 0.035 | | | 29 | | | 7.1 | 7.3 | | | | | 200 |
| Jan-95 | | 170 | | | | | | | 3.3 | 150 | 0.014 | | | 29 | | | 6.7 | 7.4 | | | | | 190 |
| Apr-95 | | 170 | | | | | | | 11 | 130 | 0.025 | | | 31 | | | 7.4 | 7.3 | | | | | 250 |
| Jul-95 | | 170 | | | | | | | 20 | 130 | 0.044 | | | 77 | | | 7.2 | 7.1 | | | | | 190 |
| Oct-95 | | 170 | | | | | | | 4.3 | 150 | 0.0086 | | | 28 | | | 7.0 | 7.2 | | | | | 170 |
| Jan-96 | | 150 | | | | | | | 3.3 | 130 | 0.0094 | | | 27 | | | 7.3 | 6.3 | | | | | 150 |
| Apr-96 | | 150 | | | | | | | 7.3 | 130 | 0.011 | | | 22 | | | 6.9 | 7.0 | | | | | 210 |
| Jul-96 | | 150 | | | | | | | 3.3 | 130 | 0.0047 | | | 17 | | | 7.2 | 7.2 | | | | | 200 |
| Oct-96 | | 160 | | | | | | | 5.9 | 120 | 0.0042 | | | 14 | | | 7.2 | 7.3 | | | | | 160 |
| Jan-97 | | 160 | | | | | | | 6.2 | 120 | 0.015 | | | 34 | | | 7.4 | 7.0 | | | | | 220 |
| Apr-97 | | 140 | | | | | | | 16 | 130 | 0.0080 | | | 17 | | | 7.3 | 6.9 | | | | | 210 |
| Jul-97 | | 140 | | | | | | | 14 | 140 | 0.0035 | | | 12 | | | 6.9 | 7.0 | | | | | 200 |
| Oct-97 | | 150 | | | | | | | 40 | 140 | 0.0047 | | | 10 | | | 6.9 | 7.2 | | | | | 120 |
| Jan-98 | | 150 | | | | | | | 27 | 140 | 0.012 | | | 12 | | | 7.1 | 7.3 | | | | | 140 |
| Apr-98 | | 96 | | | | | | | 20 | 130 | 0.0064 | | | 9.9 | | | 7.4 | 7.4 | | | | | 170 |
| Jul-98 | | 160 | | | | | | | 10 | 130 | 0.0077 | | | 32 | | | 7.1 | 7.5 | | | | | 220 |
| Oct-98 | | 140 | | | | | | | 5.0 | 140 | 0.0094 | | | 12 | | | 7.1 | 7.1 | | | | | 150 |
| Feb-99 | | 160 | | | | | | | 2.6 | 140 | 0.0070 | | | 12 | | | 7.5 | 7.0 | | | | | 140 |
| Feb-99 | D | 160 | | | | | | | 2.8 | 140 | 0.0069 | | | 12 | | | ---- | 7.3 | | | | | 170 |
| Apr-99 | | 160 | | | | | | | 3.2 | 130 | 0.0066 | | | 9.0 | | | 6.7 | 8.0 | | | | | 140 |
| Jul-99 | | 160 | <4.2 | 40 | <2.1 | 34 | <1.7 | 0.58 | <6.9 | 140 | 0.014 | <1.4 | 14 | 10 | <0.050 | | 7.1 | 7.2 | 3.60 | <1.3 | <0.45 | 6.0 | 180 |
| Oct-99 | | 160 | <4.2 | 41 | 0.22 | 33 | <1.7 | 0.53 | 1.9 | 140 | 0.014 | <1.4 | 13 | 8.1 | <0.050 | | 7.4 | 7.7 | 5.9 | <1.3 | <0.45 | 5.8 | 180 |
| Jan-00 | | 160 | | | | | | | <0.47 | 130 | 0.085 | | | 56 | | | 6.7 | 7.1 | | | | | 150 |
| Apr-00 | | 160 | | | | | | | 1.7 | 140 | 0.012 | | | 7.9 | | | 6.9 | 7.1 | | | | | 170 |
| Jul-00 | | 160 | <1.7 | 43 | <0.21 | | | <0.74 | 0.65 | 150 | 0.0086 | <1.4 | | 22 | <0.050 | | 6.3 | 7.0 | | <1.6 | <0.55 | | 160 |
| Oct-00 | | 160 | | | | | | | 0.80 | 140 | 0.0080 | | | 16 | | | 7.2 | 7.3 | | | | | 200 |
| Oct-00 | D | 160 | | | | | | | <0.53 | 140 | 0.17 | | | 79 | | | | 7.6 | | | | | 200 |
| Jan-01 | | 160 | | | | | | | <0.53 | 130 | 0.085 | | | 52 | | | 7.3 | 7.1 | | | | | 130 |
| Apr-01 | | 160 | | | | | | | <2.7 | 140 | 0.055 | | | 54 | | | 7.0 | 7.4 | | | | | 160 |
| Jul-01 | | 150 | <2.3 | 41 | <0.23 | 35 | | <0.57 | <2.7 | 150 | 0.015 | <0.92 | 14 | 14 | <0.050 | | 6.9 | 7.2 | | <1.6 | <0.56 | | 160 |
| Oct-01 | | 160 | <2.3 | 39 | <0.23 | 31 | | <0.57 | <2.7 | 130 | 0.10 | <0.92 | 12 | 65 | <0.050 | | 6.8 | 7.3 | | <1.6 | <0.56 | | 130 |
| Jan-02 | | 160 | | | | | | | <2.7 | 130 | <0.0050 | | | 9.6 | | | 6.8 | 7.3 | | | | | 190 |
| Jan-02 | D | 160 | | | | | | | <2.7 | 130 | 0.0061 | | | 11 | | | | 7.4 | | | | | 200 |
| Apr-02 | | 160 | | | | | | | <2.7 | 140 | 0.0053 | | | 8.3 | | | 7.1 | 7.3 | | | | | 170 |
| Jul-02 | | 160 | <2.6/2.9 | 40 | <0.23 | | | <0.44 | <2.7 | 140 | 0.0056 | <0.92 | | 9.7 | <0.050 | | 7.4 | 7.0 | | <2.5 | <0.47 | | 200 |
| Oct-02 | | 160 | | | | | | | <2.7 | 140 | 0.033 | | | 22 | | | 7.0 | 7.1 | | | | | 160 |
| Jan-03 | | 160 | | | | | | | <2.7 | 130 | 0.053 | | | 42 | | | 7.2 | 7.2 | | | | | 150 |
| Apr-03 | | 170 | | | | | | | <1.3 | 140 | 0.032 | | | 25 | | | 7.5 | 7.2 | | | | | 170 |
| Jul-03 | | 160 | <1.2 | 43 | <0.17 | 35 | | <0.43 | <1.3 | 150 | 0.066 | <0.94 | 14 | 43 | <0.025 | | 7.3 | 7.1 | | <2.0 | <0.40 | | 160 |
| Oct-03 | | 160 | | | | | | | <1.3 | 130 | 0.13 | | | 69 | | | 7.3 | 7.1 | | | | | 170 |
| Jan-04 | | 160 | | | | | | | <1.3 | 140 | 0.11 | | | 78 | | | 7.2 | 7.1 | | | | | 220 |
| Apr-04 | | 160 | | | | | | | <1.3 | 140 | 0.10 | | | 77 | | | 7.3 | 7.4 | | | | | 160 |
| Jul-04 | | 160 | <1.8 | 45 | <0.16 | 35 | <2.5 | <0.45 | <1.3 | 140 | 0.066 | <1.0 | 14 | 97 | <0.025 | | 6.8 | 7.3 | 5.8 | <2.1 | <0.67 | 7.2 | 120 |
| Oct-04 | | 160 | <1.8 | | | 33 | | | 1.5 | 130 | <0.0050 | | 13 | 17 | | | 7.3 | 7.2 | | | | | 120 |
| Jan-05 | | 160 | <0.73 | | | | | | <1.3 | 130 | 0.058 | | | 75 | | | 7.0 | 7.4 | | | | | 94 |
| Apr-05 | | 160 | <0.66 | | | | | | <1.3 | 140 | <0.0050 | | | 26 | | | 6.6 | 7.7 | | | | | 120 |
| Jul-05 | | 160 | <0.66 | 42 | <0.17 | 36 | | <0.55 | <1.3 | 150 | 0.059 | <1.2 | 15 | 41 | <0.025 | 2.4 | 7.4 | 6.8 | | <2.0 | <0.47 | | 130 |
| Oct-05 | | 170 | <0.66 | | | | | | <2.7 | 140 | <0.0050 | | | 21 | | | 7.1 | 7.2 | | | | | 150 |
| Jan-06 | | 160 | <0.66 | | | | | | <2.7 | 140 | 0.35 | | | 170 | | | 7.1 | 7.2 | | | | | 110 |
| Apr-06 | | 160 | <0.57 | | | | | | <2.7 | 140 | 0.2 | | | 89 | | | 6.3 | 7.4 | | | | | 93 |
| Jul-06 | | 160 | <0.57 | 40 | <0.17 | 32 | <2.5 | <0.88 | 26 | 130 | <0.0050 | <1.3 | 14 | 5.6 | <0.025 | | 7.1 | 7.2 | 5.90 | <1.8 | <1.1 | 7.1 | 170 |
| Oct-06 | | 150 | <0.57 | | | | | | <2.7 | 150 | <0.0050 | | | 6.1 | | | 7.3 | 7.7 | | | | | 120 |
| Oct-06 | D | 160 | <0.57 | | | | | | <2.7 | 150 | <0.0050 | | | 6.2 | | | | 7.7 | | | | | 66 |

D = Field Duplicate

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MW1004P

| | Sulf | Zn | Color | Field Cond | Lab Cond | Redox | Odor | Turbidity | Temp | Grd Water |
|---|---|---|---|---|---|---|---|---|---|---|
| | (mg/l) | (ug/l) | (After Filter) | (umho) | (umho) | (mV) | | (Purging) | (°C) | El (Feet) |
| Permit Standard | 250 | 5000 | | | | | | | | |
| ACL | | | | | | | | | | |
| Apr-91 | | | | | | | | | | |
| Jul-91 | <10 | | | | | | | | | |
| Oct-91 | <10 | | | | | | | | | |
| Jan-92 | <10 | | | | | | | | | |
| Apr-92 | <10 | | | | | | | | | |
| Jul-92 | <10 | | | | | | | | | |
| Oct-92 | <10 | | | | | | | | | |
| Jan-93 | <10 | | | | | | | | | |
| Apr-93 | 3 | | | | | | | | | |
| Jul-93 | 5 | | | | | | | | | |
| Oct-93 | 3 | | | 329 | | | | | | 1090.27 |
| Jan-94 | 2 | | | 371 | | | | | | 1088.40 |
| Apr-94 | 3.0 | | | 287 | | | | | | 1087.03 |
| Jul-94 | 2.5 | | | 317 | | | | | | 1086.74 |
| Oct-94 | 3.9 | | None | 303 | | | None | Mod. | | 1086.36 |
| Jan-95 | 1.7 | | None | 315 | | | None | None | | 1085.81 |
| Apr-95 | 4.7 | | None | 292 | | | None | None | | 1086.80 |
| Jul-95 | 1.8 | | None | 317 | | | None | None | | 1086.38 |
| Oct-95 | 8.1 | | None | 308 | | | None | None | | 1079.81 |
| Jan-96 | 2.3 | | None | 295 | | | None | None | | 1078.22 |
| Apr-96 | 4.2 | | None | 258 | | | None | None | | 1077.65 |
| Jul-96 | 4.3 | | None | 287 | | | None | None | | 1076.74 |
| Oct-96 | 4.2 | | None | 340 | | | None | None | | 1076.74 |
| Jan-97 | 5.5 | | None | 238 | | | None | None | | 1077.50 |
| Apr-97 | 6.9 | | None | 311 | | | None | None | | 1078.42 |
| Jul-97 | 6.5 | | None | 277 | | | None | None | | 1083.61 |
| Oct-97 | 5.3 | | None | 349 | | | None | None | | 1096.14 |
| Jan-98 | 8.8 | | None | 271 | | | None | None | | 1097.86 |
| Apr-98 | 8.5 | | None | 303 | | | None | None | | 1099.54 |
| Jul-98 | 9.2 | | None | 292 | | | None | None | | 1103.73 |
| Oct-98 | 8.6 | | None | 327 | | | None | None | | 1102.49 |
| Feb-99 | 7.6 | | None | 267 | | | None | None | 7.7 | 1101.91 |
| Feb-99 | 7.6 | | — | — | | | — | — | — | — |
| Apr-99 | 6.6 | | None | 294 | | | None | None | 14.3 | 1103.29 |
| Jul-99 | 3 | <12 | None | 308 | | | None | None | 16.1 | 1104.97 |
| Oct-99 | 2.8 | <12 | None | 320 | | | None | None | 9.8 | 1104.88 |
| Jan-00 | <5.0 | | None | 310 | | | None | None | 10.7 | 1103.16 |
| Apr-00 | <5.0 | | None | 293 | | | None | None | 9.6 | 1103.32 |
| Jul-00 | <5.0 | <12 | None | 300 | 320 | | None | Vslight | 11.7 | 1104.69 |
| Oct-00 | <5.0 | <12 | None | 284 | 240 | | None | None | 11.2 | 1104.41 |
| Oct-00 | <5.0 | <12 | | | 270 | | | | | |
| Jan-01 | <5.0 | <12 | None | 293 | 300 | 46 | None | None | 9.7 | 1103.37 |
| Apr-01 | <5 | <12 | None | 260 | 290 | 144 | None | None | 10.5 | 1107.47 |
| Jul-01 | <5.0 | <12 | None | 260 | 320 | 99 | None | None | 14.4 | 1107.30 |
| Oct-01 | <5.0 | <12 | None | 260 | 310 | 94 | None | None | 11.9 | 1105.50 |
| Jan-02 | <5.0 | <12 | None | 276 | 310 | 83 | None | None | 11.2 | 1106.20 |
| Jan-02 | <5.0 | <12 | | | 300 | | | | | |
| Apr-02 | <5.0 | <10 | None | 263 | 330 | 188 | None | None | 10.6 | 1105.74 |
| Jul-02 | <5.0 | <10 | None | 267 | 300 | 106 | None | None | 13.7 | 1107.04 |
| Oct-02 | <5.0 | <10 | None | 270 | 290 | 52 | None | None | 11.6 | 1108.31 |
| Jan-03 | <5.0 | <10 | None | 274 | 300 | 205 | None | None | 10.2 | 1105.93 |
| Apr-03 | <5.0 | <10 | None | 262 | 300 | 178 | None | None | 12.6 | 1105.58 |
| Jul-03 | <2.5 | <5.0 | None | 263 | 280 | 96 | None | None | 13.4 | 1107.30 |
| Oct-03 | <2.5 | <5.0 | None | 272 | 294 | 48 | None | None | 12.1 | 1104.84 |
| Jan-04 | <2.5 | | None | 290 | 273 | 52 | None | None | 8.2 | 1104.24 |
| Apr-04 | <2.5 | | None | 275 | 281 | 117 | None | Vslight | 10.2 | 1104.46 |
| Jul-04 | <2.5 | <5.0 | None | 275 | 264 | 114 | None | None | 12.6 | 1106.69 |
| Oct-04 | <2.5 | | None | 271 | 319 | 109 | None | None | 10.8 | 1104.65 |
| Jan-05 | <2.5 | | None | 270 | 288 | 102 | None | None | 9.1 | 1104.67 |
| Apr-05 | <2.5 | | None | 265 | 291 | 124 | None | None | 9.3 | 1104.74 |
| Jul-05 | <2.5 | <5.0 | None | 270 | 295 | 58 | None | None | 13.9 | 1104.59 |
| Oct-05 | <2.5 | | None | 277 | 294 | 83 | None | None | 10.0 | 1105.61 |
| Jan-06 | <2.5 | | None | 290 | 295 | 95 | None | None | 9.5 | 1105.59 |
| Apr-06 | 2.5 | | None | 270 | 285 | 88 | None | None | 9.7 | 1105.34 |
| Jul-06 | <2.5 | 20 | None | 266 | 281 | 72 | None | None | 12.4 | 1103.79 |
| Oct-06 | 3.1 | | None | 280 | 265 | 75 | None | None | 11.5 | 1103.68 |
| Oct-06 | 4.5 | | | | 271 | | | | | |

Flambeau Mining Company
1/30/2007
SRK Att 1.xls

D = Field Duplicate

Well MW-1000PR Original Well Depth: 57.37' Reestablished as MW-1000P-R in 3/96 1998 Adj. Depth: 57.8'

| | | Alk (mg/l) | NH3 (mg/l) | NO3+NO2 (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | Hg (ug/l) | Ni (ug/l) | Field pH (s.u.) | Lab pH (s.u.) | K | Se (ug/l) | Ag (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | | | | | | | | | | | | | | | | | | | | | | | |
| ACL | | | | | | | | | | | | | | | | | | | | | | | |
| Apr-91 | | | | | | | | | | | | | | | | | | | | | | | |
| Jul-91 | | 65 | | | | | | | | | <14 | 84 | 0.65 | | | 850 | | | | 6.8 | | | |
| Oct-91 | | 90 | | | | | | | | | <14 | 110 | 0.84 | | | 880 | | | | 6.9 | | | |
| Jan-92 | | 88 | | | | | | | | | <14 | 110 | 1.7 | | | 820 | | | | 6.4 | | | |
| Apr-92 | | 84 | | | | | | | | | <14 | 88 | 1.3 | | | 830 | | | | 6.7 | | | |
| Jul-92 | | 81 | | | | | | | | | 14 | 120 | 0.47 | | | 730 | | | | 7.1 | | | |
| Oct-92 | | 95 | | | | | | | | | <14 | 100 | 0.8 | | | 780 | | | | 7.1 | | | |
| Jan-93 | | 84 | | | | | | | | | <14 | 88 | 0.15 | | | 710 | | | | 6.5 | | | |
| Apr-93 | | 82 | | | | | | | | | 20 | 90 | 0.27 | | | 940 | | | | 6.4 | | | |
| Jul-93 | | 82 | | | | | | | | | 16 | 86 | 0.061 | | | 730 | | | | 6.3 | | | |
| Oct-93 | | 62 | | | | | | | | | 13 | 120 | 0.032 | | | 910 | | | 7.0 | 6.5 | | | |
| Jan-94 | | 43 | | | | | | | | | 22 | 54 | <0.015 | | | 340 | | | 6.9 | 6.5 | | | |
| Apr-94 | | 44 | | | | | | | | | 23 | 54 | 0.021 | | | 500 | | | 7.7 | 6.6 | | | |
| Jul-94 | | 39 | | | | | | | | | 17 | 49 | 0.026 | | | 420 | | | 7.5 | 6.5 | | | |
| Oct-94 | | 34 | | | | | | | | | 58 | 36 | 0.047 | | | 360 | | | 7.2 | 6.6 | | | |
| Jan-95 | | 30 | | | | | | | | | 52 | 36 | 0.12 | | | 290 | | | 7.1 | 7.1 | | | |
| Apr-95 | | 38 | | | | | | | | | 58 | 35 | 0.026 | | | 320 | | | 7.4 | 6.8 | | | |
| Jul-95 | | 34 | | | | | | | | | 43 | 36 | 0.0096 | | | 240 | | | 8.1 | 6.4 | | | |
| Oct-95 | | 36 | | | | | | | | | 61 | 39 | 0.027 | | | 110 | | | 7.3 | 6.7 | | | |
| Jan-96 | | 27 | | | | | | | | | 49 | 33 | 0.011 | | | 54 | | | 6.9 | 5.9 | | | |
| Apr-96 | | 53 | | | | | | | | | 31 | 40 | 0.018 | | | 64 | | | 7.1 | 7.2 | | | |
| Jul-96 | | 35 | | | | | | | | | 33 | 38 | 0.0066 | | | 120 | | | 7.3 | 7.1 | | | |
| Oct-96 | | 38 | | | | | | | | | 57 | 36 | 0.010 | | | 140 | | | 7.4 | 7.2 | | | |
| Jan-97 | | 27 | | | | | | | | | 33 | 33 | 0.0093 | | | 150 | | | 7.2 | 6.6 | | | |
| Apr-97 | | 36 | | | | | | | | | 32 | 43 | 0.043 | | | 190 | | | 7.5 | 7.1 | | | |
| Jul-97 | | 33 | | | | | | | | | 29 | 39 | 0.0079 | | | 61 | | | 6.7 | 6.6 | | | |
| Oct-97 | | 40 | | | | | | | | | 34 | 45 | 0.0044 | | | 110 | | | 6.6 | 6.7 | | | |
| Jan-98 | | 54 | | | | | | | | | 40 | 110 | 0.0061 | | | 490 | | | 6.5 | 6.4 | | | |
| Apr-98 | | 93 | | | | | | | | | 98 | 470 | 0.0440 | | | 3000 | | | 6.7 | 6.5 | | | |
| Jul-98 | | 71 | | | | | | | | | 66 | 480 | 0.076 | | | 1800 | | | 6.3 | 6.6 | | | |
| Oct-98 | | 100 | | | | | | | | | 53 | 570 | 0.012 | | | 2000 | | | 6.2 | 6.7 | | | |
| Feb-99 | | 120 | | | | | | | | | 37 | 760 | 1.2 | | | 4800 | | | 6.2 | 6.5 | | | |
| Apr-99 | | 120 | | | | | | | | | 54 | 740 | 1.2 | | | 5300 | | | 6.2 | 6.7 | | | |
| Apr-99 | D | 120 | | | | | | | | | 55 | 770 | 1.3 | | | 5300 | | | — | 8.0 | | | |
| Jul-99 | | 130 | | | <42 | <50 | 28 | 220 | 10 | <4.2 | 130 | 770 | 3.3 | <14 | 61 | 5400 | <0.050 | | 6.1 | 6.2 | 2.6 | <1.3 | <4.5 |
| Jul-99 | D | 120 | | | <42 | <50 | <21 | 220 | 10 | <4.2 | 97 | 770 | 3.2 | <14 | 62 | 5600 | <0.050 | | — | 6.2 | 2.8 | 1.6 | <4.5 |
| Oct-99 | | 130 | | | <8.4 | 43 | <2.1 | 210 | 11 | 2.6 | 17 | 760 | 3.6 | <2.9 | 56 | 5200 | <0.050 | | 6.7 | 6.3 | 2.9 | <1.3 | <0.90 |
| Jan-00 | | 140 | | | | | | | | | 1.9 | 670 | 4.4 | | | 4100 | | | 6.3 | 6.2 | | | |
| Apr-00 | | 140 | | | | | | | | | 19 | 720 | 3.4 | | | 3800 | | | 6.9 | 6.0 | | | |
| Apr-00 | D | 150 | | | | | | | | | 18 | 700 | 4.3 | | | 4000 | | | — | 6.0 | | | |
| Jul-00 | | 140 | | | <8.6 | 38 | <1.0 | | | <3.7 | 7.3 | 710 | 2.3 | <7.2 | | 5000 | <0.050 | | 6.3 | 6.1 | | <1.6 | <2.7 |
| Oct-00 | | 170 | | | | | | | | | <2.6 | 680 | 6.6 | | | 4200 | | | 6.2 | 6.5 | | | |
| Jan-01 | | 180 | | | | | | | | | <2.6 | 610 | 6.8 | | | 3700 | | | 6.1 | 6.2 | | | |
| Apr-01 | | 170 | | | | | | | | | 14 | 650 | 1.3 | | | 2900 | | | 5.9 | 6.3 | | | |
| Jul-01 | | 180 | | | <11 | 36 | <1.1 | 190 | | <2.9 | <13 | 660 | 7.1 | <4.6 | 47 | 3900 | <0.050 | | 6.0 | 6.2 | | <1.6 | <2.8 |
| Oct-01 | | 190 | | | <11 | 32 | <1.1 | 160 | | <2.9 | <13 | 560 | 2.8 | <4.6 | 40 | 3300 | <0.050 | | 6.0 | 6.3 | | <1.6 | <2.8 |
| Jan-02 | | 190 | | | | | | | | | <13 | 570 | 6.2 | | | 3500 | | | 6.1 | 6.4 | | | |
| Apr-02 | | 190 | | | | | | | | | <13 | 570 | 2.6 | | | 2800 | | | 6.2 | 6.6 | | | |
| Jul-02 | | 200 | | | 10/<13 | 40 | <1.1 | | | <2.2 | <13 | 610 | 6.2 | <9.2 | | 3600 | <0.050 | | 6.3 | 6.3 | | <2.5 | 3.1 |
| Oct-02 | | 200 | | | | | | | | | <13 | 600 | 7.4 | | | 3400 | | | 6.1 | 6.5 | | | |
| Jan-03 | | 200 | | | 11 | 42 | <1.1 | 170 | 16 | <2.2 | <13 | 590 | 6.7 | <9.2 | 41 | 3200 | <0.050 | | 6.2 | 6.3 | | <13 | <2.4 |
| Apr-03 | | 200 | | | | | | | | | <6.7 | 570 | 5.1 | | | 3200 | | | 6.2 | 6.3 | | | |
| Jul-03 | | 200 | | | 12 | 42 | <0.85 | 170 | | <2.2 | <6.7 | 580 | 6.6 | <4.7 | 40 | 3200 | <0.025 | | 6.3 | 6.1 | | <2.0 | <2.0 |
| Oct-03 | | 210 | | | | | | | | | <6.7 | 560 | 6.5 | | | 3100 | | | 6.2 | 6.6 | | | |
| Jan-04 | | 210 | | | | | | | | | <6.7 | 530 | 4.3 | | | 2900 | | | 6.3 | 6.4 | | | |
| Apr-04 | | 210 | | | | | | | | | <6.7 | 530 | 7.0 | | | 2900 | | | 6.7 | 6.5 | | | |
| DNR(4/04) | | 205 | 0.444 | <0.019 | 13.5 | 43 | 0.30 | 151 | 17.3 | <1 | 2.1 | 540 | 6.6 | <1 | 39.7 | 3010 | <0.03 | | | 6.8 | | <1 | <0.1 |
| Jul-04 | | 200 | | | <1.8 | 41 | <0.80 | 150 | 18 | <2.3 | 28 | 530 | 2.3 | <5.2 | 37 | 2800 | <0.025 | | 6.1 | 6.5 | 3.90 | <2.1 | <3.4 |
| Oct-04 | | 210 | | | 3.2 | | | 140 | | | 15 | 500 | 0.37 | | 35 | 2700 | | | 6.4 | 6.4 | | | |
| Jan-05 | | 220 | | | 1.3 | | | | | | 16 | 510 | 0.51 | | | 2500 | | | 6.2 | 6.7 | | | |
| Apr-05 | | 210 | | | 2.7 | | | | | | 17 | 530 | 0.75 | | | 3000 | | | 6.3 | 6.9 | | | |
| Jul-05 | | 210 | 0.54 | <0.025 | 4.0 | 44 | <0.17 | 160 | | 1.2 | 27 | 560 | 1.5 | <1.2 | 40 | 2900 | <0.025 | 94 | 6.7 | 6.5 | | <2.0 | 1.4 |
| Oct-05 | | 210 | | | 2.9 | | | | | | 25 | 580 | 0.73 | | | 2900 | | | 6.6 | 6.9 | | | |
| Jan-06 | | 210 | | | 3.0 | | | | | | 58 | 480 | 0.68 | | | 2400 | | | 6.8 | 6.8 | | | |
| Apr-06 | | 210 | 0.43 | 0.043 | 1.8 | 40 | <0.17 | 150 | 18 | <0.88 | 30 | 530 | 0.46 | 2.9 | 37 | 2600 | <0.025 | | 6.6 | 6.4 | | <1.8 | <1.1 |
| Jul-06 | | 270 | | | 1.7 | 42 | <0.17 | 130 | 18 | <0.88 | 21 | 480 | 0.62 | <1.3 | 36 | 2400 | <0.025 | | 6.5 | 6.6 | 3.90 | <1.8 | <1.1 |
| Oct-06 | | 210 | | | 2.8 | | | | | | 12 | 550 | 0.49 | | | 2700 | | | 7.0 | 6.5 | | | |

D = Field Duplicate

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| | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | | | | | | | | | | | | |
| ACL | | | | | | | | | | | | |
| Apr-91 | | | | | | | | | | | | |
| Jul-91 | | 190 | <10 | | | | | | | | | |
| Oct-91 | | 160 | <10 | | | | | | | | | |
| Jan-92 | | 120 | 11 | | | | | | | | | |
| Apr-92 | | 120 | 14 | | | | | | | | | |
| Jul-92 | | 140 | 12 | | | | | | | | | |
| Oct-92 | | 160 | 12 | | | | | | | | | |
| Jan-93 | | 100 | <10 | | | | | | | | | |
| Apr-93 | | 130 | 12 | | | | | | | | | |
| Jul-93 | | 140 | 15 | | | | | | | | | |
| Oct-93 | | 110 | 12 | | | 233 | | | | | | 1074.86 |
| Jan-94 | | 70 | 12 | | | 135 | | | | | | 1073.75 |
| Apr-94 | | 95 | 12 | | | 124 | | | | | | 1071.98 |
| Jul-94 | | 90 | 11 | | | 133 | | | | | | 1071.01 |
| Oct-94 | | 120 | 17 | | None | 116 | | | None | V. Sl. | | 1071.03 |
| Jan-95 | | 88 | 9 | | None | 116 | | | None | None | | 1068.79 |
| Apr-95 | | 90 | 14 | | None | 106 | | | None | Slight | | 1070.00 |
| Jul-95 | | 99 | 10 | | None | 116 | | | None | None | | 1070.99 |
| Oct-95 | | 75 | 11 | | None | 119 | | | None | None | | 1071.39 |
| Jan-96 | | 87 | 9 | | None | 112 | | | None | None | | 1069.64 |
| Apr-96 | | 130 | 16 | | None | 149 | | | None | None | | 1066.96 |
| Jul-96 | | 140 | 9 | | None | 114 | | | None | None | | 1070.33 |
| Oct-96 | | 76 | 7 | | None | 109 | | | None | None | | 1068.99 |
| Jan-97 | | 160 | 10 | | None | 112 | | | None | None | | 1070.35 |
| Apr-97 | | 160 | 10 | | None | 133 | | | None | None | | 1072.62 |
| Jul-97 | | 110 | 8 | | None | 107 | | | None | None | | 1073.70 |
| Oct-97 | | 82 | 6 | | None | 132 | | | None | None | | 1087.37 |
| Jan-98 | | 96 | 180 | | None | 576 | | | None | None | | 1087.51 |
| Apr-98 | | 770 | 310 | | None | 888 | | | None | None | | 1089.61 |
| Jul-98 | | 250 | 350 | | None | 1097 | | | None | None | | 1086.30 |
| Oct-98 | | 960 | 480 | | None | 1338 | | | None | None | | 1086.24 |
| Feb-99 | | 1200 | 560 | | None | 1293 | | | None | None | 9.7 | 1086.21 |
| Apr-99 | | 1300 | 440 | | None | 1319 | | | None | None | 14.3 | 1086.61 |
| Apr-99 | | 1200 | 340 | | — | — | | | — | — | — | — |
| Jul-99 | 10 | 1300 | 380 | 890 | None | 1310 | | | None | None | 16.3 | 1087.96 |
| Jul-99 | 10 | 1300 | 350 | 880 | — | — | | | — | — | — | — |
| Oct-99 | 7.9 | 1100 | 680 | 730 | None | 1400 | | | None | None | 12.7 | 1086.75 |
| Jan-00 | | 1000 | 610 | | None | 1300 | | | None | None | 12.0 | 1086.61 |
| Apr-00 | | 920 | 560 | | None | 1274 | | | None | None | 8.4 | 1087.26 |
| Apr-00 | | 1000 | 550 | | — | — | | | — | — | — | — |
| Jul-00 | | 930 | 550 | 620 | None | 1200 | 1200 | | None | None | 13.0 | 1087.30 |
| Oct-00 | | 1100 | 460 | 900 | None | 1189 | 1100 | | None | V. Sl. | 12.2 | 1086.79 |
| Jan-01 | | 1000 | 440 | 810 | None | 1192 | 1100 | 143 | None | None | 11.1 | 1088.39 |
| Apr-01 | | 910 | 480 | 600 | None | 1200 | 1100 | 175 | None | None | 9.7 | 1091.12 |
| Jul-01 | | 950 | 450 | 860 | None | 1130 | 1100 | 147 | None | None | 14.9 | 1087.88 |
| Oct-01 | | 940 | 450 | 440 | None | 1109 | 1100 | 163 | None | None | 14.0 | 1087.26 |
| Jan-02 | | 970 | 440 | 690 | None | 1099 | 1100 | 176 | None | None | 12.4 | 1088.25 |
| Apr-02 | | 970 | 430 | 410 | None | 1088 | 1100 | 153 | None | None | 12.4 | 1094.71 |
| Jul-02 | | 1000 | 380 | 640 | None | 1093 | 1100 | 157 | None | None | 14.9 | 1087.66 |
| Oct-02 | | 870 | 370 | 690 | None | 1088 | 1000 | 90 | None | None | 12.0 | 1090.89 |
| Jan-03 | | 990 | 390 | 700 | None | 1080 | 1000 | 170 | None | None | 11.0 | 1087.45 |
| Apr-03 | | 920 | 380 | 680 | None | 1047 | 1000 | 154 | None | None | 13.3 | 1087.83 |
| Jul-03 | | 810 | 360 | 730 | None | 1027 | 990 | 150 | None | None | 12.6 | 1087.76 |
| Oct-03 | | 810 | 350 | 700 | None | 1040 | 1009 | 166 | None | None | 12.6 | 1086.98 |
| Jan-04 | | 790 | 360 | | None | 1065 | 949 | 98 | None | None | 9.3 | 1087.59 |
| Apr-04 | | 720 | 330 | | None | 1025 | 964 | 105 | None | None | 8.7 | 1088.38 |
| DNR(4/04) | | 750 | 363 | 623 | | | 1010 | | | | | |
| Jul-04 | 9.3 | 690 | 310 | 830 | None | 998 | 854 | 146 | None | None | 15.2 | 1087.40 |
| Oct-04 | | 670 | 320 | | None | 970 | 1010 | | None | None | | 1087.16 |
| Jan-05 | | 660 | 310 | | None | 991 | 968 | 133 | None | None | 10.6 | 1087.89 |
| Apr-05 | | 660 | 320 | | None | 882 | 973 | 105 | None | None | 10.7 | 1088.23 |
| Jul-05 | | 680 | 330 | 650 | None | 962 | 978 | 139 | None | None | 14.5 | 1087.41 |
| Oct-05 | | 730 | 330 | | None | 955 | 937 | 141 | None | None | 11.0 | 1087.92 |
| Jan-06 | | 670 | 300 | | None | 1014 | 910 | 126 | None | None | 9.3 | 1087.71 |
| Apr-06 | | 620 | 300 | 560 | None | 926 | 844 | 129 | None | None | 12.3 | 1088.35 |
| Jul-06 | 7.7 | 660 | 310 | 500 | None | 928 | 848 | 100 | None | None | 12.5 | 1086.96 |
| Oct-06 | | 600 | 290 | | None | 948 | 878 | 108 | None | None | 10.4 | 1085.87 |

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D = Field Duplicate Sample

| Well MW-1010P Well Depth: 115.4' | | Alk (mg/l) | NH3 (mg/l) | NO3+NO2 (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | Hg (ug/l) | Ni (ug/l) | Field pH (s.u.) | Lab pH (s.u.) | K | Se (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | | | | | | | | | | | | | | | | | | | | | | |
| ACL | | | | | | | | | | | | | | | | | | | | | | |
| Jul-91 | | 140 | | | | | | | | | <14 | 140 | <0.055 | | | 260 | | | | 7.1 | | |
| Oct-91 | | 160 | | | | | | | | | <15 | 130 | <0.055 | | | 280 | | | | 7.3 | | |
| Jan-92 | | 150 | | | | | | | | | <16 | 130 | 0.15 | | | 250 | | | | 7.2 | | |
| Apr-92 | | 160 | | | | | | | | | <17 | 140 | <0.055 | | | 200 | | | | 7.7 | | |
| Jul-92 | | 160 | | | | | | | | | <18 | 180 | <0.055 | | | 86 | | | | 7.0 | | |
| Oct-92 | | 180 | | | | | | | | | <19 | 160 | <0.055 | | | 140 | | | | 7.8 | | |
| Jan-93 | | 190 | | | | | | | | | <20 | 130 | <0.055 | | | 31 | | | | 8.4 | | |
| Apr-93 | | 170 | | | | | | | | | <21 | 130 | 0.055 | | | 140 | | | | 7.1 | | |
| Jul-93 | | 150 | | | | | | | | | <22 | 130 | <0.015 | | | 35 | | | | 6.7 | | |
| Oct-93 | | 160 | | | | | | | | | <23 | 130 | <0.015 | | | 18 | | | 7.5 | 7.4 | | |
| Jan-94 | | 160 | | | | | | | | | <24 | 150 | <0.015 | | | 170 | | | 7.3 | 7.6 | | |
| Apr-94 | | 160 | | | | | | | | | <25 | 150 | <0.015 | | | 14 | | | 7.4 | 7.5 | | |
| Jul-94 | | 160 | | | | | | | | | <26 | 150 | <0.015 | | | 10 | | | 7.2 | 7.3 | | |
| Oct-94 | | 160 | | | | | | | | | 3.2 | 150 | 0.0046 | | | 14 | | | 7.5 | 7.4 | | |
| Jan-95 | | 160 | | | | | | | | | 6.7 | 160 | 0.0040 | | | 60 | | | 7.6 | 7.5 | | |
| Apr-95 | | 170 | | | | | | | | | 9.7 | 130 | 0.0050 | | | 51 | | | 7.4 | 7.6 | | |
| Jul-95 | | 160 | | | | | | | | | 21 | 130 | 0.0017 | | | 11 | | | 7.6 | 7.3 | | |
| Oct-95 | | 140 | | | | | | | | | 63 | 140 | 0.037 | | | 21 | | | 7.4 | 7.4 | | |
| Jan-96 | | 140 | | | | | | | | | 45 | 130 | 0.0023 | | | 13 | | | 7.0 | 6.5 | | |
| Apr-96 | | 160 | | | | | | | | | 16 | 140 | 0.0036 | | | 100 | | | 7.2 | 7.2 | | |
| Jul-96 | | 140 | | | | | | | | | 74 | 130 | <0.0010 | | | 18 | | | 7.4 | 7.5 | | |
| Oct-96 | | 150 | | | | | | | | | 39 | 130 | 0.0026 | | | 21 | | | 7.6 | 7.5 | | |
| Jan-97 | | 140 | | | | | | | | | 56 | 130 | 0.0018 | | | 28 | | | 7.2 | 7.1 | | |
| Apr-97 | | 150 | | | | | | | | | 15 | 150 | 0.0080 | | | 120 | | | 7.4 | 6.9 | | |
| Jul-97 | | 130 | | | | | | | | | 48 | 140 | 0.0010 | | | 26 | | | 7.3 | 7.3 | | |
| Oct-97 | | 140 | | | | | | | | | 30 | 140 | <0.0010 | | | 29 | | | 7.0 | 7.5 | | |
| Jan-98 | | 140 | | | | | | | | | 26 | 130 | <0.0010 | | | 29 | | | 7.4 | 7.6 | | |
| Apr-98 | | 130 | | | | | | | | | 19 | 130 | 0.0034 | | | 43 | | | 7.6 | 7.5 | | |
| Jul-98 | | 150 | | | | | | | | | 27 | 130 | 0.0034 | | | 29 | | | 7.2 | 7.7 | | |
| Oct-98 | | 130 | | | | | | | | | 20 | 130 | <0.0010 | | | 22 | | | 7.5 | 7.1 | | |
| Feb-99 | | 140 | | | | | | | | | 24 | 130 | 0.0046 | | | 20 | | | 7.0 | 7.3 | | |
| Apr-99 | | 160 | | | | | | | | | 12 | 140 | 0.019 | | | 67 | | | 7.1 | 8.0 | | |
| Jul-99 | | 150 | | | 16 | 38 | <2.1 | 39 | 2.9 | <0.42 | 12 | 140 | 0.0074 | <1.4 | 11 | 59 | <0.050 | | 7.2 | 7.3 | 1.80 | <1.3 |
| Oct-99 | | 150 | | | 6.8 | 40 | 0.29 | 38 | 3.1 | <0.42 | 3.5 | 140 | 0.0096 | <1.4 | 9.8 | 65 | <0.050 | | 7.6 | 7.8 | 2.7 | <1.3 |
| Oct-99 | D | 140 | | | 13 | 41 | <0.21 | 40 | 2.6 | <0.42 | 0.84 | 140 | 0.011 | <1.4 | 10 | 130 | <0.050 | | — | | 2.6 | <1.3 |
| Jan-00 | | 140 | | | | | | | | | 2.2 | 130 | 0.017 | | | 39 | | | 6.8 | 7.2 | | |
| Apr-00 | | 140 | | | | | | | | | 9.9 | 150 | 0.0066 | | | 24 | | | 7.1 | 7.3 | | |
| Jul-00 | | 140 | | | 12 | 39 | <1.0 | | | <3.7 | 14 | 140 | <0.025 | <7.2 | | 26 | <0.050 | | 6.5 | 7.2 | | 1.8 |
| Jul-00 | D | 150 | | | 11 | 39 | 0.69 | | | <0.74 | 9.9 | 140 | 0.012 | <1.4 | | 40 | <0.050 | | — | 7.4 | | <1.6 |
| Oct-00 | | 150 | | | | | | | | | 4.3 | 140 | 0.41 | | | 250 | | | 7.5 | 7.7 | | |
| Jan-01 | | 160 | | | | | | | | | <0.53 | 140 | 0.17 | | | 180 | | | 7.6 | 7.2 | | |
| Apr-01 | | 150 | | | | | | | | | 5.5 | 140 | 0.066 | | | 64 | | | 7.1 | 7.5 | | |
| Jul-01 | | 140 | | | 6.1 | 42 | 0.28 | 42 | | <0.57 | <2.7 | 150 | 0.16 | <0.92 | 11 | 150 | <0.050 | | 7.1 | 7.5 | | <1.6 |
| Oct-01 | | 150 | | | 13 | 33 | <0.23 | 35 | | <0.57 | 5.3 | 120 | 0.0097 | <0.92 | 8.4 | 18 | <0.050 | | 6.6 | 7.4 | | 1.7 |
| Jan-02 | | 150 | | | | | | | | | <2.7 | 130 | 0.069 | | | 76 | | | 7.0 | 7.4 | | |
| Apr-02 | | 150 | | | | | | | | | <2.7 | 140 | 0.18 | | | 180 | | | 7.1 | 7.3 | | |
| Jul-02 | | 160 | | | 16/18 | 38 | <0.23 | | | <0.44 | <2.7 | 140 | 0.030 | <0.92 | | 42 | <0.050 | | 7.4 | 7.2 | | <2.5 |
| Oct-02 | | 150 | | | | | | | | | <2.7 | 140 | 0.035 | | | 120 | | | 7.3 | 7.4 | | |
| Jan-03 | | 150 | | | 19 | 36 | <0.23 | 39 | <5.0 | <0.44 | <2.7 | 140 | 0.036 | <0.92 | 9.8 | 120 | <0.050 | | 7.2 | 7.3 | | <2.5 |
| Apr-03 | | 150 | | | | | | | | | 4.8 | 140 | <0.010 | | | 14 | | | 7.6 | 7.5 | | |
| Jul-03 | | 150 | | | 11 | 39 | <0.17 | 42 | | 0.50 | <1.3 | 150 | 0.031 | <0.94 | 10 | 120 | <0.025 | | 7.3 | 8.1 | | <2.0 |
| Oct-03 | | 140 | | | | | | | | | <1.3 | 140 | 0.064 | | | 130 | | | 7.3 | 7.4 | | |
| Mar-04 | | 150 | | | | | | | | | 2.1 | 150 | 0.095 | | | 180 | | | 7.7 | 7.6 | | |
| Apr-04 | | 140 | | | | | | | | | <1.3 | 140 | 0.013 | | | 97 | | | 7.6 | 7.5 | | |
| DNR(4/04) | | 144 | 0.047 | 0.031 | 14.5 | 33 | 0.06 | 40.9 | 3.2 | <1 | 1.6 | 145 | <0.1 | <1 | 10.4 | 92 | <0.03 | | | 8.0 | | <1 |
| Jul-04 | | 160 | | | 2.3 | 46 | <0.16 | 44 | 4.3 | <0.45 | <1.3 | 160 | 0.18 | <1.0 | 11 | 210 | <0.025 | | 7.0 | 7.4 | 2.6 | <2.1 |
| Oct-04 | | 160 | | | 3.3 | | | 42 | | | <1.3 | 150 | 0.19 | | 11 | 200 | | | 6.9 | 7.5 | | |
| Jan-05 | | 150 | | | 18 | | | | | | <1.3 | 140 | <0.0050 | | | 92 | | | 6.7 | 7.4 | | |
| Apr-05 | | 150 | | | 9.9 | | | | | | <1.3 | 150 | 0.034 | | | 150 | | | 6.7 | 7.8 | | |
| Jul-05 | | 150 | 0.12 | 0.025 | 22 | 42 | <0.17 | 46 | | <0.55 | <1.3 | 160 | <0.0050 | <1.2 | 11 | 85 | <0.025 | 2.2 | 7.9 | 7.7 | | <2.0 |
| Oct-05 | | 160 | | | 3.9 | | | | | | <2.7 | 170 | 0.044 | | | 160 | | | 7.1 | 7.2 | | |
| Jan-06 | | 150 | | | 4.3 | | | | | | <2.7 | 140 | 0.057 | | | 170 | | | 7.2 | 7.3 | | |
| Apr-06 | | 150 | 0.041 | <0.025 | 4.2 | 48 | <0.17 | 46 | 4.1 | <0.88 | <2.7 | 160 | 0.029 | <1.8 | 12 | 150 | <0.025 | | 7.0 | 7.6 | | <1.8 |
| Jul-06 | | 150 | | | 4.4 | 46 | <0.17 | 40 | 4.2 | <0.88 | 2.8 | 150 | 0.045 | <1.3 | 12 | 150 | <0.025 | | 7.2 | 7.2 | 2.60 | <1.8 |
| Oct-06 | | 160 | | | 5.7 | | | | | | <2.7 | 170 | 0.017 | | | 110 | | | 7.8 | 7.2 | | |

D = Field Duplicate

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| | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | | | | | | | | | | | | | |
| ACL | | | | | | | | | | | | | |
| Jul-91 | | | 180 | <10 | | | | | | | | | |
| Oct-91 | | | 250 | 10 | | | | | | | | | |
| Jan-92 | | | 200 | 16 | | | | | | | | | |
| Apr-92 | | | 340 | 14 | | | | | | | | | |
| Jul-92 | | | 180 | <10 | | | | | | | | | |
| Oct-92 | | | 280 | <10 | | | | | | | | | |
| Jan-93 | | | 210 | 32 | | | | | | | | | |
| Apr-93 | | | 270 | 28 | | | | | | | | | |
| Jul-93 | | | 180 | 11 | | | | | | | | | |
| Oct-93 | | | 230 | 5 | | | 294 | | | | | | 1080.16 |
| Jan-94 | | | 170 | 3 | | | 283 | | | | | | 1081.09 |
| Apr-94 | | | 180 | 3.0 | | | 276 | | | | | | 1080.00 |
| Jul-94 | | | 190 | 3.4 | | | 322 | | | | | | 1078.27 |
| Oct-94 | | | 200 | 4.5 | | None | 309 | | | None | V. Sl. | | 1080.17 |
| Jan-95 | | | 250 | 3.3 | | None | 337 | | | None | None | | 1078.26 |
| Apr-95 | | | 240 | 5.0 | | None | 311 | | | None | None | | 1079.01 |
| Jul-95 | | | 200 | 2.4 | | None | 315 | | | None | None | | 1077.61 |
| Oct-95 | | | 200 | 9.6 | | None | 291 | | | None | None | | 1079.23 |
| Jan-96 | | | 180 | 3.4 | | None | 313 | | | None | None | | 1077.28 |
| Apr-96 | | | 200 | 3.8 | | None | 309 | | | None | None | | 1076.11 |
| Jul-96 | | | 200 | 5.9 | | None | 285 | | | None | None | | 1077.43 |
| Oct-96 | | | 170 | 5.8 | | None | 302 | | | None | None | | 1076.75 |
| Jan-97 | | | 180 | 5.8 | | None | 282 | | | None | None | | 1078.40 |
| Apr-97 | | | 170 | 6.7 | | None | 346 | | | None | None | | 1081.61 |
| Jul-97 | | | 170 | 7.0 | | None | 295 | | | None | None | | 1083.07 |
| Oct-97 | | | 170 | 5.1 | | None | 303 | | | None | None | | 1087.13 |
| Jan-98 | | | 190 | 9.2 | | None | 284 | | | None | None | | 1087.61 |
| Apr-98 | | | 170 | 5.6 | | None | 294 | | | None | None | | 1089.49 |
| Jul-98 | | | 160 | 11 | | None | 284 | | | None | None | | 1086.64 |
| Oct-98 | | | 190 | 8.6 | | None | 309 | | | None | None | | 1086.42 |
| Feb-99 | | | 170 | 8.3 | | None | 288 | | | None | None | 9.7 | 1086.37 |
| Apr-99 | | | 140 | 7.6 | | None | 284 | | | None | None | 15.2 | 1086.95 |
| Jul-99 | <0.45 | 5.1 | 200 | 5.5 | <12 | None | 269 | | | None | None | 15.2 | 1088.46 |
| Oct-99 | <0.45 | 4.7 | 170 | 5.3 | <12 | None | 300 | | | None | None | 9.0 | 1086.81 |
| Oct-99 | <0.45 | 3.7 | 170 | 5.2 | <12 | — | — | | | — | — | — | ---- |
| Jan-00 | | | 130 | <5.0 | | None | 280 | | | None | None | 10.1 | 1086.65 |
| Apr-00 | | | 140 | <5.0 | | None | 283 | | 77 | None | None | 9.6 | 1087.46 |
| Jul-00 | <2.7 | | 190 | <5.0 | <60 | None | 290 | 290 | | None | V. Sl. | 11.9 | 1087.16 |
| Jul-00 | <0.55 | | 160 | <5.0 | <12 | — | — | 310 | ---- | — | — | — | — |
| Oct-00 | | | 220 | <5.0 | <12 | None | 268 | 270 | | None | None | 10.4 | 1086.67 |
| Jan-01 | | | 170 | <5.0 | <12 | None | 270 | 300 | 88 | None | None | 9.3 | 1088.16 |
| Apr-01 | | | 130 | <5 | <12 | None | 250 | 290 | -8 | None | None | 11.5 | 1090.56 |
| Jul-01 | <0.56 | | 140 | 6.0 | <12 | None | 250 | 300 | 173 | None | None | 12.6 | 1087.82 |
| Oct-01 | <0.56 | | 180 | 5.4 | <12 | None | 246 | 300 | See Comment | None | None | 13.7 | 1087.10 |
| Jan-02 | | | 230 | <5.0 | <12 | None | 246 | 330 | -25 | None | None | 11.5 | 1087.87 |
| Apr-02 | | | 200 | 5.5 | <10 | None | 249 | 310 | -19 | None | None | 11.5 | 1094.26 |
| Jul-02 | 0.55 | | 240 | 5.8 | <10 | None | 250 | 300 | 9 | None | None | 14.4 | 1087.55 |
| Oct-02 | | | 200 | <5.0 | <10 | None | 269 | 280 | -60 | None | None | 11.0 | 1089.49 |
| Jan-03 | <0.47 | | 180 | 7.0 | <10 | None | 257 | 270 | -24 | None | None | 11.0 | 1086.94 |
| Apr-03 | | | 170 | 5.3 | <10 | None | 253 | 300 | -32 | None | None | 12.8 | 1087.55 |
| Jul-03 | <0.40 | | 170 | 5.9 | <5.0 | None | 255 | 280 | -20 | None | None | 12.5 | 1087.54 |
| Oct-03 | | | 180 | 6.4 | <5.0 | None | 343 | 256 | -47 | None | None | 12.2 | 1086.76 |
| Mar-04 | | | 160 | 6.9 | | None | 269 | 287 | | None | None | 10.3 | 1083.41 |
| Apr-04 | | | 130 | 8.8 | | None | 276 | 273 | 20 | None | None | 9.8 | 1088.35 |
| DNR(4/04) | <0.1 | | 178 | 7.8 | <16 | | | 299 | | | | | |
| Jul-04 | <0.67 | 5.3 | 130 | 4.3 | <5.0 | None | 284 | 263 | 55 | None | None | 13.8 | 1087.09 |
| Oct-04 | | | 140 | 6.1 | | None | 281 | 331 | 64 | None | None | 9.9 | 1086.86 |
| Jan-05 | | | 130 | 11 | | None | 284 | 298 | 72 | None | None | 10.4 | 1087.56 |
| Apr-05 | | | 110 | 11 | | None | 284 | 288 | 60 | None | None | 11.4 | 1088.20 |
| Jul-05 | <0.47 | | 170 | 14.0 | <5.0 | None | 288 | 291 | 94 | None | None | 12.9 | 1087.16 |
| Oct-05 | | | 150 | 8.8 | | None | 283 | 312 | 25 | None | None | 11.1 | 1087.81 |
| Jan-06 | | | 130 | 9.2 | | None | 301 | 309 | 90 | None | None | 10.7 | 1087.51 |
| Apr-06 | <1.1 | | 89 | 13 | <5.0 | None | 278 | 306 | 101 | None | None | 13.6 | 1088.21 |
| Jul-06 | <1.1 | 5.3 | 150 | 14 | <5.0 | None | 290 | 286 | 104 | None | None | 12.7 | 1086.63 |
| Oct-06 | | | 92 | 8 | | None | 289 | 299 | 71 | None | None | 10.4 | 1086.79 |

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# MW1002

| | Well MW-1002 Well Depth: 17.71' | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Alk | As | Ba | Cd | Ca | Cl | Cr | Cu | Hard | Fe | Pb | Mg | Mn | Hg | Ni | Field pH | Lab pH | K | Se | Ag |
| | (mg/l) | (ug/l) | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (ug/l) | (mg/l) | (ug/l) | (ug/l) | (ug/l) | (s.u.) | su | | (ug/l) | (ug/l) |
| Permit Standard | | 50 | 1000 | 10 | | 250 | 50 | 1000 | | 0.30 | 50 | | | 2 | | | | | 10 | 50 |
| ACL | | | | | | | | | | | | | 210 | | | | | | | |
| Jul-91 | 50 | | | | | | | <14 | 60 | 0.99 | | | 5.1 | | | | 6.8 | | | |
| Oct-91 | 49 | | | | | | | <14 | 60 | <0.055 | | | <4.0 | | | | 6.9 | | | |
| Jan-92 | 47 | | | | | | | <14 | 67 | <0.055 | | | <4.0 | | | | 6.5 | | | |
| Apr-92 | 49 | | | | | | | <14 | 48 | <0.055 | | | <4.0 | | | | 7.0 | | | |
| Jul-92 | 41 | | | | | | | <14 | 120 | <0.055 | | | <4.0 | | | | 7.0 | | | |
| Oct-92 | 53 | | | | | | | <14 | 82 | <0.055 | | | 15 | | | | 7.5 | | | |
| Jan-93 | 53 | | | | | | | <14 | 66 | 0.059 | | | 4.7 | | | | 6.7 | | | |
| Apr-93 | 66 | | | | | | | <10 | 90 | <0.010 | | | <4.0 | | | | 6.5 | | | |
| Jul-93 | 42 | | | | | | | <12 | 52 | 0.034 | | | <4.0 | | | | 5.8 | | | |
| Oct-93 | 42 | | | | | | | <12 | 52 | <0.015 | | | <4.0 | | | 7.5 | 6.5 | | | |
| Jan-94 | 39 | | | | | | | <12 | 50 | <0.015 | | | <4 | | | 7.5 | 6.6 | | | |
| Apr-94 | 35 | | | | | | | <12 | 45 | <0.015 | | | <4 | | | 7.5 | 6.7 | | | |
| Jul-94 | 31 | | | | | | | <12 | 44 | <0.015 | | | <4 | | | 7.0 | 6.5 | | | |
| Oct-94 | 38 | | | | | | | <1.6 | 46 | 0.0056 | | | <0.47 | | | 7.0 | 6.6 | | | |
| Jan-95 | 38 | | | | | | | <0.47 | 47 | 0.0073 | | | 2.7 | | | 6.7 | 6.8 | | | |
| Apr-95 | 42 | | | | | | | 2.0 | 42 | 0.0039 | | | 0.27 | | | 7.4 | 6.7 | | | |
| Jul-95 | 33 | | | | | | | 0.97 | 35 | <0.0017 | | | 0.42 | | | 7.2 | 6.3 | | | |
| Oct-95 | 30 | | | | | | | 1.6 | 38 | 0.0040 | | | 1.4 | | | 6.6 | 6.7 | | | |
| Jan-96 | 35 | | | | | | | <0.68 | 41 | 0.0031 | | | 0.12 | | | 7.0 | 6.2 | | | |
| Apr-96 | 32 | | | | | | | 1.7 | 36 | 0.017 | | | 0.98 | | | 6.8 | 6.7 | | | |
| Jul-96 | 34 | | | | | | | 1.6 | 97 | 0.021 | | | 0.50 | | | 6.8 | 6.5 | | | |
| Oct-96 | 41 | | | | | | | 3.5 | 42 | 0.0063 | | | 0.20 | | | 6.9 | 7.1 | | | |
| Jan-97 | 42 | | | | | | | 0.99 | 46 | 0.011 | | | <0.18 | | | 7.5 | 7.1 | | | |
| Apr-97 | 41 | | | | | | | 0.79 | 46 | 0.0070 | | | 0.87 | | | 7.4 | 6.8 | | | |
| Jul-97 | 30 | | | | | | | 1.3 | 45 | 0.0087 | | | 0.80 | | | 6.4 | 6.3 | | | |
| Oct-97 | 40 | | | | | | | 0.86 | 46 | 0.0030 | | | 0.52 | | | 6.0 | 6.7 | | | |
| Jan-98 | 40 | | | | | | | 1.4 | 47 | 0.034 | | | 0.26 | | | 7.2 | 6.6 | | | |
| Apr-98 | 30 | | | | | | | 0.86 | 37 | 0.050 | | | 1.7 | | | 7.3 | 6.8 | | | |
| Jul-98 | 44 | | | | | | | 0.90 | 50 | 0.0077 | | | 0.92 | | | 6.6 | 7.0 | | | |
| Oct-98 | 52 | | | | | | | 0.56 | 57 | 0.0096 | | | 0.40 | | | 7.1 | 6.7 | | | |
| Feb-99 | 54 | | | | | | | <0.54 | 60 | 0.012 | | | 0.71 | | | 7.3 | 6.7 | | | |
| Apr-99 | 52 | | | | | | | 0.51 | 59 | 0.0018 | | | <0.41 | | | 6.6 | 7.2 | | | |
| Jul-99 | 50 | <4.2 | 6.6 | 2.6 | 15 | 2.0 | 1.0 | <4.7 | 58 | 0.0027 | <1.4 | 4.9 | <0.41 | <0.050 | | 6.7 | 6.7 | <1.1 | <1.3 | <0.45 |
| Oct-99 | 46 | | | | | | | <0.47 | 51 | 0.029 | | | <0.41 | | | 7.0 | 6.9 | | | |
| Jan-00 | 57 | | | | | | | <0.47 | 65 | <0.0010 | | | <0.41 | | | 6.9 | 6.9 | | | |
| Apr-00 | 55 | | | | | | | 0.91 | 67 | 0.0039 | | | <0.41 | | | 6.8 | 6.5 | | | |
| Jul-00 | 52 | <1.7 | 7.3 | <0.21 | | | 0.77 | <0.53 | 66 | <0.0050 | <1.4 | | <2.0 | <0.050 | | 6.7 | 6.5 | | <1.6 | <0.55 |
| Oct-00 | 47 | | | | | | | <0.53 | 58 | <0.0050 | | | <2.0 | | | 6.4 | 6.9 | | | |
| Jan-01 | 58 | | | | | | | <0.53 | 66 | <0.0050 | | | <2.0 | | | 6.6 | 7.7 | | | |
| Apr-01 | 60 | | | | | | | <2.7 | 72 | 0.012 | | | <2 | | | 6.5 | 6.7 | | | |
| Jul-01 | 54 | <2.3 | 7.7 | <0.23 | | | 1.4 | <2.7 | 67 | <0.0050 | <0.92 | | <2.0 | <0.050 | | 6.1 | 6.6 | | <1.6 | <0.56 |
| Oct-01 | 53 | | | | | | | <2.7 | 57 | <0.0050 | | | <2.0 | | | 6.0 | 6.8 | | | |
| Jan-02 | 59 | | | | | | | <2.7 | 64 | <0.0050 | | | <2.0 | | | 6.4 | 6.9 | | | |
| Apr-02 | 61 | | | | | | | <2.7 | 65 | <0.0050 | | | <2.0 | | | 6.5 | 6.7 | | | |
| Apr-02 D | 60 | | | | | | | <2.7 | 65 | <0.0050 | | | <2.0 | | | | 6.6 | | | |
| Jul-02 | 59 | <2.6/<2.7 | 7.8 | <0.23 | | | 0.79 | <2.7 | 66 | <0.0050 | <0.92 | | <2.0 | <0.050 | | 6.6 | 6.6 | | <2.5 | <0.47 |
| Oct-02 | 68 | | | | | | | <2.7 | 72 | <0.0050 | | | <2.0 | | | 6.3 | 6.8 | | | |
| Jan-03 | 65 | | | | | | | <2.7 | 66 | 0.012 | | | <2.0 | | | 6.5 | 6.7 | | | |
| Apr-03 | 68 | | | | | | | <1.3 | 71 | <0.010 | | | <2.0 | | | 6.3 | 6.5 | | | |
| Jul-03 | 63 | <1.2 | 7.6 | <0.17 | 17 | | 0.96 | <1.3 | 65 | 0.0079 | <0.94 | 5.5 | <1.0 | <0.025 | | 6.5 | 6.6 | | <2.0 | <0.40 |
| Oct-03 | 65 | | | | | | | <1.3 | 66 | <0.0050 | | | 4.9 | | | 6.3 | 6.8 | | | |
| Jan-04 | 64 | | | | | | | <1.3 | 69 | 0.0060 | | | 3.1 | | | 6.6 | 6.7 | | | |
| Apr-04 | 61 | | | | | | | <1.3 | 65 | <0.0050 | | | <1.0 | | | 6.7 | 6.9 | | | |
| Jul-04 | 53 | <1.8 | 7.1 | <0.16 | 16 | 3.2 | 1.1 | <1.3 | 60 | <0.0050 | <1.0 | 5.0 | <1.0 | <0.025 | | 6.5 | 6.9 | 0.81 | <2.1 | <0.67 |
| Oct-04 | 56 | <1.8 | | | 15 | | | <1.3 | 56 | <0.0050 | | 4.6 | 3.0 | | | 6.7 | 6.8 | | | |
| Jan-05 | 59 | <0.73 | | | | | | <1.3 | 62 | <0.0050 | | | <1.0 | | | 6.9 | 7.6 | | | |
| Apr-05 | 56 | <0.66 | | | | | | <1.3 | 61 | <0.0050 | | | <1.0 | | | 6.8 | 7.6 | | | |
| Jul-05 | 47 | <0.66 | 6.2 | <0.17 | 14 | | 1.2 | 1.6 | 53 | <0.0050 | <1.2 | 4.6 | <1.0 | <0.025 | 1.5 | 6.7 | 6.7 | | <2.0 | <0.47 |
| Oct-05 | 50 | <0.66 | | | | | | <2.7 | 60 | <0.0050 | | | <1.0 | | | 6.5 | 7.4 | | | |
| Jan-06 | 51 | <0.66 | | | | | | <2.7 | 52 | <0.0050 | | | <1.0 | | | 7.1 | 7.6 | | | |
| Apr-06 | 52 | <0.57 | | | | | | <2.7 | 61 | 0.006 | | | <1.0 | | | 6.7 | 6.6 | | | |
| Jul-06 | 50 | <0.57 | 6.3 | <0.17 | 13 | 3.5 | <0.88 | 2.9 | 53 | <0.0050 | <1.3 | 4.7 | <1.0 | <0.025 | | 6.5 | 7.1 | 0.59 | <1.8 | <1.1 |
| Oct-06 | 52 | <0.57 | | | | | | <2.7 | 62 | <0.0050 | | | <1.0 | | | 6.8 | 7.3 | | | |

D = Field Duplicate

Flambeau Mining Company
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## MW1002

| | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | | 500 | 250 | 5000 | | | | | | | |
| ACL | | | | | | | | | | | |
| Jul-91 | | 160 | <10 | | | | | | | | |
| Oct-91 | | 170 | <10 | | | | | | | | |
| Jan-92 | | 100 | <10 | | | | | | | | |
| Apr-92 | | 85 | 11 | | | | | | | | |
| Jul-92 | | 87 | <10 | | | | | | | | |
| Oct-92 | | 130 | 11 | | | | | | | | |
| Jan-93 | | 90 | <10 | | | | | | | | |
| Apr-93 | | 120 | 9 | | | | | | | | |
| Jul-93 | | 100 | 10 | | | | | | | | |
| Oct-93 | | 78 | 6 | | | 138 | | | | | 1091.71 |
| Jan-94 | | 82 | 7 | | | 151 | | | | | 1091.21 |
| Apr-94 | | 86 | 7.0 | | | 105 | | | | | 1091.21 |
| Jul-94 | | 94 | 6.6 | | | 109 | | | | | 1091.02 |
| Oct-94 | | 87 | 6.1 | | None | 122 | | None | None | | 1092.12 |
| Jan-95 | | 120 | 6.2 | | None | 143 | | None | None | | 1090.71 |
| Apr-95 | | 170 | 7.3 | | None | 106 | | None | None | | 1091.70 |
| Jul-95 | | 76 | 5.3 | | None | 99 | | None | None | | 1090.41 |
| Oct-95 | | 86 | 7.9 | | None | 120 | | None | None | | 1091.61 |
| Jan-96 | | 65 | 5.4 | | None | 154 | | None | None | | 1091.25 |
| Apr-96 | | 120 | 5.9 | | None | 142 | | None | None | | 1091.57 |
| Jul-96 | | 94 | 5.9 | | None | 120 | | None | None | | 1092.26 |
| Oct-96 | | 85 | 6.9 | | None | 155 | | None | None | | 1090.73 |
| Jan-97 | | 110 | 6.3 | | None | 124 | | None | None | | 1092.32 |
| Apr-97 | | 110 | 7.0 | | None | 140 | | None | None | | 1094.09 |
| Jul-97 | | 88 | 6.6 | | None | 118 | | None | None | | 1091.83 |
| Oct-97 | | 76 | 6.0 | | None | 114 | | None | None | | 1090.89 |
| Jan-98 | | 82 | 7.6 | | None | 110 | | None | None | | 1090.00 |
| Apr-98 | | 89 | <5.0 | | None | 132 | | None | None | | 1095.91 |
| Jul-98 | | 100 | 8.2 | | None | 125 | | None | None | | 1090.67 |
| Oct-98 | | 120 | 6.9 | | None | 158 | | None | None | | 1090.03 |
| Feb-99 | | 92 | 8.3 | | None | 143 | | None | None | 8.4 | 1089.33 |
| Apr-99 | | 72 | 7.3 | | None | 160 | | None | None | 12.8 | 1091.06 |
| Jul-99 | 2.8 | 110 | 5.9 | <12 | None | 149 | | None | None | 16.0 | 1092.31 |
| Oct-99 | | 91 | 6.9 | | None | 140 | | None | None | 12.3 | 1090.59 |
| Jan-00 | | 110 | 5.6 | | None | 170 | | None | None | 10.7 | 1089.42 |
| Apr-00 | | 98 | 5.2 | | None | 166 | | None | None | 9.4 | 1090.33 |
| Jul-00 | | 110 | 5.7 | <12 | None | 160 | 160 | None | None | 16.6 | 1092.01 |
| Oct-00 | | 120 | 5.7 | <12 | None | 125 | 140 | None | None | 13.9 | 1090.59 |
| Jan-01 | | 120 | 6.7 | <12 | None | 156 | 160 | None | None | 7.7 | 1089.93 |
| Apr-01 | | 99 | 6.4 | <12 | None | 130 | 170 | None | None | 9.3 | 1095.48 |
| Jul-01 | | 79 | 7.6 | <12 | None | 123 | 160 | None | None | 13.6 | 1092.93 |
| Oct-01 | | 140 | 7.1 | <12 | None | 123 | 150 | None | None | 14.6 | 1090.63 |
| Jan-02 | | 110 | 6.4 | <12 | None | 129 | 170 | None | None | 12.0 | 1091.30 |
| Apr-02 | | 130 | 6.8 | <10 | None | 122 | 160 | None | None | 14.8 | 1093.61 |
| Apr-02 | | 130 | 7.0 | <10 | | | 160 | | | | |
| Jul-02 | | 120 | 5.8 | <10 | None | 124 | 150 | None | None | 14.5 | 1093.51 |
| Oct-02 | | 100 | <5.0 | <10 | None | 141 | 160 | None | None | 14.1 | 1095.93 |
| Jan-03 | | 92 | 6.4 | <10 | None | 136 | 160 | None | None | 9.8 | 1091.65 |
| Apr-03 | | 100 | <5.0 | <10 | None | 134 | 160 | None | None | 8.7 | 1091.51 |
| Jul-03 | | 100 | 2.9 | <5.0 | None | 122 | 140 | None | None | 13.7 | 1093.00 |
| Oct-03 | | 110 | 4.6 | <5.0 | None | 135 | 158 | None | None | 14.1 | 1090.23 |
| Jan-04 | | 130 | 6.1 | | None | 142 | 143 | None | None | 8.6 | 1089.83 |
| Apr-04 | | 37 | 6.0 | | None | 128 | 131 | None | None | 9.0 | 1092.45 |
| Jul-04 | 3.2 | 93 | 5.6 | <5.0 | None | 114 | 117 | None | None | 15.0 | 1092.22 |
| Oct-04 | | 59 | 4.6 | | None | 116 | 144 | None | None | | 1090.26 |
| Jan-05 | | 24 | 5.1 | | None | 122 | 146 | None | None | 9.2 | 1090.20 |
| Apr-05 | | 8.0 | 6.1 | | None | 117 | 133 | None | None | 8.3 | 1091.64 |
| Jul-05 | | 82 | 4.9 | <5.0 | None | 98 | 223 | None | None | 12.4 | 1090.63 |
| Oct-05 | | 120 | 5.2 | | None | 104 | 124 | None | None | 12.9 | 1092.07 |
| Jan-06 | | 33 | 4.6 | | None | 112 | 126 | None | None | 9.7 | 1090.67 |
| Apr-06 | | 26 | 6.2 | | None | 112 | 131 | None | None | 9.5 | 1092.17 |
| Jul-06 | 3.1 | 88 | 5.1 | <5.0 | None | 109 | 119 | None | None | 14.4 | 1089.57 |
| Oct-06 | | <2.0 | 6.3 | | None | 109 | 128 | None | None | 13.2 | 1089.47 |

Flambeau Mining Company
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**MW1002G**

| | | Well MW-1002G Well Depth: 53.88' | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Alk (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | Hg (ug/l) | Ni (ug/l) | Field pH (s.u.) | Lab pH (s.u.) | K | Se (ug/l) | Ag (ug/l) |
| Permit Standard | | | 50 | 1000 | 10 | | 250 | 50 | 1000 | | 0.30 | 50 | | 90 | 2 | | | | | 10 | 50 |
| ACL | | | | | | | | | | | | | | | | | | | | | |
| Jul-91 | | 86 | | | | | | | <14 | 100 | <0.055 | | | 5.4 | | | | 6.8 | | | |
| Oct-91 | | 88 | | | | | | | <14 | 120 | <0.055 | | | <4.0 | | | | 6.8 | | | |
| Jan-92 | | 80 | | | | | | | <14 | 110 | <0.055 | | | <4.0 | | | | 6.4 | | | |
| Apr-92 | | 84 | | | | | | | <14 | 110 | <0.055 | | | <4.0 | | | | 6.9 | | | |
| Jul-92 | | 79 | | | | | | | <14 | 160 | <0.055 | | | <4.0 | | | | 6.8 | | | |
| Oct-92 | | 85 | | | | | | | <14 | 130 | <0.055 | | | <4.0 | | | | 7.2 | | | |
| Jan-93 | | 75 | | | | | | | <14 | 94 | <0.055 | | | <4.0 | | | | 6.6 | | | |
| Apr-93 | | 44 | | | | | | | <10 | 76 | <0.010 | | | <4.0 | | | | 6.4 | | | |
| Jul-93 | | 64 | | | | | | | <12 | 80 | <0.015 | | | <4.0 | | | | 6.2 | | | |
| Oct-93 | | 82 | | | | | | | <12 | 110 | <0.015 | | | <4.0 | | | 7.4 | 6.6 | | | |
| Jan-94 | | 94 | | | | | | | <12 | 120 | <0.015 | | | <4 | | | 7.0 | 6.6 | | | |
| Apr-94 | | 92 | | | | | | | <12 | 120 | <0.015 | | | <4 | | | 7.4 | 6.6 | | | |
| Jul-94 | | 92 | | | | | | | <12 | 120 | <0.015 | | | <4 | | | 6.7 | 6.5 | | | |
| Oct-94 | | 88 | | | | | | | <1.6 | 110 | 0.0054 | | | <0.47 | | | 6.8 | 6.6 | | | |
| Jan-95 | | 90 | | | | | | | <0.47 | 110 | 0.0072 | | | 2.1 | | | 6.7 | 6.7 | | | |
| Apr-95 | | 93 | | | | | | | 1.4 | 100 | 0.0044 | | | <0.086 | | | 6.9 | 6.6 | | | |
| Jul-95 | | 90 | | | | | | | <0.68 | 100 | 0.0019 | | | <0.086 | | | 6.9 | 6.5 | | | |
| Oct-95 | | 100 | | | | | | | <0.68 | 110 | <0.0017 | | | <0.086 | | | 6.9 | 6.8 | | | |
| Jan-96 | | 85 | | | | | | | <0.68 | 100 | <0.0017 | | | <0.086 | | | 6.8 | 6.4 | | | |
| Apr-96 | | 110 | | | | | | | <0.68 | 100 | 0.0039 | | | 0.14 | | | 6.6 | 6.7 | | | |
| Jul-96 | | 79 | | | | | | | <0.54 | 93 | 0.0038 | | | <0.18 | | | 6.7 | 6.6 | | | |
| Oct-96 | | 86 | | | | | | | <0.54 | 93 | 0.0039 | | | <0.18 | | | 6.8 | 6.8 | | | |
| Jan-97 | | 80 | | | | | | | 1.9 | 96 | 0.0024 | | | <0.18 | | | 7.2 | 6.7 | | | |
| Apr-97 | | 81 | | | | | | | <0.54 | 100 | 0.0029 | | | <0.18 | | | 7.0 | 6.6 | | | |
| Jul-97 | | 78 | | | | | | | <0.54 | 100 | 0.0051 | | | <0.18 | | | 6.5 | 6.3 | | | |
| Oct-97 | | 88 | | | | | | | <0.54 | 98 | <0.0010 | | | <0.18 | | | 6.4 | 6.5 | | | |
| Jan-98 | | 82 | | | | | | | <0.54 | 100 | 0.0034 | | | <0.18 | | | 6.9 | 6.6 | | | |
| Apr-98 | | 75 | | | | | | | <0.54 | 98 | 0.0047 | | | 0.21 | | | 7.0 | 6.8 | | | |
| Jul-98 | | 82 | | | | | | | 0.69 | 93 | 0.0038 | | | <0.18 | | | 6.8 | 6.9 | | | |
| Oct-98 | | 76 | | | | | | | <0.54 | 97 | <0.0010 | | | <0.18 | | | 7.0 | 6.7 | | | |
| Feb-99 | | 85 | | | | | | | <0.54 | 97 | 0.0035 | | | 0.24 | | | 6.5 | 6.7 | | | |
| Apr-99 | | 85 | | | | | | | <0.47 | 95 | <.0010 | | | <0.41 | | | 6.5 | 7.2 | | | |
| Jul-99 | | 84 | 5.0 | 24 | 3.4 | 25 | 9.7 | <0.42 | <4.7 | 100 | 0.0022 | <1.4 | 9.5 | <0.41 | <0.050 | | 7.0 | 6.5 | <1.1 | <1.3 | <0.45 |
| Oct-99 | | 87 | | | | | | | <0.47 | 100 | 0.0061 | | | <0.41 | | | 7.2 | 6.9 | | | |
| Jan-00 | | 87 | | | | | | | <0.47 | 98 | 0.0031 | | | <0.41 | | | 7.1 | 6.8 | | | |
| Apr-00 | | 89 | | | | | | | <0.60 | 100 | 0.0027 | | | <0.41 | | | 6.8 | 6.5 | | | |
| Jul-00 | | 90 | <1.7 | 27 | <0.21 | | | <0.74 | <0.53 | 110 | <0.0050 | <1.4 | | <2.0 | <0.050 | | 6.6 | 6.6 | | 1.9 | <0.55 |
| Oct-00 | | 89 | | | | | | | <0.53 | 110 | <0.0050 | | | <2.0 | | | 6.6 | 7.1 | | | |
| Jan-01 | | 90 | | | | | | | <0.53 | 99 | <0.0050 | | | <2.0 | | | 6.5 | 7.3 | | | |
| Apr-01 | | 89 | | | | | | | <2.7 | 110 | <0.005 | | | <2 | | | 6.3 | 6.8 | | | |
| Apr-01 | D | 89 | | | | | | | <2.7 | 110 | <0.005 | | | <2 | | | | 6.7 | | | |
| Jul-01 | | 89 | <2.3 | 27 | <0.23 | | | 0.81 | 3.6 | 110 | <0.0050 | <0.92 | | <2.0 | <0.050 | | 6.6 | 6.7 | | <1.6 | <0.56 |
| Oct-01 | | 89 | | | | | | | <2.7 | 94 | <0.0050 | | | <2.0 | | | 6.1 | 6.6 | | | |
| Jan-02 | | 91 | | | | | | | <2.7 | 99 | <0.0050 | | | <2.0 | | | 6.5 | 6.8 | | | |
| Apr-02 | | 91 | | | | | | | <2.7 | 100 | <0.0050 | | | <2.0 | | | 6.4 | 6.7 | | | |
| Jul-02 | | 92 | <2.6/<2.7 | 27 | <0.23 | | | <0.44 | <2.7 | 110 | <0.0050 | <0.92 | | <2.0 | <0.050 | | 6.6 | 6.5 | | <2.5 | <0.47 |
| Oct-02 | | 96 | | | | | | | <2.7 | 110 | <0.0050 | | | <2.0 | | | 6.4 | 6.6 | | | |
| Jan-03 | | 92 | | | | | | | <2.7 | 100 | 0.0089 | | | <2.0 | | | 6.6 | 6.7 | | | |
| Apr-03 | | 90 | | | | | | | <1.3 | 110 | <0.010 | | | <2.0 | | | 6.5 | 6.7 | | | |
| Jul-03 | | 90 | <1.2 | 27 | <0.17 | 27 | | 0.60 | <1.3 | 110 | 0.0066 | <0.94 | 10 | <1.0 | <0.025 | | 6.5 | 6.5 | | 2 | <0.40 |
| Oct-03 | | 88 | | | | | | | <1.3 | 100 | <0.0050 | | | 1.5 | | | 6.5 | 6.7 | | | |
| Jan-04 | | 89 | | | | | | | <1.3 | 100 | <0.0050 | | | 2.6 | | | 6.6 | 6.5 | | | |
| Apr-04 | | 90 | | | | | | | <1.3 | 100 | 0.022 | | | <1.0 | | | 6.8 | 6.8 | | | |
| Jul-04 | | 90 | <1.8 | 27 | <0.16 | 27 | 11 | <0.45 | <1.3 | 110 | <0.0050 | <1.0 | 9.9 | <1.0 | <0.025 | | 6.8 | 6.8 | 1.1 | <2.1 | <0.67 |
| Oct-04 | | 93 | <1.8 | | | 24 | | | <1.3 | 98 | <0.0050 | | 9.0 | 4.1 | | | 6.7 | 6.7 | | | |
| Jan-05 | | 93 | <0.73 | | | | | | <1.3 | 100 | <0.0050 | | | <1.0 | | | 6.6 | 7.3 | | | |
| Apr-05 | | 91 | <0.66 | | | | | | <1.3 | 100 | <0.0050 | | | <1.0 | | | 6.7 | 7.4 | | | |
| Jul-05 | | 91 | <0.66 | 26 | <0.17 | 27 | | <0.55 | <1.3 | 110 | <0.0050 | <1.2 | 10 | <1.0 | <0.025 | 1.9 | 6.8 | 6.6 | | <2.0 | <0.47 |
| Oct-05 | | 89 | <0.66 | | | | | | <2.7 | 110 | <0.0050 | | | <1.0 | | | 6.5 | 7.2 | | | |
| Jan-06 | | 89 | <0.66 | | | | | | <2.7 | 94 | <0.0050 | | | <1.0 | | | 7.0 | 7.4 | | | |
| Apr-06 | | 89 | <0.57 | | | | | | <2.7 | 110 | 0.015 | | | <1.0 | | | 6.8 | 6.7 | | | |
| Jul-06 | | 86 | <0.57 | 26 | <0.17 | 24 | 10 | <0.88 | <2.7 | 99 | <0.0050 | <1.3 | 9.6 | 2.9 | <0.025 | | 6.6 | 6.9 | 0.84 | <1.8 | <1.1 |
| Oct-06 | | 87 | <0.57 | | | | | | <2.7 | 110 | <0.0050 | | | <1.0 | | | 6.9 | 7.1 | | | |

D = Field Duplicate

Flambeau Mining Company
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| | Na | TDS | Sulf | Zn | Color | Field Cond | Lab Cond | Odor | Turbidity | Temp | Grd Water |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (mg/l) | (mg/l) | (mg/l) | (ug/l) | (After Filter) | (umho) | (umho) | | (Purging) | (°C) | El (Feet) |
| Permit Standard | | 500 | 250 | 5000 | | | | | | | |
| ACL | | | | | | | | | | | |
| Jul-91 | | 240 | <10 | | | | | | | | |
| Oct-91 | | 280 | 10 | | | | | | | | |
| Jan-92 | | 140 | 11 | | | | | | | | |
| Apr-92 | | 150 | 14 | | | | | | | | |
| Jul-92 | | 150 | 11 | | | | | | | | |
| Oct-92 | | 180 | 11 | | | | | | | | |
| Jan-93 | | 98 | 12 | | | | | | | | |
| Apr-93 | | 74 | 8 | | | | | | | | |
| Jul-93 | | 140 | 11 | | | | | | | | |
| Oct-93 | | 190 | 11 | | | 262 | | | | | 1091.77 |
| Jan-94 | | 180 | 14 | | | 278 | | | | | 1091.31 |
| Apr-94 | | 170 | 12 | | | 267 | | | | | 1091.27 |
| Jul-94 | | 170 | 12 | | | 238 | | | | | 1091.07 |
| Oct-94 | | 200 | 14 | | None | 269 | | None | None | | 1092.18 |
| Jan-95 | | 240 | 12 | | None | 301 | | None | None | | 1090.77 |
| Apr-95 | | 170 | 15 | | None | 255 | | None | None | | 1091.77 |
| Jul-95 | | 190 | 11 | | None | 275 | | None | None | | 1090.65 |
| Oct-95 | | 160 | 14 | | None | 239 | | None | None | | 1091.68 |
| Jan-96 | | 150 | 11 | | None | 232 | | None | None | | 1091.31 |
| Apr-96 | | 220 | 11 | | None | 264 | | None | None | | 1091.63 |
| Jul-96 | | 200 | 11 | | None | 221 | | None | None | | 1092.33 |
| Oct-96 | | 120 | 11 | | None | 226 | | None | None | | 1090.78 |
| Jan-97 | | 180 | 9.6 | | None | 245 | | None | None | | 1092.43 |
| Apr-97 | | 200 | 10 | | None | 260 | | None | None | | 1094.21 |
| Jul-97 | | 200 | 9.3 | | None | 271 | | None | None | | 1094.93 |
| Oct-97 | | 160 | 7.8 | | None | 228 | | None | None | | 1090.97 |
| Jan-98 | | 150 | 12 | | None | 218 | | None | None | | 1090.06 |
| Apr-98 | | 180 | 11 | | None | 245 | | None | None | | 1095.83 |
| Jul-98 | | 180 | 13 | | None | 215 | | None | None | | 1090.72 |
| Oct-98 | | 120 | 13 | | None | 194 | | None | None | | 1090.04 |
| Feb-99 | | 160 | 11 | | None | 215 | | None | None | 9.1 | 1089.39 |
| Apr-99 | | 100 | 9.8 | | None | 248 | | None | None | 14.4 | 1091.10 |
| Jul-99 | 4.7 | 180 | 11 | <12 | None | 227 | | None | None | 17.8 | 1092.30 |
| Oct-99 | | 150 | 12 | | None | 240 | | None | None | 8.9 | 1090.62 |
| Jan-00 | | 120 | 12 | | None | 240 | | None | None | 8.7 | 1089.43 |
| Apr-00 | | 140 | 11 | | None | 239 | | None | None | 8.1 | 1090.34 |
| Jul-00 | | 160 | 12 | <12 | None | 220 | 240 | None | None | 15.5 | 1092.00 |
| Oct-00 | | 150 | 12 | <12 | None | 223 | 190 | None | None | 10.0 | 1090.62 |
| Jan-01 | | 150 | 12 | <12 | None | 253 | 230 | None | None | 7.1 | 1089.93 |
| Apr-01 | | 170 | 12 | <12 | None | 200 | 230 | None | None | 11.8 | 1095.38 |
| Apr-01 | | 200 | 11 | <12 | | | 230 | | | | |
| Jul-01 | | 120 | 11 | 19 | None | 202 | 240 | None | None | 12.4 | 1092.90 |
| Oct-01 | | 140 | 11 | <12 | None | 203 | 240 | None | None | 11.2 | 1090.63 |
| Jan-02 | | 150 | 10 | <12 | None | 203 | 240 | None | None | 11.8 | 1091.25 |
| Apr-02 | | 150 | 9.4 | <10 | None | 201 | 250 | None | None | 14.8 | 1093.66 |
| Jul-02 | | 160 | 8.1 | <10 | None | 208 | 240 | None | None | 15.3 | 1093.78 |
| Oct-02 | | 180 | 8.2 | <10 | None | 211 | 220 | None | None | 10.4 | 1095.89 |
| Jan-03 | | 160 | 9.9 | <10 | None | 215 | 240 | None | None | 10.2 | 1091.63 |
| Apr-03 | | 170 | 9.5 | <10 | None | 212 | 250 | None | None | 12.4 | 1091.43 |
| Jul-03 | | 150 | 8.0 | <5.0 | None | 209 | 220 | None | None | 13.8 | 1092.92 |
| Oct-03 | | 160 | 8.0 | <5.0 | None | 209 | 230 | None | None | 11.4 | 1090.23 |
| Jan-04 | | 160 | 8.6 | | None | 215 | 219 | None | None | 8.4 | 1089.80 |
| Apr-04 | | 92 | 8.3 | | None | 206 | 206 | None | None | 12.6 | 1092.38 |
| Jul-04 | 5.4 | 140 | 8.7 | <5.0 | None | 202 | 191 | None | None | 15.8 | 1092.14 |
| Oct-04 | | 110 | 8.4 | | None | 204 | 235 | None | None | | 1090.23 |
| Jan-05 | | 93 | 9.6 | | None | 208 | 228 | None | None | 9.0 | 1090.42 |
| Apr-05 | | 95 | 9.2 | | None | 206 | 222 | None | None | 10.3 | 1091.79 |
| Jul-05 | | 140 | 8.8 | <5.0 | None | 184 | 201 | None | None | 12.6 | 1090.54 |
| Oct-05 | | 120 | 9.0 | | None | 201 | 223 | None | None | 10.2 | 1091.97 |
| Jan-06 | | 95 | 8.3 | | None | 213 | 220 | None | None | 9.4 | 1090.58 |
| Apr-06 | | 67 | 9.1 | | None | 201 | 217 | None | None | 11.9 | 1092.06 |
| Jul-06 | 5.4 | 140 | 8.7 | <5.0 | None | 199.4 | 209 | None | None | 13.1 | 1088.49 |
| Oct-06 | | 37 | 9.3 | | None | 200 | 211 | None | None | 9.6 | 1089.42 |

Flambeau Mining Company
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**MW1005**

Well MW-1005 Well Depth: 20.16'

| Date | D | Alk (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | | | 50 | 1000 | 10 | | 250 | 50 | 1000 | | | 50 | |
| ACL | | | | | | | | | | | 27.6 | | |
| Oct-87 | | 64 | | | | | | | <5 | 370 | 7.2 | | |
| Nov-87 | | 74 | | | | | | | <5 | 380 | 6.1 | | |
| Dec-87 | | 64 | | | | | | | <5 | 380 | 13 | | |
| Jan-88 | | 70 | | | | | | | <6 | 380 | 12 | | |
| Feb-88 | | 80 | | | | | | | 5 | 390 | 12 | | |
| Mar-88 | | 60 | | | | | | | 16 | 390 | 7.9 | | |
| Apr-88 | | 60 | | | | | | | 18 | 360 | 3.5 | | |
| May-88 | | 72 | | | | | | | <10 | 400 | 15 | | |
| Jun-88 | | 81 | | | | | | | <10 | 350 | 21 | | |
| Jul-88 | | 81 | | | | | | | 25 | 340 | 19 | | |
| Aug-88 | | 60 | | | | | | | 15 | 330 | 1.1 | | |
| Sep-88 | | 93 | | | | | | | <10 | 380 | 12 | | |
| Jan-91 | | | | | | | | | | | | | |
| Apr-91 | | | | | | | | | | | | | |
| Jul-91 | | 84 | | | | | | | <14 | 380 | 17 | | |
| Oct-91 | | 92 | | | | | | | <14 | 360 | 20 | | |
| Jan-92 | | 86 | | | | | | | <14 | 1000 | 18 | | |
| Apr-92 | | 90 | | | | | | | <14 | 520 | 17 | | |
| Jul-92 | | 90 | | | | | | | <14 | 440 | 19 | | |
| Oct-92 | | 110 | | | | | | | <14 | 420 | 22 | | |
| Jan-93 | | 94 | | | | | | | <14 | 400 | 24 | | |
| Apr-93 | | 78 | | | | | | | <10 | 500 | 24 | | |
| Jul-93 | | 74 | | | | | | | <12 | 410 | 18 | | |
| Oct-93 | | 84 | | | | | | | <12 | 390 | 25 | | |
| Jan-94 | | 81 | | | | | | | <12 | 440 | 24 | | |
| Apr-94 | | 88 | | | | | | | <12 | 450 | 24 | | |
| Jul-94 | | 75 | | | | | | | <12 | 450 | 31 | | |
| Oct-94 | | 78 | | | | | | | <1.6 | 420 | 28 | | |
| Jan-95 | | 84 | | | | | | | <0.47 | 370 | 29 | | |
| Apr-95 | | 79 | | | | | | | 1.3 | 320 | 28 | | |
| Jul-95 | | 75 | | | | | | | <0.68 | 320 | 28 | | |
| Oct-95 | | 55 | | | | | | | <0.68 | 360 | 32 | | |
| Jan-96 | | 78 | | | | | | | <0.68 | 330 | 28 | | |
| Apr-96 | | 73 | | | | | | | <0.68 | 300 | 23 | | |
| Jul-96 | | 68 | | | | | | | <0.54 | 300 | 19 | | |
| Oct-96 | | 64 | | | | | | | 5.0 | 320 | 17 | | |
| Jan-97 | | 79 | | | | | | | 15 | 300 | 23 | | |
| Apr-97 | | 66 | | | | | | | 4.5 | 280 | 21 | | |
| Jul-97 | | 63 | | | | | | | 5.9 | 300 | 29 | | |
| Oct-97 | | 77 | | | | | | | <0.54 | 280 | 23 | | |
| Jan-98 | | 71 | | | | | | | <0.54 | 260 | 21 | | |
| Apr-98 | | 69 | | | | | | | <0.54 | 250 | 21 | | |
| Jul-98 | | 130 | | | | | | | <0.54 | 240 | 17 | | |
| Oct-98 | | 65 | | | | | | | <0.54 | 250 | 19 | | |
| Feb-99 | | 74 | | | | | | | <0.54 | 230 | 20 | | |
| Apr-99 | | 69 | | | | | | | <0.47 | 200 | 20 | | |
| Jul-99 | | 65 | 5.0 | 92 | <2.1 | 44 | 240 | 1.5 | <4.7 | 200 | 19 | <1.4 | 22 |
| Oct-99 | | 65 | | | | | | | <0.47 | 190 | 18 | | |
| Jan-00 | | 85 | | | | | | | <0.47 | 200 | 16 | | |
| Apr-00 | | 66 | | | | | | | <0.67 | 190 | 18 | | |
| Jul-00 | | 64 | <1.7 | 94 | <0.21 | | | 1.1 | 0.70 | 210 | 20 | <1.4 | |
| Oct-00 | | 58 | | | | | | | 0.58 | 190 | 17 | | |
| Jan-01 | | 58 | | | | | | | <0.53 | 160 | 16 | | |
| Apr-01 | | 61 | | | | | | | <2.7 | 170 | 15 | | |
| Jul-01 | | 53 | <2.3 | 82 | <0.23 | | | 1.9 | <2.7 | 190 | 15 | <0.92 | |
| Oct-01 | | 49 | | | | | | | <2.7 | 170 | 12 | | |
| Jan-02 | | 55 | | | | | | | <2.7 | 160 | 13 | | |
| Apr-02 | | 54 | | | | | | | <2.7 | 160 | 12 | | |
| Jul-02 | | 50 | 3.2/3.9 | 88 | <0.23 | | | 0.87 | <2.7 | 180 | 12 | <0.92 | |
| Oct-02 | | 51 | | | | | | | <2.7 | 210 | 12 | | |
| Oct-02 | | 50 | | | | | | | <2.7 | 210 | 12 | | |
| Jan-03 | | 55 | | | | | | | <2.7 | 290 | 12 | | |
| Apr-03 | | 62 | | | | | | | <1.3 | 390 | 18 | | |
| Jul-03 | | 53 | <1.2 | 150 | <0.85 | 80 | | <0.43 | 1.4 | 350 | 16 | <0.94 | 37 |
| Oct-03 | | 55 | | | | | | | <1.3 | 420 | 18 | | |
| Jan-04 | | 56 | | | | | | | <1.3 | 260 | 15 | | |
| Jan-04 | D | 58 | | | | | | | <1.3 | 270 | 19 | | |
| Apr-04 | | 57 | | | | | | | <1.3 | 280 | 17 | | |
| Jul-04 | | 55 | <1.8 | 130 | <0.16 | 63 | 210 | <0.45 | 1.9 | 280 | 18 | <1.0 | 30 |
| Oct-04 | | 55 | 4.3 | | | 60 | | | <1.3 | 270 | 15 | | 29 |
| Jan-05 | | 54 | 2.3 | | | | | | <1.3 | 180 | 12 | | |
| Apr-05 | | 52 | 2.3 | | | | | | <1.3 | 190 | 17 | | |
| Apr-05 | D | 51 | 2.2 | | | | | | <1.3 | 190 | 17 | | |
| Jul-05 | | 46 | 1.5 | 77 | 0.44 | 40 | | 1.5 | <1.3 | 180 | 14 | <1.2 | 20 |
| Oct-05 | | 61 | 2.0 | | | | | | <2.7 | 290 | 17 | | |
| Jan-06 | | 51 | 1.7 | | | | | | <2.7 | 200 | 15 | | |
| Apr-06 | | 52 | 2.2 | | | | | | <2.7 | 210 | 13 | | |
| Jul-06 | | 54 | 1.7 | 110 | <0.17 | 48 | 200 | <0.88 | <2.7 | 220 | 12 | <1.3 | 24 |
| Oct-06 | | 54 | 2.3 | | | | | | <2.7 | 300 | 16 | | |

| Date | D | Mn (ug/l) | Hg (ug/l) | Ni (ug/l) | Field pH (s.u.) | Lab pH (s.u.) | K | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | | | 2 | | | | | 10 | 50 | | | 250 | 5000 | | |
| ACL | | 1310 | | | | | | | | | 1000 | | | | |
| Oct-87 | | 1400 | | | 5.5 | | | | | | 640 | 16 | | | 844 |
| Nov-87 | | 1100 | | | 5.6 | | | | | | 610 | 16 | | | 816 |
| Dec-87 | | 750 | | | 5.8 | | | | | | 650 | 17 | | | 822 |
| Jan-88 | | 650 | | | 5.6 | | | | | | 640 | 8 | | | 787 |
| Feb-88 | | 750 | | | 5.5 | | | | | | 550 | 22 | | | 867 |
| Mar-88 | | 710 | | | 5.3 | | | | | | 630 | 20 | | | 880 |
| Apr-88 | | 630 | | | 5.9 | | | | | | 580 | 17 | | | 868 |
| May-88 | | 560 | | | 6.0 | | | | | | 730 | 18 | | | 954 |
| Jun-88 | | 620 | | | 6.1 | | | | | | 770 | 9 | | | 924 |
| Jul-88 | | 640 | | | 7.0 | | | | | | 650 | 17 | | | 468 |
| Aug-88 | | 450 | | | 6.1 | | | | | | 1000 | 20 | | | 825 |
| Sep-88 | | 560 | | | 5.6 | | | | | | 690 | <25 | | | 842 |
| Jan-91 | | | | | 7.8 | | | | | | | | | None | 733 |
| Apr-91 | | | | | 6.6 | | | | | | | | | None | 842 |
| Jul-91 | | 510 | | | 7.7 | 6.3 | | | | | 570 | 15 | | None | 1028 |
| Oct-91 | | 490 | | | 7.3 | 6.4 | | | | | 770 | 12 | | None | 981 |
| Jan-92 | | 460 | | | 6.1 | 6.2 | | | | | 530 | 14 | | None | 870 |
| Apr-92 | | 380 | | | 6.3 | 6.3 | | | | | 680 | 16 | | None | 905 |
| Jul-92 | | 440 | | | 6.0 | 6.3 | | | | | 640 | 15 | | None | 912 |
| Oct-92 | | 470 | | | 6.1 | 6.5 | | | | | 600 | 15 | | None | 1013 |
| Jan-93 | | 520 | | | | 6.2 | | | | | 140 | 23 | | | |
| Apr-93 | | 540 | | | 6.1 | 5.8 | | | | | 630 | 15 | | None | 971 |
| Jul-93 | | 420 | | | 6.1 | 5.6 | | | | | 590 | 18 | | None | |
| Oct-93 | | 610 | | | 6.7 | 5.9 | | | | | 680 | 17 | | None | 1005 |
| Jan-94 | | 530 | | | 6.3 | 6.0 | | | | | 560 | 18 | | None | 1072 |
| Apr-94 | | 540 | | | 7.6 | 5.9 | | | | | 620 | 13 | | None | 1082 |
| Jul-94 | | 690 | | | 6.2 | 5.9 | | | | | 600 | 14 | | None | 1093 |
| Oct-94 | | 630 | | | 6.1 | 5.9 | | | | | 620 | 20 | | None | 1028 |
| Jan-95 | | 650 | | | 6.2 | 6.1 | | | | | 660 | 14 | | None | 1035 |
| Apr-95 | | 600 | | | 6.2 | 5.8 | | | | | 770 | 18 | | None | 1014 |
| Jul-95 | | 640 | | | 6.3 | 5.9 | | | | | 730 | 14 | | None | 1049 |
| Oct-95 | | 700 | | | 6.2 | 6.0 | | | | | 740 | 21 | | None | 976 |
| Jan-96 | | 600 | | | 6.2 | 5.8 | | | | | 560 | 14 | | None | 963 |
| Apr-96 | | 550 | | | 6.0 | 6.1 | | | | | 530 | 14 | | V. Slight | 967 |
| Jul-96 | | 470 | | | 6.1 | 6.0 | | | | | 650 | 14 | | None | 858 |
| Oct-96 | | 430 | | | 6.2 | 6.1 | | | | | 550 | 14 | | None | 948 |
| Jan-97 | | 540 | | | 5.9 | 5.9 | | | | | 600 | 13 | | None | 921 |
| Apr-97 | | 510 | | | 6.3 | 6.2 | | | | | 620 | 12 | | None | 812 |
| Jul-97 | | 800 | | | 6.2 | 5.7 | | | | | 220 | 12 | | None | 755 |
| Oct-97 | | 590 | | | 6.0 | 6.0 | | | | | 510 | 10 | | None | 804 |
| Jan-98 | | 490 | | | 6.1 | 6.1 | | | | | 490 | 14 | | None | 782 |
| Apr-98 | | 500 | | | 6.1 | 6.3 | | | | | 440 | 13 | | None | 725 |
| Jul-98 | | 400 | | | 6.2 | 6.2 | | | | | 440 | 16 | | None | 644 |
| Oct-98 | | 460 | | | 6.1 | 6.1 | | | | | 430 | 17 | | None | 724 |
| Feb-99 | | 470 | | | 6.2 | 6.1 | | | | | 370 | 12 | | None | 598 |
| Apr-99 | | 460 | | | 6.3 | 6.4 | | | | | 430 | 11 | | None | 596 |
| Jul-99 | | 460 | <0.050 | | 6.2 | 6.0 | <1.1 | <1.3 | <0.45 | 13 | 530 | 12 | <12 | None | 603 |
| Oct-99 | | 410 | | | 6.5 | 6.5 | | | | | 400 | 17 | | None | 570 |
| Jan-00 | | 530 | | | 6.8 | 6.1 | | | | | 300 | 16 | | None | 600 |
| Apr-00 | | 410 | | | 6.8 | 6.0 | | | | | 400 | 13 | | None | 598 |
| Jul-00 | | 600 | <0.050 | | 6.6 | 6.0 | | <1.6 | <0.55 | | 470 | 15 | <12 | None | 520 |
| Oct-00 | | 390 | | | 6.2 | 6.4 | | | | | 430 | 15 | <12 | None | 530 |
| Jan-01 | | 370 | | | 6.2 | 6.5 | | | | | 300 | 15 | <12 | None | 520 |
| Apr-01 | | 350 | | | 5.6 | 6.2 | | | | | 370 | 14 | <12 | None | 460 |
| Jul-01 | | 420 | <0.050 | | 5.9 | 6.1 | | <1.6 | <0.56 | | 330 | 14 | <12 | None | 493 |
| Oct-01 | | 340 | | | 5.7 | 6.2 | | | | | 450 | 15 | <12 | None | 530 |
| Jan-02 | | 380 | | | 5.9 | 6.2 | | | | | 310 | 14 | <12 | None | 455 |
| Apr-02 | | 280 | | | 6.2 | 6.3 | | | | | 400 | 14 | <10 | None | 472 |
| Jul-02 | | 310 | <0.050 | | 6.0 | 6.0 | | <2.5 | <0.47 | | 390 | 12 | <10 | None | 528 |
| Oct-02 | | 330 | | | 5.8 | 6.1 | | | | | 470 | 13 | <10 | None | 655 |
| Oct-02 | | 320 | | | | 6.0 | | | | | 510 | 12 | <10 | | |
| Jan-03 | | 340 | | | 5.6 | 5.9 | | | | | 620 | 14 | <10 | None | 1079 |
| Apr-03 | | 440 | | | 5.7 | 6.0 | | | | | 550 | 22 | <10 | None | 1080 |
| Jul-03 | | 450 | <0.025 | | 5.5 | 5.9 | | <2.0 | <2.0 | | 580 | 11 | <5.0 | None | 1014 |
| Oct-03 | | 440 | | | 5.6 | 6.1 | | | | | 850 | 11 | <5.0 | None | 1260 |
| Jan-04 | | 360 | | | 5.7 | 6.1 | | | | | 430 | 14 | | None | 829 |
| Jan-04 | D | 540 | | | | 6.0 | | | | | 510 | 14 | | | |
| Apr-04 | | 430 | | | 6.3 | 6.2 | | | | | 500 | 14 | | None | 807 |
| Jul-04 | | 520 | <0.025 | | 6.0 | 6.3 | 0.78 | <2.1 | <0.67 | 17 | 480 | 13 | <5.0 | None | 733 |
| Oct-04 | | 390 | | | 5.9 | 6.2 | | | | | 550 | 14 | | None | 799 |
| Jan-05 | | 310 | | | 6.1 | 6.7 | | | | | 280 | 13 | | None | 510 |
| Apr-05 | | 450 | | | 6.1 | 7.0 | | | | | 300 | 14 | | None | 528 |
| Apr-05 | D | 460 | | | | 6.8 | | | | | 290 | 14 | | | |
| Jul-05 | | 370 | <0.025 | 11 | 6.2 | 6.3 | | <2.0 | 1.2 | | 270 | 16 | <5.0 | None | 497 |
| Oct-05 | | 480 | | | 6.0 | 6.4 | | | | | 450 | 14 | | None | 786 |
| Jan-06 | | 440 | | | 6.5 | 6.8 | | | | | 350 | 14 | | None | 597 |
| Apr-06 | | 320 | | | 6.2 | 6.1 | | | | | 290 | 14 | | None | 596 |
| Jul-06 | | 340 | <0.025 | | 6.4 | 6.2 | 0.71 | <1.8 | <1.1 | 21 | 560 | 14 | <5.0 | V. Slight | 715 |
| Oct-06 | | 380 | | | 6.3 | 6.3 | | | | | 320 | 15 | | None | 833 |

D = Field Duplicate

Flambeau Mining Company
1/30/2007
SRK Alt 1.xls

MW1005

| | Lab Cond (umho) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|
| Permit Standard | | | | | |
| ACL | | | | | |
| Oct-87 | | | | | |
| Nov-87 | | | | | |
| Dec-87 | | | | | |
| Jan-88 | | | | | |
| Feb-88 | | | | | |
| Mar-88 | | | | | |
| Apr-88 | | | | | |
| May-88 | | | | | |
| Jun-88 | | | | | |
| Jul-88 | | | | | |
| Aug-88 | | | | | |
| Sep-88 | | | | | |
| Jan-91 | | None | High | | |
| Apr-91 | | None | High | | |
| Jul-91 | | None | Moderate | | |
| Oct-91 | | None | High | | |
| Jan-92 | | None | Moderate | | |
| Apr-92 | | Slight | High | | |
| Jul-92 | | Slight | Slight | | |
| Oct-92 | | Moderate | VSlight | | |
| Jan-93 | | | | | |
| Apr-93 | | None | Slight | | |
| Jul-93 | | None | Slight | | |
| Oct-93 | | Slight | Slight | | 1140.03 |
| Jan-94 | | Slight | None | | 1138.39 |
| Apr-94 | | None | None | | 1140.00 |
| Jul-94 | | None | Moderate | | 1139.53 |
| Oct-94 | | None | None | | 1138.79 |
| Jan-95 | | Slight | None | | 1137.52 |
| Apr-95 | | None | None | | 1138.27 |
| Jul-95 | | Slight | Slight | | 1137.69 |
| Oct-95 | | Slight | None | | 1138.86 |
| Jan-96 | | None | None | | 1137.72 |
| Apr-96 | | Slight | None | | 1139.05 |
| Jul-96 | | None | None | | 1139.74 |
| Oct-96 | | None | None | | 1137.60 |
| Jan-97 | | None | None | | 1138.10 |
| Apr-97 | | None | None | | 1139.51 |
| Jul-97 | | None | None | | 1137.92 |
| Oct-97 | | None | None | | 1138.61 |
| Jan-98 | | Slight | None | | 1136.65 |
| Apr-98 | | Slight | None | | 1139.07 |
| Jul-98 | | Slight | None | | 1138.11 |
| Oct-98 | | None | None | | 1136.87 |
| Feb-99 | | None | None | 6.9 | 1135.69 |
| Apr-99 | | Slight | None | 16.7 | 1137.97 |
| Jul-99 | | None | None | 14.6 | 1139.21 |
| Oct-99 | | Slight | None | 10.7 | 1137.86 |
| Jan-00 | | None | None | --- | 1137.18 |
| Apr-00 | | Slight | None | 5.4 | 1138.07 |
| Jul-00 | 560 | Slight | None | 11.7 | 1138.43 |
| Oct-00 | 570 | None | None | 11.5 | 1137.55 |
| Jan-01 | 500 | None | None | 8.7 | 1136.92 |
| Apr-01 | 510 | None | None | 10.0 | 1140.04 |
| Jul-01 | 520 | None | None | 12.5 | 1140.32 |
| Oct-01 | 590 | None | None | 12.7 | 1138.85 |
| Jan-02 | 510 | None | None | 10.8 | 1139.08 |
| Apr-02 | 560 | None | None | 12.1 | 1140.78 |
| Jul-02 | 590 | None | None | 13.9 | 1141.12 |
| Oct-02 | 690 | None | None | 12.1 | 1141.76 |
| Oct-02 | 720 | | | | |
| Jan-03 | 1100 | None | None | 9.1 | 1140.47 |
| Apr-03 | 1000 | None | None | 9.6 | 1139.42 |
| Jul-03 | 930 | None | None | 11.5 | 1140.38 |
| Oct-03 | 980 | None | None | 12.3 | 1138.41 |
| Jan-04 | 806 | None | None | 9.3 | 1137.52 |
| Jan-04 | 775 | | | | |
| Apr-04 | 668 | None | None | 9.6 | 1139.18 |
| Jul-04 | 714 | None | None | 14.3 | 1139.35 |
| Oct-04 | 882 | None | None | 11.7 | 1138.67 |
| Jan-05 | 586 | None | None | 9.6 | 1138.48 |
| Apr-05 | 505 | None | None | 7.9 | 1139.08 |
| Apr-05 | 541 | | | | |
| Jul-05 | 444 | None | None | 10.7 | 1138.52 |
| Oct-05 | 801 | Vslight | None | 11.2 | 1138.49 |
| Jan-06 | 531 | None | None | 8.9 | 1138.33 |
| Apr-06 | 563 | None | None | 8.6 | 1139.51 |
| Jul-06 | 669 | Vslight | VSlight | 14.8 | 1137.18 |
| Oct-06 | 759 | None | None | 11.1 | 1137.03 |

Flambeau Mining Company
1/30/2007
SRK Att 1.xls

MW1005S

Well MW-1005S Well Depth: 52.43

| | Alk (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | Hg (ug/l) | Ni (ug/l) | Field pH (s.u.) | Lab pH (s.u.) | K | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | | 50 | 1000 | 10 | | 250 | 50 | 1000 | | | 50 | | | 2 | | | | | 10 | 50 | | 500 | 250 | 5000 | |
| ACL | | | | | | | | | | 4.88 | | | 0.32 | | | | | | | | | | | | |
| Oct-87 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov-87 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec-87 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan-88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb-88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar-88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Apr-88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| May-88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jun-88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jul-88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug-88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sep-88 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan-91 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Apr-91 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jul-91 | 170 | | | | | | | <14 | 170 | 0.3 | | | 210 | | | | 6.4 | | | | | 220 | <10 | | |
| Oct-91 | 170 | | | | | | | <14 | 170 | 3.8 | | | 220 | | | | 7.0 | | | | | 370 | <10 | | |
| Jan-92 | 170 | | | | | | | <14 | 250 | 3.6 | | | 210 | | | | 6.7 | | | | | | <10 | | |
| Apr-92 | 180 | | | | | | | <14 | 290 | 3.7 | | | 200 | | | | 7.1 | | | | | 210 | <10 | | |
| Jul-92 | 170 | | | | | | | <14 | 220 | 4.1 | | | 210 | | | | 6.8 | | | | | 220 | <10 | | |
| Oct-92 | 190 | | | | | | | <14 | 270 | 3.9 | | | 200 | | | | 7.3 | | | | | 260 | <10 | | |
| Jan-93 | 180 | | | | | | | <14 | 180 | 4.1 | | | 210 | | | | 7.3 | | | | | 160 | 10 | | |
| Apr-93 | 81 | | | | | | | <10 | 210 | 4.4 | | | 230 | | | | 6.6 | | | | | 200 | 8 | | |
| Jul-93 | 170 | | | | | | | <12 | 160 | 4.2 | | | 220 | | | | 6.4 | | | | | 200 | 9 | | |
| Oct-93 | 170 | | | | | | | <12 | 160 | 4.2 | | | 240 | | | 7.3 | 6.9 | | | | | 220 | 6 | | |
| Jan-94 | 160 | | | | | | | <12 | 160 | 4.0 | | | 200 | | | 7.2 | 7.0 | | | | | 190 | 9 | | |
| Apr-94 | 160 | | | | | | | <12 | 160 | 4.1 | | | 200 | | | 7.5 | 7.0 | | | | | 200 | 8.0 | | |
| Jul-94 | 160 | | | | | | | <12 | 160 | 4.1 | | | 200 | | | 6.9 | 6.9 | | | | | 210 | 7.2 | | |
| Oct-94 | 160 | | | | | | | <1.6 | 160 | 3.7 | | | 190 | | | 7.3 | 7.0 | | | | | 240 | 13.0 | | None |
| Jan-95 | 160 | | | | | | | <0.47 | 150 | 4.2 | | | 220 | | | 6.7 | 7.1 | | | | | 240 | 8.9 | | None |
| Apr-95 | 160 | | | | | | | <0.68 | 130 | 4.0 | | | 200 | | | 7.0 | 7.1 | | | | | 190 | 9.3 | | None |
| Jul-95 | 170 | | | | | | | <0.68 | 140 | 3.8 | | | 200 | | | 6.9 | 6.8 | | | | | 220 | 6.9 | | None |
| Oct-95 | 170 | | | | | | | <0.68 | 160 | 4.3 | | | 220 | | | 7.1 | 7.0 | | | | | 220 | 14 | | None |
| Jan-96 | 160 | | | | | | | <0.68 | 140 | 3.7 | | | 200 | | | 7.3 | 6.7 | | | | | 190 | 7.0 | | None |
| Apr-96 | 160 | | | | | | | <0.68 | 140 | 3.9 | | | 200 | | | 6.8 | 6.9 | | | | | 240 | 7.6 | | None |
| Jul-96 | 150 | | | | | | | <0.54 | 140 | 3.6 | | | 190 | | | 6.8 | 6.6 | | | | | 230 | 8.8 | | None |
| Oct-96 | 160 | | | | | | | 0.63 | 130 | 3.6 | | | 200 | | | 7.1 | 7.0 | | | | | 220 | 8.2 | | None |
| Jan-97 | 160 | | | | | | | 4.0 | 140 | 3.8 | | | 200 | | | 6.8 | 6.7 | | | | | 250 | 7.4 | | None |
| Apr-97 | 160 | | | | | | | 1.6 | 150 | 4.1 | | | 210 | | | 6.8 | 6.5 | | | | | 250 | 9.5 | | None |
| Jul-97 | 140 | | | | | | | 0.71 | 150 | 4.0 | | | 200 | | | 6.8 | 6.7 | | | | | 260 | 9.8 | | None |
| Oct-97 | 150 | | | | | | | <0.54 | 150 | 4.2 | | | 210 | | | 6.8 | 7.0 | | | | | 190 | 6.2 | | Slight |
| Jan-98 | 170 | | | | | | | <0.54 | 120 | 3.3 | | | 170 | | | 7.1 | 6.8 | | | | | 200 | 11 | | None |
| Apr-98 | 140 | | | | | | | <0.54 | 140 | 4.2 | | | 200 | | | 7.2 | 7.1 | | | | | 250 | 11 | | None |
| Jul-98 | 160 | | | | | | | 11 | 150 | 3.9 | | | 200 | | | 6.7 | 7.2 | | | | | 230 | 15 | | None |
| Oct-98 | 150 | | | | | | | <0.54 | 150 | 3.9 | | | 210 | | | 6.8 | 6.8 | | | | | 180 | 13 | | None |
| Feb-99 | 170 | | | | | | | <0.54 | 150 | 4.0 | | | 200 | | | 6.9 | 6.9 | | | | | 180 | 8.9 | | None |
| Apr-99 | 160 | | | | | | | <0.47 | 140 | 4.1 | | | 210 | | | 7.0 | 7.4 | | | | | 210 | 8.6 | | None |
| Jul-99 | 160 | <4.2 | 39 | <2.1 | 38 | <1.7 | 0.57 | <4.7 | 150 | 4.3 | <1.4 | 13 | 220 | <0.050 | | 6.7 | 6.8 | 2.1 | <1.3 | <0.45 | 5.6 | 240 | 9.5 | <12 | None |
| Oct-99 | 160 | | | | | | | <0.47 | 150 | 4.1 | | | 210 | | | 7.0 | 7.3 | | | | | 210 | 5.6 | | None |
| Jan-00 | 170 | | | | | | | <0.47 | 150 | 3.9 | | | 210 | | | 6.7 | 6.8 | | | | | 210 | <5.0 | | None |
| Apr-00 | 170 | | | | | | | <0.60 | 150 | 4.2 | | | 220 | | | 7.0 | 6.9 | | | | | 230 | <5.0 | | None |
| Jul-00 | 170 | 2.9 | 46 | <0.21 | | | <0.74 | <0.53 | 170 | 4.6 | <1.4 | | 240 | <0.050 | | 6.5 | 7.0 | | 1.6 | <0.55 | | 200 | <5.0 | <12 | None |
| Oct-00 | 170 | | | | | | | <0.53 | 160 | 4.3 | | | 220 | | | 7.3 | 7.1 | | | | | 210 | <5.0 | <12 | None |
| Jan-01 | 170 | | | | | | | <0.53 | 150 | 4.1 | | | 210 | | | 7.0 | 6.6 | | | | | 200 | <5.0 | <12 | None |
| Apr-01 | 170 | | | | | | | <2.7 | 160 | 4.4 | | | 230 | | | 6.7 | 7.1 | | | | | 210 | <5 | <12 | None |
| Jul-01 | 170 | <2.3 | 45 | <0.23 | | | <0.57 | <2.7 | 170 | 4.4 | <0.92 | | 230 | <0.050 | | 6.9 | 7.0 | | <1.6 | <0.56 | | 190 | <5.0 | <12 | None |
| Oct-01 | 170 | | | | | | | <2.7 | 140 | 3.9 | | | 210 | | | 6.5 | 6.9 | | | | | 230 | <5.0 | <12 | None |
| Jan-02 | 170 | | | | | | | <2.7 | 150 | 4.1 | | | 210 | | | 6.9 | 7.1 | | | | | 260 | <5.0 | <12 | None |
| Apr-02 | 170 | | | | | | | <2.7 | 150 | 4.2 | | | 210 | | | 7.1 | 7.1 | | | | | 240 | <5.0 | <10 | None |
| Jul-02 | 170 | 3.3/5.7 | 44 | <0.23 | | | <0.44 | <2.7 | 160 | 4.4 | <0.92 | | 220 | <0.050 | | 7.0 | 6.7 | | <2.5 | <0.47 | | 250 | <5.0 | <10 | None |
| Oct-02 | 170 | | | | | | | <2.7 | 150 | 4.1 | | | 210 | | | 6.9 | 6.7 | | | | | 220 | <5.0 | <10 | None |
| Jan-03 | 170 | | | | | | | <2.7 | 150 | 3.7 | | | 200 | | | 7.0 | 7.0 | | | | | 220 | <5.0 | <10 | None |
| Apr-03 | 170 | | | | | | | <1.3 | 160 | 4.2 | | | 220 | | | 7.0 | 6.8 | | | | | 250 | <5.0 | <10 | None |
| Jul-03 | 170 | 2.1 | 42 | <0.17 | 41 | | <0.43 | <1.3 | 160 | 4.2 | <0.94 | 14 | 230 | <0.025 | | 7.0 | 6.8 | | <2.0 | <0.40 | | 200 | <2.5 | <5.0 | None |
| Oct-03 | 170 | | | | | | | <1.3 | 150 | 4.0 | | | 210 | | | 7.2 | 6.9 | | | | | 210 | <2.5 | <5.0 | None |
| Jan-04 | 170 | | | | | | | <1.3 | 150 | 4.2 | | | 220 | | | 6.9 | 6.9 | | | | | 240 | <2.5 | | None |
| Apr-04 | 160 | | | | | | | <1.3 | 150 | 4.3 | | | 210 | | | 6.9 | 7.1 | | | | | 130 | 3.7 | | None |
| Jul-04 | 160 | <1.8 | 44 | <0.16 | 40 | 2.6 | <0.45 | <1.3 | 160 | 4.2 | <1.0 | 14 | 220 | <0.025 | | 6.8 | 7.1 | 3.1 | <2.1 | <0.67 | 7.0 | 150 | 4.2 | <5.0 | None |
| Oct-04 | 170 | 3.9 | | | 38 | | | <1.3 | 150 | 3.7 | | 13 | 210 | | | 6.6 | 6.9 | | | | | 160 | 3.6 | | None |
| Jan-05 | 160 | 2.4 | | | | | | <1.3 | 150 | 3.8 | | | 210 | | | 6.4 | 7.2 | | | | | 130 | 4.8 | | None |
| Apr-05 | 160 | 2.8 | | | | | | <1.3 | 150 | 4.4 | | | 240 | | | 6.3 | 7.1 | | | | | 170 | 4.3 | | None |
| Jul-05 | 170 | 3.0 | 44 | <0.17 | 42 | | <0.55 | <1.3 | 160 | 4.5 | <1.2 | 15 | 240 | <0.025 | 1.5 | 7.2 | 6.7 | | <2.0 | <0.47 | | 180 | 3.9 | <5.0 | None |
| Oct-05 | 170 | 1.9 | | | | | | <2.7 | 180 | 4.2 | | | 240 | | | 6.4 | 6.9 | | | | | 200 | 4.2 | | None |
| Jan-06 | 160 | 2.4 | | | | | | <2.7 | 140 | 4.0 | | | 210 | | | 6.8 | 6.9 | | | | | 160 | 3.2 | | None |
| Apr-06 | 170 | 2.8 | | | | | | <2.7 | 160 | 4.4 | | | 230 | | | 6.6 | 7.1 | | | | | 140 | 4.0 | | None |
| Apr-06 D | 170 | 2.3 | | | | | | <2.7 | 160 | 4.4 | | | 230 | | | | 7.1 | | | | | 110 | 4.0 | | |
| Jul-06 | 170 | 2.8 | 44 | <0.17 | 37 | <2.5 | <0.88 | <2.7 | 150 | 4.0 | <1.3 | 14 | 210 | <0.025 | | 6.7 | 7.0 | 3.1 | <1.8 | <1.1 | 7.2 | 170 | 3.8 | <5.0 | None |
| Oct-06 | 160 | 2.3 | | | | | | <2.7 | 170 | 4.4 | | | 240 | | | 7.3 | 6.9 | | | | | 83 | 4.1 | | None |

D = Field Duplicate

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**MW1005S**

| | Field Cond (umho) | Lab Cond (umho) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|
| Permit Standard | | | | | | |
| ACL | | | | | | |
| Oct-87 | | | | | | |
| Nov-87 | | | | | | |
| Dec-87 | | | | | | |
| Jan-88 | | | | | | |
| Feb-88 | | | | | | |
| Mar-88 | | | | | | |
| Apr-88 | | | | | | |
| May-88 | | | | | | |
| Jun-88 | | | | | | |
| Jul-88 | | | | | | |
| Aug-88 | | | | | | |
| Sep-88 | | | | | | |
| Jan-91 | | | | | | |
| Apr-91 | | | | | | |
| Jul-91 | | | | | | |
| Oct-91 | | | | | | |
| Jan-92 | | | | | | |
| Apr-92 | | | | | | |
| Jul-92 | | | | | | |
| Oct-92 | | | | | | |
| Jan-93 | | | | | | |
| Apr-93 | | | | | | |
| Jul-93 | | | | | | |
| Oct-93 | 321 | | | | | 1139.29 |
| Jan-94 | 357 | | | | | 1138.29 |
| Apr-94 | 344 | | | | | 1139.14 |
| Jul-94 | 322 | | | | | 1138.65 |
| Oct-94 | 320 | | Slight | None | | 1137.49 |
| Jan-95 | 425 | | Slight | None | | 1136.86 |
| Apr-95 | 315 | | Slight | None | | 1137.20 |
| Jul-95 | 358 | | Slight | None | | 1137.06 |
| Oct-95 | 354 | | Slight | None | | 1137.60 |
| Jan-96 | 360 | | None | None | | 1137.09 |
| Apr-96 | 329 | | None | None | | 1139.04 |
| Jul-96 | 323 | | Slight | None | | 1139.05 |
| Oct-96 | 329 | | None | None | | 1137.07 |
| Jan-97 | 321 | | None | None | | 1137.05 |
| Apr-97 | 344 | | None | None | | 1138.40 |
| Jul-97 | 689 | | None | None | | 1137.65 |
| Oct-97 | 351 | | None | None | | 1137.49 |
| Jan-98 | 313 | | Strong | None | | 1136.35 |
| Apr-98 | 332 | | Slight | None | | 1137.81 |
| Jul-98 | 305 | | None | None | | 1137.32 |
| Oct-98 | 327 | | None | None | | 1136.02 |
| Feb-99 | 319 | | None | None | 5.7 | 1135.21 |
| Apr-99 | 297 | | None | None | 16.6 | 1136.65 |
| Jul-99 | 331 | | Slight | None | 17.2 | 1138.05 |
| Oct-99 | 320 | | Slight | None | 8.3 | 1137.32 |
| Jan-00 | 380 | | Moderate | None | — | 1136.76 |
| Apr-00 | 354 | | Moderate | None | 6.6 | 1136.99 |
| Jul-00 | 330 | 320 | Slight | None | 11.4 | 1137.92 |
| Oct-00 | 330 | 310 | Slight | None | 9.4 | 1137.20 |
| Jan-01 | 335 | 320 | Slight | None | 10.1 | 1136.42 |
| Apr-01 | 310 | 310 | Slight | None | 10.8 | 1139.04 |
| Jul-01 | 308 | 330 | Moderate | None | 11.2 | 1139.84 |
| Oct-01 | 306 | 320 | Slight | None | 9.9 | 1138.31 |
| Jan-02 | 304 | 330 | Slight | None | 12.8 | 1138.59 |
| Apr-02 | 300 | 330 | Slight | None | 18.9 | 1139.89 |
| Jul-02 | 302 | 340 | Moderate | None | 15.4 | 1141.05 |
| Oct-02 | 300 | 300 | Slight | None | 9.7 | 1141.94 |
| Jan-03 | 301 | 310 | Moderate | None | 11.6 | 1140.35 |
| Apr-03 | 298 | 300 | Moderate | None | 11.7 | 1138.82 |
| Jul-03 | 305 | 300 | Slight | None | 11.6 | 1140.12 |
| Oct-03 | 317 | 309 | Moderate | None | 11.6 | 1138.15 |
| Jan-04 | 329 | 308 | Slight | None | 8.3 | 1137.23 |
| Apr-04 | 298 | 280 | Slight | None | 14.2 | 1138.11 |
| Jul-04 | 294 | 298 | Vslight | None | 14.7 | 1139.16 |
| Oct-04 | 298 | 330 | Moderate | None | 10.9 | 1138.06 |
| Jan-05 | 301 | 310 | Moderate | None | 8.7 | 1137.89 |
| Apr-05 | 294 | 295 | Moderate | None | 11.2 | 1137.95 |
| Jul-05 | 296 | 312 | Slight | None | 11.8 | 1138.25 |
| Oct-05 | 298 | 305 | Moderate | None | 9.4 | 1137.60 |
| Jan-06 | 316 | 304 | Moderate | None | 8.8 | 1137.47 |
| Apr-06 | 298 | 300 | Slight | None | 10.9 | 1138.64 |
| Apr-06 | | 301 | | - | | |
| Jul-06 | 302 | 294 | Vslight | None | 13.4 | 1137.26 |
| Oct-06 | 302 | 304 | Moderate | None | 9.8 | 1136.55 |

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## MW1005P

| Well MW-1005P Well Depth: 93.46' | Alk (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | CO2 [ug/l] | Hg (ug/l) | Ni (ug/l) | Field pH (s.u.) | Lab pH (s.u.) | K | Se (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | | 50 | 1000 | 10 | | 250 | 50 | 1000 | | | 50 | | 230 | | 2 | | | | | 10 |
| ACL | | | | | | | | | | 1.4 | | | | | | | | | | |
| Jul-91 | 260 | | | | | | | <14 | 230 | 1.2 | | | 220 | | | | | 7.2 | | |
| Oct-91 | 260 | | | | | | | <14 | 230 | 1.0 | | | 150 | | | | | 7.1 | | |
| Jan-92 | 260 | | | | | | | <14 | 240 | 0.75 | | | 160 | | | | | 6.8 | | |
| Apr-92 | 260 | | | | | | | <14 | 240 | 1.0 | | | 130 | | | | | 7.0 | | |
| Jul-92 | 270 | | | | | | | <14 | 260 | 0.95 | | | 150 | | | | | 6.9 | | |
| Oct-92 | 270 | | | | | | | <14 | 260 | 12 | | | 100 | | | | | 7.6 | | |
| Jan-93 | 260 | | | | | | | <14 | 240 | 1.1 | | | 110 | | | | | 7.4 | | |
| Apr-93 | 250 | | | | | | | <10 | 250 | 0.46 | | | 150 | | | | | 6.9 | | |
| Jul-93 | 250 | | | | | | | <12 | 230 | 0.61 | | | 140 | | | | | 6.6 | | |
| Oct-93 | 250 | | | | | | | <12 | 220 | 0.17 | | | 69 | | | | 7.5 | 7.3 | | |
| Jan-94 | 250 | | | | | | | <12 | 230 | 0.19 | | | 35 | | | | 7.3 | 7.4 | | |
| Apr-94 | 250 | | | | | | | <12 | 230 | 0.20 | | | 160 | | | | 7.2 | 7.1 | | |
| Jul-94 | 240 | | | | | | | <12 | 230 | 0.22 | | | 100 | | | | 6.9 | 7.0 | | |
| Oct-94 | 250 | | | | | | | <1.6 | 250 | 0.24 | | | 62 | | | | 7.2 | 7.2 | | |
| Jan-95 | 270 | | | | | | | 4.4 | 230 | 0.04 | | | 41 | | | | 7.1 | 7.4 | | |
| Apr-95 | 270 | | | | | | | 3.7 | 200 | 0.08 | | | 41 | | | | 7.5 | 7.3 | | |
| Jul-95 | 280 | | | | | | | 1.8 | 200 | 0.07 | | | 90 | | | | 7.2 | 7.0 | | |
| Oct-95 | 260 | | | | | | | 2.1 | 230 | 0.17 | | | 72 | | | | 7.2 | 7.1 | | |
| Jan-96 | 240 | | | | | | | <0.68 | 210 | 0.28 | | | 97 | | | | 7.3 | 6.9 | | |
| Apr-96 | 250 | | | | | | | <0.68 | 210 | 0.049 | | | 35 | | | | 6.9 | 7.2 | | |
| Jul-96 | 240 | | | | | | | 3.9 | 210 | 0.064 | | | 140 | | | | 6.9 | 7.1 | | |
| Oct-96 | 260 | | | | | | | 8.2 | 200 | 0.37 | | | 67 | | | | 7.2 | 7.1 | | |
| Jan-97 | 260 | | | | | | | 2.7 | 210 | 0.073 | | | 24 | | | | 7.0 | 7.4 | | |
| Apr-97 | 250 | | | | | | | 1.6 | 220 | 0.41 | | | 77 | | | | 7.0 | 6.7 | | |
| Jul-97 | 240 | | | | | | | 2.0 | 230 | 0.087 | | | 66 | | | | 7.0 | 6.8 | | |
| Oct-97 | 240 | | | | | | | <0.54 | 230 | 0.17 | | | 62 | | | | 6.9 | 7.1 | | |
| Jan-98 | 250 | | | | | | | 0.7 | 220 | 0.41 | | | 72 | | | | 7.1 | 7.1 | | |
| Apr-98 | 240 | | | | | | | 1.1 | 210 | 0.077 | | | 29 | | | | 7.4 | 7.4 | | |
| Jul-98 | 260 | | | | | | | <0.54 | 220 | 0.34 | | | 100 | | | | 7.0 | 7.3 | | |
| Oct-98 | 230 | | | | | | | 1.9 | 220 | 0.17 | | | 63 | | | | 7.0 | 6.6 | | |
| Feb-99 | 250 | | | | | | | <0.54 | 220 | 0.066 | | | 27 | | | | 7.6 | 7.3 | | |
| Apr-99 | 250 | | | | | | | 1.1 | 210 | 0.049 | | | 23 | | | | 7.0 | 7.7 | | |
| Jul-99 | 240 | <4.2 | 64 | <2.1 | 52 | 3.5 | <0.42 | <4.7 | 220 | 0.054 | <1.4 | 21 | 51 | | <0.050 | | 6.9 | 7.0 | 8.1 | <1.3 |
| Oct-99 | 240 | | | | | | | <0.47 | 220 | 0.97 | | | 88 | 26000 | | | 7.3 | 7.4 | | |
| Jan-00 | 250 | | | | | | | <0.47 | 200 | 0.14 | | | 47 | | | | 6.7 | 7.1 | | |
| Apr-00 | 250 | | | | | | | <0.60 | 220 | 0.37 | | | 80 | 32000 | | | 7.3 | 7.0 | | |
| Jul-00 | 250 | <1.7 | 70 | 0.28 | | | <0.74 | <0.53 | 230 | 0.058 | <1.4 | | 75 | | <0.050 | | 6.5 | 7.1 | | <1.6 |
| Oct-00 | 240 | | | | | | | 0.74 | 220 | 0.13 | | | 38 | | | | 7.3 | 7.4 | | |
| Jan-01 | 250 | | | | | | | <0.53 | 210 | 0.058 | | | 24 | | | | 7.2 | 6.9 | | |
| Apr-01 | 240 | | | | | | | <2.7 | 220 | 0.055 | | | 27 | 24000 | | | 6.7 | 7.3 | | |
| Jul-01 | 230 | <2.3 | 69 | 0.40 | 56 | | 0.58 | <2.7 | 230 | 0.087 | <0.92 | 22 | 49 | | <0.050 | | 7.1 | 7.2 | | <1.6 |
| Jul-01 D | 240 | <2.3 | 68 | <0.23 | 56 | | <0.57 | <2.7 | 230 | 0.77 | <0.92 | 22 | 80 | | <0.050 | | | 7.2 | | <1.6 |
| Oct-01 | 240 | | | | | | | <2.7 | 200 | 0.20 | | | 68 | | | | 6.6 | 7.1 | | |
| Jan-02 | 250 | | | | | | | <2.7 | 200 | 0.077 | | | 30 | | | | 7.0 | 7.4 | | |
| Apr-02 | 240 | | | | | | | <2.7 | 210 | 0.076 | | | 20 | | | | 7.2 | 7.3 | | |
| Jul-02 | 250 | <2.6/4.6 | 70 | <0.23 | | | <0.44 | <2.7 | 220 | 0.12 | <0.92 | | 71 | | <0.050 | | 7.2 | 7.1 | | <2.5 |
| Oct-02 | 240 | | | | | | | <2.7 | 210 | 0.23 | | | 54 | | | | 7.2 | 6.9 | | |
| Jan-03 | 250 | | | | | | | <2.7 | 190 | 0.52 | | | 51 | | | | 7.2 | 7.1 | | |
| Apr-03 | 230 | | | | | | | <1.3 | 200 | 0.73 | | | 110 | | | | 7.1 | 6.9 | | |
| Jul-03 | 240 | <1.2 | 67 | <0.17 | 55 | | <0.43 | <1.3 | 230 | 1.1 | <0.94 | 22 | 74 | | <0.025 | | 7.1 | 7.0 | | <2.0 |
| Oct-03 | 240 | | | | | | | <1.3 | 210 | 1.0 | | | 74 | | | | 7.3 | 7.1 | | |
| Jan-04 | 240 | | | | | | | <1.3 | 220 | 0.38 | | | 43 | | | | 7.3 | 7.0 | | |
| Apr-04 | 240 | | | | | | | <1.3 | 220 | 0.11 | | | 20 | | | | 7.1 | 7.3 | | |
| Jul-04 | 240 | <1.8 | 69 | <0.16 | 54 | 4.2 | <0.45 | <1.3 | 220 | 0.45 | <1.0 | 21 | 93 | | <0.025 | | 7.0 | 7.2 | 8.7 | <2.1 |
| Oct-04 | 240 | 2.6 | | | 51 | | | <1.3 | 210 | 0.47 | | 20 | 87 | | | | 7.1 | 7.4 | | |
| Jan-05 | 250 | <0.73 | | | | | | <1.3 | 210 | 0.85 | | | 79 | | | | 7.1 | 7.5 | | |
| Apr-05 | 240 | <0.66 | | | | | | <1.3 | 220 | 0.11 | | | 17 | | | | 6.7 | 7.4 | | |
| Jul-05 | 240 | <0.66 | 69 | <0.17 | 57 | | <0.55 | <1.3 | 230 | 0.17 | <1.2 | 23 | 82 | | <0.025 | 1.8 | 7.4 | 7.2 | | <2.0 |
| Oct-05 | 240 | <0.66 | | | | | | <2.7 | 220 | 0.030 | | | 48 | | | | 6.5 | 7.2 | | |
| Jan-06 | 250 | <0.66 | | | | | | <2.7 | 200 | 0.49 | | | 75 | | | | 6.9 | 7.0 | | |
| Apr-06 | 250 | <0.57 | | | | | | <2.7 | 230 | 0.22 | | | 40 | | | | 6.7 | 7.2 | | |
| Jul-06 | 240 | <0.57 | 67 | <0.17 | 48 | 4.0 | <0.88 | <2.7 | 210 | 0.60 | <1.3 | 21 | 86 | | <0.025 | | 6.6 | 7.1 | 9.20 | <1.8 |
| Oct-06 | 240 | <0.57 | | | | | | <2.7 | 230 | 0.019 | | | 39 | | | | 7.0 | 7.2 | | |

D = Field Duplicate

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# MW1005P

| | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Permit Standard | 50 | | 500 | 250 | 5000 | | | | | | | | |
| ACL | | | | | | | | | | | | | |
| Jul-91 | | | 290 | <10 | | | | | | | | | |
| Oct-91 | | | 440 | <10 | | | | | | | | | |
| Jan-92 | | | 280 | <10 | | | | | | | | | |
| Apr-92 | | | 350 | <10 | | | | | | | | | |
| Jul-92 | | | 270 | <10 | | | | | | | | | |
| Oct-92 | | | 320 | <10 | | | | | | | | | |
| Jan-93 | | | 220 | <10 | | | | | | | | | |
| Apr-93 | | | 240 | 2 | | | | | | | | | |
| Jul-93 | | | 260 | 3 | | | | | | | | | |
| Oct-93 | | | 300 | <2 | | | 462 | | | | | | 1139.85 |
| Jan-94 | | | 260 | <2 | | | 487 | | | | | | 1138.88 |
| Apr-94 | | | 270 | <2 | | | 487 | | | | | | 1139.44 |
| Jul-94 | | | 270 | <2 | | | 456 | | | | | | 1138.96 |
| Oct-94 | | | 280 | 2.5 | | None | 452 | | | V. Sl. | V. Sl. | | 1137.79 |
| Jan-95 | | | 340 | <0.56 | | None | 511 | | | None | None | | 1137.14 |
| Apr-95 | | | 300 | <0.56 | | None | 420 | | | None | None | | 1137.45 |
| Jul-95 | | | 290 | <0.56 | | None | 454 | | | Slight | None | | 1137.47 |
| Oct-95 | | | 260 | 5.3 | | None | 470 | | | None | None | | 1137.79 |
| Jan-96 | | | 270 | 0.93 | | None | 464 | | | None | None | | 1137.39 |
| Apr-96 | | | 300 | 2.2 | | None | 486 | | | None | None | | 1139.37 |
| Jul-96 | | | 300 | 2.6 | | None | 441 | | | None | None | | 1139.57 |
| Oct-96 | | | 280 | 3.6 | | None | 471 | | | None | None | | 1137.46 |
| Jan-97 | | | 280 | 5.4 | | None | 462 | | | None | None | | 1137.41 |
| Apr-97 | | | 320 | 5.8 | | None | 480 | | | None | None | | 1138.85 |
| Jul-97 | | | 280 | 6.7 | | None | 448 | | | None | None | | 1137.66 |
| Oct-97 | | | 260 | <5.0 | | None | 505 | | | None | None | | 1137.77 |
| Jan-98 | | | 270 | 11 | | None | 456 | | | None | None | | 1136.00 |
| Apr-98 | | | 280 | 9.6 | | None | 461 | | | None | None | | 1137.92 |
| Jul-98 | | | 270 | 12 | | None | 458 | | | None | None | | 1137.63 |
| Oct-98 | | | 250 | 9.4 | | None | 477 | | | None | None | | 1136.19 |
| Feb-99 | | | 250 | 7.8 | | None | 449 | | | None | None | 6.7 | 1135.35 |
| Apr-99 | | | 230 | 7.8 | | None | 464 | | | None | None | 11.0 | 1136.65 |
| Jul-99 | <0.45 | 9.0 | 250 | 7.3 | <12 | None | 501 | | | None | None | 15.9 | 1138.09 |
| Oct-99 | | | 260 | <1.5 | | None | 460 | | | Slight | None | 9.8 | 1137.64 |
| Jan-00 | | | 280 | <5.0 | | None | 480 | | | Moderate | None | — | 1136.65 |
| Apr-00 | | | 220 | <5.0 | | None | 483 | | 64 | None | None | 6.4 | 1137.05 |
| Jul-00 | <0.55 | | 290 | <5.0 | <12 | None | 460 | 470 | | None | Slight | 12.5 | 1138.08 |
| Oct-00 | | | 260 | <5.0 | <12 | None | 448 | 450 | | None | None | 10.5 | 1137.56 |
| Jan-01 | | | 260 | <5.0 | <12 | None | 454 | 450 | 37 | None | None | 8.4 | 1136.65 |
| Apr-01 | | | 290 | <5 | <12 | None | 430 | 450 | 17 | None | None | 12.8 | 1138.80 |
| Jul-01 | <0.56 | | 250 | <5.0 | <12 | None | 428 | 460 | 8 | None | None | 12.2 | 1140.03 |
| Jul-01 | <0.56 | | 210 | <5.0 | <12 | | | 470 | | | | | |
| Oct-01 | | | 270 | <5.0 | <12 | None | 424 | 470 | 5 | None | None | 9.9 | 1138.59 |
| Jan-02 | | | 270 | <5.0 | <12 | None | 418 | 450 | 7 | None | None | 8.6 | 1138.67 |
| Apr-02 | | | 270 | <5.0 | <10 | None | 434 | 480 | 2 | None | None | 13.7 | 1139.89 |
| Jul-02 | <0.47 | | 270 | <5.0 | <10 | None | 426 | 460 | 26 | None | None | 13.6 | 1141.25 |
| Oct-02 | | | 300 | <5.0 | <10 | None | 428 | 420 | 5 | None | None | 10.2 | 1142.14 |
| Jan-03 | | | 290 | <5.0 | <10 | None | 298 | 440 | 22 | None | None | 9.8 | 1140.70 |
| Apr-03 | | | 220 | <5.0 | <10 | None | 381 | 420 | -4 | None | Vslight | 10.4 | 1138.93 |
| Jul-03 | <0.40 | | 260 | <2.5 | <5.0 | None | 439 | 460 | -3 | None | None | 13.4 | 1140.27 |
| Oct-03 | | | 260 | <2.5 | <5.0 | None | 436 | 436 | -18 | None | None | 11.6 | 1138.32 |
| Jan-04 | | | 260 | <2.5 | | None | 438 | 439 | -2 | None | None | 5.9 | 1137.38 |
| Apr-04 | | | 220 | <2.5 | | None | 436 | 420 | 4 | None | None | 12.4 | 1137.86 |
| Jul-04 | <0.67 | 7.4 | 170 | <2.5 | <5.0 | None | 428 | 411 | -5 | None | None | 11.4 | 1139.37 |
| Oct-04 | | | 210 | <2.5 | | None | 436 | 470 | -2 | None | Slight | 9.9 | 1138.05 |
| Jan-05 | | | 210 | <2.5 | | None | 428 | 459 | 15 | None | None | 9.5 | 1137.86 |
| Apr-05 | | | 200 | <2.5 | | None | 437 | 424 | -2 | None | None | 9.7 | 1137.90 |
| Jul-05 | <0.47 | | 230 | <2.5 | 7.1 | None | 428 | 449 | -1 | None | None | 13.3 | 1138.30 |
| Oct-05 | | | 210 | <2.5 | | None | 427 | 442 | -6 | None | None | 9.2 | 1137.53 |
| Jan-06 | | | 200 | <2.5 | | None | 434 | 419 | 20 | None | None | 8.4 | 1137.24 |
| Apr-06 | | | 210 | <2.5 | | None | 439 | 433 | 6 | None | Vslight | 10.2 | 1138.47 |
| Jul-06 | <1.1 | 7.2 | 200 | <2.5 | <5.0 | None | 423 | 413 | 1 | None | None | 14.7 | 1136.80 |
| Oct-06 | | | 140 | <2.5 | | None | 456 | 423 | -3 | None | None | 10.3 | 1136.78 |

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# MW-1013

| Well MW-1013 | | Alk (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | CO2 [ug/l] | Hg (ug/l) | Field pH (s.u.) | Lab pH (s.u.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr-99 | | | | | | | | | | | | | | | | | | |
| Jul-99 | | | | | | | | | | | | | | | | | | |
| Oct-99 | | | | | | | | | | | | | | | | | | |
| Jan-00 | | | | | | | | | | | | | | | | | Well not recovered suff | |
| Apr-00 | | | | | | | | | | | | | | | | | | |
| Jul-00 | | | | | | | | | | | | | | | | | | |
| Oct-00 | | | | | | | | | | | | | | | | | | |
| Jan-01 | | | | | | | | | | | | | | | | | | |
| Apr-01 | | | | | | | | | | | | | | | | | | |
| Jul-01 | | | | | | | | | | | | | | | | | | |
| Oct-01 | | | | | | | | | | | | | | | | | | |
| Jan-02 | | | | | | | | | | | | | | | | | | |
| Apr-02 | | | | | | | | | | | | | | | | | | |
| Jul-02 | | | | | | | | | | | | | | | | | | |
| Oct-02 | | | | | | | | | | | | | | | | | | |
| Jan-03 | | | | | | | | | | | | | | | | | | |
| Apr-03 | | | | | | | | | | | | | | | | | | |
| Oct-03 | | | | | | | | | | | | | | | | | | |
| Jan-04 | | | | | | | | | | | | | | | | | | |
| Apr-04 | | | | | | | | | | | | | | | | | | |
| Jul-04 | | | | | | | | | | | | | | | | | | |
| Oct-04 | | | | | | | | | | | | | | | | | | |
| Jan-05 | | | | | | | | | | | | | | | | | | |
| Apr-05 | | | | | | | | | | | | | | | | | | |
| Jul-05 | | | | | | | | | | | | | | | | | | |
| Oct-05 | | 510 | 2.5 | | | | | | <13 | 600 | 22 | | | 25000 | | | 6.1 | 6.37 |
| Jan-06 | | 680 | 0.98 | | | | | | <13 | 560 | 12 | | | 22000 | | | 6.4 | 6.64 |
| Apr-06 | | 510 | <1.0 | 150 | <1.7 | 150 | 18 | <10 | 23 | 550 | 2.2 | 14 | 44 | 21000 | | <0.025 | 6.0 | 6.28 |
| Jul-06 | | 520 | <1.0 | 160 | <1.7 | 140 | 17 | <10 | 24 | 530 | 3.2 | <13 | 45 | 20000 | | <0.025 | 6.1 | 6.38 |
| Jul-06 | D | 560 | <1.0 | 150 | <1.7 | 140 | 17 | <10 | 29 | 520 | 3.2 | <13 | 43 | 19000 | | <0.025 | | 6.39 |
| Oct-06 | | 520 | <1.0 | | | | | | <13 | 580 | 11 | | | 24000 | | | 6.5 | 6.42 |

D = Field Duplicate

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# MW-1013

| | K | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr-99 | | | | | | | | | | | | | | | 1105.11 |
| Jul-99 | | | | | | | | | | | | | | | 1106.07 |
| Oct-99 | | | | | | | | | | | | | | | 1105.80 |
| Jan-00 | d sufficiently to collect groundwater sample. | | | | | | | | | | | | | | 1104.64 |
| Apr-00 | | | | | | | | | | | 97 | | | | 1103.87 |
| Jul-00 | | | | | | | | | | | | | | | 1104.58 |
| Oct-00 | | | | | | | | | | | | | | | 1105.06 |
| Jan-01 | | | | | | | | | | | | | | | 1103.78 |
| Apr-01 | | | | | | | | | | | | | | | 1104.08 |
| Jul-01 | | | | | | | | | | | | | | | 1106.08 |
| Oct-01 | | | | | | | | | | | | | | | 1106.69 |
| Jan-02 | | | | | | | | | | | | | | | 1105.28 |
| Apr-02 | | | | | | | | | | | | | | | 1105.35 |
| Jul-02 | | | | | | | | | | | | | | | 1106.66 |
| Oct-02 | | | | | | | | | | | | | | | 1107.28 |
| Jan-03 | | | | | | | | | | | | | | | 1105.97 |
| Apr-03 | | | | | | | | | | | | | | | 1106.02 |
| Oct-03 | | | | | | | | | | | | | | | 1109.30 |
| Jan-04 | | | | | | | | | | | | | | | 1108.22 |
| Apr-04 | | | | | | | | | | | | | | | 1108.20 |
| Jul-04 | | | | | | | | | | | | | | | 1111.69 |
| Oct-04 | | | | | | | | | | | | | | | 1110.47 |
| Jan-05 | | | | | | | | | | | | | | | 1109.19 |
| Apr-05 | | | | | | | | | | | | | | | 1108.43 |
| Jul-05 | | | | | | | | | | | | | | | 1110.98 |
| Oct-05 | | | | | 760 | 62 | | None | 1332 | 1040 | 73 | None | None | 12.9 | 1109.89 |
| Jan-06 | | | | | 700 | 79 | | None | 1211 | 1190 | 72 | None | None | 8.4 | 1108.54 |
| Apr-06 | | <2.4 | <12 | | 640 | 65 | <50 | None | 1040 | 888 | 150 | None | None | 9.0 | 1108.42 |
| Jul-06 | 3.1 | <2.4 | <12 | 19 | 630 | 58 | <50 | None | 1091 | 942 | 92 | None | None | 13.0 | 1111.08 |
| Jul-06 | 3.1 | 3.4 | <12 | 18 | 670 | 58 | <50 | | | 961 | | | | | |
| Oct-06 | | | | | 620 | 55 | | None | 1233 | 998 | 81 | None | None | 12.3 | 1109.73 |

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# MW-1013A

| | Well MW-1013A | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Alk (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | CO2 [ug/l] | Hg (ug/l) | Field pH (s.u.) | Lab pH (s.u.) | K |
| Apr-99 | | | | | | | | | | | | | | | | | | |
| Jul-99 | | | | | | | | | | | | | | | | | | |
| Oct-99 | | | | | | | | | | | | | | | | | | |
| Jan-00 | | | | | | | | | | | | | | | | | | |
| Apr-00 | | | | | | | | | | | | | | | | | | |
| Jul-00 | | | | | | | | | | | | | | | | | | |
| Oct-00 | | | | | | | | | | | | | | | | | | |
| Jan-01 | | | | | | | | | | | | | | | | | | |
| Apr-01 | | | | | | | | | | | | | | | | | | |
| Jul-01 | | | | | | | | | | | | | | | | | | |
| Oct-01 | | | | | | | | | | | | | | | | | | |
| Jan-02 | | | | | | | | | | | | | | | | | | |
| Apr-02 | | | | | | | | | | | | | | | | | | |
| Jul-02 | | | | | | | | | | | | | | | | | | |
| Oct-02 | | | | | | | | | | | | | | | | | | |
| Jan-03 | | | | | | | | | | | | | | | | | | |
| Apr-03 | | | | | | | | | | | | | | | | | | |
| Oct-03 | | | | | | | | | | | | | | | | | | |
| Jan-04 | | | | | | | | | | | | | | | | | | |
| Apr-04 | | | | | | | | | | | | | | | | | | |
| Jul-04 | | | | | | | | | | | | | | | | | | |
| Oct-04 | | | | | | | | | | | | | | | | | | |
| Jan-05 | | | | | | | | | | | | | | | | | | |
| Apr-05 | | | | | | | | | | | | | | | | | | |
| Jul-05 | | | | | | | | | | | | | | | | | | |
| Oct-05 | 370 | 0.86 | | | | | | <13 | 680 | <0.33 | | | 4500 | | | 6.7 | 6.82 | |
| Jan-06 | 340 | <0.85 | | | | | | <13 | 500 | <0.33 | | | 2900 | | | 6.8 | 6.78 | |
| Apr-06 | 340 | <1.0 | 120 | <1.7 | 190 | 11 | <10 | 17 | 730 | <0.33 | 19 | 62 | 3900 | | <0.025 | 6.2 | 6.72 | |
| Jul-06 | 320 | <1.0 | 99 | <1.7 | 120 | 6.7 | <10 | 16 | 460 | <0.33 | <13 | 42 | 1700 | | <0.025 | 6.52 | 6.69 | 7.1 |
| Oct-06 | 300 | <1.0 | | | | | | <13 | 490 | <0.33 | | | 2400 | | | 7 | 6.87 | |

Well not recovered sufficiently to collect groundwater sample.

# MW-1013A

| | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp ($^oC$) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr-99 | | | | | | | | | | | | | | 1094.73 |
| Jul-99 | | | | | | | | | | | | | | 1095.38 |
| Oct-99 | | | | | | | | | | | | | | 1095.51 |
| Jan-00 | | | | | | | | | | | | | | 1095.62 |
| Apr-00 | | | | | | | | | | 97 | | | | 1095.36 |
| Jul-00 | | | | | | | | | | | | | | 1095.79 |
| Oct-00 | | | | | | | | | | | | | | 1096.20 |
| Jan-01 | | | | | | | | | | | | | | 1095.72 |
| Apr-01 | | | | | | | | | | | | | | 1097.10 |
| Jul-01 | | | | | | | | | | | | | | 1097.19 |
| Oct-01 | | | | | | | | | | | | | | 1096.90 |
| Jan-02 | | | | | | | | | | | | | | 1097.02 |
| Apr-02 | | | | | | | | | | | | | | 1097.18 |
| Jul-02 | | | | | | | | | | | | | | 1097.44 |
| Oct-02 | | | | | | | | | | | | | | 1097.85 |
| Jan-03 | | | | | | | | | | | | | | 1097.39 |
| Apr-03 | | | | | | | | | | | | | | 1097.95 |
| Oct-03 | | | | | | | | | | | | | | 1097.00 |
| Jan-04 | | | | | | | | | | | | | | 1096.91 |
| Apr-04 | | | | | | | | | | | | | | 1097.43 |
| Jul-04 | | | | | | | | | | | | | | 1097.86 |
| Oct-04 | | | | | | | | | | | | | | 1097.11 |
| Jan-05 | | | | | | | | | | | | | | 1097.27 |
| Apr-05 | | | | | | | | | | | | | | 1097.16 |
| Jul-05 | | | | | | | | | | | | | | 1096.86 |
| Oct-05 | | | | 870 | 380 | | None | 1576 | 1180 | 153 | None | None | 11.4 | 1096.84 |
| Jan-06 | | | | 650 | 240 | | None | 1271 | 1000 | 156 | Slight | None | 8.4 | 1097.01 |
| Apr-06 | <2.4 | <12 | | 640 | 270 | 61 | None | 1571 | 929 | 152 | VSl | None | 11.0 | 1097.29 |
| Jul-06 | <2.4 | <12 | 35 | 600 | 220 | <50 | None | 1104 | 899 | 160 | None | None | 13.2 | 1096.52 |
| Oct-06 | | | | 560 | 200 | | None | 1015 | 951 | 130 | Moderate | None | 10.9 | 1096.36 |

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# MW-1013B

Well MW-1013B Well Depth: 86.3'

| | | Alk | NH3 | NO3+NO2 | As | Ba | Cd | Ca | Cl | Cr | Cu | Hard | Fe | Pb | Mg | Mn | CO2 | Hg | Ni |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (mg/l) | (mg/l) | (mg/l) | (ug/l) | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (ug/l) | (mg/l) | (ug/l) | [ug/l] | (ug/l) | (ug/l) |
| Feb-99 | | 630 | | | | | | | | | 36 | 2300 | 0.045 | | | 25000 | | | |
| Apr-99 | | 550 | | | | | | | | | 16 | 2300 | 0.33 | | | 30000 | | | |
| Jul-99 | | 620 | | | <42 | <50 | <21 | 630 | 35 | 16 | 33 | 2200 | 0.76 | <14 | 150 | 29000 | | <0.050 | |
| Oct-99 | | 540 | | | <42 | <50 | <4.2 | 650 | 35 | 14 | <9.4 | 2200 | 0.17 | <14 | 150 | 28000 | 180000 | <0.050 | |
| Jan-00 | | 560 | | | 17 | <50 | <2.1 | 600 | 28 | 18 | <4.7 | 2100 | 0.41 | <14 | 150 | 30000 | | <0.050 | |
| Apr-00 | | 520 | | | 12 | <50 | <3.1 | 630 | 35 | <6.2 | 19 | 2200 | 0.27 | <24 | 150 | 32000 | 470000 | <0.050 | |
| Jul-00 | | 660 | | | <21 | <50 | <2.3 | 670 | <40 | 5.1 | 14 | 2300 | <0.36 | <9.6 | 160 | 34000 | | <0.050 | |
| Oct-00 | | 620 | | | | | | | | | <12 | 2200 | 0.84 | | | 35000 | | | |
| Jan-01 | | 590 | | | | | | | | | <12 | 1900 | 0.41 | | | 30000 | | | |
| Apr-01 | | 530 | | | | | | | | | 35 | 2300 | 0.72 | | | 40000 | 410000 | | |
| Jul-01 | | 490 | | | <15 | <50 | 3.3 | 700 | | 6.4 | 33 | 2400 | 0.89 | <7.9 | 160 | 40000 | | <0.050 | |
| Oct-01 | | 560 | | | 18 | <50 | <1.7 | 600 | | 4.8 | 69 | 2000 | 0.66 | <7.9 | 130 | 34000 | | <0.050 | |
| Jan-02 | | 600 | | | | | | | | | 52 | 2100 | 0.71 | | | 36000 | | | |
| Apr-02 | | 520 | | | | | | | | | 110 | 2200 | 0.36 | | | 34000 | | | |
| Jul-02 | | 690 | | | 28/<15 | <50 | <1.7 | | | <4.5 | 150 | 2300 | 0.70 | <7.4 | | 39000 | | <0.050 | |
| Oct-02 | | 620 | | | | | | | | | 210 | 2300 | <0.15 | | | 36000 | | | |
| Jan-03 | | 630 | | | <27 | <50 | 2.4 | 640 | <50 | <4.5 | 92 | 2200 | 0.15 | <7.4 | 150 | 33000 | | <0.050 | |
| Apr-03 | | 660 | | | | | | | | | 160 | 2200 | 1.2 | | | 39000 | | | |
| Jul-03 | | 620 | | | <2.6 | <25 | <2.1 | 660 | | <6.4 | 120 | 2300 | 0.61 | <10 | 150 | 38000 | | <0.025 | |
| Jul-03 | D | 580 | | | 4.3 | <25 | <2.1 | 660 | | <6.4 | 110 | 2300 | 0.36 | <10 | 150 | 37000 | | <0.025 | |
| Oct-03 | | 590 | | | | | | | | | 110 | 2300 | <0.29 | | | 35000 | | | |
| Oct-03 | D | 550 | | | | | | | | | 140 | 2200 | 0.83 | | | 37000 | | | |
| Jan-04 | | 580 | | | | | | | | | 170 | 2200 | 1.6 | | | 40000 | | | |
| Apr-04 | | 560 | | | | | | | | | 230 | 2200 | <0.33 | | | 32000 | | | |
| Jul-04 | | 550 | | | <2.6 | <25 | <1.7 | 640 | 47 | <5.1 | 150 | 2200 | <0.33 | 20 | 150 | 24000 | | <0.025 | |
| Oct-04 | | 640 | | | 4.2 | | | 640 | | | 380 | 2200 | <0.33 | | 140 | 34000 | | | |
| Jan-05 | | 580 | | | 4.8 | | | | | | 180 | 2200 | <0.33 | | | 24000 | | | |
| Apr-05 | | 630 | | | 1.7 | | | | | | 450 | 2200 | <0.33 | | | 42000 | | | |
| Jul-05 | | 640 | 0.081 | 0.060 | 1.9 | <25 | <1.7 | 690 | | <4.5 | 400 | 2300 | <0.33 | <10 | 150 | 39000 | | <0.025 | 45.0 |
| Oct-05 | | 630 | | | <0.85 | | | | | | 230 | 2300 | <0.33 | | | 30000 | | | |
| Jan-06 | | 590 | | | 1.1 | | | | | | 210 | 2200 | <0.33 | | | 22000 | | | |
| Apr-06 | | 590 | 0.2 | 0.082 | <1.0 | <25 | <1.7 | 650 | 48 | <10 | 280 | 2200 | <0.22 | <13 | 150 | 25000 | | <0.025 | |
| Jul-06 | | 610 | | | 1.4 | <25 | <1.7 | 630 | 46 | <10 | 470 | 2200 | <0.33 | <13 | 150 | 36000 | | <0.025 | |
| Oct-06 | | 480 | | | <1.0 | | | | | | 200 | 2400 | <0.33 | | | 23000 | | | |

D = Field Duplicate

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# MW-1013B

| | Field pH (s.u.) | Lab pH (s.u.) | K | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Feb-99 | 6.2 | 6.5 | | | | | 3100 | 1400 | | None | 3540 | | | None | None | | 1093.95 |
| Apr-99 | 6.2 | 6.4 | | | | | 3700 | 770 | | Slight | 3130 | | | None | Moderate | 16.0 | 1094.58 |
| Jul-99 | 6.4 | 6.5 | 8.2 | 1.7 | <4.5 | 35 | 3800 | 1600 | <120 | None | 3020 | | | Slight | Slight | 18.3 | 1095.20 |
| Oct-99 | 6.6 | 6.8 | 5.9 | <1.3 | <4.5 | 26 | 3700 | 1900 | <120 | None | 3200 | | | Slight | Slight | 14.2 | 1095.49 |
| Jan-00 | 6.4 | 6.4 | 6.4 | <1.3 | <4.5 | 33 | 3300 | 1700 | <120 | None | 3000 | | | None | Slight | 12.6 | 1095.59 |
| Apr-00 | 6.6 | 6.3 | 8.5 | <7.8 | <4.7 | 27 | 3600 | 1200 | <120 | None | 3120 | | 230 | None | Slight | 8.7 | 1095.54 |
| Jul-00 | 6.3 | 6.3 | 7.2 | <17 | <5.5 | 34 | 3200 | 1600 | <120 | None | 3000 | 2800 | | None | Slight | 16.0 | 1096.09 |
| Oct-00 | 6.3 | 6.9 | | | | | 3200 | 1500 | <120 | None | 3180 | 1800 | | None | Slight | 13.9 | 1096.45 |
| Jan-01 | 6.1 | 6.3 | | | | | 3300 | 1600 | <120 | None | 3230 | 2700 | 174 | None | V.Slight | 11.2 | 1095.86 |
| Apr-01 | 6.0 | 6.5 | | | | | 3300 | 1600 | <120 | None | 3400 | 2600 | 203 | None | V.Slight | 14.0 | 1097.57 |
| Jul-01 | 6.1 | 6.3 | | <10 | 6.5 | | 3500 | 1600 | 130 | None | 3290 | 2700 | 252 | None | V.Slight | 15.7 | 1097.63 |
| Oct-01 | 6.1 | 6.3 | | <16 | 6.0 | | 3200 | 1600 | 130 | None | 3320 | 3000 | 201 | None | V.Slight | 14.4 | 1097.19 |
| Jan-02 | 6.2 | 6.4 | | | | | 3600 | 1600 | <120 | None | 3380 | 2900 | 201 | None | Moderate | 13.0 | 1097.33 |
| Apr-02 | 6.2 | 6.4 | | | | | 3200 | 1600 | <120 | None | 3370 | 3100 | 205 | None | None | 12.3 | 1097.63 |
| Jul-02 | 6.4 | 6.3 | | <15 | 4.3 | | 3900 | 1400 | 130 | None | 3340 | 3000 | 202 | None | None | 16.1 | 1097.95 |
| Oct-02 | 6.1 | 6.4 | | | | | 3000 | 1600 | 130 | None | 3390 | 2900 | 221 | None | Slight | 13.6 | 1097.30 |
| Jan-03 | 6.1 | 6.4 | | <30 | 5.8 | | 3400 | 1600 | 130 | None | 3420 | 2800 | 208 | None | None | 9.8 | 1098.58 |
| Apr-03 | 6.2 | 6.3 | | | | | 3500 | 1500 | 130 | None | 3340 | 3000 | 203 | None | None | 12.1 | 1097.87 |
| Jul-03 | 6.3 | 6.8 | | <2.7 | <7.7 | | 3100 | 1600 | 140 | None | 3290 | 2800 | 200 | None | V.Slight | 14.9 | 1098.71 |
| Jul-03 | | 6.6 | | <2.7 | <7.7 | | 3100 | 1500 | 130 | | | 2800 | | | | | |
| Oct-03 | 6.3 | 6.4 | | | | | 3200 | 1500 | 140 | None | 3350 | 2890 | 199 | None | None | 16.1 | 1097.29 |
| Oct-03 | | 6.5 | | | | | 3200 | 1500 | 150 | | | 2830 | | | | | |
| Jan-04 | 6.2 | 6.33 | | | | | 3200 | 1600 | | None | 3370 | 2820 | 212 | None | V.Slight | 12.1 | 1097.13 |
| Apr-04 | 6.3 | 6.52 | | | | | 3100 | 1500 | | None | 3260 | | 188 | None | None | 14.7 | 1097.77 |
| Jul-04 | 6.1 | 6.34 | 6.8 | <8.0 | <6.7 | 31 | 3100 | 1600 | 150 | None | 3340 | 2480 | 191 | None | V.Slight | 13.3 | 1098.27 |
| Oct-04 | 6.3 | 6.26 | | | | | 3100 | 1600 | | None | 3250 | 3010 | 204 | None | None | 13.1 | 1097.10 |
| Jan-05 | 6.3 | 6.52 | | | | | 3000 | 1700 | | None | 3390 | 2990 | 207 | None | None | 9.0 | 1097.29 |
| Apr-05 | 6.2 | 6.55 | | | | | 3100 | 1700 | | None | 3420 | 2930 | 238 | None | None | 11.3 | 1097.61 |
| Jul-05 | 6.4 | 6.25 | | <1.9 | <6.7 | | 3100 | 1700 | 200 | None | 3200 | 2810 | 229 | None | None | 15.8 | 1097.22 |
| Oct-05 | 6.4 | 6.46 | | | | | 3100 | 1500 | | None | 3260 | 2620 | 222 | None | None | 11.9 | 1096.98 |
| Jan-06 | 6.4 | 6.51 | | | | | 3000 | 1500 | | None | 3480 | 2510 | 223 | None | None | 14.6 | 1097.17 |
| Apr-06 | 6.1 | 6.3 | | <2.4 | <12 | | 3000 | 1600 | 210 | None | 3300 | 2490 | 210 | None | None | 9.7 | 1097.65 |
| Jul-06 | 6.17 | 6.36 | 6.3 | <4.8 | <12 | 31 | 3000 | 1600 | 210 | None | 3280 | 2780 | 249 | None | None | 13.6 | 1096.73 |
| Oct-06 | 6.5 | 6.46 | | | | | 3000 | 1600 | | None | 3360 | 2720 | 309 | None | None | 10.9 | 1096.54 |

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# MW-1013C

Well MW-1013C Well Depth: 201.5'

| | | Alk (mg/l) | NH3 (mg/l) | NO3+NO2 (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | CO2 [ug/l] | Hg (ug/l) | Ni (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Feb-99 | | 480 | | | | | | | | | 100 | 2100 | 0.92 | | | 7200 | | | |
| Apr-99 | | 430 | | | | | | | | | 75 | 2200 | 0.84 | | | 7700 | | | |
| Jul-99 | | 430 | | | 83 | <50 | <21 | 570 | 50 | <4.2 | 50 | 2100 | 1.3 | <14 | 160 | 7300 | | <0.050 | |
| Oct-99 | | 400 | | | <42 | <50 | <4.2 | 610 | 50 | 7.2 | <9.4 | 2200 | 1.4 | <14 | 170 | 7600 | 140000 | <0.050 | |
| Jan-00 | | 510 | | | <15 | <50 | 2.1 | 550 | 58 | <4.2 | <4.7 | 2100 | 1.5 | <14 | 170 | 7300 | | <0.050 | |
| Apr-00 | | 460 | | | 14 | <50 | <3.1 | 590 | 50 | <6.2 | 11 | 2200 | 1.6 | <24 | 170 | 7800 | 270000 | <0.050 | |
| Jul-00 | | 520 | | | <21 | <50 | <2.3 | 620 | 56 | <4.0 | <12 | 2300 | 2.2 | <9.6 | 180 | 8400 | | <0.050 | |
| Oct-00 | | 540 | | | | | | | | | <12 | 2200 | 1.6 | | | 8200 | | | |
| Jan-01 | | 520 | | | | | | | | | <12 | 2100 | 2.6 | | | 7800 | | | |
| Jan-01 | D | 470 | | | | | | | | | <12 | 2000 | 2.5 | | | 7700 | | | |
| Apr-01 | | 440 | | | | | | | | | <13 | 2300 | 2.1 | | | 9100 | 260000 | | |
| Jul-01 | | 460 | | | <15 | <50 | <1.7 | 630 | | <3.4 | <13 | 2300 | 3.2 | <7.9 | 180 | 9000 | | <0.050 | |
| Oct-01 | | 480 | | | 22 | <50 | <1.7 | 550 | | <3.4 | <13 | 2000 | 2.7 | <7.9 | 160 | 8500 | | <0.050 | |
| Jan-02 | | 510 | | | | | | | | | <13 | 2100 | 4.5 | | | 8800 | | | |
| Apr-02 | | 480 | | | | | | | | | 14 | 2100 | 3.9 | | | 8900 | | | |
| Jul-02 | | 520 | | | <27/<15 | <50 | <1.7 | | | <4.5 | <13 | 2300 | 4.1 | <7.4 | | 10000 | | <0.050 | |
| Oct-02 | | 570 | | | | | | | | | <13 | 2300 | 5.4 | | | 9900 | | | |
| Jan-03 | | 570 | | | <27 | <50 | <1.7 | 600 | 53 | <4.5 | <13 | 2300 | 5.4 | <7.4 | 180 | 9500 | | <0.050 | |
| Apr-03 | | 540 | | | | | | | | | <13 | 2200 | 4.7 | | | 9600 | | | |
| Jul-03 | | 500 | | | 17 | <25 | <2.1 | 610 | | <6.4 | <13 | 2300 | 4.2 | <10 | 180 | 9600 | | <0.025 | |
| Oct-03 | | 540 | | | | | | | | | <13 | 2200 | 6.2 | | | 9800 | | | |
| Jan-04 | | 490 | | | | | | | | | 40 | 2200 | 2.8 | | | 9100 | | | |
| Apr-04 | | 490 | | | | | | | | | <13 | 2200 | 7.8 | | | 9700 | | | |
| DNR(4/04) | | 527 | 6.25 | <0.019 | 9.9 | 15 | 0.10 | 576 | 52.4 | 5.4 | 2.3 | 2180 | 7.2 | <1 | 180 | 9830 | | <0.03 | |
| Jul-04 | | 520 | | | 16 | <25 | <1.7 | 600 | 57 | <5.1 | <13 | 2300 | 7.4 | <8.7 | 180 | 10000 | | <0.025 | |
| Jul-04 | D | 490 | | | 9.7 | <25 | <1.7 | 590 | 61 | <5.1 | <13 | 2200 | 7.3 | 14 | 180 | 10000 | | <0.025 | |
| Oct-04 | | 520 | | | 17 | | | 580 | | | <13 | 2200 | 7.0 | | 170 | 9800 | | | |
| Jan-05 | | 540 | | | 20 | | | | | | <13 | 2100 | 7.2 | | | 9500 | | | |
| Apr-05 | | 520 | | | 16 | | | | | | <13 | 2200 | 8.2 | | | 10000 | | | |
| Jul-05 | | 510 | 7.2 | 0.048 | 13 | <25 | <1.7 | 630 | | 32 | <13 | 2300 | 8.5 | <10 | 190 | 11000 | | <0.025 | 200 |
| Oct-05 | | 510 | | | 9.2 | | | | | | <13 | 2200 | 8.3 | | | 11000 | | | |
| Oct-05 | D | 500 | | | 9.4 | | | | | | <13 | 2300 | 8.7 | | | 11000 | | | |
| Jan-06 | | 550 | | | 13 | | | | | | <13 | 2100 | 7.6 | | | 9700 | | | |
| Apr-06 | | 520 | 6.4 | 0.079 | 12 | <25 | <1.7 | 620 | 61 | <10 | <13 | 2300 | 8.9 | <13 | 180 | 11000 | | <0.025 | |
| Jul-06 | | 520 | | | 18 | <25 | <1.7 | 580 | 53 | <10 | 14 | 2200 | 7.0 | <13 | 180 | 9800 | | <0.025 | |
| Oct-06 | | 580 | | | 15 | | | | | | <13 | 2200 | 9.1 | | | 11000 | | | |

D = Field Duplicate
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# MW-1013C

| | Field pH (s.u.) | Lab pH (s.u.) | K (ug/l) | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Feb-99 | 6.3 | 6.6 | | | | | 3000 | 1300 | | None | 3170 | | | None | None | | 1095.27 |
| Apr-99 | 6.4 | 6.6 | | | | | 3300 | 920 | | None | 3030 | | | None | None | 13.5 | 1095.73 |
| Jul-99 | 6.4 | 6.7 | 23 | 3.0 | <4.5 | 35 | 2700 | 870 | 660 | Slight | 3020 | | | None | VSlight | ------ | 1096.67 |
| Oct-99 | 6.8 | 6.7 | 26 | <1.3 | <4.5 | 29 | 3000 | 2000 | 660 | None | 3300 | | | None | Moderate | 9.6 | 1096.97 |
| Jan-00 | 6.5 | 6.4 | 23 | <1.3 | 5.2 | 39 | 2900 | 1700 | 630 | None | 2700 | | | Vslight | Slight | 10.4 | 1097.10 |
| Apr-00 | 6.7 | 6.4 | 25 | <7.8 | <4.7 | 34 | 2900 | 1700 | 610 | None | 3370 | | 177 | None | Moderate | 8.5 | 1097.39 |
| Jul-00 | 6.3 | 6.4 | 24 | <17 | <5.5 | 45 | 3300 | 1600 | 620 | None | 3100 | 2800 | | None | VSlight | 13.8 | 1097.84 |
| Oct-00 | 6.4 | 6.9 | | | | | 3200 | 1600 | 370 | None | 3310 | 2500 | | None | VSlight | 11.9 | 1097.86 |
| Jan-01 | 6.3 | 6.4 | | | | | 3200 | 1600 | 480 | None | 3310 | 2800 | 80 | None | VSlight | 11.4 | 1098.03 |
| Jan-01 | | 6.4 | | | | | 3000 | 1600 | 470 | | | 2800 | | | | | |
| Apr-01 | 6.3 | 6.5 | | | | | 3000 | 1600 | 330 | None | 3000 | 2700 | 84 | None | Vslight | 13.8 | 1100.12 |
| Jul-01 | 6.3 | 6.6 | | <10 | <3.1 | | 3500 | 1600 | 570 | None | 3400 | 2800 | 30 | None | VSlight | 15.0 | 1099.39 |
| Oct-01 | 6.2 | 6.5 | | <16 | 6.8 | | 3200 | 1700 | 510 | None | 3380 | 3100 | 21 | None | VSlight | 12.6 | 1099.04 |
| Jan-02 | 6.3 | 6.5 | | | | | 3400 | 1700 | 500 | None | 3430 | 3000 | 48 | None | Slight | 11.5 | 1099.65 |
| Apr-02 | 6.3 | 6.6 | | | | | 3200 | 1700 | 360 | None | 3420 | 3500 | 51 | None | Slight | 14.4 | 1101.39 |
| Jul-02 | 6.4 | 6.6 | | <15 | <4.3 | | 3500 | 1500 | 440 | None | 3400 | 3100 | 49 | Vslight | VSlight | 16.5 | 1099.76 |
| Oct-02 | 6.4 | 6.5 | | | | | 3400 | 1600 | 480 | None | 3520 | 3000 | -46 | None | VSlight | 11.7 | 1101.33 |
| Jan-03 | 6.5 | 6.4 | | <30 | 5.7 | | 3500 | 1800 | 440 | None | 3510 | 3000 | 46 | Slight | Moderate | 11.6 | 1099.80 |
| Apr-03 | 6.4 | 6.5 | | | | | 3500 | 1700 | 310 | None | 3450 | 3000 | 44 | Vslight | VSlight | 16.5 | 1099.98 |
| Jul-03 | 6.3 | 6.5 | | <27 | <7.7 | | 3200 | 1700 | 320 | None | 3430 | 2900 | 27 | Slight | VSlight | 14.6 | 1100.31 |
| Oct-03 | 6.4 | 6.5 | | | | | 3200 | 1700 | 400 | None | 3520 | 2950 | 16 | None | VSlight | 12.7 | 1099.27 |
| Jan-04 | 6.3 | 6.6 | | | | | 3300 | 1700 | | None | 3510 | 2860 | 51 | None | Slight | 10.9 | 1099.18 |
| Apr-04 | 6.7 | 6.6 | | | | | 3200 | 1600 | | None | 3520 | 2870 | 59 | Vslight | VSlight | 12.1 | 1099.81 |
| DNR(4/04) | | 6.8 | | <1 | 0.3 | | 3210 | 1840 | 454 | | | 3210 | | | | | |
| Jul-04 | 6.2 | 6.5 | 26 | <16 | <6.7 | 42 | 3200 | 1400 | 460 | None | 3490 | 2660 | 45 | None | Vslight | 14.9 | 1099.75 |
| Jul-04 | | 6.6 | 25 | <8.0 | <6.7 | 41 | 3200 | 1600 | 460 | | | 2640 | | | | | |
| Oct-04 | 6.3 | 6.5 | | | | | 3200 | 1700 | | None | 3450 | 3120 | 50 | Slight | None | 12.1 | 1099.48 |
| Jan-05 | 6.3 | 6.6 | | | | | 3000 | 1700 | | None | 3540 | 3060 | 67 | None | Slight | 10.7 | 1099.34 |
| Apr-05 | 6.3 | 6.7 | | | | | 3100 | 1700 | | None | 3390 | 3010 | 66 | Vslight | VSlight | 12.4 | 1099.38 |
| Jul-05 | 6.6 | 6.5 | | <1.9 | <6.7 | | 3100 | 1800 | 460 | None | 3400 | 2910 | 17 | None | Slight | 14.1 | 1098.89 |
| Oct-05 | 6.7 | 6.7 | | | | | 3200 | 1700 | | None | 3410 | 2950 | 37 | Vslight | None | 11.9 | 1099.20 |
| Oct-05 | | 6.7 | | | | | 3100 | 1700 | | | | 2930 | | | | | |
| Jan-06 | 6.3 | 6.7 | | | | | 3100 | 1700 | | None | 3480 | 2860 | 61 | None | Vslight | 11.4 | 1099.30 |
| Apr-06 | 6.2 | 6.5 | | <2.4 | <12 | | 3000 | 1600 | 470 | None | 3380 | 2550 | 51 | None | None | 12.0 | 1099.24 |
| Jul-06 | 6.1 | 6.7 | 24 | 2.7 | <12 | 43 | 3100 | 1700 | 440 | Vslight | 3300 | 2750 | 51 | None | Slight | 14.7 | 1098.20 |
| Oct-06 | 6.7 | 6.6 | | | | | 3000 | 1600 | | None | 3390 | 2790 | 16 | None | Slight | 12.4 | 1097.94 |

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# MW-1014

| | Well MW-1014 | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Alk (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | CO2 [ug/l] | Hg (ug/l) | Field pH (s.u.) | Lab pH (s.u.) | K |
| Apr-99 | | | | | | | | | | | | | | | | | | |
| Jul-99 | | | | | | | | | | | | | | | | | | |
| Oct-99 | | | | | | | | | | | | | | | | | | |
| Jan-00 | | | | | | | | | | | | | | | | | | |
| Apr-00 | | | | | | | | | | | | | | | | | | |
| Jul-00 | | | | | | | | | | | | | | | | | | |
| Oct-00 | | | | | | | | | | | | | | | | | | |
| Jan-01 | | | | | | | | | | | | | | | | | | |
| Apr-01 | | | | | | | | | | | | | | | | | | |
| Jul-01 | | | | | | | | | | | | | | | | | | |
| Oct-01 | | | | | | | | | | | | | | | | | | |
| Jan-02 | | | | | | | | | | | | | | | | | | |
| Apr-02 | | | | | | | | | | | | | | | | | | |
| Jul-02 | | | | | | | | | | | | | | | | | | |
| Oct-02 | | | | | | | | | | | | | | | | | | |
| Jan-03 | | | | | | | | | | | | | | | | | | |
| Apr-03 | | | | | | | | | | | | | | | | | | |
| Oct-03 | | | | | | | | | | | | | | | | | | |
| Jan-04 | | | | | | | | | | | | | | | | | | |
| Apr-04 | | | | | | | | | | | | | | | | | | |
| Jul-04 | | | | | | | | | | | | | | | | | | |
| Oct-04 | | | | | | | | | | | | | | | | | | |
| Jan-05 | | | | | | | | | | | | | | | | | | |
| Oct-05 | 170 | <0.85 | | | | | | <13 | 350 | <0.33 | | | 1300 | | | 7.1 | 6.78 | |
| Jan-06 | 170 | <0.85 | | | | | | <13 | 310 | <0.33 | | | 1100 | | | 6.9 | 6.5 | |
| Apr-06 | 150 | <1.0 | 40 | <1.7 | 91 | 30 | <10 | 36 | 340 | <0.33 | <13 | 28 | 1200 | | <0.025 | 6.5 | 6.3 | |
| Jul-06 | 170 | <1.0 | <25 | <1.7 | 84 | 26 | <10 | 26 | 320 | <0.33 | <13 | 28 | 940 | | <0.025 | 6.54 | 6.59 | 3.7 |
| Oct-06 | 170 | <1.0 | | | | | | <13 | 350 | <0.33 | | | 880 | | | 6.7 | 6.8 | |

Well not recovered sufficiently to collect groundwater sample.

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# MW-1014

| | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp ($^oC$) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr-99 | | | | | | | | | | | | | | DRY |
| Jul-99 | | | | | | | | | | | | | | DRY |
| Oct-99 | | | | | | | | | | | | | | 1111.60 |
| Jan-00 | | | | | | | | | | | | | | 1112.07 |
| Apr-00 | | | | | | | | | | 160 | | | | 1112.41 |
| Jul-00 | | | | | | | | | | | | | | 1113.00 |
| Oct-00 | | | | | | | | | | | | | | 1113.98 |
| Jan-01 | | | | | | | | | | | | | | 1113.86 |
| Apr-01 | | | | | | | | | | | | | | 1114.62 |
| Jul-01 | | | | | | | | | | | | | | 1115.67 |
| Oct-01 | | | | | | | | | | | | | | 1116.86 |
| Jan-02 | | | | | | | | | | | | | | 1116.91 |
| Apr-02 | | | | | | | | | | | | | | 1117.24 |
| Jul-02 | | | | | | | | | | | | | | 1117.37 |
| Oct-02 | | | | | | | | | | | | | | 1118.56 |
| Jan-03 | | | | | | | | | | | | | | 1119.07 |
| Apr-03 | | | | | | | | | | | | | | 1118.91 |
| Oct-03 | | | | | | | | | | | | | | 1119.25 |
| Jan-04 | | | | | | | | | | | | | | 1118.37 |
| Apr-04 | | | | | | | | | | | | | | 1117.83 |
| Jul-04 | | | | | | | | | | | | | | 1118.45 |
| Oct-04 | | | | | | | | | | | | | | 1119.12 |
| Jan-05 | | | | | | | | | | | | | | 1118.50 |
| Oct-05 | | | | 500 | 200 | | None | 726 | 688 | 202 | None | None | 11.0 | 1117.70 |
| Jan-06 | | | | 540 | 190 | | None | 748 | 696 | 261 | None | None | 9.9 | 1117.27 |
| Apr-06 | <2.4 | <12 | | 410 | 170 | 79 | None | 677 | 630 | 271 | None | None | 10.4 | 1117.25 |
| Jul-06 | <2.4 | <12 | 20 | 490 | 180 | 59 | None | 713 | 661 | 175 | None | None | 12.1 | 1117.53 |
| Oct-06 | | | | 430 | 180 | | None | 739 | 647 | 165 | None | Slight | 10.7 | 1117.45 |



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# MW-1014A

| | Well MW-1014A Well Depth: 63.9' | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Alk (mg/l) | NH3 (mg/l) | NO3+NO2 | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | CO2 [ug/l] | Hg (ug/l) | Ni (ug/l) | Field pH (s.u.) | Lab pH (s.u.) |
| Apr-99 | | | | | | | | | | | | | | | | | | | | |
| Jul-99 | | | | | | | | | | | | | | | | | | | | |
| Oct-99 | Previous to April 2000, well not recovered sufficiently to collect groundwater sample. | | | | | | | | | | | | | | | | | | | |
| Jan-00 | | | | | | | | | | | | | | | | | | | | |
| Apr-00 | 390 | | | 15 | 59 | <3.1 | 330 | <50 | <6.2 | <6.0 | 1300 | 0.55 | <24 | 120 | 7200 | 150000 | <0.050 | | 6.9 | 6.6 |
| Jul-00 | 430 | | | <21 | 58 | <2.3 | 360 | <25 | 12 | <12 | 1400 | 1.2 | <9.6 | 130 | 7100 | | <0.050 | | 6.6 | 6.6 |
| Oct-00 | 430 | | | | | | | | | <12 | 1400 | 0.96 | | | 6700 | | | | 6.7 | 6.9 |
| Jan-01 | 410 | | | | | | | | | <12 | 1200 | 0.83 | | | 5400 | | | | 6.5 | 6.6 |
| Apr-01 | 430 | | | | | | | | | <13 | 1400 | 0.69 | | | 6700 | 180000 | | | 6.3 | 6.7 |
| Jul-01 | 420 | | | <15 | <50 | <1.7 | 370 | | 5.3 | <13 | 1500 | 0.70 | <7.9 | 130 | 6500 | | <0.050 | | 6.2 | 6.6 |
| Oct-01 | 430 | | | 37 | <50 | <1.7 | 330 | | <3.4 | <13 | 1300 | 1.5 | <7.9 | 110 | 6000 | | <0.050 | | 6.3 | 6.7 |
| Jan-02 | 460 | | | | | | | | | <13 | 1300 | 0.65 | | | 5900 | | | | 6.6 | 6.7 |
| Apr-02 | 410 | | | | | | | | | 16 | 1400 | 0.51 | | | 5900 | | | | 6.8 | 6.7 |
| Jul-02 | 460 | | | <27/<15 | <50 | <1.7 | | | <4.5 | <13 | 1400 | 0.38 | <7.4 | | 6100 | | <0.050 | | 6.5 | 6.6 |
| Jul-02 | 480 | | | <27/<15 | <50 | <1.7 | | | <4.5 | <13 | 1500 | 0.42 | <7.4 | | 6400 | | <0.050 | | | 6.6 |
| Oct-02 | 470 | | | | | | | | | <13 | 1400 | 0.54 | | | 5700 | | | | 6.5 | 6.7 |
| Jan-03 | 480 | | | <27 | <50 | <1.7 | 350 | <20 | <4.5 | <13 | 1400 | 0.54 | <7.4 | 120 | 5300 | | <0.050 | | 6.5 | 6.6 |
| Apr-03 | 500 | | | | | | | | | <13 | 1400 | <0.29 | | | 4600 | | | | 6.4 | 6.7 |
| Jul-03 | 420 | | | <2.6 | 27 | <2.1 | 340 | | <6.4 | <13 | 1400 | 0.32 | <10 | 120 | 4200 | | <0.025 | | 6.6 | 6.9 |
| Oct-03 | 440 | | | | | | | | | <13 | 1400 | 1.0 | | | 3000 | | | | 6.6 | 6.8 |
| Jan-04 | 490 | | | | | | | | | <13 | 1300 | 1.0 | | | 3100 | | | | 6.6 | 6.79 |
| Apr-04 | 470 | | | | | | | | | <13 | 1300 | 0.13 | | | 3100 | | | | 6.8 | 6.72 |
| DNR(4/04) | 463 | 0.024 | <0.19 | <1 | 20 | 1.05 | 331 | 10.9 | 1.5 | 6.0 | 1320 | 0.1 | <1 | 119 | 3050 | | <0.03 | | | 7.00 |
| Jul-04 | 440 | | | <2.6 | 25 | <1.7 | 340 | 15 | <5.1 | <13 | 1400 | 0.43 | <8.7 | 120 | 2100 | | <0.025 | | 6.7 | 6.66 |
| Oct-04 | 490 | | | 2.9 | | | 320 | | | <13 | 1300 | <0.33 | | 110 | 2000 | | | | 6.7 | 6.64 |
| Jan-05 | 480 | | | 2.3 | | | | | | <13 | 1300 | <0.33 | | | 2000 | | | | 6.7 | 6.89 |
| Apr-05 | 440 | | | 1.9 | | | | | | <13 | 1300 | <0.33 | | | 2000 | | | | 6.6 | 6.92 |
| Jul-05 | 500 | 0.059 | 0.044 | 1.2 | <25 | <1.7 | 340 | | 8.1 | <13 | 1300 | <0.33 | 13 | 120 | 1400 | | <0.025 | 13 | 6.8 | 6.59 |
| Oct-05 | 450 | | | <0.85 | | | | | | <13 | 1300 | <0.33 | | | 1500 | | | | 6.7 | 6.85 |
| Jan-06 | 480 | | | <0.85 | | | | | | 17 | 1200 | <0.33 | | | 1500 | | | | 6.8 | 6.72 |
| Apr-06 | 440 | 0.038 | 0.059 | <1.0 | <25 | <1.7 | 340 | 17 | <10 | 22 | 1300 | <0.33 | <13 | 120 | 2100 | | <0.025 | | 6.4 | 6.63 |
| Jul-06 | 450 | | | <1.0 | <25 | <1.7 | 320 | <18 | <10 | 31 | 1300 | <0.33 | <13 | 120 | 1400 | | <0.025 | | 6.6 | 6.65 |
| Oct-06 | 480 | | | <1.0 | | | | | | <13 | 1400 | <0.66 | | | 820 | | | | 6.7 | 6.79 |

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# MW-1014A

| | K (ug/l) | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr-99 | | | | | | | | | | | | | | | 1103.93 |
| Jul-99 | | | | | | | | | | | | | | | 1106.42 |
| Oct-99 | | | | | | | | | | | | | | | 1107.87 |
| Jan-00 | | | | | | | | | | | | | | | 1109.22 |
| Apr-00 | 12 | <7.8 | <4.7 | 34 | 1800 | 970 | <120 | None | 2220 | | 165 | None | None | 11.2 | 1109.24 |
| Jul-00 | 12 | <17 | <5.5 | 35 | 2200 | 960 | <120 | None | 2000 | 2000 | | None | None | 15.4 | 1110.50 |
| Oct-00 | | | | | 2300 | 880 | <120 | None | 2250 | 1800 | | None | Vslight | 14.1 | 1111.39 |
| Jan-01 | | | | | 1900 | 970 | <120 | None | 2310 | 1900 | 113 | Slight | VSlight | NA | 1111.59 |
| Apr-01 | | | | | 1700 | 920 | <120 | None | 2300 | 1900 | 138 | None | Slight | 12.1 | 1112.51 |
| Jul-01 | | <10 | <3.1 | | 2000 | 960 | <120 | None | 2250 | 2000 | 147 | None | Slight | 17.4 | 1112.88 |
| Oct-01 | | <16 | <3.1 | | 1900 | 1000 | <120 | None | 2280 | 2200 | 152 | Vslight | Slight | 14.3 | 1114.03 |
| Jan-02 | | | | | 2100 | 1000 | <120 | None | 2280 | 2000 | 170 | Vslight | None | 13.5 | 1114.51 |
| Apr-02 | | | | | 1900 | 1000 | <120 | None | 2250 | 2200 | 155 | None | Slight | 11.5 | 1115.15 |
| Jul-02 | | <15 | 4.8 | | 2100 | 910 | <120 | None | 2280 | 2100 | 177 | None | Vslight | 15.1 | 1114.80 |
| Jul-02 | | <15 | 4.3 | | 2200 | 910 | <120 | | | 2100 | | | | | |
| Oct-02 | | | | | 1800 | 930 | <120 | None | 2370 | 2100 | 86 | None | None | 12.7 | 1115.50 |
| Jan-03 | | <30 | <4.3 | | 2100 | 1000 | <120 | None | 2370 | 2000 | 198 | None | Vslight | 12.0 | 1116.36 |
| Apr-03 | | | | | 2000 | 930 | <100 | None | 2280 | 2100 | 156 | None | None | 14.3 | 1116.82 |
| Jul-03 | | <2.7 | <7.7 | | 1900 | 910 | <50 | None | 2230 | 1900 | 206 | None | Vslight | 13.6 | 1116.45 |
| Oct-03 | | | | | 2000 | 980 | 77 | None | 2310 | 2080 | 218 | None | Vslight | 12.9 | 1116.50 |
| Jan-04 | | | | | 2000 | 1000 | | None | 2310 | 1951 | 185 | None | None | 7.0 | 1116.08 |
| Apr-04 | | | | | 1800 | 910 | | None | 2250 | 1942 | 211 | None | Slight | 9.5 | 1116.64 |
| DNR(4/04) | | <1 | <0.1 | | 1920 | 1040 | <16 | | | 2190 | | | | | |
| Jul-04 | 11 | <8.0 | <6.7 | 52 | 1900 | 940 | <50 | None | 2250 | 1810 | 175 | None | None | 17.1 | 1115.52 |
| Oct-04 | | | | | 1800 | 930 | | None | 2220 | 2100 | 184 | None | Slight | 12.6 | 1114.83 |
| Jan-05 | | | | | 1800 | 990 | | None | 2330 | 1980 | 246 | None | Vslight | 8.9 | 1115.84 |
| Apr-05 | | | | | 1800 | 1000 | | None | 2250 | 1760 | 276 | None | Vslight | 10.0 | 1115.68 |
| Jul-05 | | <7.4 | 14 | | 1800 | 1000 | <50 | None | 2170 | 1920 | 269 | None | None | 14.1 | 1114.86 |
| Oct-05 | | | | | 1800 | 890 | | None | 2270 | 1890 | 213 | None | None | 11.2 | 1114.97 |
| Jan-06 | | | | | 1800 | 970 | | None | 2390 | 1910 | 252 | None | None | 11.2 | 1114.81 |
| Apr-06 | | <2.4 | <12 | | 1700 | 880 | 55 | None | 2200 | 1680 | 268 | None | None | 11.5 | 1114.95 |
| Jul-06 | 9.6 | 2.8 | <12 | 58 | 1800 | 1000 | 57 | None | 2190 | 1820 | 190 | None | None | 12.8 | 1114.77 |
| Oct-06 | | | | | 1800 | 1000 | | None | 2290 | 1860 | 176 | None | None | 10.6 | 1114.6 |

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# MW-1014B

| | | Well MW-1014B Well Depth: 104.9' | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Alk (mg/l) | As (ug/l) | NH3 (mg/l) | NO3+NO2 (mg/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | CO2 [ug/l] | Hg (ug/l) | Ni (ug/l) | Field pH (s.u.) | Lab pH (s.u.) |
| Feb-99 | | 510 | | | | | | | | | 810 | 2100 | 0.062 | | | 23000 | | | | 6.2 | 6.3 |
| Apr-99 | | 460 | | | | | | | | | 420 | 2100 | 0.033 | | | 23000 | | | | 6.2 | 6.4 |
| Jul-99 | | 540 | 70 | | | <50 | 31 | 580 | 49 | 13 | 520 | 2100 | 0.072 | <14 | 170 | 23000 | | <0.050 | | 6.3 | 6.4 |
| Oct-99 | | 570 | <42 | | | <50 | 10 | 640 | 43 | 7.4 | 530 | 2200 | <0.010 | <14 | 150 | 23000 | 300000 | <0.050 | | 6.4 | 6.5 |
| Jan-00 | | 490 | <15 | | | <50 | 10 | 550 | <100 | <4.2 | 500 | 1900 | 0.055 | <14 | 140 | 20000 | | <0.050 | | 6.5 | 6.2 |
| Apr-00 | | 480 | <7.5 | | | <50 | 10 | 600 | 42 | <6.2 | 520 | 2100 | <0.15 | <24 | 150 | 22000 | 560000 | <0.050 | | 6.4 | 6.2 |
| Jul-00 | | 510 | <21 | | | <50 | 8.9 | 600 | 38 | <4.0 | 330 | 2200 | <0.36 | <9.6 | 160 | 21000 | | <0.050 | | 6.3 | 6.4 |
| Oct-00 | | 520 | | | | | | | | | 430 | 2200 | <0.36 | | | 21000 | | | | 6.3 | 6.6 |
| Jan-01 | | 550 | | | | | | | | | 450 | 1900 | <0.36 | | | 18000 | | | | 6.3 | 6.3 |
| Apr-01 | | 520 | | | | | | | | | 530 | 2000 | <0.15 | | | 19000 | 470000 | | | 6.1 | 6.3 |
| Jul-01 | | 440 | <15 | | | <50 | 6.2 | 600 | | 8.9 | 480 | 2200 | <0.15 | <7.9 | 160 | 20000 | | <0.050 | | 6.0 | 6.3 |
| Oct-01 | | 510 | 20 | | | <50 | 4.3 | 530 | | <3.4 | 490 | 1900 | <0.15 | <7.9 | 140 | 18000 | | <0.050 | | 6.1 | 6.4 |
| Jan-02 | | 540 | | | | | | | | | 540 | 1900 | <0.15 | | | 18000 | | | | 6.2 | 6.3 |
| Apr-02 | | 500 | | | | | | | | | 470 | 1900 | <0.15 | | | 17000 | | | | 6.4 | 6.4 |
| Jul-02 | | 550 | <27/<15 | | | <50 | 4.7 | | | <4.5 | 550 | 2100 | <0.15 | <7.4 | | 19000 | | <0.050 | | 6.3 | 6.3 |
| Oct-02 | | 490 | | | | | | | | | 450 | 2000 | <0.15 | | | 17000 | | | | 6.3 | 6.5 |
| Jan-03 | | 610 | <27 | | | <50 | 6.9 | 580 | 46 | <4.5 | 590 | 2000 | <0.15 | <74 | 140 | 17000 | | <0.050 | | 6.2 | 6.3 |
| Apr-03 | | 610 | | | | | | | | | 690 | 2100 | <0.29 | | | 19000 | | | | 6.3 | 6.2 |
| Jul-03 | | 530 | <2.6 | | | <25 | 4.2 | 530 | | <6.4 | 500 | 1900 | <0.29 | <10 | 140 | 16000 | | <0.025 | | 6.3 | 6.2 |
| Oct-03 | | 540 | | | | | | | | | 640 | 2100 | <0.29 | | | 19000 | | | | 6.4 | 6.4 |
| Jan-04 | | 570 | | | | | | | | | 590 | 2000 | <0.29 | | | 17000 | | | | 6.3 | 6.4 |
| Apr-04 | | 530 | | | | | | | | | 440 | 1700 | <0.33 | | | 14000 | | | | 6.5 | 6.47 |
| Apr-04 | D | 570 | | | | | | | | | 440 | 1700 | <0.33 | | | 14000 | | | | | 6.42 |
| DNR(4/04) | | 461 | <1 | 3.58 | 0.03 | 15 | 4.39 | 538 | 39.0 | 4.3 | 492 | 1920 | <0.1 | <1 | 139 | 18800 | | <0.03 | | | 6.84 |
| Jul-04 | | 450 | <2.6 | | | <25 | 2.9 | 530 | 49 | <5.1 | 520 | 1900 | <0.33 | <8.7 | 140 | 15000 | | <0.025 | | 6.3 | 6.4 |
| Oct-04 | | 620 | 3.6 | | | | | 560 | | | 550 | 2000 | <0.33 | | 140 | 17000 | | | | 6.3 | 6.33 |
| Jan-05 | | 550 | 5.3 | | | | | | | | 520 | 2000 | <0.33 | | | 16000 | | | | 6.4 | 6.56 |
| Apr-05 | | 520 | 2.6 | | | | | | | | 460 | 1900 | <0.33 | | | 16000 | | | | 6.4 | 6.61 |
| Jul-05 | | 570 | 2.3 | 3.9 | 0.14 | <25 | 2.8 | 610 | | 14 | 560 | 2100 | <0.33 | <10 | 150 | 17000 | | <0.025 | 440 | 6.5 | 6.28 |
| Oct-05 | | 470 | 1.2 | | | | | | | | 400 | 1800 | <0.33 | | | 15000 | | | | 6.5 | 6.67 |
| Jan-06 | | 570 | 2.4 | | | | | | | | 560 | 1900 | <0.33 | | | 16000 | | | | 6.5 | 6.46 |
| Apr-06 | | 550 | 1.1 | 4 | 0.13 | <25 | <1.7 | 540 | 45 | 14 | 530 | 1900 | <0.33 | <13 | 130 | 14000 | | <0.025 | | 6.2 | 6.33 |
| Jul-06 | | 520 | 1.8 | | | <25 | <1.7 | 470 | 42 | <10 | 510 | 1700 | <0.33 | <13 | 130 | 12000 | | <0.025 | | 6.4 | 6.42 |
| Oct-06 | | 460 | <1.0 | | | | | | | | 460 | 1900 | <0.33 | | | 13000 | | | | 6.5 | 6.58 |

D = Field Duplicate

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# MW-1014B

| | K (ug/l) | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp ($^{o}C$) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Feb-99 | | | | | 2900 | 1200 | | None | 3280 | | | None | Slight | | 1105.62 |
| Apr-99 | | | | | 3300 | 770 | | None | 2890 | | | None | None | 14.2 | 1106.23 |
| Jul-99 | 25 | 2.2 | <45 | 93 | 3100 | 580 | 2500 | None | 3540 | | | None | Moderate | 17.4 | 1107.13 |
| Oct-99 | 17 | 1.4 | <4.5 | 24 | 3100 | 1600 | 5000 | None | 3200 | | | None | Moderate | 12.1 | 1108.33 |
| Jan-00 | 18 | 2.6 | <4.5 | 27 | 3200 | 1400 | 4100 | None | 3000 | | | None | Slight | 12.1 | 1108.88 |
| Apr-00 | 23 | <7.8 | <4.7 | 26 | 3200 | 1500 | 3700 | None | 2940 | | 290 | None | Slight | 14.2 | 1108.85 |
| Jul-00 | 22 | <17 | <5.5 | 42 | 3000 | 1600 | 2500 | None | 3000 | 2700 | | None | Slight | 15.1 | 1109.47 |
| Oct-00 | | | | | 2900 | 1500 | 2100 | None | 3240 | 2400 | | None | Moderate | 13.1 | 1110.09 |
| Jan-01 | | | | | 2600 | 1400 | 2800 | None | 3140 | 2600 | 226 | None | Slight | 10.5 | 1109.89 |
| Apr-01 | | | | | 3300 | 1400 | 3500 | None | 3200 | 2500 | 207 | None | Moderate | 13.5 | 1111.14 |
| Jul-01 | | <10 | <3.1 | | 3000 | 1500 | 1900 | None | 2990 | 2700 | 235 | None | Moderate | 16.5 | 1112.02 |
| Oct-01 | | <16 | 7.2 | | 2900 | 1600 | 1600 | None | 3150 | 2900 | 219 | None | Moderate | 13.4 | 1112.38 |
| Jan-02 | | | | | 3100 | 1500 | 2800 | None | 3110 | 2700 | 222 | None | Vslight | 12.6 | 1112.61 |
| Apr-02 | | | | | 3100 | 1500 | 1500 | None | 3140 | 3000 | 218 | None | Slight | 13.1 | 1113.00 |
| Jul-02 | | <15 | 4.6 | | 3000 | 1400 | 1900 | None | 3100 | 3000 | 245 | None | Moderate | 14.1 | 1113.19 |
| Oct-02 | | | | | 3300 | 1300 | 1500 | None | 3110 | 2600 | 221 | None | Moderate | 12.2 | 1114.21 |
| Jan-03 | | <30 | <4.3 | | 2800 | 1500 | 2500 | None | 3160 | 2700 | 232 | None | Slight | 11.5 | 1114.14 |
| Apr-03 | | | | | 3400 | 1500 | 2500 | Moderate | 2970 | 3000 | 228 | None | Moderate | 13.6 | 1113.96 |
| Jul-03 | | <2.7 | <7.7 | | 3800 | 1400 | 1600 | None | 2900 | 2600 | 240 | None | Moderate | 12.6 | 1114.33 |
| Oct-03 | | | | | 3000 | 1500 | 2600 | None | 2930 | 2760 | 251 | None | Slight | 12.4 | 1113.77 |
| Jan-04 | | | | | 3100 | 1600 | | None | 3130 | 2820 | 198 | None | Moderate | 10.0 | 1113.07 |
| Apr-04 | | | | | 2800 | 1400 | | None | 2880 | 2750 | 246 | None | Slight | 11.3 | 1112.89 |
| Apr-04 | | | | | 2800 | 1400 | | | | 2750 | | | | | |
| DNR(4/04) | | <1 | <0.1 | | 2530 | 1480 | 1470 | | | 2710 | | | | | |
| Jul-04 | 20 | <8.0 | <6.7 | 32 | 2600 | 1300 | 1200 | None | 2950 | 2290 | 191 | None | Vslight | 14.3 | 1113.85 |
| Oct-04 | | | | | 2800 | 1500 | | None | 2950 | 2910 | 215 | None | Vslight | 13.1 | 1113.33 |
| Jan-05 | | | | | 2700 | 1500 | | None | 3210 | 2750 | 277 | None | None | 9.1 | 1113.05 |
| Apr-05 | | | | | 2700 | 1400 | | None | 2790 | 2470 | 288 | None | Vslight | 10.2 | 1112.91 |
| Jul-05 | | <1.9 | 11 | | 2800 | 1500 | 2200 | None | 3010 | 2630 | 299 | None | Vslight | 15.0 | 1112.42 |
| Oct-05 | | | | | 2400 | 1300 | | None | 2820 | 2290 | 261 | None | Vslight | 12.0 | 1112.41 |
| Jan-06 | | | | | 2800 | 1400 | | None | 3350 | 2650 | 287 | None | None | 14.6 | 1112.12 |
| Apr-06 | | <2.4 | <12 | | 2700 | 1400 | 1300 | None | 2740 | 2260 | 292 | None | Vslight | 12.0 | 1112.27 |
| Jul-06 | 18 | <2.4 | <12 | 29 | 2400 | 1400 | 1100 | Slight | 2780 | 2220 | 222 | None | None | 13.7 | 1112.10 |
| Oct-06 | | | | | 2400 | 1300 | | None | 2900 | 2300 | 215 | None | Vslight | 10.9 | 1111.88 |

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# MW-1014C

| | | Alk | NH3 | NO3+NO2 | As | Ba | Cd | Ca | Cl | Cr | Cu | Hard | Fe | Pb | Mg | Mn | CO2 | Hg | Ni | Field pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Well MW-1014C Well Depth: 156.6' | | | | | | | | | | | | | | | | | | |
| | | (mg/l) | (mg/l) | (mg/l) | (ug/l) | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (ug/l) | (mg/l) | (ug/l) | [ug/l] | (ug/l) | (ug/l) | (s.u.) |
| Feb-99 | | 360 | | | | | | | | | <4.7 | 980 | 14 | | | 4300 | | | | 6.3 |
| Apr-99 | | 330 | | | | | | | | | <4.7 | 1000 | 15 | | | 4500 | | | | 6.3 |
| Jul-99 | | 370 | | | <42 | <50 | <21 | 280 | 32 | <4.2 | 16 | 930 | 14 | <14 | 56 | 4000 | | <0.050 | | 6.4 |
| Oct-99 | | 380 | | | <42 | <50 | <4.2 | 290 | 33 | <4.2 | <9.4 | 960 | 14 | <14 | 56 | 4000 | 160000 | <0.050 | | 6.6 |
| Jan-00 | | 320 | | | <15 | 25 | <0.21 | 250 | 31 | <0.42 | <0.47 | 810 | 12 | <1.4 | 48 | 3200 | | <0.050 | | 6.6 |
| Jan-00 | D | 300 | | | <15 | 25 | <0.21 | 230 | 30 | 2.0 | <0.47 | 820 | 11 | 2.0 | 46 | 3100 | | <0.050 | | ---- |
| Apr-00 | | 320 | | | 14 | <50 | <3.1 | 260 | 33 | <6.2 | <6.0 | 870 | 13 | <24 | 51 | 3600 | 260000 | <0.050 | | 6.7 |
| Jul-00 | | 350 | | | 39 | <50 | <2.3 | 270 | 36 | 4.2 | <12 | 890 | 13 | <9.6 | 54 | 3500 | | <0.050 | | 6.4 |
| Oct-00 | | 390 | | | | | | | | | <12 | 840 | 12 | | | 3200 | | | | 6.4 |
| Jan-01 | | 340 | | | | | | | | | <12 | 760 | 11 | | | 2900 | | | | 6.5 |
| Apr-01 | | 330 | | | | | | | | | <13 | 830 | 12 | | | 3100 | 220000 | | | 6.2 |
| Apr-01 | D | | | | | | | | | | | | | | | | 220000 | | | |
| Jul-01 | | 330 | | | 21 | <50 | <1.7 | 240 | | 4.7 | <13 | 810 | 11 | <7.9 | 49 | 3000 | | <0.050 | | 6.2 |
| Oct-01 | | 350 | | | 15 | <50 | <1.7 | 210 | | <3.4 | <13 | 710 | 9.6 | <7.9 | 44 | 2900 | | <0.050 | | 6.2 |
| Jan-02 | | 350 | | | | | | | | | <13 | 690 | 9.2 | | | 2600 | | | | 6.6 |
| Apr-02 | | 340 | | | | | | | | | 15 | 710 | 9.1 | | | 2600 | | | | 6.4 |
| Jul-02 | | 350 | | | <27/18 | <50 | <1.7 | | | <4.5 | <13 | 740 | 9.4 | <7.4 | | 2700 | | <0.050 | | 6.6 |
| Oct-02 | | 360 | | | | | | | | | <13 | 730 | 9.1 | | | 2600 | | | | 6.5 |
| Jan-03 | | 390 | | | <27 | <50 | <1.7 | 210 | 39 | <4.5 | <13 | 700 | 8.3 | <7.4 | 45 | 2400 | | <0.050 | | 6.4 |
| Jan-03 | | 370 | | | <27 | <50 | <1.7 | 200 | 42 | <4.5 | <13 | 690 | 8.3 | <7.4 | 45 | 2400 | | <0.050 | | |
| Apr-03 | | 380 | | | | | | | | | <13 | 690 | 8.0 | | | 2400 | | | | 6.4 |
| Jul-03 | | 340 | | | 13 | 26 | <2.1 | 210 | | <6.4 | <13 | 700 | 8.2 | <10 | 45 | 2500 | | <0.025 | | 6.4 |
| Oct-03 | | 340 | | | | | | | | | <1.3 | 680 | 7.8 | | | 2400 | | | | 6.6 |
| Jan-04 | | 310 | | | | | | | | | <1.3 | 650 | 7.4 | | | 2300 | | | | 6.4 |
| Apr-04 | | 330 | | | | | | | | | <13 | 640 | 7.5 | | | 2300 | | | | 6.8 |
| DNR(4/04) | | | | | 8.4 | 26 | <0.05 | 185 | 38.2 | <1 | 1.2 | 657 | 6.9 | <1 | 47.3 | 2220 | | <0.03 | | |
| Jul-04 | | 300 | | | 15 | 27 | <1.7 | 190 | 40 | <5.1 | <13 | 660 | 7.2 | 11 | 43 | 2300 | | <0.025 | | 6.4 |
| Oct-04 | | 350 | | | 17 | | | 180 | | | <13 | 610 | 6.6 | | 41 | 2100 | | | | 6.5 |
| Jan-05 | | 340 | | | 21 | | | | | | <13 | 600 | 6.4 | | | 2000 | | | | 6.5 |
| Apr-05 | | 330 | | | 16 | | | | | | <13 | 660 | 7.0 | | | 2300 | | | | 6.3 |
| Jul-05 | | 350 | 0.85 | 0.037 | 15 | 27 | <1.7 | 190 | | <4.5 | <13 | 650 | 6.9 | <10 | 43 | 2200 | | <0.025 | 81.0 | 6.9 |
| Oct-05 | | 320 | | | 14 | | | | | | <13 | 630 | 7.0 | | | 2200 | | | | 6.7 |
| Jan-06 | | 300 | | | 16 | | | | | | <13 | 590 | 6.2 | | | 2000 | | | | 6.9 |
| Jan-06 | D | 310 | | | 18 | | | | | | <13 | 570 | 6.0 | | | 1900 | | | | |
| Apr-06 | | 340 | 0.76 | 0.041 | 16 | 28 | <1.7 | 180 | 40 | <10 | <13 | 620 | 6.4 | <13 | 42 | 2100 | | <0.025 | | 6.4 |
| Jul-06 | | 350 | | - | 16 | <25 | <1.7 | 160 | 38 | <10 | 16 | 580 | 5.9 | <13 | 41 | 1900 | | <0.025 | | 6.6 |
| Oct-06 | | 330 | | - | 20 | | | | | | <13 | 620 | 6.1 | | | 2000 | | | | 7.0 |

D = Field Duplicate

Flambeau Mining Company
1/30/2007
SRK Att 1.xls

# MW-1014C

| | Lab pH (s.u.) | K | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Feb-99 | 6.5 | | | | | 1200 | 520 | | None | 1900 | | | None | None | | 1103.39 |
| Apr-99 | 6.5 | | | | | 1200 | 440 | | None | 1623 | | | None | None | 13.5 | 1102.83 |
| Jul-99 | 6.5 | 4.8 | 1.8 | <45 | 11 | 1200 | 370 | 2200 | None | 1657 | | | None | None | 13.2 | 1103.90 |
| Oct-99 | 6.7 | 4.0 | <1.3 | <4.5 | 9.6 | 1200 | 700 | 2100 | None | 1600 | | | None | None | 9.9 | 1104.81 |
| Jan-00 | 6.5 | 6.3 | 1.9 | <0.45 | 12 | 1200 | 540 | 1700 | None | 1500 | | | None | None | 10.5 | 1105.18 |
| Jan-00 | 6.4 | 6.3 | 1.6 | <0.45 | 11 | 1300 | 560 | 1600 | ---- | ---- | | | ---- | ---- | ---- | ---- |
| Apr-00 | 6.3 | 7.6 | <7.8 | <4.7 | 9.4 | 1000 | 440 | 1800 | None | 1470 | | 88 | None | None | 11.9 | 1105.25 |
| Jul-00 | 6.5 | 7.4 | <17 | <5.5 | 12 | 1400 | 480 | 1700 | None | 1400 | 1400 | | None | None | 13.7 | 1105.82 |
| Oct-00 | 6.7 | | | | | 1300 | 450 | 1500 | None | 1490 | 1200 | | None | None | 11.5 | 1106.21 |
| Jan-01 | 6.4 | | | | | 1100 | 450 | 1200 | None | 1452 | 1300 | 64 | None | None | 10.9 | 1106.15 |
| Apr-01 | 6.5 | | | | | 1100 | 420 | 1300 | None | 1400 | 1300 | 55 | None | None | 12.8 | 1107.65 |
| Apr-01 | | | | | | | | | | | | | | | | |
| Jul-01 | 6.5 | | <10 | <3.1 | | 1100 | 420 | 1200 | None | 1360 | 1300 | 40 | None | None | 13.7 | 1108.11 |
| Oct-01 | 6.6 | | <1.6 | 4.6 | | 990 | 410 | 1100 | None | 1354 | 1300 | 56 | None | None | 12.2 | 1108.10 |
| Jan-02 | 6.5 | | | | | 1100 | 390 | 980 | None | 1341 | 1200 | 38 | None | None | 13.9 | 1108.48 |
| Apr-02 | 6.6 | | | | | 1000 | 390 | 950 | None | 1310 | 1300 | 36 | None | None | 13.5 | 1109.25 |
| Jul-02 | 6.6 | | <15 | <4.3 | | 1200 | 330 | 1000 | None | 1269 | 1300 | 45 | None | None | 17.2 | 1108.93 |
| Oct-02 | 6.6 | | | | | 810 | 330 | 940 | None | 1299 | 1200 | 38 | None | None | 11.6 | 1110.10 |
| Jan-03 | 6.5 | | <30 | <4.3 | | 1100 | 380 | 840 | None | 1311 | 1200 | 74 | None | None | 11.0 | 1109.58 |
| Jan-03 | 6.4 | | <30 | <4.3 | | 1000 | 370 | 860 | | | 1400 | | | | | |
| Apr-03 | 6.5 | | | | | 990 | 340 | 810 | None | 1287 | 1300 | 7 | None | None | 13.3 | 1109.35 |
| Jul-03 | 6.6 | | <13 | <7.7 | | 920 | 330 | 820 | None | 1239 | 1100 | 40 | None | None | 13.0 | 1109.74 |
| Oct-03 | 6.6 | | | | | 910 | 320 | 770 | None | 1256 | 1160 | 55 | None | None | 12.7 | 1109.01 |
| Jan-04 | 6.54 | | | | | 930 | 320 | | None | 1259 | 1096 | 34 | None | None | 10.6 | 1108.52 |
| Apr-04 | 6.69 | | | | | 820 | 290 | | None | 1233 | 1108 | 53 | None | None | 11.6 | 1108.53 |
| DNR(4/04) | | | <1 | <0.1 | | 868 | 330 | 638 | | | | | | | | |
| Jul-04 | 6.59 | 6.2 | <8.0 | <6.7 | 12 | 820 | 290 | 630 | None | 1171 | 1029 | 31 | None | None | 15.5 | 1109.22 |
| Oct-04 | 6.59 | | | | | 780 | 300 | | None | 1175 | 1190 | 60 | None | None | 13.0 | 1108.87 |
| Jan-05 | 6.80 | | | | | 730 | 300 | | None | 1174 | 1110 | 70 | None | None | 11.4 | 1108.62 |
| Apr-05 | 6.82 | | | | | 750 | 290 | | None | 1202 | 1090 | 64 | None | None | 11.2 | 1108.19 |
| Jul-05 | 6.52 | | <1.9 | <6.7 | | 760 | 300 | 550 | None | 1150 | 1090 | 57 | None | None | 15.0 | 1107.80 |
| Oct-05 | 6.77 | | | | | 790 | 290 | | None | 1157 | 1040 | 54 | None | None | 11.4 | 1108.06 |
| Jan-06 | 6.69 | | | | | 740 | 280 | | None | 1182 | 1110 | 67 | None | None | 9.6 | 1107.25 |
| Jan-06 | 6.76 | | | | | 750 | 270 | | | | 1070 | | | | | |
| Apr-06 | 6,66 | | <2.4 | <12 | | 700 | 270 | 560 | None | 1124 | 961 | 80 | None | None | 12.8 | 1107.90 |
| Jul-06 | 6.63 | 5.4 | <2.4 | <12 | 12 | 770 | 260 | 470 | None | 1080 | 989 | 63 | None | None | 13.0 | 1107.35 |
| Oct-06 | 6.71 | | | | | 700 | 260 | | None | 1113 | 997 | 36 | None | None | 11.1 | 1106.97 |

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# MW-1015A

| | Well MW-1015A Well Depth: 67.20' | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Alk (mg/l) | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Pb (ug/l) | Mg (mg/l) | Mn (ug/l) | CO2 [ug/l] | Hg (ug/l) | Ni (ug/l) | Field pH (s.u.) | Lab pH (s.u.) |
| Standard | | 50 | 1000 | 10 | | | 50 | 1000 | | 0.30 | 50 | | 90 | | 2 | | | |
| Apr-01 | 75 | <2.3 | 22 | <0.23 | | | <0.57 | <2.7 | 88 | 0.0082 | <0.92 | | <2 | | <0.05 | | 7.1 | 7.0 |
| May-01 | 77 | <2.3 | 19 | <0.23 | | | <0.57 | <2.7 | 83 | <0.0050 | <0.92 | | 2.5 | | <0.050 | | 7.0 | 7.0 |
| Jun-01 | 75 | <2.3 | 18 | <0.23 | | | <0.57 | <2.7 | 85 | <0.0050 | <0.92 | | 4.2 | | <0.050 | | 7.0 | 6.9 |
| Jul-01 | 75 | <2.3 | 17 | <0.23 | | | <0.57 | <2.7 | 90 | <0.0050 | <0.92 | | 7.5 | | <0.050 | | 6.6 | 7.1 |
| Aug-01 | 76 | <2.3 | 17 | <0.23 | | | <0.57 | <2.7 | 90 | <0.0050 | <0.92 | | 9.7 | | <0.050 | | 6.7 | 7.2 |
| Sep-01 | 79 | <2.3 | 15 | <0.23 | | | <0.57 | <2.7 | 82 | 0.020 | <0.92 | | 15 | | <0.050 | | 7.2 | 6.9 |
| Oct-01 | 77 | 2.3 | 14 | <0.23 | 19 | | <0.57 | <2.7 | 78 | <0.0050 | <0.92 | 7.4 | 10 | | <0.050 | | 6.6 | 7.0 |
| Nov-01 | 76 | <2.3 | 14 | <0.23 | | | <0.57 | <2.7 | 85 | <0.0050 | <0.92 | | 11 | | <0.050 | | 6.6 | 7.4 |
| Dec-01 | 78 | <2.3 | 14 | <0.23 | | | <0.57 | <2.7 | 87 | 0.023 | <0.92 | | 13 | | <0.050 | | 6.5 | 7.2 |
| Jan-02 | 78 | <2.3 | 14 | <0.23 | | | <0.57 | <2.7 | 82 | <0.0050 | <0.92 | | 12 | | <0.050 | | 6.9 | 7.0 |
| Feb-02 | 78 | <2.3 | 14 | <0.23 | | | <0.57 | <2.7 | 87 | <0.0050 | <0.92 | | 14 | | <0.050 | | 6.5 | 7.7 |
| Mar-02 | 78 | 2.3 | 14 | <0.23 | | | <0.57 | <2.7 | 88 | 0.0074 | <0.92 | | 15 | | <0.050 | | 6.4 | 7.5 |
| Apr-02 | 80 | | | | | | | <2.7 | 86 | <0.0050 | | | 15 | | | | 6.8 | 7.0 |
| Jul-02 | 79 | <2.6/<2.7 | 12 | <0.23 | | | <0.44 | <2.7 | 88 | <0.0050 | <0.92 | | 16 | | <0.050 | | 6.9 | 7.0 |
| Oct-02 | 79 | | | | | | | <2.7 | 84 | <0.0050 | | | 13 | | | | 6.7 | 6.4 |
| Jan-03 | 79 | | | | | | | <2.7 | 83 | <0.0050 | | | 12 | | | | 6.8 | 7.2 |
| Mar-03 | | | | | | | | | | <0.010 | | | 16 | | | | 7.1 | |
| Apr-03 | 78 | | | | | | | <1.3 | 88 | <0.010 | | | 16 | | | | 6.9 | 7.5 |
| Jul-03 | 79 | <1.2 | 9.8 | <0.17 | 22 | | <0.43 | <1.3 | 90 | <0.0050 | <0.94 | 8.6 | 12 | | <0.025 | | 6.9 | 6.7 |
| Oct-03 | 78 | | | | | | | <1.3 | 83 | <0.0050 | | | 11 | | | | 7.1 | 7.1 |
| Jan-04 | 79 | | | | | | | <1.3 | 85 | <0.0050 | | | 14 | | | | 7.2 | 6.72 |
| Apr-04 | 79 | | | | | | | <1.3 | 86 | <0.0050 | | | 15 | | | | 7.2 | 7.17 |
| Jul-04 | 78 | <1.8 | 9.2 | <0.16 | 21 | 5.8 | <0.45 | <1.3 | 89 | <0.0050 | <1.0 | 8.5 | 12 | | <0.025 | | 6.8 | 7.17 |
| Oct-04 | 79 | <1.8 | | | 20 | | | <1.3 | 83 | <0.0050 | | 8.0 | 11 | | | | 7.3 | 7.09 |
| Jan-05 | 79 | <0.73 | | | | | | <1.3 | 83 | <0.0050 | | | 11 | | | | 6.9 | 7.42 |
| Apr-05 | 79 | <0.66 | | | | | | <1.3 | 87 | <0.0050 | | | 16 | | | | 6.8 | 7.68 |
| Jul-05 | 78 | <0.66 | 8.9 | <0.17 | 22 | | <0.55 | <1.3 | 89 | <0.0050 | <1.2 | 9.0 | 12 | | <0.025 | 3.0 | 7.2 | 6.78 |
| Oct-05 | 85 | <0.66 | | | | | | 3.8 | 96 | <0.0050 | | | 13 | | | | 6.2 | 7.36 |
| Jan-06 | 76 | <0.66 | | | | | | <2.7 | 80 | <0.0050 | | | 9.0 | | | | 7.2 | 7.43 |
| Apr-06 | 77 | <0.57 | | | | | | <2.7 | 90 | <0.0050 | | | 11 | | | | 7.0 | 7.03 |
| Jul-06 | 79 | <0.57 | 8.5 | <0.17 | 19 | 5.7 | <0.88 | 3.3 | 82 | <0.0050 | <1.3 | 8.3 | 8.2 | | <0.025 | | 6.0 | 7.3 |
| Oct-06 | 78 | <0.57 | | | | | | <2.7 | 92 | <0.0050 | | | 9.5 | | | | 7.1 | 7.25 |

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# MW-1015A

| | K | Se | Ag | Na | TDS | Sulf | Zn | Color | Field Cond | Lab Cond | Redox | Odor | Turbidity | Temp | Grd Water |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (mg/l) | (ug/l) | (After Filter) | (umho) | (umho) | (mV) | | (Purging) | (°C) | El (Feet) |
| Standard | | 10 | 50 | | 500 | 250 | 5000 | | | | | | | | |
| Apr-01 | | <1.6 | <0.56 | | 120 | 8.2 | <12 | None | 160 | 190 | | None | None | 9.6 | 1092.09 |
| May-01 | | <1.6 | <0.56 | | 110 | 9.2 | <12 | None | 150 | 190 | | None | None | 11.6 | 1089.83 |
| Jun-01 | | <1.6 | <0.56 | | 110 | 8.4 | <12 | None | 150 | 190 | | None | None | 12.9 | 1089.53 |
| Jul-01 | | <1.6 | <0.56 | | 110 | 9.8 | <12 | None | 153 | 200 | | None | None | 12.6 | 1088.74 |
| Aug-01 | | <1.6 | 0.99 | | 100 | 7.6 | <12 | None | 159 | 190 | | None | None | 12.6 | 1088.12 |
| Sep-01 | | <1.6 | <0.56 | | 150 | 7.8 | <12 | None | 160 | 190 | | None | None | 10.2 | 1087.55 |
| Oct-01 | | <1.6 | <0.56 | | 130 | 10 | <12 | None | 160 | 190 | | None | None | 11.3 | 1087.58 |
| Nov-01 | | <1.6 | <0.56 | | 110 | 9.7 | <12 | None | 160 | 190 | | None | None | 10.3 | 1087.86 |
| Dec-01 | | <1.6 | <0.56 | | 150 | 7.8 | <12 | None | 164 | 200 | | None | None | 10.6 | 1088.72 |
| Jan-02 | | <1.6 | <0.56 | | 150 | 7.8 | <12 | None | 164 | 180 | | None | None | 10.4 | 1088.65 |
| Feb-02 | | <2.5 | <0.56 | | 130 | 7.6 | <12 | None | 162 | 200 | | None | None | 9.8 | 1088.38 |
| Mar-02 | | <2.5 | <0.56 | | 120 | 8.8 | <12 | None | 170 | 190 | | None | None | 11.2 | 1087.91 |
| Apr-02 | | | | | 140 | 9.0 | <10 | None | 164 | 200 | | None | None | 14.3 | 1093.59 |
| Jul-02 | | <2.5 | <0.47 | | 150 | 7.7 | <10 | None | 163 | 180 | | None | None | 14.3 | 1088.64 |
| Oct-02 | | | | | 150 | 9.1 | <10 | None | 162 | 190 | | None | None | 11.3 | 1090.94 |
| Jan-03 | | | | | 130 | 8.5 | <10 | None | 167 | 190 | | None | None | 9.4 | 1088.46 |
| Mar-03 | | | | | | | | None | 164 | | | None | None | 10.0 | 1088.75 |
| Apr-03 | | | | | 120 | 7.7 | <10 | None | 163 | 200 | | None | None | 10.6 | 1088.49 |
| Jul-03 | | <2.0 | <0.40 | | 130 | 6.6 | <5.0 | None | 166 | 170 | | None | None | 12.6 | 1088.38 |
| Oct-03 | | | | | 140 | 7.1 | <5.0 | None | 167 | 191 | | None | None | 11.0 | 1087.24 |
| Jan-04 | | | | | 160 | 8.7 | | None | 165 | 168 | | None | None | 10.8 | 1087.39 |
| Apr-04 | | | | | 62 | 9.0 | | None | 168 | 177 | | None | None | 11.5 | 1089.17 |
| Jul-04 | 0.94 | <2.1 | <0.67 | 3.4 | 88 | 7.7 | <5.0 | None | 165 | 174 | 183 | None | None | 13.7 | 1087.88 |
| Oct-04 | | | | | 95 | 7.6 | | None | 164 | 195 | 116 | None | None | 9.4 | 1087.22 |
| Jan-05 | | | | | 65 | 7.7 | | None | 162 | 184 | 128 | None | None | 8.3 | 1087.45 |
| Apr-05 | | | | | 51 | 8.6 | | None | 162 | 171 | 194 | None | None | 10.9 | 1088.58 |
| Jul-05 | | <2.0 | <0.47 | | 110 | 8.5 | <5.0 | None | 162 | 522 | | None | None | 11.2 | 1087.37 |
| Oct-05 | | | | | 110 | 8.8 | | None | 161 | 181 | 70 | None | None | 10.1 | 1088.12 |
| Jan-06 | | | | | 79 | 8.4 | | None | 165 | 181 | 160 | None | None | 9.1 | 1088.05 |
| Apr-06 | | | | | 39 | 9.1 | | None | 162 | 178 | 173 | None | None | 11.3 | 1088.71 |
| Jul-06 | 0.83 | <1.8 | <1.1 | 3.5 | 100 | 8.6 | <5.0 | None | 161 | 167 | 73 | None | None | 11.2 | 1086.95 |
| Oct-06 | | | | | 21 | 9.3 | | None | 162 | 175 | 156 | None | None | 10.3 | 1086.85 |

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# MW-1015B

| | | Well MW-1015B Well Depth: 152.29' | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Alk | As | Ba | Cd | Ca | Cl | Cr | Cu | Hard | Fe | Pb | Mg | Mn | CO2 | Hg | Ni | Field pH | Lab pH |
| | | (mg/l) | (ug/l) | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (ug/l) | (ug/l) | (mg/l) | (mg/l) | (ug/l) | (mg/l) | (ug/l) | [ug/l] | (ug/l) | (ug/l) | (s.u.) | (s.u.) |
| Standard | | | 50 | 1000 | 10 | | | 50 | 1000 | | 0.30 | 50 | | 230 | | 2 | | | |
| Apr-01 | | 180 | <2.3 | 51 | <0.23 | | | <0.57 | <2.7 | 140 | 0.069 | <0.92 | | 140 | | <0.05 | | 7.6 | 7.7 |
| May-01 | | 180 | <2.3 | 48 | <0.23 | | | <0.57 | <2.7 | 140 | <0.0050 | <0.92 | | 36 | | <0.050 | | 7.8 | 7.6 |
| Jun-01 | | 180 | <2.3 | 46 | <0.23 | | | <0.57 | <2.7 | 140 | <0.0050 | <0.92 | | 23 | | <0.050 | | 7.6 | 7.9 |
| Jul-01 | | 180 | <2.3 | 47 | <0.23 | | | <0.57 | <2.7 | 150 | <0.0050 | <0.92 | | 19 | | <0.050 | | 7.3 | 7.8 |
| Aug-01 | | 180 | <2.3 | 49 | <0.23 | | | <0.57 | <2.7 | 150 | <0.0050 | <0.92 | | 13 | | <0.050 | | 7.5 | 7.7 |
| Sep-01 | | 180 | <2.3 | 43 | <0.23 | | | <0.57 | <2.7 | 130 | 0.0052 | <0.92 | | 18 | | <0.050 | | 7.7 | 7.5 |
| Oct-01 | | 180 | <2.3 | 41 | <0.23 | 30 | | <0.57 | <2.7 | 130 | <0.0050 | <0.92 | 12 | 8.6 | | <0.050 | | 7.1 | 7.7 |
| Nov-01 | | 180 | <2.3 | 43 | <0.23 | | | <0.57 | <2.7 | 140 | <0.0050 | <0.92 | | 8.9 | | <0.050 | | 7.2 | 7.7 |
| Dec-01 | | 180 | <2.3 | 44 | <0.23 | | | <0.57 | <2.7 | 140 | 0.0069 | <0.92 | | 11 | | <0.050 | | 7.0 | 7.7 |
| Jan-02 | | 180 | <2.3 | 43 | <0.23 | | | <0.57 | <2.7 | 130 | <0.0050 | <0.92 | | 25 | | <0.050 | | 7.4 | 7.7 |
| Feb-02 | | 180 | <2.3 | 44 | <0.23 | | | <0.57 | <2.7 | 140 | 0.030 | <0.92 | | 33 | | <0.050 | | 7.0 | 7.8 |
| Mar-02 | | 180 | <2.3 | 46 | <0.23 | | | <0.57 | <2.7 | 140 | 0.0066 | <0.92 | | 22 | | <0.050 | | 6.5 | 7.5 |
| Apr-02 | | 180 | | | | | | | <2.7 | 140 | <0.0050 | | | 73 | | | | 7.4 | 7.7 |
| Jul-02 | | 180 | <2.6/2.8 | 44 | <0.23 | | | <0.44 | <2.7 | 140 | 0.069 | <0.92 | | 53 | | <0.050 | | 7.6 | 7.5 |
| Oct-02 | | 180 | | | | | | | <2.7 | 140 | 0.42 | | | 380 | | | | 6.9 | 7.0 |
| Jan-03 | | 180 | | | | | | | <2.7 | 130 | 0.12 | | | 440 | | | | 7.4 | 7.9 |
| Mar-03 | | | | | | | | | | | 0.31 | | | 170 | | | | 7.5 | |
| Apr-03 | | 180 | | | | | | | <1.3 | 150 | 0.30 | | | 180 | | | | 7.8 | 7.7 |
| Apr-03 | D | 190 | | | | | | | <1.3 | 140 | 0.21 | | | 250 | | | | | 7.8 |
| Jul-03 | | 180 | <1.2 | 45 | <0.17 | 34 | | <0.43 | <1.3 | 140 | 0.45 | <4.7 | 14 | 170 | | <0.025 | | 7.6 | 7.4 |
| Oct-03 | | 170 | | | | | | | <1.3 | 130 | 0.67 | | | 290 | | | | 7.8 | 7.7 |
| Jan-04 | | 180 | | | | | | | <1.3 | 130 | 0.44 | | | 240 | | | | 7.8 | 7.34 |
| Apr-04 | | 180 | | | | | | | <1.3 | 140 | 0.38 | | | 120 | | | | 7.5 | 7.8 |
| Jul-04 | | 170 | <1.8 | 44 | <.16 | 33 | 51 | <0.45 | <1.3 | 140 | 0.45 | <1.0 | 14 | 190 | | <0.13 | | 7.1 | 7.73 |
| Oct-04 | | 180 | <1.8 | | | 32 | | | <1.3 | 130 | 0.30 | | 13 | 140 | | | | 7.6 | 7.64 |
| Oct-04 | D | 180 | <1.8 | | | 32 | | | <1.3 | 130 | 0.30 | | 13 | 140 | | | | | 7.82 |
| Jan-05 | | 180 | <0.73 | | | | | | <1.3 | 130 | 0.22 | | | 120 | | | | 7.4 | 7.52 |
| Apr-05 | | 180 | <0.66 | | | | | | <1.3 | 140 | 0.29 | | | 130 | | | | 7.1 | 7.96 |
| Jul-05 | | 180 | <0.66 | 43 | <0.17 | 36 | | <0.55 | <1.3 | 150 | 0.40 | <1.2 | 15 | 140 | | <0.025 | 2.3 | 8.0 | 7.45 |
| Oct-05 | | 180 | <0.66 | | | | | | <2.7 | 150 | 0.30 | | | 140 | | | | 6.3 | 7.60 |
| Jan-06 | | 180 | <0.66 | | | | | | <2.7 | 140 | 0.32 | | | 110 | | | | 7.2 | 7.62 |
| Apr-06 | | 180 | <0.57 | | | | | | <2.7 | 140 | 0.44 | | | 100 | | | | 7.1 | 7.84 |
| Jul-06 | | 170 | 0.97 | 43 | <0.17 | 32 | 77 | <0.88 | <2.7 | 140 | 0.052 | <1.3 | 14 | 97 | | <0.025 | | 6.3 | 7.52 |
| Oct-06 | | 180 | <0.57 | | | | | | <2.7 | 160 | 0.32 | | | 110 | | | | 7.5 | 7.44 |

D = Field Duplicate

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SRK Att 1.xls

# MW-1015B

| | K | Se (ug/l) | Ag (ug/l) | Na (mg/l) | TDS (mg/l) | Sulf (mg/l) | Zn (ug/l) | Color (After Filter) | Field Cond (umho) | Lab Cond (umho) | Redox (mV) | Odor | Turbidity (Purging) | Temp (°C) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard | | 10 | 50 | | 500 | 250 | 5000 | | | | | | | | |
| Apr-01 | | <1.6 | <0.56 | | 290 | <5 | <12 | None | 460 | 500 | | Slight | None | 8.3 | 1091.09 |
| May-01 | | <1.6 | <0.56 | | 220 | 5.1 | <12 | None | 470 | 510 | | None | None | 9.6 | 1089.79 |
| Jun-01 | | <1.6 | <0.56 | | 220 | <5.0 | <12 | None | 450 | 500 | | None | None | 12.8 | 1089.69 |
| Jul-01 | | <1.6 | <0.56 | | 240 | <5.0 | <12 | None | 451 | 490 | | None | None | 12.9 | 1088.67 |
| Aug-01 | | <1.6 | <0.56 | | 240 | 5.3 | <12 | None | 462 | 480 | | None | None | 11.0 | 1088.21 |
| Sep-01 | | <1.6 | <0.56 | | 290 | <5.0 | <12 | None | 458 | 500 | | None | None | 10.7 | 1087.59 |
| Oct-01 | | <1.6 | <0.56 | | 310 | <5.0 | <12 | None | 450 | 490 | | None | None | 10.1 | 1087.67 |
| Nov-01 | | <1.6 | <0.56 | | 280 | <5.0 | <12 | None | 450 | 510 | | None | None | 9.8 | 1087.84 |
| Dec-01 | | <1.6 | <0.56 | | 300 | <5.0 | <12 | None | 468 | 480 | | None | None | --- | 1088.74 |
| Jan-02 | | <1.6 | <0.56 | | 310 | <5.0 | <12 | None | 458 | 500 | | None | None | 10.0 | 1088.54 |
| Feb-02 | | <2.5 | <0.56 | | 290 | <5.0 | <12 | None | 483 | 550 | | None | None | 8.3 | 1087.90 |
| Mar-02 | | <2.5 | <0.56 | | 280 | <5.0 | <12 | None | 460 | 520 | | None | None | 8.4 | 1087.79 |
| Apr-02 | | | | | 320 | <5.0 | <10 | None | 467 | 510 | | None | None | 12.1 | 1092.33 |
| Jul-02 | | <2.5 | <0.47 | | 350 | <5.0 | <10 | None | 496 | 530 | | None | None | 13.4 | 1088.82 |
| Oct-02 | | | | | 300 | <5.0 | <10 | None | 466 | 470 | | None | None | 8.8 | 1091.21 |
| Jan-03 | | | | | 270 | <5.0 | <10 | None | 463 | 520 | | None | None | 8.5 | 1088.27 |
| Mar-03 | | | | | | | | None | 458 | | | None | None | 8.6 | 1088.76 |
| Apr-03 | | | | | 310 | <5.0 | <10 | None | 456 | 490 | | None | None | 10.5 | 1088.45 |
| Apr-03 | | | | | 320 | <5.0 | <10 | | | 530 | | | | | |
| Jul-03 | | <2.0 | <0.40 | | 270 | <2.5 | <5.0 | None | 463 | 480 | | Vslight | None | 11.3 | 1088.49 |
| Oct-03 | | | | | 320 | <2.5 | <5.0 | None | 480 | 513 | | Slight | None | 10.1 | 1087.21 |
| Jan-04 | | | | | 310 | <2.5 | | None | 471 | 497 | | Slight | None | 7.6 | 1087.43 |
| Apr-04 | | | | | 210 | <2.5 | | None | 481 | 448 | | Moderate | None | 11.3 | 1089.08 |
| Jul-04 | 5.9 | <2.1 | <0.67 | 39 | 220 | <2.5 | <5.0 | None | 458 | 428 | -104 | Slight | None | 12.2 | 1087.97 |
| Oct-04 | | | | | 220 | <2.5 | | None | 459 | 507 | -99 | None | None | 9.5 | 1087.21 |
| Oct-04 | | | | | 230 | <2.5 | | | | 503 | | | | | |
| Jan-05 | | | | | 230 | <2.5 | | None | 464 | 485 | -89 | Moderate | None | 7.6 | 1087.61 |
| Apr-05 | | | | | 190 | <2.5 | | None | 451 | 469 | -93 | None | None | 9.3 | 1088.60 |
| Jul-05 | | <2.0 | <0.47 | | 260 | <2.5 | <5.0 | None | 457 | 341 | -91 | Slight | None | 11.2 | 1087.49 |
| Oct-05 | | | | | 260 | <2.5 | | None | 461 | 466 | -93 | Slight | None | 9.2 | 1088.24 |
| Jan-06 | | | | | 270 | <2.5 | | None | 472 | 421 | -73 | Slight | None | 8.2 | 1087.80 |
| Apr-06 | | | | | 190 | <2.5 | | None | 464 | 455 | -84 | Vslight | None | 9.8 | 1088.89 |
| Jul-06 | 6.5 | <1.8 | <1.1 | 46 | 270 | <2.5 | <5.0 | None | 466 | 462 | -63 | None | None | 12.1 | 1086.84 |
| Oct-06 | | | | | 230 | 2.5 | | None | 466 | 470 | -73 | None | None | 9.5 | 1086.94 |

Flambeau Mining Company
1/30/2007
SRK Att 1.xls

# ATTACHMENT 2
# PHREEQ-C RESULTS

Prepared by: JTC
Checked by: DBM

```
Input file: C:\Program Files\AquaChem50\PHRin.tmp
 Output file: C:\Program Files\AquaChem50\PHRout.tmp
Database file: c:\Program Files\AquaChem50\PHREEQC.dat

------------------
Reading data base.
------------------

        SOLUTION_MASTER_SPECIES
        SOLUTION_SPECIES
        PHASES
        EXCHANGE_MASTER_SPECIES
        EXCHANGE_SPECIES
        SURFACE_MASTER_SPECIES
        SURFACE_SPECIES
        RATES
        END
------------------------------------
Reading input data for simulation 1.
------------------------------------

        TITLE #New Step
        SOLUTION 1 MW1005P, 7/5/2006
                units   mg/l
                pH      7.40
                pe      -0.018
                temp    13.3
                Ca      57
                Mg      23
                Fe      0.17
                Mn      0.082
                Ba      0.069
                Zn      7.1     ug/l
                Cl      4.2
                S       2.5
                Alkalinity      240  as HCO3
        SOLUTION 2 MW1013B, 7/5/2006
                units   mg/l
                pH      6.40
                pe      3.996
                temp    15.8
                Ca      690
                Mg      150
                Fe      0.33
                N(-3)   0.08
                Mn      39
                Ba      0.025
                Zn      200     ug/l
                Cl      47
                S       1700
                Alkalinity      640  as HCO3
        SOLUTION 3 MW1013C, 7/5/2006
                units   mg/l
```

```
    pH      6.60
    pe      0.298
    temp    14.1
    Ca      630
    Mg      190
    Fe      8.5
    N(-3)   7.2
    Mn      11
    Ba      0.025
    Zn      460     ug/l
    Cl      57
    S       1800
    Alkalinity      510  as HCO3
SOLUTION 4 MW1014A, 7/5/2006
    units   mg/l
    pH      6.80
    pe      4.721
    temp    14.1
    Ca      340
    Mg      120
    Fe      0.33
    N(-3)   0.06
    Mn      1.4
    Ba      0.025
    Zn      50      ug/l
    Cl      15
    S       1000
    Alkalinity      500  as HCO3
SOLUTION 5 MW1014B, 7/5/2006
    units   mg/l
    pH      6.50
    pe      5.232
    temp    15
    Ca      610
    Mg      150
    Fe      0.33
    N(-3)   2.3
    Mn      17
    Ba      0.025
    Zn      2200    ug/l
    Cl      49
    S       1500
    Alkalinity      570  as HCO3
SOLUTION 6 MW1014C, 7/5/2006
    units   mg/l
    pH      6.90
    pe      0.997
    temp    15
    Ca      190
    Mg      43
    Fe      6.9
    N(-3)   0.85
    Mn      2.2
```

```
        Ba      0.027
        Zn      550     ug/l
        Cl      40
        S       300
        Alkalinity      350  as HCO3
SELECTED_OUTPUT
file    C:\Program Files\AquaChem50\PHRSelOut.tmp
simulation      false
state   false
solutiontrue
distance        false
time    false
step    true
ph      true
pe      true
reactionfalse
temperature     true
alkalinity      true
ionic_strength  true
water   true
percent_error   true
end
```

------------------------------------------
Beginning of initial solution calculations.
------------------------------------------

Initial solution 1. MW1005P, 7/5/2006

-----------------------------Solution composition------------------------------

| Elements | Molality | Moles |
|---|---|---|
| Alkalinity | 3.934e-003 | 3.934e-003 |
| Ba | 5.026e-007 | 5.026e-007 |
| Ca | 1.423e-003 | 1.423e-003 |
| Cl | 1.185e-004 | 1.185e-004 |
| Fe | 3.045e-006 | 3.045e-006 |
| Mg | 9.463e-004 | 9.463e-004 |
| Mn | 1.493e-006 | 1.493e-006 |
| S | 2.603e-005 | 2.603e-005 |
| Zn | 1.086e-007 | 1.086e-007 |

----------------------------Description of solution----------------------------

pH = 7.400
pe = -0.018
Activity of water = 1.000
Ionic strength = 6.658e-003
Mass of water (kg) = 1.000e+000
Total carbon (mol/kg) = 4.305e-003
Total CO2 (mol/kg) = 4.305e-003
Temperature (deg C) = 13.300
Electrical balance (eq) = 6.432e-004
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 7.42
Iterations = 9
Total H = 1.110163e+002
Total O = 5.551885e+001

----------------------------Distribution of species----------------------------

| | Species | Molality | Activity | Log Molality | Log Activity | Log Gamma |
|---|---|---|---|---|---|---|
| | OH- | 1.068e-007 | 9.799e-008 | -6.971 | -7.009 | -0.037 |
| | H+ | 4.294e-008 | 3.981e-008 | -7.367 | -7.400 | -0.033 |
| | H2O | 5.551e+001 | 9.999e-001 | 1.744 | -0.000 | 0.000 |
| Ba | 5.026e-007 | | | | | |
| | Ba+2 | 4.904e-007 | 3.520e-007 | -6.309 | -6.453 | -0.144 |
| | BaHCO3+ | 8.998e-009 | 8.269e-009 | -8.046 | -8.083 | -0.037 |
| | BaSO4 | 2.724e-009 | 2.728e-009 | -8.565 | -8.564 | 0.001 |
| | BaCO3 | 4.553e-010 | 4.560e-010 | -9.342 | -9.341 | 0.001 |
| | BaOH+ | 3.260e-013 | 2.996e-013 | -12.487 | -12.523 | -0.037 |
| C(4) | 4.305e-003 | | | | | |
| | HCO3- | 3.844e-003 | 3.541e-003 | -2.415 | -2.451 | -0.036 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | CO2 | 3.816e-004 | 3.822e-004 | -3.418 | -3.418 | 0.001 |
| | CaHCO3+ | 3.861e-005 | 3.557e-005 | -4.413 | -4.449 | -0.036 |
| | MgHCO3+ | 2.871e-005 | 2.638e-005 | -4.542 | -4.579 | -0.037 |
| | CaCO3 | 4.406e-006 | 4.412e-006 | -5.356 | -5.355 | 0.001 |
| | CO3-2 | 4.405e-006 | 3.172e-006 | -5.356 | -5.499 | -0.143 |
| | MgCO3 | 1.668e-006 | 1.671e-006 | -5.778 | -5.777 | 0.001 |
| | FeHCO3+ | 6.344e-007 | 5.830e-007 | -6.198 | -6.234 | -0.037 |
| | MnHCO3+ | 2.589e-007 | 2.380e-007 | -6.587 | -6.624 | -0.037 |
| | MnCO3 | 1.896e-007 | 1.899e-007 | -6.722 | -6.721 | 0.001 |
| | FeCO3 | 1.251e-007 | 1.252e-007 | -6.903 | -6.902 | 0.001 |
| | ZnCO3 | 2.647e-008 | 2.651e-008 | -7.577 | -7.577 | 0.001 |
| | ZnHCO3+ | 2.032e-008 | 1.868e-008 | -7.692 | -7.729 | -0.037 |
| | BaHCO3+ | 8.998e-009 | 8.269e-009 | -8.046 | -8.083 | -0.037 |
| | Zn(CO3)2-2 | 2.521e-009 | 1.798e-009 | -8.598 | -8.745 | -0.147 |
| | BaCO3 | 4.553e-010 | 4.560e-010 | -9.342 | -9.341 | 0.001 |
| Ca | | 1.423e-003 | | | | |
| | Ca+2 | 1.377e-003 | 9.909e-004 | -2.861 | -3.004 | -0.143 |
| | CaHCO3+ | 3.861e-005 | 3.557e-005 | -4.413 | -4.449 | -0.036 |
| | CaCO3 | 4.406e-006 | 4.412e-006 | -5.356 | -5.355 | 0.001 |
| | CaSO4 | 2.724e-006 | 2.728e-006 | -5.565 | -5.564 | 0.001 |
| | CaOH+ | 4.494e-009 | 4.130e-009 | -8.347 | -8.384 | -0.037 |
| | CaHSO4+ | 6.088e-013 | 5.594e-013 | -12.216 | -12.252 | -0.037 |
| Cl | | 1.185e-004 | | | | |
| | Cl- | 1.185e-004 | 1.088e-004 | -3.926 | -3.963 | -0.037 |
| | MnCl+ | 3.635e-010 | 3.341e-010 | -9.439 | -9.476 | -0.037 |
| | FeCl+ | 2.690e-010 | 2.472e-010 | -9.570 | -9.607 | -0.037 |
| | ZnCl+ | 7.801e-012 | 7.168e-012 | -11.108 | -11.145 | -0.037 |
| | MnCl2 | 1.584e-014 | 1.586e-014 | -13.800 | -13.800 | 0.001 |
| | ZnCl2 | 7.763e-016 | 7.775e-016 | -15.110 | -15.109 | 0.001 |
| | MnCl3- | 5.171e-019 | 4.752e-019 | -18.286 | -18.323 | -0.037 |
| | ZnCl3- | 9.598e-020 | 8.820e-020 | -19.018 | -19.055 | -0.037 |
| | FeCl+2 | 2.423e-022 | 1.728e-022 | -21.616 | -21.762 | -0.147 |
| | ZnCl4-2 | 6.123e-024 | 4.366e-024 | -23.213 | -23.360 | -0.147 |
| | FeCl2+ | 1.344e-025 | 1.235e-025 | -24.872 | -24.908 | -0.037 |
| | FeCl3 | 1.341e-030 | 1.344e-030 | -29.872 | -29.872 | 0.001 |
| Fe(2) | | 3.045e-006 | | | | |
| | Fe+2 | 2.276e-006 | 1.646e-006 | -5.643 | -5.784 | -0.141 |
| | FeHCO3+ | 6.344e-007 | 5.830e-007 | -6.198 | -6.234 | -0.037 |
| | FeCO3 | 1.251e-007 | 1.252e-007 | -6.903 | -6.902 | 0.001 |
| | FeOH+ | 5.727e-009 | 5.263e-009 | -8.242 | -8.279 | -0.037 |
| | FeSO4 | 3.617e-009 | 3.623e-009 | -8.442 | -8.441 | 0.001 |
| | FeCl+ | 2.690e-010 | 2.472e-010 | -9.570 | -9.607 | -0.037 |
| | FeHSO4+ | 1.011e-015 | 9.294e-016 | -14.995 | -15.032 | -0.037 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -68.466 | -68.466 | 0.001 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -102.208 | -102.245 | -0.037 |
| Fe(3) | | 9.689e-011 | | | | |
| | Fe(OH)3 | 6.101e-011 | 6.110e-011 | -10.215 | -10.214 | 0.001 |
| | Fe(OH)2+ | 3.494e-011 | 3.211e-011 | -10.457 | -10.493 | -0.037 |
| | Fe(OH)4- | 9.336e-013 | 8.579e-013 | -12.030 | -12.067 | -0.037 |
| | FeOH+2 | 8.592e-015 | 6.127e-015 | -14.066 | -14.213 | -0.147 |
| | Fe+3 | 1.530e-019 | 7.739e-020 | -18.815 | -19.111 | -0.296 |
| | FeSO4+ | 1.090e-020 | 1.002e-020 | -19.962 | -19.999 | -0.037 |
| | FeCl+2 | 2.423e-022 | 1.728e-022 | -21.616 | -21.762 | -0.147 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Fe(SO4)2- | 3.517e-024 | 3.232e-024 | -23.454 | -23.491 | -0.037 |
| | FeCl2+ | 1.344e-025 | 1.235e-025 | -24.872 | -24.908 | -0.037 |
| | Fe2(OH)2+4 | 6.464e-027 | 1.671e-027 | -26.190 | -26.777 | -0.587 |
| | FeHSO4+2 | 1.539e-027 | 1.098e-027 | -26.813 | -26.960 | -0.147 |
| | FeCl3 | 1.341e-030 | 1.344e-030 | -29.872 | -29.872 | 0.001 |
| | Fe3(OH)4+5 | 2.854e-034 | 3.449e-035 | -33.544 | -34.462 | -0.918 |
| H(0) | | 2.748e-018 | | | | |
| | H2 | 1.374e-018 | 1.376e-018 | -17.862 | -17.861 | 0.001 |
| Mg | | 9.463e-004 | | | | |
| | Mg+2 | 9.142e-004 | 6.608e-004 | -3.039 | -3.180 | -0.141 |
| | MgHCO3+ | 2.871e-005 | 2.638e-005 | -4.542 | -4.579 | -0.037 |
| | MgSO4 | 1.748e-006 | 1.750e-006 | -5.758 | -5.757 | 0.001 |
| | MgCO3 | 1.668e-006 | 1.671e-006 | -5.778 | -5.777 | 0.001 |
| | MgOH+ | 2.183e-008 | 2.006e-008 | -7.661 | -7.698 | -0.037 |
| Mn(2) | | 1.493e-006 | | | | |
| | Mn+2 | 1.042e-006 | 7.539e-007 | -5.982 | -6.123 | -0.141 |
| | MnHCO3+ | 2.589e-007 | 2.380e-007 | -6.587 | -6.624 | -0.037 |
| | MnCO3 | 1.896e-007 | 1.899e-007 | -6.722 | -6.721 | 0.001 |
| | MnSO4 | 1.641e-009 | 1.643e-009 | -8.785 | -8.784 | 0.001 |
| | MnCl+ | 3.635e-010 | 3.341e-010 | -9.439 | -9.476 | -0.037 |
| | MnOH+ | 1.963e-010 | 1.804e-010 | -9.707 | -9.744 | -0.037 |
| | MnCl2 | 1.584e-014 | 1.586e-014 | -13.800 | -13.800 | 0.001 |
| | MnCl3- | 5.171e-019 | 4.752e-019 | -18.286 | -18.323 | -0.037 |
| Mn(3) | | 8.078e-033 | | | | |
| | Mn+3 | 8.078e-033 | 3.775e-033 | -32.093 | -32.423 | -0.330 |
| O(0) | | 0.000e+000 | | | | |
| | O2 | 0.000e+000 | 0.000e+000 | -60.588 | -60.588 | 0.001 |
| S(-2) | | 2.450e-036 | | | | |
| | HS- | 1.664e-036 | 1.527e-036 | -35.779 | -35.816 | -0.037 |
| | H2S | 7.853e-037 | 7.865e-037 | -36.105 | -36.104 | 0.001 |
| | S-2 | 0.000e+000 | 0.000e+000 | -41.552 | -41.696 | -0.144 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -68.466 | -68.466 | 0.001 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -102.208 | -102.245 | -0.037 |
| S(6) | | 2.603e-005 | | | | |
| | SO4-2 | 2.155e-005 | 1.546e-005 | -4.666 | -4.811 | -0.144 |
| | CaSO4 | 2.724e-006 | 2.728e-006 | -5.565 | -5.564 | 0.001 |
| | MgSO4 | 1.748e-006 | 1.750e-006 | -5.758 | -5.757 | 0.001 |
| | FeSO4 | 3.617e-009 | 3.623e-009 | -8.442 | -8.441 | 0.001 |
| | BaSO4 | 2.724e-009 | 2.728e-009 | -8.565 | -8.564 | 0.001 |
| | MnSO4 | 1.641e-009 | 1.643e-009 | -8.785 | -8.784 | 0.001 |
| | ZnSO4 | 1.380e-010 | 1.382e-010 | -9.860 | -9.859 | 0.001 |
| | HSO4- | 5.110e-011 | 4.696e-011 | -10.292 | -10.328 | -0.037 |
| | CaHSO4+ | 6.088e-013 | 5.594e-013 | -12.216 | -12.252 | -0.037 |
| | Zn(SO4)2-2 | 2.676e-014 | 1.908e-014 | -13.573 | -13.719 | -0.147 |
| | FeHSO4+ | 1.011e-015 | 9.294e-016 | -14.995 | -15.032 | -0.037 |
| | FeSO4+ | 1.090e-020 | 1.002e-020 | -19.962 | -19.999 | -0.037 |
| | Fe(SO4)2- | 3.517e-024 | 3.232e-024 | -23.454 | -23.491 | -0.037 |
| | FeHSO4+2 | 1.539e-027 | 1.098e-027 | -26.813 | -26.960 | -0.147 |
| Zn | | 1.086e-007 | | | | |
| | Zn+2 | 5.836e-008 | 4.189e-008 | -7.234 | -7.378 | -0.144 |
| | ZnCO3 | 2.647e-008 | 2.651e-008 | -7.577 | -7.577 | 0.001 |
| | ZnHCO3+ | 2.032e-008 | 1.868e-008 | -7.692 | -7.729 | -0.037 |
| | Zn(CO3)2-2 | 2.521e-009 | 1.798e-009 | -8.598 | -8.745 | -0.147 |

| | | | | | |
|---|---|---|---|---|---|
| ZnOH+ | 4.984e-010 | 4.580e-010 | -9.302 | -9.339 | -0.037 |
| Zn(OH)2 | 3.322e-010 | 3.327e-010 | -9.479 | -9.478 | 0.001 |
| ZnSO4 | 1.380e-010 | 1.382e-010 | -9.860 | -9.859 | 0.001 |
| ZnCl+ | 7.801e-012 | 7.168e-012 | -11.108 | -11.145 | -0.037 |
| Zn(OH)3- | 2.875e-014 | 2.642e-014 | -13.541 | -13.578 | -0.037 |
| Zn(SO4)2-2 | 2.676e-014 | 1.908e-014 | -13.573 | -13.719 | -0.147 |
| ZnCl2 | 7.763e-016 | 7.775e-016 | -15.110 | -15.109 | 0.001 |
| Zn(OH)4-2 | 1.475e-019 | 1.052e-019 | -18.831 | -18.978 | -0.147 |
| ZnCl3- | 9.598e-020 | 8.820e-020 | -19.018 | -19.055 | -0.037 |
| ZnCl4-2 | 6.123e-024 | 4.366e-024 | -23.213 | -23.360 | -0.147 |

------------------------------Saturation indices------------------------------

| Phase | SI | log IAP | log KT | |
|---|---|---|---|---|
| Anhydrite | -3.48 | -7.81 | -4.33 | CaSO4 |
| Aragonite | -0.23 | -8.50 | -8.27 | CaCO3 |
| Barite | -1.09 | -11.26 | -10.18 | BaSO4 |
| Calcite | -0.08 | -8.50 | -8.42 | CaCO3 |
| CO2(g) | -2.10 | -20.30 | -18.20 | CO2 |
| Dolomite | -0.37 | -17.18 | -16.81 | CaMg(CO3)2 |
| Fe(OH)3(a) | -1.80 | 16.40 | 18.20 | Fe(OH)3 |
| FeS(ppt) | -30.28 | -69.65 | -39.37 | FeS |
| Goethite | 3.66 | 16.40 | 12.74 | FeOOH |
| Gypsum | -3.23 | -7.81 | -4.59 | CaSO4:2H2O |
| H2(g) | -14.76 | -14.76 | 0.00 | H2 |
| H2O(g) | -1.83 | -0.00 | 1.83 | H2O |
| H2S(g) | -35.24 | -78.67 | -43.42 | H2S |
| Hausmannite | -23.25 | 40.80 | 64.04 | Mn3O4 |
| Hematite | 9.26 | 32.80 | 23.54 | Fe2O3 |
| Mackinawite | -29.55 | -69.65 | -40.10 | FeS |
| Manganite | -9.28 | 16.06 | 25.34 | MnOOH |
| Melanterite | -8.23 | -10.59 | -2.36 | FeSO4:7H2O |
| O2(g) | -57.68 | 29.53 | 87.21 | O2 |
| Pyrite | -43.83 | -133.55 | -89.72 | FeS2 |
| Pyrochroite | -6.52 | 8.68 | 15.20 | Mn(OH)2 |
| Pyrolusite | -19.89 | 23.44 | 43.33 | MnO2 |
| Rhodochrosite | -0.53 | -11.62 | -11.09 | MnCO3 |
| Siderite | -0.47 | -11.28 | -10.82 | FeCO3 |
| Smithsonite | -3.01 | -12.88 | -9.87 | ZnCO3 |
| Sphalerite | -23.93 | -71.24 | -47.32 | ZnS |
| Sulfur | -26.51 | -63.90 | -37.40 | S |
| Witherite | -3.34 | -11.95 | -8.61 | BaCO3 |
| Zn(OH)2(e) | -4.08 | 7.42 | 11.50 | Zn(OH)2 |

Initial solution 2. MW1013B, 7/5/2006

-----------------------------Solution composition------------------------------

| Elements | Molality | Moles |
|---|---|---|
| Alkalinity | 1.052e-002 | 1.052e-002 |
| Ba | 1.826e-007 | 1.826e-007 |
| Ca | 1.727e-002 | 1.727e-002 |
| Cl | 1.330e-003 | 1.330e-003 |
| Fe | 5.928e-006 | 5.928e-006 |
| Mg | 6.190e-003 | 6.190e-003 |
| Mn | 7.122e-004 | 7.122e-004 |
| N(-3) | 5.730e-006 | 5.730e-006 |
| S | 1.775e-002 | 1.775e-002 |
| Zn | 3.070e-006 | 3.070e-006 |

----------------------------Description of solution----------------------------

pH = 6.400
pe = 3.996
Activity of water = 0.999
Ionic strength = 6.129e-002
Mass of water (kg) = 1.000e+000
Total carbon (mol/kg) = 1.845e-002
Total CO2 (mol/kg) = 1.845e-002
Temperature (deg C) = 15.800
Electrical balance (eq) = 1.011e-003
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 1.50
Iterations = 9
Total H = 1.110229e+002
Total O = 5.562464e+001

----------------------------Distribution of species----------------------------

| | Species | Molality | Activity | Log Molality | Log Activity | Log Gamma |
|---|---|---|---|---|---|---|
| | H+ | 4.698e-007 | 3.981e-007 | -6.328 | -6.400 | -0.072 |
| | OH- | 1.512e-008 | 1.210e-008 | -7.821 | -7.917 | -0.097 |
| | H2O | 5.551e+001 | 9.991e-001 | 1.744 | -0.000 | 0.000 |
| Ba | 1.826e-007 | | | | | |
| | BaSO4 | 9.303e-008 | 9.435e-008 | -7.031 | -7.025 | 0.006 |
| | Ba+2 | 8.693e-008 | 3.849e-008 | -7.061 | -7.415 | -0.354 |
| | BaHCO3+ | 2.662e-009 | 2.162e-009 | -8.575 | -8.665 | -0.090 |
| | BaCO3 | 1.220e-011 | 1.237e-011 | -10.914 | -10.908 | 0.006 |
| | BaOH+ | 4.030e-015 | 3.273e-015 | -14.395 | -14.485 | -0.090 |
| C(4) | 1.845e-002 | | | | | |
| | HCO3- | 9.550e-003 | 7.826e-003 | -2.020 | -2.106 | -0.086 |
| | CO2 | 7.947e-003 | 8.060e-003 | -2.100 | -2.094 | 0.006 |
| | CaHCO3+ | 5.558e-004 | 4.555e-004 | -3.255 | -3.342 | -0.086 |
| | MgHCO3+ | 2.152e-004 | 1.748e-004 | -3.667 | -3.757 | -0.090 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | MnHCO3+ | 1.610e-004 | 1.308e-004 | -3.793 | -3.883 | -0.090 |
| | MnCO3 | 1.099e-005 | 1.114e-005 | -4.959 | -4.953 | 0.006 |
| | CaCO3 | 5.766e-006 | 5.848e-006 | -5.239 | -5.233 | 0.006 |
| | CO3-2 | 1.659e-006 | 7.482e-007 | -5.780 | -6.126 | -0.346 |
| | FeHCO3+ | 1.476e-006 | 1.199e-006 | -5.831 | -5.921 | -0.090 |
| | MgCO3 | 1.205e-006 | 1.222e-006 | -5.919 | -5.913 | 0.006 |
| | ZnHCO3+ | 7.784e-007 | 6.322e-007 | -6.109 | -6.199 | -0.090 |
| | ZnCO3 | 9.445e-008 | 9.579e-008 | -7.025 | -7.019 | 0.006 |
| | FeCO3 | 2.711e-008 | 2.750e-008 | -7.567 | -7.561 | 0.006 |
| | Zn(CO3)2-2 | 3.522e-009 | 1.532e-009 | -8.453 | -8.815 | -0.361 |
| | BaHCO3+ | 2.662e-009 | 2.162e-009 | -8.575 | -8.665 | -0.090 |
| | BaCO3 | 1.220e-011 | 1.237e-011 | -10.914 | -10.908 | 0.006 |
| Ca | 1.727e-002 | | | | | |
| | Ca+2 | 1.194e-002 | 5.414e-003 | -1.923 | -2.267 | -0.344 |
| | CaSO4 | 4.767e-003 | 4.834e-003 | -2.322 | -2.316 | 0.006 |
| | CaHCO3+ | 5.558e-004 | 4.555e-004 | -3.255 | -3.342 | -0.086 |
| | CaCO3 | 5.766e-006 | 5.848e-006 | -5.239 | -5.233 | 0.006 |
| | CaHSO4+ | 1.251e-008 | 1.016e-008 | -7.903 | -7.993 | -0.090 |
| | CaOH+ | 2.776e-009 | 2.255e-009 | -8.557 | -8.647 | -0.090 |
| Cl | 1.330e-003 | | | | | |
| | Cl- | 1.329e-003 | 1.066e-003 | -2.876 | -2.972 | -0.096 |
| | MnCl+ | 1.002e-006 | 8.141e-007 | -5.999 | -6.089 | -0.090 |
| | FeCl+ | 2.775e-009 | 2.254e-009 | -8.557 | -8.647 | -0.090 |
| | ZnCl+ | 1.491e-009 | 1.211e-009 | -8.826 | -8.917 | -0.090 |
| | MnCl2 | 3.734e-010 | 3.787e-010 | -9.428 | -9.422 | 0.006 |
| | ZnCl2 | 1.283e-012 | 1.301e-012 | -11.892 | -11.886 | 0.006 |
| | MnCl3- | 1.369e-013 | 1.112e-013 | -12.864 | -12.954 | -0.090 |
| | ZnCl3- | 1.809e-015 | 1.469e-015 | -14.742 | -14.833 | -0.090 |
| | FeCl+2 | 4.718e-017 | 2.053e-017 | -16.326 | -16.688 | -0.361 |
| | ZnCl4-2 | 1.673e-018 | 7.280e-019 | -17.776 | -18.138 | -0.361 |
| | FeCl2+ | 1.626e-019 | 1.320e-019 | -18.789 | -18.879 | -0.090 |
| | FeCl3 | 1.388e-023 | 1.407e-023 | -22.858 | -22.852 | 0.006 |
| Fe(2) | 5.922e-006 | | | | | |
| | Fe+2 | 3.310e-006 | 1.532e-006 | -5.480 | -5.815 | -0.334 |
| | FeHCO3+ | 1.476e-006 | 1.199e-006 | -5.831 | -5.921 | -0.090 |
| | FeSO4 | 1.105e-006 | 1.120e-006 | -5.957 | -5.951 | 0.006 |
| | FeCO3 | 2.711e-008 | 2.750e-008 | -7.567 | -7.561 | 0.006 |
| | FeCl+ | 2.775e-009 | 2.254e-009 | -8.557 | -8.647 | -0.090 |
| | FeOH+ | 7.366e-010 | 5.982e-010 | -9.133 | -9.223 | -0.090 |
| | FeHSO4+ | 3.540e-012 | 2.875e-012 | -11.451 | -11.541 | -0.090 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -110.518 | -110.512 | 0.006 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -165.208 | -165.298 | -0.090 |
| Fe(3) | 6.696e-009 | | | | | |
| | Fe(OH)2+ | 5.700e-009 | 4.630e-009 | -8.244 | -8.334 | -0.090 |
| | Fe(OH)3 | 9.757e-010 | 9.896e-010 | -9.011 | -9.005 | 0.006 |
| | FeOH+2 | 1.835e-011 | 7.986e-012 | -10.736 | -11.098 | -0.361 |
| | Fe(OH)4- | 1.904e-012 | 1.547e-012 | -11.720 | -11.811 | -0.090 |
| | FeSO4+ | 4.612e-014 | 3.746e-014 | -13.336 | -13.426 | -0.090 |
| | Fe(SO4)2- | 4.755e-015 | 3.862e-015 | -14.323 | -14.413 | -0.090 |
| | Fe+3 | 3.822e-015 | 8.618e-016 | -14.418 | -15.065 | -0.647 |
| | FeCl+2 | 4.718e-017 | 2.053e-017 | -16.326 | -16.688 | -0.361 |
| | FeCl2+ | 1.626e-019 | 1.320e-019 | -18.789 | -18.879 | -0.090 |
| | FeHSO4+2 | 9.336e-020 | 4.062e-020 | -19.030 | -19.391 | -0.361 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Fe2(OH)2+4 | 7.089e-020 | 2.541e-021 | -19.149 | -20.595 | -1.446 |
| | FeCl3 | 1.388e-023 | 1.407e-023 | -22.858 | -22.852 | 0.006 |
| | Fe3(OH)4+5 | 1.071e-024 | 5.901e-027 | -23.970 | -26.229 | -2.259 |
| H(0) | | 2.477e-024 | | | | |
| | H2 | 1.239e-024 | 1.256e-024 | -23.907 | -23.901 | 0.006 |
| Mg | | 6.190e-003 | | | | |
| | Mg+2 | 4.229e-003 | 1.971e-003 | -2.374 | -2.705 | -0.332 |
| | MgSO4 | 1.745e-003 | 1.769e-003 | -2.758 | -2.752 | 0.006 |
| | MgHCO3+ | 2.152e-004 | 1.748e-004 | -3.667 | -3.757 | -0.090 |
| | MgCO3 | 1.205e-006 | 1.222e-006 | -5.919 | -5.913 | 0.006 |
| | MgOH+ | 9.382e-009 | 7.620e-009 | -8.028 | -8.118 | -0.090 |
| Mn(2) | | 7.122e-004 | | | | |
| | Mn+2 | 4.050e-004 | 1.875e-004 | -3.392 | -3.727 | -0.334 |
| | MnHCO3+ | 1.610e-004 | 1.308e-004 | -3.793 | -3.883 | -0.090 |
| | MnSO4 | 1.342e-004 | 1.361e-004 | -3.872 | -3.866 | 0.006 |
| | MnCO3 | 1.099e-005 | 1.114e-005 | -4.959 | -4.953 | 0.006 |
| | MnCl+ | 1.002e-006 | 8.141e-007 | -5.999 | -6.089 | -0.090 |
| | MnOH+ | 6.869e-009 | 5.579e-009 | -8.163 | -8.253 | -0.090 |
| | MnCl2 | 3.734e-010 | 3.787e-010 | -9.428 | -9.422 | 0.006 |
| | MnCl3- | 1.369e-013 | 1.112e-013 | -12.864 | -12.954 | -0.090 |
| Mn(3) | | 9.333e-026 | | | | |
| | Mn+3 | 9.333e-026 | 1.435e-026 | -25.030 | -25.843 | -0.813 |
| N(-3) | | 5.730e-006 | | | | |
| | NH4+ | 5.397e-006 | 4.254e-006 | -5.268 | -5.371 | -0.103 |
| | NH4SO4- | 3.300e-007 | 2.680e-007 | -6.481 | -6.572 | -0.090 |
| | NH3 | 3.069e-009 | 3.112e-009 | -8.513 | -8.507 | 0.006 |
| O(0) | | 0.000e+000 | | | | |
| | O2 | 0.000e+000 | 0.000e+000 | -47.649 | -47.643 | 0.006 |
| S(-2) | | 0.000e+000 | | | | |
| | H2S | 0.000e+000 | 0.000e+000 | -56.157 | -56.151 | 0.006 |
| | HS- | 0.000e+000 | 0.000e+000 | -56.727 | -56.824 | -0.097 |
| | S-2 | 0.000e+000 | 0.000e+000 | -63.270 | -63.624 | -0.354 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -110.518 | -110.512 | 0.006 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -165.208 | -165.298 | -0.090 |
| S(6) | | 1.775e-002 | | | | |
| | SO4-2 | 1.111e-002 | 4.891e-003 | -1.954 | -2.311 | -0.356 |
| | CaSO4 | 4.767e-003 | 4.834e-003 | -2.322 | -2.316 | 0.006 |
| | MgSO4 | 1.745e-003 | 1.769e-003 | -2.758 | -2.752 | 0.006 |
| | MnSO4 | 1.342e-004 | 1.361e-004 | -3.872 | -3.866 | 0.006 |
| | FeSO4 | 1.105e-006 | 1.120e-006 | -5.957 | -5.951 | 0.006 |
| | ZnSO4 | 6.742e-007 | 6.838e-007 | -6.171 | -6.165 | 0.006 |
| | NH4SO4- | 3.300e-007 | 2.680e-007 | -6.481 | -6.572 | -0.090 |
| | HSO4- | 1.922e-007 | 1.561e-007 | -6.716 | -6.807 | -0.090 |
| | BaSO4 | 9.303e-008 | 9.435e-008 | -7.031 | -7.025 | 0.006 |
| | Zn(SO4)2-2 | 6.721e-008 | 2.925e-008 | -7.173 | -7.534 | -0.361 |
| | CaHSO4+ | 1.251e-008 | 1.016e-008 | -7.903 | -7.993 | -0.090 |
| | FeHSO4+ | 3.540e-012 | 2.875e-012 | -11.451 | -11.541 | -0.090 |
| | FeSO4+ | 4.612e-014 | 3.746e-014 | -13.336 | -13.426 | -0.090 |
| | Fe(SO4)2- | 4.755e-015 | 3.862e-015 | -14.323 | -14.413 | -0.090 |
| | FeHSO4+2 | 9.336e-020 | 4.062e-020 | -19.030 | -19.391 | -0.361 |
| Zn | | 3.070e-006 | | | | |
| | Zn+2 | 1.449e-006 | 6.417e-007 | -5.839 | -6.193 | -0.354 |
| | ZnHCO3+ | 7.784e-007 | 6.322e-007 | -6.109 | -6.199 | -0.090 |

| | | | | | |
|---|---|---|---|---|---|
| ZnSO4 | 6.742e-007 | 6.838e-007 | -6.171 | -6.165 | 0.006 |
| ZnCO3 | 9.445e-008 | 9.579e-008 | -7.025 | -7.019 | 0.006 |
| Zn(SO4)2-2 | 6.721e-008 | 2.925e-008 | -7.173 | -7.534 | -0.361 |
| Zn(CO3)2-2 | 3.522e-009 | 1.532e-009 | -8.453 | -8.815 | -0.361 |
| ZnCl+ | 1.491e-009 | 1.211e-009 | -8.826 | -8.917 | -0.090 |
| ZnOH+ | 1.058e-009 | 8.594e-010 | -8.975 | -9.066 | -0.090 |
| Zn(OH)2 | 5.016e-011 | 5.088e-011 | -10.300 | -10.293 | 0.006 |
| ZnCl2 | 1.283e-012 | 1.301e-012 | -11.892 | -11.886 | 0.006 |
| ZnCl3- | 1.809e-015 | 1.469e-015 | -14.742 | -14.833 | -0.090 |
| Zn(OH)3- | 4.971e-016 | 4.038e-016 | -15.304 | -15.394 | -0.090 |
| ZnCl4-2 | 1.673e-018 | 7.280e-019 | -17.776 | -18.138 | -0.361 |
| Zn(OH)4-2 | 3.691e-022 | 1.606e-022 | -21.433 | -21.794 | -0.361 |

-----------------------------Saturation indices-------------------------------

| Phase | SI | log IAP | log KT | |
|---|---|---|---|---|
| Anhydrite | -0.24 | -4.58 | -4.34 | CaSO4 |
| Aragonite | -0.11 | -8.39 | -8.28 | CaCO3 |
| Barite | 0.40 | -9.73 | -10.13 | BaSO4 |
| Calcite | 0.04 | -8.39 | -8.43 | CaCO3 |
| CO2(g) | -0.74 | -18.93 | -18.18 | CO2 |
| Dolomite | -0.35 | -17.22 | -16.87 | CaMg(CO3)2 |
| Fe(OH)3(a) | -0.76 | 17.38 | 18.14 | Fe(OH)3 |
| FeS(ppt) | -52.32 | -91.29 | -38.97 | FeS |
| Goethite | 4.80 | 17.38 | 12.58 | FeOOH |
| Gypsum | 0.01 | -4.58 | -4.58 | CaSO4:2H2O |
| H2(g) | -20.79 | -20.79 | 0.00 | H2 |
| H2O(g) | -1.76 | -0.00 | 1.76 | H2O |
| H2S(g) | -55.26 | -98.28 | -43.02 | H2S |
| Hausmannite | -15.37 | 48.01 | 63.38 | Mn3O4 |
| Hematite | 11.56 | 34.76 | 23.20 | Fe2O3 |
| Mackinawite | -51.59 | -91.29 | -39.70 | FeS |
| Manganite | -5.87 | 19.47 | 25.34 | MnOOH |
| Melanterite | -5.80 | -8.13 | -2.33 | FeSO4:7H2O |
| NH3(g) | -10.47 | 1.03 | 11.50 | NH3 |
| O2(g) | -44.73 | 41.58 | 86.31 | O2 |
| Pyrite | -79.93 | -168.78 | -88.85 | FeS2 |
| Pyrochroite | -6.13 | 9.07 | 15.20 | Mn(OH)2 |
| Pyrolusite | -13.04 | 29.86 | 42.90 | MnO2 |
| Rhodochrosite | 1.24 | -9.85 | -11.10 | MnCO3 |
| Siderite | -1.11 | -11.94 | -10.83 | FeCO3 |
| Smithsonite | -2.42 | -12.32 | -9.90 | ZnCO3 |
| Sphalerite | -44.81 | -91.67 | -46.86 | ZnS |
| Sulfur | -40.46 | -77.49 | -37.02 | S |
| Witherite | -4.95 | -13.54 | -8.59 | BaCO3 |
| Zn(OH)2(e) | -4.89 | 6.61 | 11.50 | Zn(OH)2 |

Initial solution 3. MW1013C, 7/5/2006

-----------------------------Solution composition------------------------------

| Elements | Molality | Moles |
|---|---|---|
| Alkalinity | 8.385e-003 | 8.385e-003 |
| Ba | 1.826e-007 | 1.826e-007 |
| Ca | 1.577e-002 | 1.577e-002 |
| Cl | 1.613e-003 | 1.613e-003 |
| Fe | 1.527e-004 | 1.527e-004 |
| Mg | 7.840e-003 | 7.840e-003 |
| Mn | 2.009e-004 | 2.009e-004 |
| N(-3) | 5.157e-004 | 5.157e-004 |
| S | 1.880e-002 | 1.880e-002 |
| Zn | 7.060e-006 | 7.060e-006 |

----------------------------Description of solution----------------------------

pH = 6.600
pe = 0.298
Activity of water = 0.999
Ionic strength = 6.184e-002
Mass of water (kg) = 1.000e+000
Total carbon (mol/kg) = 1.253e-002
Total CO2 (mol/kg) = 1.253e-002
Temperature (deg C) = 14.100
Electrical balance (eq) = 8.626e-004
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 1.29
Iterations = 9
Total H = 1.110229e+002
Total O = 5.561484e+001

----------------------------Distribution of species----------------------------

| | Species | Molality | Activity | Log Molality | Log Activity | Log Gamma |
|---|---|---|---|---|---|---|
| | H+ | 2.964e-007 | 2.512e-007 | -6.528 | -6.600 | -0.072 |
| | OH- | 2.077e-008 | 1.662e-008 | -7.683 | -7.779 | -0.097 |
| | H2O | 5.551e+001 | 9.992e-001 | 1.744 | -0.000 | 0.000 |
| Ba | 1.826e-007 | | | | | |
| | BaSO4 | 9.639e-008 | 9.777e-008 | -7.016 | -7.010 | 0.006 |
| | Ba+2 | 8.425e-008 | 3.728e-008 | -7.074 | -7.428 | -0.354 |
| | BaHCO3+ | 1.964e-009 | 1.595e-009 | -8.707 | -8.797 | -0.090 |
| | BaCO3 | 1.391e-011 | 1.411e-011 | -10.857 | -10.850 | 0.006 |
| | BaOH+ | 6.188e-015 | 5.025e-015 | -14.208 | -14.299 | -0.090 |
| C(4) | 1.253e-002 | | | | | |
| | HCO3- | 7.676e-003 | 6.289e-003 | -2.115 | -2.201 | -0.087 |
| | CO2 | 4.159e-003 | 4.219e-003 | -2.381 | -2.375 | 0.006 |
| | CaHCO3+ | 3.893e-004 | 3.189e-004 | -3.410 | -3.496 | -0.087 |
| | MgHCO3+ | 2.185e-004 | 1.774e-004 | -3.661 | -3.751 | -0.090 |
| | MnHCO3+ | 3.779e-005 | 3.069e-005 | -4.423 | -4.513 | -0.090 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | FeHCO3+ | 3.191e-005 | 2.591e-005 | -4.496 | -4.586 | -0.090 |
| | CaCO3 | 6.245e-006 | 6.334e-006 | -5.204 | -5.198 | 0.006 |
| | MnCO3 | 3.910e-006 | 3.966e-006 | -5.408 | -5.402 | 0.006 |
| | CO3-2 | 2.023e-006 | 9.120e-007 | -5.694 | -6.040 | -0.346 |
| | MgCO3 | 1.813e-006 | 1.839e-006 | -5.742 | -5.735 | 0.006 |
| | ZnHCO3+ | 1.478e-006 | 1.201e-006 | -5.830 | -5.921 | -0.090 |
| | FeCO3 | 8.886e-007 | 9.013e-007 | -6.051 | -6.045 | 0.006 |
| | ZnCO3 | 2.720e-007 | 2.759e-007 | -6.565 | -6.559 | 0.006 |
| | Zn(CO3)2-2 | 1.237e-008 | 5.380e-009 | -7.908 | -8.269 | -0.362 |
| | BaHCO3+ | 1.964e-009 | 1.595e-009 | -8.707 | -8.797 | -0.090 |
| | BaCO3 | 1.391e-011 | 1.411e-011 | -10.857 | -10.850 | 0.006 |
| Ca | 1.577e-002 | | | | | |
| | Ca+2 | 1.083e-002 | 4.907e-003 | -1.965 | -2.309 | -0.344 |
| | CaSO4 | 4.544e-003 | 4.609e-003 | -2.343 | -2.336 | 0.006 |
| | CaHCO3+ | 3.893e-004 | 3.189e-004 | -3.410 | -3.496 | -0.087 |
| | CaCO3 | 6.245e-006 | 6.334e-006 | -5.204 | -5.198 | 0.006 |
| | CaHSO4+ | 7.399e-009 | 6.009e-009 | -8.131 | -8.221 | -0.090 |
| | CaOH+ | 3.988e-009 | 3.239e-009 | -8.399 | -8.490 | -0.090 |
| Cl | 1.613e-003 | | | | | |
| | Cl- | 1.612e-003 | 1.293e-003 | -2.793 | -2.888 | -0.096 |
| | MnCl+ | 3.551e-007 | 2.883e-007 | -6.450 | -6.540 | -0.090 |
| | FeCl+ | 9.053e-008 | 7.352e-008 | -7.043 | -7.134 | -0.090 |
| | ZnCl+ | 3.945e-009 | 3.204e-009 | -8.404 | -8.494 | -0.090 |
| | MnCl2 | 1.604e-010 | 1.627e-010 | -9.795 | -9.789 | 0.006 |
| | ZnCl2 | 4.085e-012 | 4.144e-012 | -11.389 | -11.383 | 0.006 |
| | MnCl3- | 7.134e-014 | 5.794e-014 | -13.147 | -13.237 | -0.090 |
| | ZnCl3- | 6.916e-015 | 5.616e-015 | -14.160 | -14.251 | -0.090 |
| | ZnCl4-2 | 7.649e-018 | 3.327e-018 | -17.116 | -17.478 | -0.362 |
| | FeCl+2 | 2.636e-019 | 1.147e-019 | -18.579 | -18.941 | -0.362 |
| | FeCl2+ | 1.167e-021 | 9.478e-022 | -20.933 | -21.023 | -0.090 |
| | FeCl3 | 1.208e-025 | 1.225e-025 | -24.918 | -24.912 | 0.006 |
| Fe(2) | 1.527e-004 | | | | | |
| | Fe+2 | 8.905e-005 | 4.120e-005 | -4.050 | -4.385 | -0.335 |
| | FeHCO3+ | 3.191e-005 | 2.591e-005 | -4.496 | -4.586 | -0.090 |
| | FeSO4 | 3.073e-005 | 3.117e-005 | -4.512 | -4.506 | 0.006 |
| | FeCO3 | 8.886e-007 | 9.013e-007 | -6.051 | -6.045 | 0.006 |
| | FeCl+ | 9.053e-008 | 7.352e-008 | -7.043 | -7.134 | -0.090 |
| | FeOH+ | 2.740e-008 | 2.225e-008 | -7.562 | -7.653 | -0.090 |
| | FeHSO4+ | 6.213e-011 | 5.046e-011 | -10.207 | -10.297 | -0.090 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -52.923 | -52.917 | 0.006 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -79.531 | -79.621 | -0.090 |
| Fe(3) | 7.342e-011 | | | | | |
| | Fe(OH)2+ | 5.857e-011 | 4.757e-011 | -10.232 | -10.323 | -0.090 |
| | Fe(OH)3 | 1.468e-011 | 1.489e-011 | -10.833 | -10.827 | 0.006 |
| | FeOH+2 | 1.275e-013 | 5.547e-014 | -12.894 | -13.256 | -0.362 |
| | Fe(OH)4- | 4.220e-014 | 3.427e-014 | -13.375 | -13.465 | -0.090 |
| | FeSO4+ | 2.312e-016 | 1.878e-016 | -15.636 | -15.726 | -0.090 |
| | Fe(SO4)2- | 2.532e-017 | 2.057e-017 | -16.596 | -16.687 | -0.090 |
| | Fe+3 | 1.865e-017 | 4.204e-018 | -16.729 | -17.376 | -0.647 |
| | FeCl+2 | 2.636e-019 | 1.147e-019 | -18.579 | -18.941 | -0.362 |
| | FeCl2+ | 1.167e-021 | 9.478e-022 | -20.933 | -21.023 | -0.090 |
| | FeHSO4+2 | 2.973e-022 | 1.293e-022 | -21.527 | -21.888 | -0.362 |
| | Fe2(OH)2+4 | 3.692e-024 | 1.322e-025 | -23.433 | -24.879 | -1.446 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | FeCl3 | 1.208e-025 | 1.225e-025 | -24.918 | -24.912 | 0.006 |
| | Fe3(OH)4+5 | 6.784e-031 | 3.731e-033 | -30.169 | -32.428 | -2.260 |
| H(0) | 2.499e-017 | | | | | |
| | H2 | 1.250e-017 | 1.267e-017 | -16.903 | -16.897 | 0.006 |
| Mg | 7.840e-003 | | | | | |
| | Mg+2 | 5.363e-003 | 2.498e-003 | -2.271 | -2.602 | -0.332 |
| | MgSO4 | 2.257e-003 | 2.290e-003 | -2.646 | -2.640 | 0.006 |
| | MgHCO3+ | 2.185e-004 | 1.774e-004 | -3.661 | -3.751 | -0.090 |
| | MgCO3 | 1.813e-006 | 1.839e-006 | -5.742 | -5.735 | 0.006 |
| | MgOH+ | 1.599e-008 | 1.299e-008 | -7.796 | -7.886 | -0.090 |
| Mn(2) | 2.009e-004 | | | | | |
| | Mn+2 | 1.183e-004 | 5.475e-005 | -3.927 | -4.262 | -0.335 |
| | MnSO4 | 4.048e-005 | 4.106e-005 | -4.393 | -4.387 | 0.006 |
| | MnHCO3+ | 3.779e-005 | 3.069e-005 | -4.423 | -4.513 | -0.090 |
| | MnCO3 | 3.910e-006 | 3.966e-006 | -5.408 | -5.402 | 0.006 |
| | MnCl+ | 3.551e-007 | 2.883e-007 | -6.450 | -6.540 | -0.090 |
| | MnOH+ | 2.741e-009 | 2.226e-009 | -8.562 | -8.652 | -0.090 |
| | MnCl2 | 1.604e-010 | 1.627e-010 | -9.795 | -9.789 | 0.006 |
| | MnCl3- | 7.134e-014 | 5.794e-014 | -13.147 | -13.237 | -0.090 |
| Mn(3) | 4.191e-030 | | | | | |
| | Mn+3 | 4.191e-030 | 6.439e-031 | -29.378 | -30.191 | -0.813 |
| N(-3) | 5.157e-004 | | | | | |
| | NH4+ | 4.837e-004 | 3.812e-004 | -3.315 | -3.419 | -0.103 |
| | NH4SO4- | 3.164e-005 | 2.569e-005 | -4.500 | -4.590 | -0.090 |
| | NH3 | 3.829e-007 | 3.884e-007 | -6.417 | -6.411 | 0.006 |
| O(0) | 0.000e+000 | | | | | |
| | O2 | 0.000e+000 | 0.000e+000 | -62.244 | -62.238 | 0.006 |
| S(-2) | 7.914e-029 | | | | | |
| | H2S | 5.645e-029 | 5.726e-029 | -28.248 | -28.242 | 0.006 |
| | HS- | 2.269e-029 | 1.815e-029 | -28.644 | -28.741 | -0.097 |
| | S-2 | 9.087e-036 | 4.021e-036 | -35.042 | -35.396 | -0.354 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -52.923 | -52.917 | 0.006 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -79.531 | -79.621 | -0.090 |
| S(6) | 1.880e-002 | | | | | |
| | SO4-2 | 1.189e-002 | 5.233e-003 | -1.925 | -2.281 | -0.357 |
| | CaSO4 | 4.544e-003 | 4.609e-003 | -2.343 | -2.336 | 0.006 |
| | MgSO4 | 2.257e-003 | 2.290e-003 | -2.646 | -2.640 | 0.006 |
| | MnSO4 | 4.048e-005 | 4.106e-005 | -4.393 | -4.387 | 0.006 |
| | NH4SO4- | 3.164e-005 | 2.569e-005 | -4.500 | -4.590 | -0.090 |
| | FeSO4 | 3.073e-005 | 3.117e-005 | -4.512 | -4.506 | 0.006 |
| | ZnSO4 | 1.681e-006 | 1.705e-006 | -5.774 | -5.768 | 0.006 |
| | Zn(SO4)2-2 | 1.819e-007 | 7.911e-008 | -6.740 | -7.102 | -0.362 |
| | HSO4- | 1.254e-007 | 1.019e-007 | -6.902 | -6.992 | -0.090 |
| | BaSO4 | 9.639e-008 | 9.777e-008 | -7.016 | -7.010 | 0.006 |
| | CaHSO4+ | 7.399e-009 | 6.009e-009 | -8.131 | -8.221 | -0.090 |
| | FeHSO4+ | 6.213e-011 | 5.046e-011 | -10.207 | -10.297 | -0.090 |
| | FeSO4+ | 2.312e-016 | 1.878e-016 | -15.636 | -15.726 | -0.090 |
| | Fe(SO4)2- | 2.532e-017 | 2.057e-017 | -16.596 | -16.687 | -0.090 |
| | FeHSO4+2 | 2.973e-022 | 1.293e-022 | -21.527 | -21.888 | -0.362 |
| Zn | 7.060e-006 | | | | | |
| | Zn+2 | 3.426e-006 | 1.516e-006 | -5.465 | -5.819 | -0.354 |
| | ZnSO4 | 1.681e-006 | 1.705e-006 | -5.774 | -5.768 | 0.006 |
| | ZnHCO3+ | 1.478e-006 | 1.201e-006 | -5.830 | -5.921 | -0.090 |

| | | | | | |
|---|---|---|---|---|---|
| ZnCO3 | 2.720e-007 | 2.759e-007 | -6.565 | -6.559 | 0.006 |
| Zn(SO4)2-2 | 1.819e-007 | 7.911e-008 | -6.740 | -7.102 | -0.362 |
| Zn(CO3)2-2 | 1.237e-008 | 5.380e-009 | -7.908 | -8.269 | -0.362 |
| ZnCl+ | 3.945e-009 | 3.204e-009 | -8.404 | -8.494 | -0.090 |
| ZnOH+ | 3.452e-009 | 2.804e-009 | -8.462 | -8.552 | -0.090 |
| Zn(OH)2 | 2.978e-010 | 3.020e-010 | -9.526 | -9.520 | 0.006 |
| ZnCl2 | 4.085e-012 | 4.144e-012 | -11.389 | -11.383 | 0.006 |
| ZnCl3- | 6.916e-015 | 5.616e-015 | -14.160 | -14.251 | -0.090 |
| Zn(OH)3- | 4.678e-015 | 3.799e-015 | -14.330 | -14.420 | -0.090 |
| ZnCl4-2 | 7.649e-018 | 3.327e-018 | -17.116 | -17.478 | -0.362 |
| Zn(OH)4-2 | 5.507e-021 | 2.395e-021 | -20.259 | -20.621 | -0.362 |

------------------------------Saturation indices------------------------------

| Phase | SI | log IAP | log KT | |
|---|---|---|---|---|
| Anhydrite | -0.26 | -4.59 | -4.33 | CaSO4 |
| Aragonite | -0.07 | -8.35 | -8.27 | CaCO3 |
| Barite | 0.45 | -9.71 | -10.16 | BaSO4 |
| Calcite | 0.08 | -8.35 | -8.43 | CaCO3 |
| CO2(g) | -1.05 | -19.24 | -18.19 | CO2 |
| Dolomite | -0.16 | -16.99 | -16.83 | CaMg(CO3)2 |
| Fe(OH)3(a) | -2.47 | 15.71 | 18.18 | Fe(OH)3 |
| FeS(ppt) | -22.61 | -61.85 | -39.24 | FeS |
| Goethite | 3.02 | 15.71 | 12.69 | FeOOH |
| Gypsum | -0.01 | -4.59 | -4.59 | CaSO4:2H2O |
| H2(g) | -13.80 | -13.80 | 0.00 | H2 |
| H2O(g) | -1.80 | -0.00 | 1.80 | H2O |
| H2S(g) | -27.37 | -70.66 | -43.29 | H2S |
| Hausmannite | -23.22 | 40.61 | 63.83 | Mn3O4 |
| Hematite | 8.00 | 31.42 | 23.43 | Fe2O3 |
| Mackinawite | -21.88 | -61.85 | -39.97 | FeS |
| Manganite | -9.50 | 15.84 | 25.34 | MnOOH |
| Melanterite | -4.32 | -6.67 | -2.35 | FeSO4:7H2O |
| NH3(g) | -8.41 | 3.18 | 11.59 | NH3 |
| O2(g) | -59.33 | 27.59 | 86.92 | O2 |
| Pyrite | -29.28 | -118.72 | -89.44 | FeS2 |
| Pyrochroite | -6.26 | 8.94 | 15.20 | Mn(OH)2 |
| Pyrolusite | -20.46 | 22.73 | 43.19 | MnO2 |
| Rhodochrosite | 0.79 | -10.30 | -11.09 | MnCO3 |
| Siderite | 0.40 | -10.43 | -10.82 | FeCO3 |
| Smithsonite | -1.98 | -11.86 | -9.88 | ZnCO3 |
| Sphalerite | -16.11 | -63.28 | -47.17 | ZnS |
| Sulfur | -19.59 | -56.87 | -37.28 | S |
| Witherite | -4.87 | -13.47 | -8.60 | BaCO3 |
| Zn(OH)2(e) | -4.12 | 7.38 | 11.50 | Zn(OH)2 |

Initial solution 4. MW1014A, 7/5/2006

----------------------------Solution composition----------------------------

| Elements | Molality | Moles |
|---|---|---|
| Alkalinity | 8.210e-003 | 8.210e-003 |
| Ba | 1.824e-007 | 1.824e-007 |
| Ca | 8.500e-003 | 8.500e-003 |
| Cl | 4.239e-004 | 4.239e-004 |
| Fe | 5.921e-006 | 5.921e-006 |
| Mg | 4.946e-003 | 4.946e-003 |
| Mn | 2.553e-005 | 2.553e-005 |
| N(-3) | 4.292e-006 | 4.292e-006 |
| S | 1.043e-002 | 1.043e-002 |
| Zn | 7.664e-007 | 7.664e-007 |

----------------------------Description of solution----------------------------

pH = 6.800
pe = 4.721
Activity of water = 0.999
Ionic strength = 3.834e-002
Mass of water (kg) = 1.000e+000
Total carbon (mol/kg) = 1.095e-002
Total CO2 (mol/kg) = 1.095e-002
Temperature (deg C) = 14.100
Electrical balance (eq) = -2.535e-003
Percent error, 100*(Cat-|An|)/(Cat+|An|) = -5.95
Iterations = 9
Total H = 1.110206e+002
Total O = 5.557803e+001

----------------------------Distribution of species----------------------------

| | Species | Molality | Activity | Log Molality | Log Activity | Gamma |
|---|---|---|---|---|---|---|
| | H+ | 1.829e-007 | 1.585e-007 | -6.738 | -6.800 | -0.062 |
| | OH- | 3.168e-008 | 2.634e-008 | -7.499 | -7.579 | -0.080 |
| | H2O | 5.551e+001 | 9.995e-001 | 1.744 | -0.000 | 0.000 |
| Ba | 1.824e-007 | | | | | |
| | Ba+2 | 9.426e-008 | 4.757e-008 | -7.026 | -7.323 | -0.297 |
| | BaSO4 | 8.557e-008 | 8.633e-008 | -7.068 | -7.064 | 0.004 |
| | BaHCO3+ | 2.529e-009 | 2.122e-009 | -8.597 | -8.673 | -0.076 |
| | BaCO3 | 2.950e-011 | 2.976e-011 | -10.530 | -10.526 | 0.004 |
| | BaOH+ | 1.211e-014 | 1.016e-014 | -13.917 | -13.993 | -0.076 |
| C(4) | 1.095e-002 | | | | | |
| | HCO3- | 7.757e-003 | 6.560e-003 | -2.110 | -2.183 | -0.073 |
| | CO2 | 2.751e-003 | 2.775e-003 | -2.560 | -2.557 | 0.004 |
| | CaHCO3+ | 2.543e-004 | 2.151e-004 | -3.595 | -3.667 | -0.073 |
| | MgHCO3+ | 1.657e-004 | 1.391e-004 | -3.781 | -3.857 | -0.076 |
| | CaCO3 | 6.710e-006 | 6.769e-006 | -5.173 | -5.169 | 0.004 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | MnHCO3+ | 5.471e-006 | 4.591e-006 | -5.262 | -5.338 | -0.076 |
| | CO3-2 | 2.949e-006 | 1.507e-006 | -5.530 | -5.822 | -0.291 |
| | MgCO3 | 2.265e-006 | 2.285e-006 | -5.645 | -5.641 | 0.004 |
| | FeHCO3+ | 1.366e-006 | 1.146e-006 | -5.864 | -5.941 | -0.076 |
| | MnCO3 | 9.321e-007 | 9.403e-007 | -6.031 | -6.027 | 0.004 |
| | ZnHCO3+ | 1.835e-007 | 1.540e-007 | -6.736 | -6.812 | -0.076 |
| | FeCO3 | 6.264e-008 | 6.320e-008 | -7.203 | -7.199 | 0.004 |
| | ZnCO3 | 5.560e-008 | 5.609e-008 | -7.255 | -7.251 | 0.004 |
| | Zn(CO3)2-2 | 3.647e-009 | 1.808e-009 | -8.438 | -8.743 | -0.305 |
| | BaHCO3+ | 2.529e-009 | 2.122e-009 | -8.597 | -8.673 | -0.076 |
| | BaCO3 | 2.950e-011 | 2.976e-011 | -10.530 | -10.526 | 0.004 |
| Ca | 8.500e-003 | | | | | |
| | Ca+2 | 6.195e-003 | 3.172e-003 | -2.208 | -2.499 | -0.291 |
| | CaSO4 | 2.044e-003 | 2.062e-003 | -2.690 | -2.686 | 0.004 |
| | CaHCO3+ | 2.543e-004 | 2.151e-004 | -3.595 | -3.667 | -0.073 |
| | CaCO3 | 6.710e-006 | 6.769e-006 | -5.173 | -5.169 | 0.004 |
| | CaOH+ | 3.957e-009 | 3.320e-009 | -8.403 | -8.479 | -0.076 |
| | CaHSO4+ | 2.021e-009 | 1.696e-009 | -8.694 | -8.771 | -0.076 |
| Cl | 4.239e-004 | | | | | |
| | Cl- | 4.239e-004 | 3.530e-004 | -3.373 | -3.452 | -0.079 |
| | MnCl+ | 1.346e-008 | 1.129e-008 | -7.871 | -7.947 | -0.076 |
| | FeCl+ | 1.015e-009 | 8.516e-010 | -8.994 | -9.070 | -0.076 |
| | ZnCl+ | 1.282e-010 | 1.076e-010 | -9.892 | -9.968 | -0.076 |
| | MnCl2 | 1.725e-012 | 1.740e-012 | -11.763 | -11.759 | 0.004 |
| | ZnCl2 | 3.767e-014 | 3.800e-014 | -13.424 | -13.420 | 0.004 |
| | MnCl3- | 2.016e-016 | 1.692e-016 | -15.695 | -15.772 | -0.076 |
| | FeCl+2 | 7.096e-017 | 3.518e-017 | -16.149 | -16.454 | -0.305 |
| | ZnCl3- | 1.676e-017 | 1.406e-017 | -16.776 | -16.852 | -0.076 |
| | FeCl2+ | 9.462e-020 | 7.940e-020 | -19.024 | -19.100 | -0.076 |
| | ZnCl4-2 | 4.589e-021 | 2.275e-021 | -20.338 | -20.643 | -0.305 |
| | FeCl3 | 2.778e-024 | 2.803e-024 | -23.556 | -23.552 | 0.004 |
| Fe(2) | 5.694e-006 | | | | | |
| | Fe+2 | 3.355e-006 | 1.748e-006 | -5.474 | -5.758 | -0.283 |
| | FeHCO3+ | 1.366e-006 | 1.146e-006 | -5.864 | -5.941 | -0.076 |
| | FeSO4 | 9.070e-007 | 9.151e-007 | -6.042 | -6.039 | 0.004 |
| | FeCO3 | 6.264e-008 | 6.320e-008 | -7.203 | -7.199 | 0.004 |
| | FeOH+ | 1.784e-009 | 1.497e-009 | -8.749 | -8.825 | -0.076 |
| | FeCl+ | 1.015e-009 | 8.516e-010 | -8.994 | -9.070 | -0.076 |
| | FeHSO4+ | 1.114e-012 | 9.345e-013 | -11.953 | -12.029 | -0.076 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -128.982 | -128.979 | 0.004 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -192.951 | -193.027 | -0.076 |
| Fe(3) | 2.266e-007 | | | | | |
| | Fe(OH)2+ | 1.601e-007 | 1.343e-007 | -6.796 | -6.872 | -0.076 |
| | Fe(OH)3 | 6.605e-008 | 6.664e-008 | -7.180 | -7.176 | 0.004 |
| | Fe(OH)4- | 2.899e-010 | 2.432e-010 | -9.538 | -9.614 | -0.076 |
| | FeOH+2 | 1.993e-010 | 9.879e-011 | -9.700 | -10.005 | -0.305 |
| | FeSO4+ | 1.740e-013 | 1.460e-013 | -12.760 | -12.836 | -0.076 |
| | Fe+3 | 1.714e-014 | 4.723e-015 | -13.766 | -14.326 | -0.560 |
| | Fe(SO4)2- | 1.319e-014 | 1.106e-014 | -13.880 | -13.956 | -0.076 |
| | FeCl+2 | 7.096e-017 | 3.518e-017 | -16.149 | -16.454 | -0.305 |
| | Fe2(OH)2+4 | 6.944e-018 | 4.193e-019 | -17.158 | -18.378 | -1.219 |
| | FeHSO4+2 | 1.280e-019 | 6.344e-020 | -18.893 | -19.198 | -0.305 |
| | FeCl2+ | 9.462e-020 | 7.940e-020 | -19.024 | -19.100 | -0.076 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Fe3(OH)4+5 | 2.684e-021 | 3.342e-023 | -20.571 | -22.476 | -1.905 |
| | FeCl3 | 2.778e-024 | 2.803e-024 | -23.556 | -23.552 | 0.004 |
| H(0) | 1.426e-026 | | | | | |
| | H2 | 7.130e-027 | 7.193e-027 | -26.147 | -26.143 | 0.004 |
| Mg | 4.946e-003 | | | | | |
| | Mg+2 | 3.597e-003 | 1.878e-003 | -2.444 | -2.726 | -0.282 |
| | MgSO4 | 1.181e-003 | 1.191e-003 | -2.928 | -2.924 | 0.004 |
| | MgHCO3+ | 1.657e-004 | 1.391e-004 | -3.781 | -3.857 | -0.076 |
| | MgCO3 | 2.265e-006 | 2.285e-006 | -5.645 | -5.641 | 0.004 |
| | MgOH+ | 1.845e-008 | 1.548e-008 | -7.734 | -7.810 | -0.076 |
| Mn(2) | 2.553e-005 | | | | | |
| | Mn+2 | 1.508e-005 | 7.853e-006 | -4.822 | -5.105 | -0.283 |
| | MnHCO3+ | 5.471e-006 | 4.591e-006 | -5.262 | -5.338 | -0.076 |
| | MnSO4 | 4.039e-006 | 4.075e-006 | -5.394 | -5.390 | 0.004 |
| | MnCO3 | 9.321e-007 | 9.403e-007 | -6.031 | -6.027 | 0.004 |
| | MnCl+ | 1.346e-008 | 1.129e-008 | -7.871 | -7.947 | -0.076 |
| | MnOH+ | 6.032e-010 | 5.062e-010 | -9.220 | -9.296 | -0.076 |
| | MnCl2 | 1.725e-012 | 1.740e-012 | -11.763 | -11.759 | 0.004 |
| | MnCl3- | 2.016e-016 | 1.692e-016 | -15.695 | -15.772 | -0.076 |
| Mn(3) | 1.186e-026 | | | | | |
| | Mn+3 | 1.186e-026 | 2.446e-027 | -25.926 | -26.612 | -0.686 |
| N(-3) | 4.292e-006 | | | | | |
| | NH4+ | 4.099e-006 | 3.374e-006 | -5.387 | -5.472 | -0.084 |
| | NH4SO4- | 1.876e-007 | 1.574e-007 | -6.727 | -6.803 | -0.076 |
| | NH3 | 5.402e-009 | 5.450e-009 | -8.267 | -8.264 | 0.004 |
| O(0) | 0.000e+000 | | | | | |
| | O2 | 0.000e+000 | 0.000e+000 | -43.749 | -43.745 | 0.004 |
| S(-2) | 0.000e+000 | | | | | |
| | H2S | 0.000e+000 | 0.000e+000 | -65.790 | -65.787 | 0.004 |
| | HS- | 0.000e+000 | 0.000e+000 | -66.005 | -66.086 | -0.080 |
| | S-2 | 0.000e+000 | 0.000e+000 | -72.243 | -72.540 | -0.297 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -128.982 | -128.979 | 0.004 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -192.951 | -193.027 | -0.076 |
| S(6) | 1.043e-002 | | | | | |
| | SO4-2 | 7.201e-003 | 3.621e-003 | -2.143 | -2.441 | -0.299 |
| | CaSO4 | 2.044e-003 | 2.062e-003 | -2.690 | -2.686 | 0.004 |
| | MgSO4 | 1.181e-003 | 1.191e-003 | -2.928 | -2.924 | 0.004 |
| | MnSO4 | 4.039e-006 | 4.075e-006 | -5.394 | -5.390 | 0.004 |
| | FeSO4 | 9.070e-007 | 9.151e-007 | -6.042 | -6.039 | 0.004 |
| | NH4SO4- | 1.876e-007 | 1.574e-007 | -6.727 | -6.803 | -0.076 |
| | ZnSO4 | 1.438e-007 | 1.451e-007 | -6.842 | -6.838 | 0.004 |
| | BaSO4 | 8.557e-008 | 8.633e-008 | -7.068 | -7.064 | 0.004 |
| | HSO4- | 5.301e-008 | 4.448e-008 | -7.276 | -7.352 | -0.076 |
| | Zn(SO4)2-2 | 9.399e-009 | 4.659e-009 | -8.027 | -8.332 | -0.305 |
| | CaHSO4+ | 2.021e-009 | 1.696e-009 | -8.694 | -8.771 | -0.076 |
| | FeHSO4+ | 1.114e-012 | 9.345e-013 | -11.953 | -12.029 | -0.076 |
| | FeSO4+ | 1.740e-013 | 1.460e-013 | -12.760 | -12.836 | -0.076 |
| | Fe(SO4)2- | 1.319e-014 | 1.106e-014 | -13.880 | -13.956 | -0.076 |
| | FeHSO4+2 | 1.280e-019 | 6.344e-020 | -18.893 | -19.198 | -0.305 |
| Zn | 7.664e-007 | | | | | |
| | Zn+2 | 3.695e-007 | 1.865e-007 | -6.432 | -6.729 | -0.297 |
| | ZnHCO3+ | 1.835e-007 | 1.540e-007 | -6.736 | -6.812 | -0.076 |
| | ZnSO4 | 1.438e-007 | 1.451e-007 | -6.842 | -6.838 | 0.004 |

| | | | | | |
|---|---|---|---|---|---|
| ZnCO3 | 5.560e-008 | 5.609e-008 | -7.255 | -7.251 | 0.004 |
| Zn(SO4)2-2 | 9.399e-009 | 4.659e-009 | -8.027 | -8.332 | -0.305 |
| Zn(CO3)2-2 | 3.647e-009 | 1.808e-009 | -8.438 | -8.743 | -0.305 |
| ZnOH+ | 6.515e-010 | 5.466e-010 | -9.186 | -9.262 | -0.076 |
| ZnCl+ | 1.282e-010 | 1.076e-010 | -9.892 | -9.968 | -0.076 |
| Zn(OH)2 | 9.254e-011 | 9.336e-011 | -10.034 | -10.030 | 0.004 |
| ZnCl2 | 3.767e-014 | 3.800e-014 | -13.424 | -13.420 | 0.004 |
| Zn(OH)3- | 2.219e-015 | 1.862e-015 | -14.654 | -14.730 | -0.076 |
| ZnCl3- | 1.676e-017 | 1.406e-017 | -16.776 | -16.852 | -0.076 |
| ZnCl4-2 | 4.589e-021 | 2.275e-021 | -20.338 | -20.643 | -0.305 |
| Zn(OH)4-2 | 3.754e-021 | 1.861e-021 | -20.426 | -20.730 | -0.305 |

------------------------------Saturation indices------------------------------

| Phase | SI | log IAP | log KT | |
|---|---|---|---|---|
| Anhydrite | -0.61 | -4.94 | -4.33 | CaSO4 |
| Aragonite | -0.05 | -8.32 | -8.27 | CaCO3 |
| Barite | 0.40 | -9.76 | -10.16 | BaSO4 |
| Calcite | 0.11 | -8.32 | -8.43 | CaCO3 |
| CO2(g) | -1.23 | -19.42 | -18.19 | CO2 |
| Dolomite | -0.04 | -16.87 | -16.83 | CaMg(CO3)2 |
| Fe(OH)3(a) | 1.18 | 19.36 | 18.18 | Fe(OH)3 |
| FeS(ppt) | -61.13 | -100.37 | -39.24 | FeS |
| Goethite | 6.67 | 19.36 | 12.69 | FeOOH |
| Gypsum | -0.35 | -4.94 | -4.59 | CaSO4:2H2O |
| H2(g) | -23.04 | -23.04 | 0.00 | H2 |
| H2O(g) | -1.80 | -0.00 | 1.80 | H2O |
| H2S(g) | -64.92 | -108.21 | -43.29 | H2S |
| Hausmannite | -15.30 | 48.53 | 63.83 | Mn3O4 |
| Hematite | 15.30 | 38.73 | 23.43 | Fe2O3 |
| Mackinawite | -60.40 | -100.37 | -39.97 | FeS |
| Manganite | -5.32 | 20.02 | 25.34 | MnOOH |
| Melanterite | -5.85 | -8.20 | -2.35 | FeSO4:7H2O |
| NH3(g) | -10.26 | 1.33 | 11.59 | NH3 |
| O2(g) | -40.84 | 46.08 | 86.92 | O2 |
| Pyrite | -96.09 | -185.53 | -89.44 | FeS2 |
| Pyrochroite | -6.71 | 8.49 | 15.20 | Mn(OH)2 |
| Pyrolusite | -11.65 | 31.54 | 43.19 | MnO2 |
| Rhodochrosite | 0.16 | -10.93 | -11.09 | MnCO3 |
| Siderite | -0.76 | -11.58 | -10.82 | FeCO3 |
| Smithsonite | -2.67 | -12.55 | -9.88 | ZnCO3 |
| Sphalerite | -54.17 | -101.34 | -47.17 | ZnS |
| Sulfur | -47.89 | -85.17 | -37.28 | S |
| Witherite | -4.54 | -13.14 | -8.60 | BaCO3 |
| Zn(OH)2(e) | -4.63 | 6.87 | 11.50 | Zn(OH)2 |

Initial solution 5. MW1014B, 7/5/2006

-----------------------------Solution composition------------------------------

| Elements | Molality | Moles |
|---|---|---|
| Alkalinity | 9.369e-003 | 9.369e-003 |
| Ba | 1.826e-007 | 1.826e-007 |
| Ca | 1.526e-002 | 1.526e-002 |
| Cl | 1.386e-003 | 1.386e-003 |
| Fe | 5.926e-006 | 5.926e-006 |
| Mg | 6.188e-003 | 6.188e-003 |
| Mn | 3.103e-004 | 3.103e-004 |
| N(-3) | 1.647e-004 | 1.647e-004 |
| S | 1.566e-002 | 1.566e-002 |
| Zn | 3.375e-005 | 3.375e-005 |

----------------------------Description of solution----------------------------

pH = 6.500
pe = 5.232
Activity of water = 0.999
Ionic strength = 5.592e-002
Mass of water (kg) = 1.000e+000
Total carbon (mol/kg) = 1.517e-002
Total CO2 (mol/kg) = 1.517e-002
Temperature (deg C) = 15.000
Electrical balance (eq) = 1.693e-003
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 2.76
Iterations = 9
Total H = 1.110224e+002
Total O = 5.560855e+001

----------------------------Distribution of species----------------------------

| | Species | Molality | Activity | Log Molality | Log Activity | Gamma |
|---|---|---|---|---|---|---|
| | H+ | 3.715e-007 | 3.162e-007 | -6.430 | -6.500 | -0.070 |
| | OH- | 1.766e-008 | 1.424e-008 | -7.753 | -7.846 | -0.093 |
| | H2O | 5.551e+001 | 9.992e-001 | 1.744 | -0.000 | 0.000 |
| Ba | 1.826e-007 | | | | | |
| | BaSO4 | 9.052e-008 | 9.169e-008 | -7.043 | -7.038 | 0.006 |
| | Ba+2 | 8.955e-008 | 4.075e-008 | -7.048 | -7.390 | -0.342 |
| | BaHCO3+ | 2.475e-009 | 2.023e-009 | -8.607 | -8.694 | -0.087 |
| | BaCO3 | 1.423e-011 | 1.441e-011 | -10.847 | -10.841 | 0.006 |
| | BaOH+ | 5.336e-015 | 4.363e-015 | -14.273 | -14.360 | -0.087 |
| C(4) | 1.517e-002 | | | | | |
| | HCO3- | 8.602e-003 | 7.096e-003 | -2.065 | -2.149 | -0.084 |
| | CO2 | 5.815e-003 | 5.890e-003 | -2.235 | -2.230 | 0.006 |
| | CaHCO3+ | 4.550e-004 | 3.753e-004 | -3.342 | -3.426 | -0.084 |
| | MgHCO3+ | 2.031e-004 | 1.661e-004 | -3.692 | -3.780 | -0.087 |
| | MnHCO3+ | 6.668e-005 | 5.452e-005 | -4.176 | -4.263 | -0.087 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | ZnHCO3+ | 8.174e-006 | 6.683e-006 | -5.088 | -5.175 | -0.087 |
| | CaCO3 | 5.918e-006 | 5.995e-006 | -5.228 | -5.222 | 0.006 |
| | MnCO3 | 5.656e-006 | 5.730e-006 | -5.247 | -5.242 | 0.006 |
| | CO3-2 | 1.807e-006 | 8.367e-007 | -5.743 | -6.077 | -0.334 |
| | MgCO3 | 1.398e-006 | 1.416e-006 | -5.854 | -5.849 | 0.006 |
| | FeHCO3+ | 1.369e-006 | 1.119e-006 | -5.864 | -5.951 | -0.087 |
| | ZnCO3 | 1.233e-006 | 1.249e-006 | -5.909 | -5.903 | 0.006 |
| | Zn(CO3)2-2 | 4.999e-008 | 2.234e-008 | -7.301 | -7.651 | -0.350 |
| | FeCO3 | 3.125e-008 | 3.165e-008 | -7.505 | -7.500 | 0.006 |
| | BaHCO3+ | 2.475e-009 | 2.023e-009 | -8.607 | -8.694 | -0.087 |
| | BaCO3 | 1.423e-011 | 1.441e-011 | -10.847 | -10.841 | 0.006 |
| Ca | 1.526e-002 | | | | | |
| | Ca+2 | 1.078e-002 | 5.011e-003 | -1.967 | -2.300 | -0.333 |
| | CaSO4 | 4.023e-003 | 4.075e-003 | -2.395 | -2.390 | 0.006 |
| | CaHCO3+ | 4.550e-004 | 3.753e-004 | -3.342 | -3.426 | -0.084 |
| | CaCO3 | 5.918e-006 | 5.995e-006 | -5.228 | -5.222 | 0.006 |
| | CaHSO4+ | 8.252e-009 | 6.747e-009 | -8.083 | -8.171 | -0.087 |
| | CaOH+ | 3.214e-009 | 2.628e-009 | -8.493 | -8.580 | -0.087 |
| Cl | 1.386e-003 | | | | | |
| | Cl- | 1.386e-003 | 1.120e-003 | -2.858 | -2.951 | -0.092 |
| | MnCl+ | 4.811e-007 | 3.933e-007 | -6.318 | -6.405 | -0.087 |
| | ZnCl+ | 1.748e-008 | 1.429e-008 | -7.758 | -7.845 | -0.087 |
| | FeCl+ | 2.982e-009 | 2.438e-009 | -8.526 | -8.613 | -0.087 |
| | MnCl2 | 1.898e-010 | 1.923e-010 | -9.722 | -9.716 | 0.006 |
| | ZnCl2 | 1.587e-011 | 1.608e-011 | -10.799 | -10.794 | 0.006 |
| | MnCl3- | 7.255e-014 | 5.932e-014 | -13.139 | -13.227 | -0.087 |
| | ZnCl3- | 2.322e-014 | 1.899e-014 | -13.634 | -13.722 | -0.087 |
| | FeCl+2 | 7.945e-016 | 3.551e-016 | -15.100 | -15.450 | -0.350 |
| | ZnCl4-2 | 2.197e-017 | 9.818e-018 | -16.658 | -17.008 | -0.350 |
| | FeCl2+ | 3.016e-018 | 2.466e-018 | -17.521 | -17.608 | -0.087 |
| | FeCl3 | 2.726e-022 | 2.762e-022 | -21.564 | -21.559 | 0.006 |
| Fe(2) | 5.757e-006 | | | | | |
| | Fe+2 | 3.324e-006 | 1.577e-006 | -5.478 | -5.802 | -0.324 |
| | FeHCO3+ | 1.369e-006 | 1.119e-006 | -5.864 | -5.951 | -0.087 |
| | FeSO4 | 1.029e-006 | 1.042e-006 | -5.988 | -5.982 | 0.006 |
| | FeCO3 | 3.125e-008 | 3.165e-008 | -7.505 | -7.500 | 0.006 |
| | FeCl+ | 2.982e-009 | 2.438e-009 | -8.526 | -8.613 | -0.087 |
| | FeOH+ | 8.895e-010 | 7.273e-010 | -9.051 | -9.138 | -0.087 |
| | FeHSO4+ | 2.597e-012 | 2.124e-012 | -11.585 | -11.673 | -0.087 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -131.903 | -131.897 | 0.006 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -197.296 | -197.383 | -0.087 |
| Fe(3) | 1.694e-007 | | | | | |
| | Fe(OH)2+ | 1.397e-007 | 1.143e-007 | -6.855 | -6.942 | -0.087 |
| | Fe(OH)3 | 2.925e-008 | 2.963e-008 | -7.534 | -7.528 | 0.006 |
| | FeOH+2 | 3.618e-010 | 1.617e-010 | -9.442 | -9.791 | -0.350 |
| | Fe(OH)4- | 6.889e-011 | 5.633e-011 | -10.162 | -10.249 | -0.087 |
| | FeSO4+ | 6.978e-013 | 5.706e-013 | -12.156 | -12.244 | -0.087 |
| | Fe(SO4)2- | 6.582e-014 | 5.382e-014 | -13.182 | -13.269 | -0.087 |
| | Fe+3 | 6.205e-014 | 1.457e-014 | -13.207 | -13.836 | -0.629 |
| | FeCl+2 | 7.945e-016 | 3.551e-016 | -15.100 | -15.450 | -0.350 |
| | Fe2(OH)2+4 | 2.705e-017 | 1.079e-018 | -16.568 | -17.967 | -1.399 |
| | FeCl2+ | 3.016e-018 | 2.466e-018 | -17.521 | -17.608 | -0.087 |
| | FeHSO4+2 | 1.103e-018 | 4.930e-019 | -17.957 | -18.307 | -0.350 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Fe3(OH)4+5 | 1.027e-020 | 6.693e-023 | -19.988 | -22.174 | -2.186 |
| | FeCl3 | 2.726e-022 | 2.762e-022 | -21.564 | -21.559 | 0.006 |
| H(0) | 5.323e-027 | | | | | |
| | H2 | 2.662e-027 | 2.696e-027 | -26.575 | -26.569 | 0.006 |
| Mg | 6.188e-003 | | | | | |
| | Mg+2 | 4.337e-003 | 2.069e-003 | -2.363 | -2.684 | -0.321 |
| | MgSO4 | 1.646e-003 | 1.668e-003 | -2.783 | -2.778 | 0.006 |
| | MgHCO3+ | 2.031e-004 | 1.661e-004 | -3.692 | -3.780 | -0.087 |
| | MgCO3 | 1.398e-006 | 1.416e-006 | -5.854 | -5.849 | 0.006 |
| | MgOH+ | 1.140e-008 | 9.323e-009 | -7.943 | -8.030 | -0.087 |
| Mn(2) | 3.103e-004 | | | | | |
| | Mn+2 | 1.817e-004 | 8.621e-005 | -3.741 | -4.064 | -0.324 |
| | MnHCO3+ | 6.668e-005 | 5.452e-005 | -4.176 | -4.263 | -0.087 |
| | MnSO4 | 5.577e-005 | 5.650e-005 | -4.254 | -4.248 | 0.006 |
| | MnCO3 | 5.656e-006 | 5.730e-006 | -5.247 | -5.242 | 0.006 |
| | MnCl+ | 4.811e-007 | 3.933e-007 | -6.318 | -6.405 | -0.087 |
| | MnOH+ | 3.684e-009 | 3.012e-009 | -8.434 | -8.521 | -0.087 |
| | MnCl2 | 1.898e-010 | 1.923e-010 | -9.722 | -9.716 | 0.006 |
| | MnCl3- | 7.255e-014 | 5.932e-014 | -13.139 | -13.227 | -0.087 |
| Mn(3) | 6.141e-025 | | | | | |
| | Mn+3 | 6.141e-025 | 1.003e-025 | -24.212 | -24.999 | -0.787 |
| N(-3) | 1.647e-004 | | | | | |
| | NH4+ | 1.558e-004 | 1.240e-004 | -3.807 | -3.907 | -0.099 |
| | NH4SO4- | 8.768e-006 | 7.169e-006 | -5.057 | -5.145 | -0.087 |
| | NH3 | 1.061e-007 | 1.075e-007 | -6.974 | -6.969 | 0.006 |
| O(0) | 0.000e+000 | | | | | |
| | O2 | 0.000e+000 | 0.000e+000 | -42.587 | -42.581 | 0.006 |
| S(-2) | 0.000e+000 | | | | | |
| | H2S | 0.000e+000 | 0.000e+000 | -66.943 | -66.938 | 0.006 |
| | HS- | 0.000e+000 | 0.000e+000 | -67.429 | -67.523 | -0.093 |
| | S-2 | 0.000e+000 | 0.000e+000 | -73.906 | -74.248 | -0.342 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -131.903 | -131.897 | 0.006 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -197.296 | -197.383 | -0.087 |
| S(6) | 1.566e-002 | | | | | |
| | SO4-2 | 9.917e-003 | 4.489e-003 | -2.004 | -2.348 | -0.344 |
| | CaSO4 | 4.023e-003 | 4.075e-003 | -2.395 | -2.390 | 0.006 |
| | MgSO4 | 1.646e-003 | 1.668e-003 | -2.783 | -2.778 | 0.006 |
| | MnSO4 | 5.577e-005 | 5.650e-005 | -4.254 | -4.248 | 0.006 |
| | NH4SO4- | 8.768e-006 | 7.169e-006 | -5.057 | -5.145 | -0.087 |
| | ZnSO4 | 7.178e-006 | 7.271e-006 | -5.144 | -5.138 | 0.006 |
| | FeSO4 | 1.029e-006 | 1.042e-006 | -5.988 | -5.982 | 0.006 |
| | Zn(SO4)2-2 | 6.429e-007 | 2.873e-007 | -6.192 | -6.542 | -0.350 |
| | HSO4- | 1.370e-007 | 1.120e-007 | -6.863 | -6.951 | -0.087 |
| | BaSO4 | 9.052e-008 | 9.169e-008 | -7.043 | -7.038 | 0.006 |
| | CaHSO4+ | 8.252e-009 | 6.747e-009 | -8.083 | -8.171 | -0.087 |
| | FeHSO4+ | 2.597e-012 | 2.124e-012 | -11.585 | -11.673 | -0.087 |
| | FeSO4+ | 6.978e-013 | 5.706e-013 | -12.156 | -12.244 | -0.087 |
| | Fe(SO4)2- | 6.582e-014 | 5.382e-014 | -13.182 | -13.269 | -0.087 |
| | FeHSO4+2 | 1.103e-018 | 4.930e-019 | -17.957 | -18.307 | -0.350 |
| Zn | 3.375e-005 | | | | | |
| | Zn+2 | 1.644e-005 | 7.482e-006 | -4.784 | -5.126 | -0.342 |
| | ZnHCO3+ | 8.174e-006 | 6.683e-006 | -5.088 | -5.175 | -0.087 |
| | ZnSO4 | 7.178e-006 | 7.271e-006 | -5.144 | -5.138 | 0.006 |

| | | | | | |
|---|---|---|---|---|---|
| ZnCO3 | 1.233e-006 | 1.249e-006 | -5.909 | -5.903 | 0.006 |
| Zn(SO4)2-2 | 6.429e-007 | 2.873e-007 | -6.192 | -6.542 | -0.350 |
| Zn(CO3)2-2 | 4.999e-008 | 2.234e-008 | -7.301 | -7.651 | -0.350 |
| ZnCl+ | 1.748e-008 | 1.429e-008 | -7.758 | -7.845 | -0.087 |
| ZnOH+ | 1.446e-008 | 1.182e-008 | -7.840 | -7.927 | -0.087 |
| Zn(OH)2 | 9.283e-010 | 9.404e-010 | -9.032 | -9.027 | 0.006 |
| ZnCl2 | 1.587e-011 | 1.608e-011 | -10.799 | -10.794 | 0.006 |
| ZnCl3- | 2.322e-014 | 1.899e-014 | -13.634 | -13.722 | -0.087 |
| Zn(OH)3- | 1.149e-014 | 9.396e-015 | -13.940 | -14.027 | -0.087 |
| ZnCl4-2 | 2.197e-017 | 9.818e-018 | -16.658 | -17.008 | -0.350 |
| Zn(OH)4-2 | 1.053e-020 | 4.705e-021 | -19.978 | -20.327 | -0.350 |

-----------------------------Saturation indices-----------------------------

| Phase | SI | log IAP | log KT | |
|---|---|---|---|---|
| Anhydrite | -0.31 | -4.65 | -4.34 | CaSO4 |
| Aragonite | -0.10 | -8.38 | -8.28 | CaCO3 |
| Barite | 0.41 | -9.74 | -10.14 | BaSO4 |
| Calcite | 0.05 | -8.38 | -8.43 | CaCO3 |
| CO2(g) | -0.89 | -19.08 | -18.19 | CO2 |
| Dolomite | -0.29 | -17.14 | -16.85 | CaMg(CO3)2 |
| Fe(OH)3(a) | 0.77 | 18.93 | 18.16 | Fe(OH)3 |
| FeS(ppt) | -62.91 | -102.00 | -39.09 | FeS |
| Goethite | 6.29 | 18.93 | 12.63 | FeOOH |
| Gypsum | -0.06 | -4.65 | -4.58 | CaSO4:2H2O |
| H2(g) | -23.46 | -23.46 | 0.00 | H2 |
| H2O(g) | -1.78 | -0.00 | 1.78 | H2O |
| H2S(g) | -66.06 | -109.20 | -43.15 | H2S |
| Hausmannite | -13.32 | 50.27 | 63.59 | Mn3O4 |
| Hematite | 14.55 | 37.86 | 23.31 | Fe2O3 |
| Mackinawite | -62.18 | -102.00 | -39.83 | FeS |
| Manganite | -4.67 | 20.67 | 25.34 | MnOOH |
| Melanterite | -5.81 | -8.15 | -2.34 | FeSO4:7H2O |
| NH3(g) | -8.95 | 2.59 | 11.54 | NH3 |
| O2(g) | -39.67 | 46.93 | 86.60 | O2 |
| Pyrite | -98.62 | -187.74 | -89.13 | FeS2 |
| Pyrochroite | -6.27 | 8.93 | 15.20 | Mn(OH)2 |
| Pyrolusite | -10.64 | 32.40 | 43.04 | MnO2 |
| Rhodochrosite | 0.95 | -10.14 | -11.09 | MnCO3 |
| Siderite | -1.05 | -11.88 | -10.83 | FeCO3 |
| Smithsonite | -1.31 | -11.20 | -9.89 | ZnCO3 |
| Sphalerite | -54.32 | -101.33 | -47.01 | ZnS |
| Sulfur | -48.60 | -85.74 | -37.14 | S |
| Witherite | -4.87 | -13.47 | -8.60 | BaCO3 |
| Zn(OH)2(e) | -3.63 | 7.87 | 11.50 | Zn(OH)2 |

Initial solution 6. MW1014C, 7/5/2006

-----------------------------Solution composition-----------------------------

Elements Molality Moles

| | | |
|---|---|---|
| Alkalinity | 5.741e-003 | 5.741e-003 |
| Ba | 1.968e-007 | 1.968e-007 |
| Ca | 4.745e-003 | 4.745e-003 |
| Cl | 1.129e-003 | 1.129e-003 |
| Fe | 1.237e-004 | 1.237e-004 |
| Mg | 1.770e-003 | 1.770e-003 |
| Mn | 4.008e-005 | 4.008e-005 |
| N(-3) | 6.074e-005 | 6.074e-005 |
| S | 3.126e-003 | 3.126e-003 |
| Zn | 8.422e-006 | 8.422e-006 |

----------------------------Description of solution----------------------------

pH = 6.900
pe = 0.997
Activity of water = 1.000
Ionic strength = 1.930e-002
Mass of water (kg) = 1.000e+000
Total carbon (mol/kg) = 7.314e-003
Total CO2 (mol/kg) = 7.314e-003
Temperature (deg C) = 15.000
Electrical balance (eq) = 3.138e-004
Percent error, 100*(Cat-|An|)/(Cat+|An|) = 1.38
Iterations = 11
Total H = 1.110184e+002
Total O = 5.553908e+001

----------------------------Distribution of species----------------------------

| | Species | Molality | Log Activity | Log Molality | Log Activity | Gamma |
|---|---|---|---|---|---|---|
| | H+ | 1.411e-007 | 1.259e-007 | -6.851 | -6.900 | -0.049 |
| | OH- | 4.111e-008 | 3.579e-008 | -7.386 | -7.446 | -0.060 |
| | H2O | 5.551e+001 | 9.997e-001 | 1.744 | -0.000 | 0.000 |
| Ba | 1.968e-007 | | | | | |
| | Ba+2 | 1.380e-007 | 8.180e-008 | -6.860 | -7.087 | -0.227 |
| | BaSO4 | 5.561e-008 | 5.586e-008 | -7.255 | -7.253 | 0.002 |
| | BaHCO3+ | 3.155e-009 | 2.759e-009 | -8.501 | -8.559 | -0.058 |
| | BaCO3 | 4.914e-011 | 4.936e-011 | -10.309 | -10.307 | 0.002 |
| | BaOH+ | 2.517e-014 | 2.201e-014 | -13.599 | -13.657 | -0.058 |
| C(4) | 7.314e-003 | | | | | |
| | HCO3- | 5.483e-003 | 4.820e-003 | -2.261 | -2.317 | -0.056 |
| | CO2 | 1.585e-003 | 1.592e-003 | -2.800 | -2.798 | 0.002 |
| | CaHCO3+ | 1.387e-004 | 1.220e-004 | -3.858 | -3.914 | -0.056 |
| | MgHCO3+ | 5.624e-005 | 4.918e-005 | -4.250 | -4.308 | -0.058 |
| | FeHCO3+ | 2.790e-005 | 2.440e-005 | -4.554 | -4.613 | -0.058 |
| | MnHCO3+ | 7.997e-006 | 6.994e-006 | -5.097 | -5.155 | -0.058 |
| | CaCO3 | 4.871e-006 | 4.893e-006 | -5.312 | -5.310 | 0.002 |
| | CO3-2 | 2.390e-006 | 1.428e-006 | -5.622 | -5.845 | -0.224 |
| | ZnHCO3+ | 1.957e-006 | 1.712e-006 | -5.708 | -5.767 | -0.058 |
| | MnCO3 | 1.838e-006 | 1.846e-006 | -5.736 | -5.734 | 0.002 |
| | FeCO3 | 1.726e-006 | 1.734e-006 | -5.763 | -5.761 | 0.002 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | MgCO3 | 1.049e-006 | 1.054e-006 | -5.979 | -5.977 | 0.002 |
| | ZnCO3 | 7.999e-007 | 8.035e-007 | -6.097 | -6.095 | 0.002 |
| | Zn(CO3)2-2 | 4.193e-008 | 2.453e-008 | -7.377 | -7.610 | -0.233 |
| | BaHCO3+ | 3.155e-009 | 2.759e-009 | -8.501 | -8.559 | -0.058 |
| | BaCO3 | 4.914e-011 | 4.936e-011 | -10.309 | -10.307 | 0.002 |
| Ca | | 4.745e-003 | | | | |
| | Ca+2 | 4.012e-003 | 2.397e-003 | -2.397 | -2.620 | -0.224 |
| | CaSO4 | 5.889e-004 | 5.915e-004 | -3.230 | -3.228 | 0.002 |
| | CaHCO3+ | 1.387e-004 | 1.220e-004 | -3.858 | -3.914 | -0.056 |
| | CaCO3 | 4.871e-006 | 4.893e-006 | -5.312 | -5.310 | 0.002 |
| | CaOH+ | 3.612e-009 | 3.158e-009 | -8.442 | -8.501 | -0.058 |
| | CaHSO4+ | 4.459e-010 | 3.899e-010 | -9.351 | -9.409 | -0.058 |
| Cl | | 1.129e-003 | | | | |
| | Cl- | 1.129e-003 | 9.839e-004 | -2.947 | -3.007 | -0.060 |
| | FeCl+ | 7.861e-008 | 6.874e-008 | -7.105 | -7.163 | -0.058 |
| | MnCl+ | 7.461e-008 | 6.525e-008 | -7.127 | -7.185 | -0.058 |
| | ZnCl+ | 5.412e-009 | 4.733e-009 | -8.267 | -8.325 | -0.058 |
| | MnCl2 | 2.790e-011 | 2.802e-011 | -10.554 | -10.552 | 0.002 |
| | ZnCl2 | 4.657e-012 | 4.677e-012 | -11.332 | -11.330 | 0.002 |
| | MnCl3- | 8.684e-015 | 7.594e-015 | -14.061 | -14.120 | -0.058 |
| | ZnCl3- | 5.549e-015 | 4.853e-015 | -14.256 | -14.314 | -0.058 |
| | ZnCl4-2 | 3.769e-018 | 2.205e-018 | -17.424 | -17.657 | -0.233 |
| | FeCl+2 | 9.965e-019 | 5.828e-019 | -18.002 | -18.234 | -0.233 |
| | FeCl2+ | 4.066e-021 | 3.556e-021 | -20.391 | -20.449 | -0.058 |
| | FeCl3 | 3.483e-025 | 3.499e-025 | -24.458 | -24.456 | 0.002 |
| Fe(2) | | 1.237e-004 | | | | |
| | Fe+2 | 8.379e-005 | 5.062e-005 | -4.077 | -4.296 | -0.219 |
| | FeHCO3+ | 2.790e-005 | 2.440e-005 | -4.554 | -4.613 | -0.058 |
| | FeSO4 | 1.010e-005 | 1.015e-005 | -4.995 | -4.994 | 0.002 |
| | FeCO3 | 1.726e-006 | 1.734e-006 | -5.763 | -5.761 | 0.002 |
| | FeCl+ | 7.861e-008 | 6.874e-008 | -7.105 | -7.163 | -0.058 |
| | FeOH+ | 6.708e-008 | 5.866e-008 | -7.173 | -7.232 | -0.058 |
| | FeHSO4+ | 9.417e-012 | 8.235e-012 | -11.026 | -11.084 | -0.058 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -70.870 | -70.868 | 0.002 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -106.535 | -106.593 | -0.058 |
| Fe(3) | | 2.423e-009 | | | | |
| | Fe(OH)2+ | 1.542e-009 | 1.348e-009 | -8.812 | -8.870 | -0.058 |
| | Fe(OH)3 | 8.747e-010 | 8.786e-010 | -9.058 | -9.056 | 0.002 |
| | Fe(OH)4- | 4.801e-012 | 4.198e-012 | -11.319 | -11.377 | -0.058 |
| | FeOH+2 | 1.298e-012 | 7.592e-013 | -11.887 | -12.120 | -0.233 |
| | FeSO4+ | 3.700e-016 | 3.235e-016 | -15.432 | -15.490 | -0.058 |
| | Fe+3 | 7.585e-017 | 2.723e-017 | -16.120 | -16.565 | -0.445 |
| | Fe(SO4)2- | 1.059e-017 | 9.262e-018 | -16.975 | -17.033 | -0.058 |
| | FeCl+2 | 9.965e-019 | 5.828e-019 | -18.002 | -18.234 | -0.233 |
| | FeCl2+ | 4.066e-021 | 3.556e-021 | -20.391 | -20.449 | -0.058 |
| | Fe2(OH)2+4 | 2.033e-022 | 2.379e-023 | -21.692 | -22.624 | -0.932 |
| | FeHSO4+2 | 1.903e-022 | 1.113e-022 | -21.721 | -21.954 | -0.233 |
| | FeCl3 | 3.483e-025 | 3.499e-025 | -24.458 | -24.456 | 0.002 |
| | Fe3(OH)4+5 | 4.975e-028 | 1.741e-029 | -27.303 | -28.759 | -1.456 |
| H(0) | | 2.511e-019 | | | | |
| | H2 | 1.255e-019 | 1.261e-019 | -18.901 | -18.899 | 0.002 |
| Mg | | 1.770e-003 | | | | |
| | Mg+2 | 1.493e-003 | 9.019e-004 | -2.826 | -3.045 | -0.219 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | MgSO4 | 2.197e-004 | 2.207e-004 | -3.658 | -3.656 | 0.002 |
| | MgHCO3+ | 5.624e-005 | 4.918e-005 | -4.250 | -4.308 | -0.058 |
| | MgCO3 | 1.049e-006 | 1.054e-006 | -5.979 | -5.977 | 0.002 |
| | MgOH+ | 1.168e-008 | 1.021e-008 | -7.933 | -7.991 | -0.058 |
| Mn(2) | 4.008e-005 | | | | | |
| | Mn+2 | 2.695e-005 | 1.628e-005 | -4.569 | -4.788 | -0.219 |
| | MnHCO3+ | 7.997e-006 | 6.994e-006 | -5.097 | -5.155 | -0.058 |
| | MnSO4 | 3.223e-006 | 3.238e-006 | -5.492 | -5.490 | 0.002 |
| | MnCO3 | 1.838e-006 | 1.846e-006 | -5.736 | -5.734 | 0.002 |
| | MnCl+ | 7.461e-008 | 6.525e-008 | -7.127 | -7.185 | -0.058 |
| | MnOH+ | 1.635e-009 | 1.430e-009 | -8.787 | -8.845 | -0.058 |
| | MnCl2 | 2.790e-011 | 2.802e-011 | -10.554 | -10.552 | 0.002 |
| | MnCl3- | 8.684e-015 | 7.594e-015 | -14.061 | -14.120 | -0.058 |
| Mn(3) | 3.685e-030 | | | | | |
| | Mn+3 | 3.685e-030 | 1.102e-030 | -29.434 | -29.958 | -0.524 |
| N(-3) | 6.074e-005 | | | | | |
| | NH4+ | 5.959e-005 | 5.160e-005 | -4.225 | -4.287 | -0.063 |
| | NH4SO4- | 1.036e-006 | 9.057e-007 | -5.985 | -6.043 | -0.058 |
| | NH3 | 1.119e-007 | 1.124e-007 | -6.951 | -6.949 | 0.002 |
| O(0) | 0.000e+000 | | | | | |
| | O2 | 0.000e+000 | 0.000e+000 | -57.923 | -57.921 | 0.002 |
| S(-2) | 4.629e-038 | | | | | |
| | H2S | 2.639e-038 | 2.651e-038 | -37.579 | -37.577 | 0.002 |
| | HS- | 1.989e-038 | 1.732e-038 | -37.701 | -37.761 | -0.060 |
| | S-2 | 0.000e+000 | 0.000e+000 | -43.860 | -44.087 | -0.227 |
| | Fe(HS)2 | 0.000e+000 | 0.000e+000 | -70.870 | -70.868 | 0.002 |
| | Fe(HS)3- | 0.000e+000 | 0.000e+000 | -106.535 | -106.593 | -0.058 |
| S(6) | 3.126e-003 | | | | | |
| | SO4-2 | 2.302e-003 | 1.362e-003 | -2.638 | -2.866 | -0.228 |
| | CaSO4 | 5.889e-004 | 5.915e-004 | -3.230 | -3.228 | 0.002 |
| | MgSO4 | 2.197e-004 | 2.207e-004 | -3.658 | -3.656 | 0.002 |
| | FeSO4 | 1.010e-005 | 1.015e-005 | -4.995 | -4.994 | 0.002 |
| | MnSO4 | 3.223e-006 | 3.238e-006 | -5.492 | -5.490 | 0.002 |
| | NH4SO4- | 1.036e-006 | 9.057e-007 | -5.985 | -6.043 | -0.058 |
| | ZnSO4 | 8.282e-007 | 8.318e-007 | -6.082 | -6.080 | 0.002 |
| | BaSO4 | 5.561e-008 | 5.586e-008 | -7.255 | -7.253 | 0.002 |
| | Zn(SO4)2-2 | 1.706e-008 | 9.976e-009 | -7.768 | -8.001 | -0.233 |
| | HSO4- | 1.547e-008 | 1.353e-008 | -7.810 | -7.869 | -0.058 |
| | CaHSO4+ | 4.459e-010 | 3.899e-010 | -9.351 | -9.409 | -0.058 |
| | FeHSO4+ | 9.417e-012 | 8.235e-012 | -11.026 | -11.084 | -0.058 |
| | FeSO4+ | 3.700e-016 | 3.235e-016 | -15.432 | -15.490 | -0.058 |
| | Fe(SO4)2- | 1.059e-017 | 9.262e-018 | -16.975 | -17.033 | -0.058 |
| | FeHSO4+2 | 1.903e-022 | 1.113e-022 | -21.721 | -21.954 | -0.233 |
| Zn | 8.422e-006 | | | | | |
| | Zn+2 | 4.757e-006 | 2.820e-006 | -5.323 | -5.550 | -0.227 |
| | ZnHCO3+ | 1.957e-006 | 1.712e-006 | -5.708 | -5.767 | -0.058 |
| | ZnSO4 | 8.282e-007 | 8.318e-007 | -6.082 | -6.080 | 0.002 |
| | ZnCO3 | 7.999e-007 | 8.035e-007 | -6.097 | -6.095 | 0.002 |
| | Zn(CO3)2-2 | 4.193e-008 | 2.453e-008 | -7.377 | -7.610 | -0.233 |
| | Zn(SO4)2-2 | 1.706e-008 | 9.976e-009 | -7.768 | -8.001 | -0.233 |
| | ZnOH+ | 1.281e-008 | 1.120e-008 | -7.892 | -7.951 | -0.058 |
| | ZnCl+ | 5.412e-009 | 4.733e-009 | -8.267 | -8.325 | -0.058 |
| | Zn(OH)2 | 2.229e-009 | 2.239e-009 | -8.652 | -8.650 | 0.002 |

| | | | | | |
|---|---|---|---|---|---|
| ZnCl2 | 4.657e-012 | 4.677e-012 | -11.332 | -11.330 | 0.002 |
| Zn(OH)3- | 6.429e-014 | 5.622e-014 | -13.192 | -13.250 | -0.058 |
| ZnCl3- | 5.549e-015 | 4.853e-015 | -14.256 | -14.314 | -0.058 |
| ZnCl4-2 | 3.769e-018 | 2.205e-018 | -17.424 | -17.657 | -0.233 |
| Zn(OH)4-2 | 1.210e-019 | 7.076e-020 | -18.917 | -19.150 | -0.233 |

-----------------------------Saturation indices-----------------------------

| Phase | SI | log IAP | log KT | |
|---|---|---|---|---|
| Anhydrite | -1.15 | -5.49 | -4.34 | CaSO4 |
| Aragonite | -0.19 | -8.47 | -8.28 | CaCO3 |
| Barite | 0.19 | -9.95 | -10.14 | BaSO4 |
| Calcite | -0.04 | -8.47 | -8.43 | CaCO3 |
| CO2(g) | -1.46 | -19.65 | -18.19 | CO2 |
| Dolomite | -0.51 | -17.36 | -16.85 | CaMg(CO3)2 |
| Fe(OH)3(a) | -0.76 | 17.40 | 18.16 | Fe(OH)3 |
| FeS(ppt) | -31.24 | -70.34 | -39.09 | FeS |
| Goethite | 4.77 | 17.40 | 12.63 | FeOOH |
| Gypsum | -0.90 | -5.49 | -4.58 | CaSO4:2H2O |
| H2(g) | -15.79 | -15.79 | 0.00 | H2 |
| H2O(g) | -1.78 | -0.00 | 1.78 | H2O |
| H2S(g) | -36.70 | -79.84 | -43.15 | H2S |
| Hausmannite | -20.76 | 42.83 | 63.59 | Mn3O4 |
| Hematite | 11.49 | 34.80 | 23.31 | Fe2O3 |
| Mackinawite | -30.51 | -70.34 | -39.83 | FeS |
| Manganite | -8.43 | 16.91 | 25.34 | MnOOH |
| Melanterite | -4.82 | -7.16 | -2.34 | FeSO4:7H2O |
| NH3(g) | -8.93 | 2.61 | 11.54 | NH3 |
| O2(g) | -55.01 | 31.59 | 86.60 | O2 |
| Pyrite | -45.26 | -134.38 | -89.13 | FeS2 |
| Pyrochroite | -6.19 | 9.01 | 15.20 | Mn(OH)2 |
| Pyrolusite | -18.23 | 24.81 | 43.04 | MnO2 |
| Rhodochrosite | 0.46 | -10.63 | -11.09 | MnCO3 |
| Siderite | 0.69 | -10.14 | -10.83 | FeCO3 |
| Smithsonite | -1.51 | -11.40 | -9.89 | ZnCO3 |
| Sphalerite | -24.58 | -71.59 | -47.01 | ZnS |
| Sulfur | -26.91 | -64.05 | -37.14 | S |
| Witherite | -4.33 | -12.93 | -8.60 | BaCO3 |
| Zn(OH)2(e) | -3.25 | 8.25 | 11.50 | Zn(OH)2 |

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End of simulation.

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Reading input data for simulation 2.

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End of run.

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# Appendix B

## Groundwater Quality & Elevation/Surface Water Quality/Trends

Foth

# Memorandum

January 18, 2007

TO: Jana Murphy, Flambeau Mining Co.

CC: Jim Hutchison, Foth I&E

FR: Stephen Lehrke, Foth I&E
Steve Donohue, Foth I&E

RE: Flambeau Mining Company - 2006 Annual Report Groundwater and Surface Water Trends

## Background

Groundwater and surface water sample results collected for the 2006 monitoring program were added to the analytical monitoring historical database. These results were statistically tested and graphically displayed to determine whether any significant increasing or decreasing trends are occurring in the groundwater or surface water chemistry. Groundwater quality results, trend graphs and statistical test results are included as Attachment 1 for the quarterly monitoring parameters and Attachment 2 for the annual monitoring parameters. Surface water quality results, trend graphs and statistical test results are included as Attachment 3. Hydrographs are included as Attachment 4.

Intervention boundary wells included in the trend analyses are MW-1000P-R, MW-1002, MW-1002G, MW-1004P, MW-1004S, MW-1005, MW-1005P, MW-1005S, and MW-1010P. The in-pit wells included in the trend analyses are MW-1013, MW-1013A, MW-1013B, MW-1013C, MW-1014, MW-1014A, MW-1014B and MW-1014C. Wells MW-1015A and MW-1015B (also included in the analyses) were constructed in January 2001 approximately 1000 ft. northwest of the backfilled pit and adjacent to the compliance boundary.

## Statistical Methods

October of 1997 was selected as the start date for the trend tests. October of 1997 is the beginning of the post-mining period. The trend analyses begin in February, 1999 for the in-pit wells MW-1013B, MW-1013C, MW-1014A, MW-1014B and MW-1014C, and April, 2001 for wells MW-1015A and MW-1015B, which is when monitoring began. Trend analyses are also included for the first time for wells MW-1013, MW-1013A and MW-1014. Monitoring of these wells began in October, 2005, with sufficient groundwater recovery to collect samples.

The trend analyses for the annual monitoring parameters of arsenic, barium, cadmium, calcium, chloride, chromium, lead, magnesium, mercury, selenium and silver begin with July 1999 in all

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wells since this was the recent start date of monitoring for these parameters. With the exception of arsenic, no trend test is yet performed for these parameters in MW-1013, MW-1013A and MW-1014 due to small sample sizes.

The non-parametric Mann-Kendall test for trend was used to statistically determine existing trends in the post-mining data. This test indicates whether any general increasing or decreasing trends have occurred during this time frame. The results of the trend tests are best used in conjunction with the trend graphs of Attachments 1, 2 and 3 to properly evaluate trend conditions. It should be noted that a statistically increasing or decreasing trend does not necessarily indicate a substantial increase or decrease in actual parameter concentrations. There are situations where variation in the data is extremely small, allowing very slight consecutive concentration changes to be detected as a statistically significant trend. Although these minor trends may occur, they should not be construed as an indication of a broader impact on water quality.

In addition, since the statistical trend tests indicate whether a general trend is occurring over the entire time frame of the post-mining period, there may be cases when a short term trend conflicts with the statistical result for the general longer term trend. Therefore as stated, it is most appropriate to interpret the statistical results in conjunction visually with the trend graphs and in the context of the broader site hydrology.

The procedure for the Mann-Kendall test is given in Gilbert (1987)[1]. The Type I error for each test was set to 0.01. All non-detected values were replaced with a common value below the lowest detected value.

In the trend test results of Attachments 1, 2 and 3, a "+" indicates a statistically increasing trend and a "-" indicates a statistically decreasing trend. If neither a "+" or "-" is given, no statistically significant trend is present.

## Trend Results

Quarterly Parameters (Attachment 1)

The majority of observable trends, increasing and/or decreasing, were exhibited in the groundwater results for the quarterly parameters of alkalinity, copper, hardness, iron, manganese, sulfate, TDS, zinc, pH, conductivity and redox. A number of the observed trends are similar to those noted in the previous annual report.

Many of the trends indicated as statistically significant are the result of only small consecutive concentration changes over the post-mining period, with overall concentration change being very low. Other trends reflecting greater concentration changes are noted in the intervention boundary wells MW-1000P-R, MW-1005, MW-1010P and MW1015B, and the in-pit wells MW-1013B,

[1]Gilbert, R.O., 1987. " Statistical Methods for Environmental Pollution Monitoring", Van Nostrand Reinhold, New York.

MW-1013C, MW-1014A, MW-1014B and MW-1014C. Utilizing both the statistical trend results and the historical trend graphs of Attachment 1, a summary of these is given as follows:

- MW-1000P-R: Alkalinity, hardness, iron, manganese, sulfate, TDS and conductivity exhibited an increase in concentrations at the beginning of the post-mining period, but recently have stabilized or decreased.

- MW-1005: Hardness, iron, manganese, TDS and conductivity decreased from approximately 1994 through 2003, at which point moderate increases (still below historical levels) occurred. Concentrations have since stabilized or once again decreased.

- MW-1010P: Decreasing trends of copper and TDS were noted for the post-mining period. In addition, the iron and manganese increases which were noted during 2000, decreased or remained consistent.

- MW-1013B: Copper has illustrated generally increasing concentrations since 2001. Decreasing trends were noted for iron and TDS.

- MW-1013C: Overall increasing trends continue for iron and manganese.

- MW-1014A: Decreasing trends continue for iron and manganese.

- MW-1014B: Decreasing trends continue for manganese and zinc.

- MW-1014C: Decreasing trends continue for hardness, iron, manganese, sulfate, TDS, zinc and conductivity.

- MW-1015B: After increasing in 2002 to 2003, concentrations of iron and manganese have been consistent or decreasing. This is similar to recent trends at the upgradient well MW-1005P.

The following provides a more detailed narrative of the statistical trend results for each well. All statistically significant trends are noted, regardless of the magnitude concentration change.

<u>Intervention Boundary Wells</u>

- MW-1000P-R: Several parameters exhibited an immediate increase in concentrations at the beginning of the post-mining period. These are alkalinity, hardness, iron, manganese, sulfate, TDS and conductivity. While increasing trends from 1997 through 2006 are indicated by the statistical results, these increases occurred primarily following the rebound of water levels after the production period ended and have since stabilized or decreased. As can be seen in the historical trend graphs, concentration trends of hardness, manganese, sulfate, TDS and conductivity reversed in 2000 and have since been decreasing. Iron decreased in 2004. The trend of alkalinity is recently no longer increasing and has stabilized.

- MW-1002: Trends indicated by the statistical results in this well reflect small consecutive changes in actual low concentrations. These are decreasing trends in iron, sulfate and conductivity.

- MW-1002G: A statistically increasing trend is indicated for alkalinity, while decreasing trends are indicated for sulfate, TDS and conductivity. However, actual concentration changes in these parameters are small, with the trends being due to small consecutive concentration changes.

- MW-1004P: Statistically decreasing trends were noted for copper and sulfate, however these were due to small consecutive concentration changes. The increasing trend noted for manganese in 2005 is no longer indicated, with concentrations returning to very low levels.

- MW-1004S: Increasing trends continue to be noted for hardness and sulfate. Concentrations since 1997 have slowly increased a total of approximately 10 to 20 mg/L. Similarly slow increasing trends can be visually detected in the trend graphs for alkalinity and conductivity. However, levels of alkalinity, hardness and conductivity remain below levels observed historically prior to the onset of mining in 1993. A statistically decreasing trend was noted for iron, but due only to small consecutive concentration changes.

- MW-1005: Overall statistically decreasing trends of alkalinity, iron and manganese continue to be observed for the post-mining period. As can be observed in the trend graphs, hardness, iron, manganese, TDS and conductivity decreased from approximately 1994 through 2003, at which point moderate increases (still below historical levels) occurred. Concentrations have since stabilized or once again decreased.

- MW-1005P: Decreasing trends of sulfate, TDS and conductivity and redox continue. Sulfate has not been detected in this well since 1999.

- MW-1005S: A decreasing trend for conductivity and an increasing trend for manganese continue to be noted, however in each case actual concentration changes are small.

- MW-1010P: Decreasing trends of copper and TDS and increasing trends of hardness, manganese and sulfate were noted for the post-mining period. Similar to MW-1000P-R, copper concentrations were elevated from 1994 through 1999, but have since decreased to low levels. The decreasing trend of TDS, however, is due to decreases beginning in 2004. The increasing trends of alkalinity, hardness and sulfate correspond to only small concentration changes well within the historical concentration range. Manganese increased significantly during October of 2000 (however still below 1991 levels) but has since remained consistent or slightly decreased. As can be seen in the trend graphs, iron also increased during this time and has since decreased to low levels.

- MW-1015A: A statistically increasing trend was noted for alkalinity, however this reflects only small consecutive changes in actual low concentrations.

- MW-1015B: A statistically increasing trend was noted for iron. However, after increasing in 2002 to 2003, concentrations have been consistent or decreasing. The recent trend in iron is similar to recent trends at the upgradient well MW-1005P. A statistically increasing trend was also noted for redox.

<u>In-Pit Wells</u>

- MW-1013: No statistically significant trends were noted for the quarterly monitoring parameters in the available data.

- MW-1013A: No statistically significant trends were noted for the quarterly monitoring parameters in the available data.

- MW-1013B: Overall statistically increasing trends (since 1999) were noted for copper and zinc. Copper has illustrated generally increasing concentrations since 2001. The increasing trend of zinc refers to only a slowly increasing trend with small actual concentration increases just above the detection limit. Decreasing trends were noted for iron and TDS. Iron has not been detected in this well since January of 2004.

- MW-1013C: Overall statistically increasing trends continue for alkalinity, iron, manganese and conductivity. The increasing trends of alkalinity, manganese and conductivity are only moderate while the trend of iron is more significant. An overall decreasing trend is denoted for zinc.

- MW-1014: No statistically significant trends were noted for the quarterly monitoring parameters in the available data.

- MW-1014A: Statistically decreasing trends were noted for iron, manganese and TDS. Iron has not been detected since July of 2004. Statistically increasing trends were noted for alkalinity and redox, however the increasing trend for alkalinity was only small.

- MW-1014B: Overall decreasing trends were noted for hardness, manganese, TDS, zinc and conductivity.

- MW-1014C: Overall decreasing trends continue for hardness, iron, manganese, sulfate, TDS, zinc and conductivity. The most significant relative decreases in concentration occur for iron, dropping from 15 mg/L in 1999 to 6 mg/L in 2006, and for zinc, dropping from 2200 ug/L in 1999 to 470 ug/L in 2006.

Annual Parameters (Attachment 2)
Similar to past trend results, the annual groundwater parameters of arsenic, barium, cadmium, calcium, chloride, chromium, lead, magnesium, mercury, selenium and silver illustrated few statistically significant trends. Since 1999, there continue to be several decreasing trends of cadmium, calcium and magnesium in various wells. These include calcium and magnesium in MW-1000PR and MW-1014C, and cadmium and magnesium in MW-1014B. Chromium in MW-1013B and barium in MW-1015A also illustrated statistically decreasing trends, however these were due to slight consecutive decreases over already low concentrations observed between 1999 and 2001. Statistically increasing trends of barium and calcium were indicated for MW-1004S, however, as can be seen in the trend plots of Attachment 2 these also were due to slight consecutive changes over already low concentrations.

Surface Water (Attachment 3)
No statistically significant trends were observed in either the upstream or downstream surface water monitoring results. Parameters currently included in the surface water monitoring are copper, hardness, iron, manganese, sulfate, zinc, pH and conductivity.

Hydrographs (Attachment 4)
As observed in the hydrographs, all wells illustrating significant drawdown during the production period of 1993 to 1997 now appear to be substantially stabilized. The wells include MW-1000P-R, MW-1001, MW-1001G, MW-1001P, MW-1003, MW-1003P, MW-1004, MW-1004P, MW-1004S, MW-1010P, OW-7, OW-39, OW-42, PZ-1006G, PZ-1006S, PZ-1007S, PZ-1008, PZ-1008G, PZ-1012, PZ-R1, PZ-S1, PZ-S3, ST-9-23 and ST-9-26.

Groundwater elevations increased steadily from 1999 through 2002 for the in-pit wells of MW-1013A, MW-1013B, MW-1013C, MW-1014, MW-1014A, MW-1014B and MW-1014C, but stabilized in 2003. Elevations for MW-1013 rose through 2004, but appear to have stabilized during 2005.

**Conclusions**

Many of the concentration trends observed during 2005 continued through 2006. Of the trend results listed above, the following are the main conclusions:

Intervention Boundary Wells

- Several parameters in MW-1000P-R (alkalinity, hardness, iron, manganese, sulfate, TDS and conductivity) exhibited concentration increases following the rebounding of water levels after the production period ended. However, as can be seen in the historical trend graphs, concentration trends of hardness, manganese, sulfate, TDS and conductivity reversed in 2000 and have since been decreasing. Iron decreased significantly in 2004. The trend of alkalinity is recently no longer increasing and has stabilized.

- Iron and manganese in MW-1010P also rose following the production period, but currently have stabilized to levels observed during the pre-mining period. TDS is currently following a decreasing trend.

- Copper in both MW-1000P-R and MW-1010P, after being elevated during the production period, have continued decreasing trends, and are now at low levels.

- A rise in iron and manganese concentrations occurred during 2004 in MW-1004P, and again during January of 2006, but decreased again to very low levels.

- Alkalinity, hardness, sulfate and conductivity continue very slow but consistent concentration increases in MW-1004S. Concentrations of these parameters, however, are still quite low.

- Hardness, iron, manganese, TDS and conductivity in the upgradient well MW-1005 observed decreasing trends through the post-mining period until 2002 and 2003 at which point increases occurred. The increasing trends reversed again during 2004 and stabilized through 2006.

- MW1015B had an increase of iron and manganese during the second half of 2002. Both trends have since reversed.

In-Pit Wells

With the in-pit wells, increasing trends continue for copper in MW-1013B, iron and manganese in MW-1013C and redox in MW-1014A. Decreasing trends continue for iron and manganese in MW-1014A, zinc in MW-1014B, and hardness, iron, sulfate, TDS, zinc and conductivity in MW-1014C.

Annual Groundwater Parameter

Few trends were noted for the annual groundwater parameters of arsenic, barium, cadmium, calcium, chloride, chromium, lead, magnesium, mercury, selenium and silver.

Surface Water Parameters

No trends were observed in either the upstream or downstream surface water monitoring results of copper, hardness, iron, manganese, sulfate, zinc, pH and conductivity.

## *Attachment 1*

## *Statistical Results*

## *Trend Graphs*

## *Historical Data*

## *(Groundwater - Quarterly Parameters)*

## Trend Analysis Results - Groundwater (Quarterly Parameters)
## Oct. 1997 - Oct. 2006

| | Alkalinity | Copper | Hardness | Iron | Manganese | Sulfate | TDS | Zinc | Field pH (su) | Field Cond (umho) | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1000PR | | | | | | | | | | | | |
| Sample Size | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 20 | 37 | 37 | 23 | 37 |
| Mann-Kendall S | 572 | -102 | -221 | 38 | -235 | -308 | -274 | -43 | 115 | -368 | -106 | 96 |
| p-Level | 0 | 0.188 | 0.004 | 0.63 | 0.002 | 0 | 0 | 0.175 | 0.137 | 0 | 0.005 | 0.216 |
| Trend | + | | - | | - | - | - | | | - | - | |
| MW-1002 | | | | | | | | | | | | |
| Sample Size | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 18 | 37 | 37 | 0 | 37 |
| Mann-Kendall S | 156 | -129 | 80 | -227 | -124 | -197 | -115 | 0 | -62 | -290 | NA | 1 |
| p-Level | 0.042 | 0.094 | 0.304 | 0.002 | 0.108 | 0.01 | 0.137 | 1 | 0.428 | 0 | NA | 0.995 |
| Trend | | | | - | | - | | | | - | | |
| MW-1002G | | | | | | | | | | | | |
| Sample Size | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 18 | 37 | 37 | 0 | 37 |
| Mann-Kendall S | 249 | -35 | 176 | -108 | 35 | -282 | -230 | -7 | 2 | -290 | NA | -10 |
| p-Level | 0 | 0.659 | 0.022 | 0.162 | 0.659 | 0 | 0.002 | 0.822 | 0.99 | 0 | NA | 0.906 |
| Trend | + | | | | | - | - | | | - | | |
| MW-1004P | | | | | | | | | | | | |
| Sample Size | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 19 | 37 | 37 | 24 | 37 |
| Mann-Kendall S | 129 | -268 | 58 | 108 | 185 | -213 | -141 | 18 | 37 | -191 | -36 | 189 |
| p-Level | 0.094 | 0 | 0.458 | 0.162 | 0.015 | 0.005 | 0.066 | 0.557 | 0.64 | 0.012 | 0.39 | 0.013 |
| Trend | | - | | | | - | | | | | | |
| MW-1004S | | | | | | | | | | | | |
| Sample Size | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 19 | 37 | 37 | 23 | 37 |
| Mann-Kendall S | 158 | -176 | 301 | -245 | -127 | 427 | -100 | 0 | 73 | 44 | -54 | 172 |
| p-Level | 0.04 | 0.022 | 0 | 0.002 | 0.099 | 0 | 0.196 | 1 | 0.349 | 0.576 | 0.164 | 0.024 |
| Trend | | | + | - | | + | | | | | | |
| MW-1005 | | | | | | | | | | | | |
| Sample Size | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 18 | 37 | 37 | 0 | 37 |
| Mann-Kendall S | -373 | 6 | 22 | -295 | -196 | 15 | -53 | 0 | -8 | -5 | NA | 88 |
| p-Level | 0 | 0.948 | 0.786 | 0 | 0.01 | 0.856 | 0.499 | 1 | 0.928 | 0.958 | NA | 0.258 |
| Trend | - | | | - | - | | | | | | | |
| MW-1005P | | | | | | | | | | | | |
| Sample Size | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 18 | 37 | 37 | 25 | 37 |
| Mann-Kendall S | -67 | -129 | -10 | 104 | 37 | -212 | -269 | 15 | -88 | -273 | -107 | 96 |
| p-Level | 0.391 | 0.094 | 0.906 | 0.18 | 0.64 | 0.006 | 0 | 0.6 | 0.258 | 0 | 0.013 | 0.216 |
| Trend | | | | | | - | - | | | - | | |
| MW-1005S | | | | | | | | | | | | |
| Sample Size | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 18 | 37 | 37 | 0 | 37 |
| Mann-Kendall S | 74 | -30 | 159 | 101 | 213 | -78 | -190 | 0 | -90 | -304 | NA | 129 |
| p-Level | 0.342 | 0.706 | 0.038 | 0.192 | 0.005 | 0.316 | 0.012 | 1 | 0.246 | 0 | NA | 0.094 |
| Trend | | | | | + | | | | | - | | |
| MW-1010P | | | | | | | | | | | | |
| Sample Size | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 20 | 37 | 37 | 23 | 37 |
| Mann-Kendall S | 207 | -370 | 328 | 180 | 259 | 200 | -208 | 0 | -3 | -11 | 77 | 31 |
| p-Level | 0.006 | 0 | 0 | 0.018 | 0 | 0.008 | 0.006 | 1 | 0.979 | 0.896 | 0.044 | 0.697 |
| Trend | + | - | + | | + | + | - | | | | | |

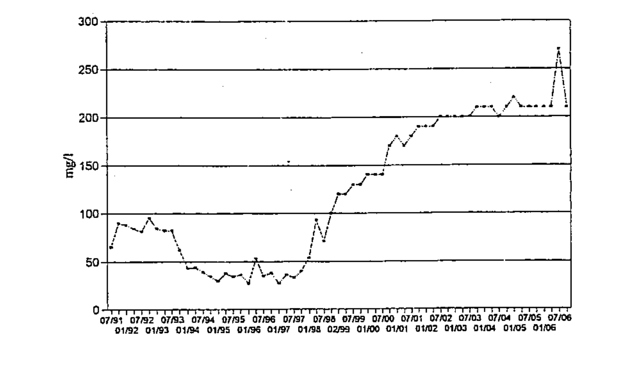
## Trend Analysis Results - Groundwater (Quarterly Parameters)
### Oct. 1997 - Oct. 2006

| | Alkalinity | Copper | Hardness | Iron | Manganese | Sulfate | TDS | Zinc | Field pH (su) | Field Cond (umho) | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MW-1013** | | | | | | | | | | | | |
| Sample Size | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 2 | 5 | 5 | 6 | 30 |
| Mann-Kendall S | 2 | 3 | -4 | -4 | -4 | -6 | -10 | NA | 2 | -2 | -1 | 271 |
| p-Level | 0.816 | 0.65 | 0.484 | 0.484 | 0.484 | 0.234 | 0.016 | NA | 0.816 | 0.816 | 1 | 0 |
| Trend | | | | | | | | | | | | + |
| **MW-1013A** | | | | | | | | | | | | |
| Sample Size | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 2 | 5 | 5 | 6 | 30 |
| Mann-Kendall S | -9 | 1 | -4 | 0 | -6 | -8 | -10 | NA | 2 | -8 | 3 | 137 |
| p-Level | 0.05 | 1 | 0.484 | 1 | 0.234 | 0.084 | 0.016 | NA | 0.816 | 0.084 | 0.72 | 0.014 |
| Trend | | | | | | | | | | | | |
| **MW-1013B** | | | | | | | | | | | | |
| Sample Size | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 22 | 32 | 32 | 25 | 32 |
| Mann-Kendall S | 34 | 349 | 25 | -170 | 21 | 54 | -272 | 161 | 27 | 124 | 86 | 154 |
| p-Level | 0.596 | 0 | 0.7 | 0.006 | 0.748 | 0.394 | 0 | 0 | 0.676 | 0.046 | 0.046 | 0.012 |
| Trend | | + | | - | | | - | + | | | | |
| **MW-1013C** | | | | | | | | | | | | |
| Sample Size | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 22 | 32 | 32 | 25 | 32 |
| Mann-Kendall S | 199 | -87 | 59 | 413 | 362 | 94 | -25 | -105 | -50 | 191 | -27 | 122 |
| p-Level | 0.001 | 0.165 | 0.35 | 0 | 0 | 0.132 | 0.7 | 0.002 | 0.43 | 0.002 | 0.548 | 0.05 |
| Trend | + | | | + | + | | | - | | + | | |
| **MW-1014** | | | | | | | | | | | | |
| Sample Size | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 2 | 5 | 5 | 6 | 26 |
| Mann-Kendall S | 0 | 1 | 1 | 0 | -8 | -5 | -4 | NA | -4 | 0 | 1 | 177 |
| p-Level | 1 | 1 | 1 | 1 | 0.084 | 0.359 | 0.484 | NA | 0.484 | 1 | 1 | 0 |
| Trend | | | | | | | | | | | | + |
| **MW-1014A** | | | | | | | | | | | | |
| Sample Size | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 19 | 27 | 27 | 25 | 31 |
| Mann-Kendall S | 146 | 62 | -78 | -210 | -302 | 28 | -140 | 43 | 94 | -7 | 168 | 227 |
| p-Level | 0.002 | 0.206 | 0.109 | 0 | 0 | 0.577 | 0.003 | 0.144 | 0.052 | 0.902 | 0 | 0 |
| Trend | + | | | - | - | | - | | | | + | + |
| **MW-1014B** | | | | | | | | | | | | |
| Sample Size | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 22 | 32 | 32 | 25 | 32 |
| Mann-Kendall S | 74 | 37 | -185 | -110 | -372 | -36 | -216 | -119 | 152 | -178 | 60 | 184 |
| p-Level | 0.238 | 0.563 | 0.002 | 0.078 | 0 | 0.574 | 0 | 0 | 0.014 | 0.004 | 0.17 | 0.002 |
| Trend | | | - | | - | | - | - | | - | | + |
| **MW-1014C** | | | | | | | | | | | | |
| Sample Size | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 22 | 32 | 32 | 25 | 32 |
| Mann-Kendall S | -92 | -3 | -415 | -451 | -440 | -412 | -367 | -217 | 155 | -447 | 21 | 152 |
| p-Level | 0.14 | 0.975 | 0 | 0 | 0 | 0 | 0 | 0 | 0.012 | 0 | 0.644 | 0.014 |
| Trend | | | - | - | - | - | - | - | | - | | |
| **MW-1015A** | | | | | | | | | | | | |
| Sample Size | 31 | 31 | 31 | 32 | 32 | 31 | 31 | 22 | 32 | 32 | 9 | 32 |
| Mann-Kendall S | 151 | 49 | 46 | -76 | 52 | -5 | -145 | 0 | 76 | 123 | -4 | -178 |
| p-Level | 0.01 | 0.418 | 0.448 | 0.226 | 0.412 | 0.946 | 0.014 | 1 | 0.226 | 0.048 | 0.762 | 0.004 |
| Trend | + | | | | | | | | | | | - |
| **MW-1015B** | | | | | | | | | | | | |
| Sample Size | 31 | 31 | 31 | 32 | 32 | 31 | 31 | 22 | 32 | 32 | 10 | 32 |
| Mann-Kendall S | -46 | 0 | 31 | 247 | 137 | -21 | -77 | 0 | -59 | 80 | 31 | -151 |
| p-Level | 0.448 | 1 | 0.612 | 0 | 0.027 | 0.736 | 0.198 | 1 | 0.35 | 0.202 | 0.004 | 0.014 |
| Trend | | | | + | | | | | | | + | |

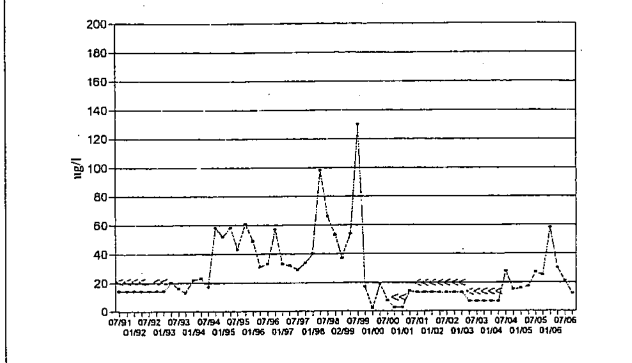
Notes: Overall increasing trend denoted by "+".
Overall decreasing trend denoted by "-"
Trend tests performed at a Type I (two-tailed) error rate of 0.01.

## MW-1000P-R

### Alkalinity




### Copper

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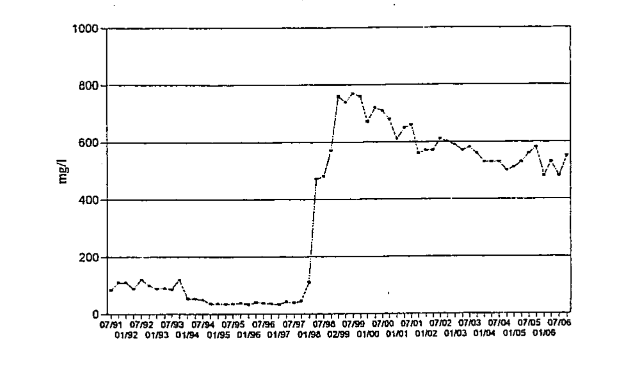
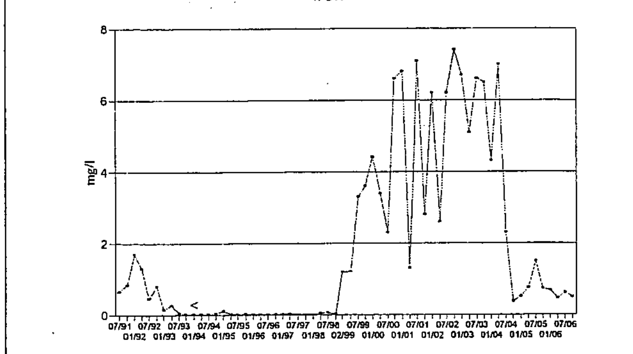
### Hardness




### Iron

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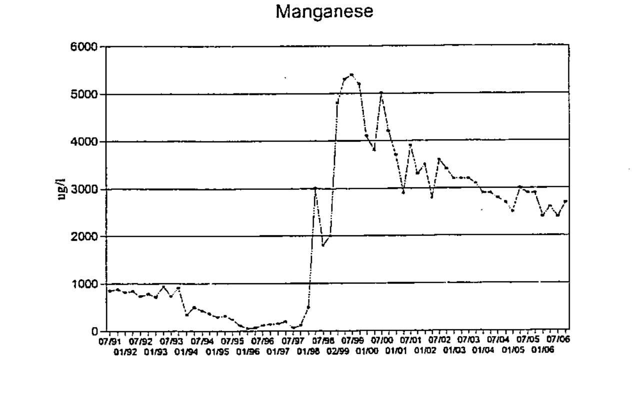
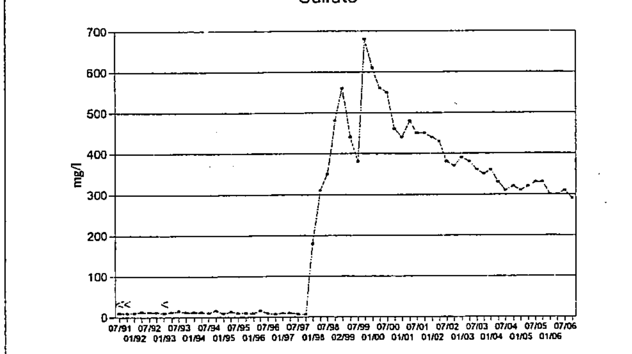
### Manganese




### Sulfate

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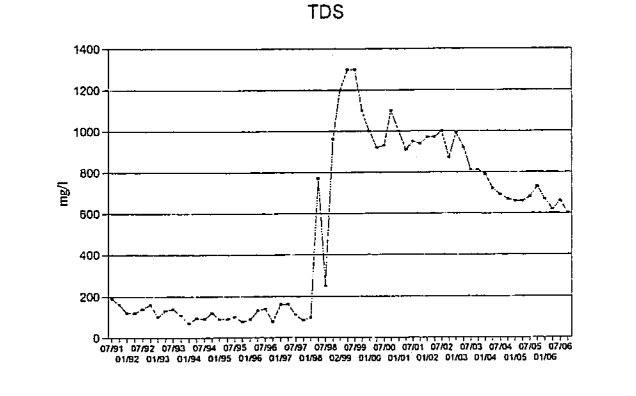
### TDS

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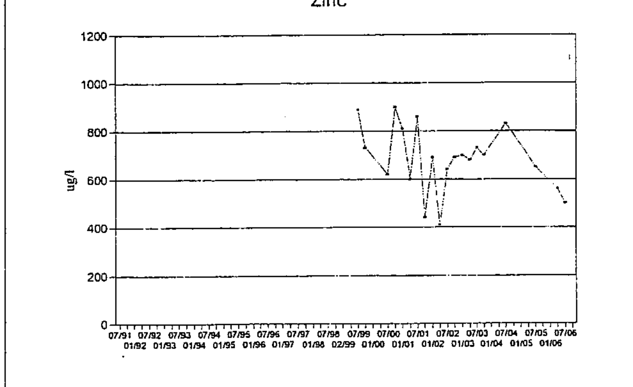
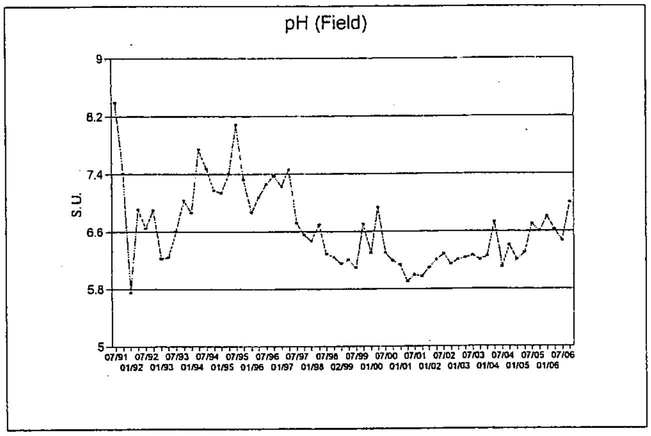
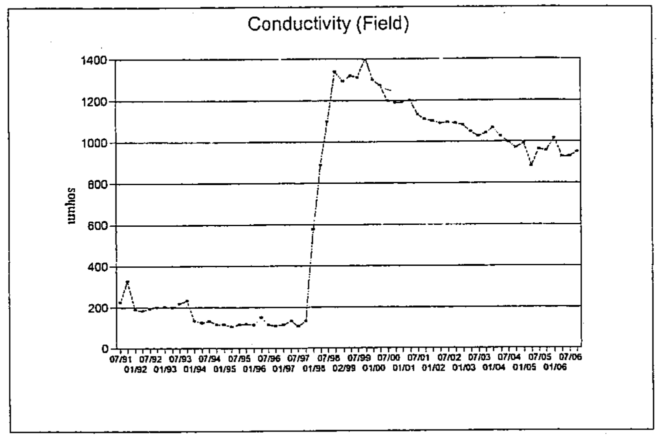
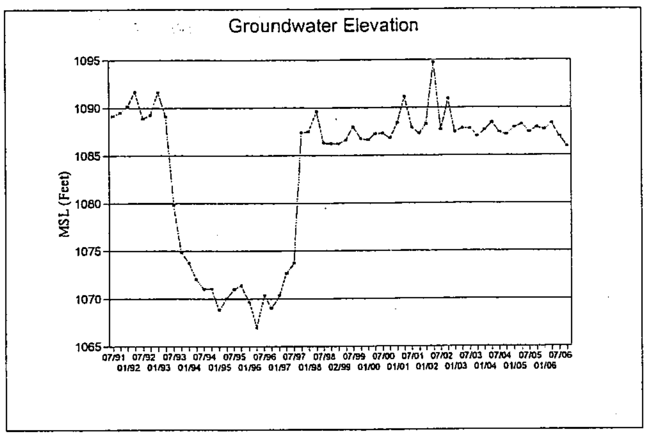
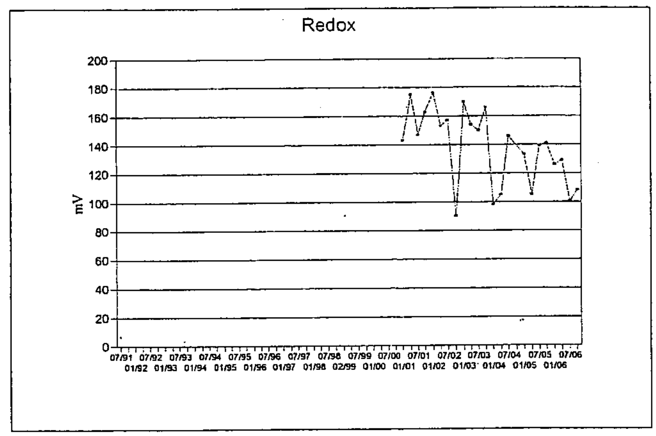


MW-1000P-R


pH (Field)
S.U.

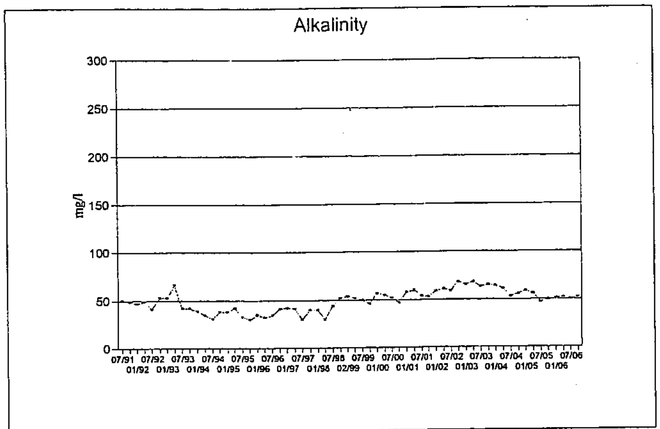

Conductivity (Field)
umhos

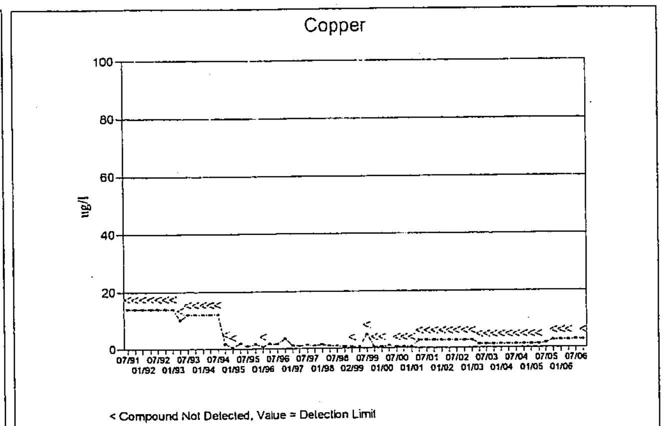

Groundwater Elevation
MSL (Feet)

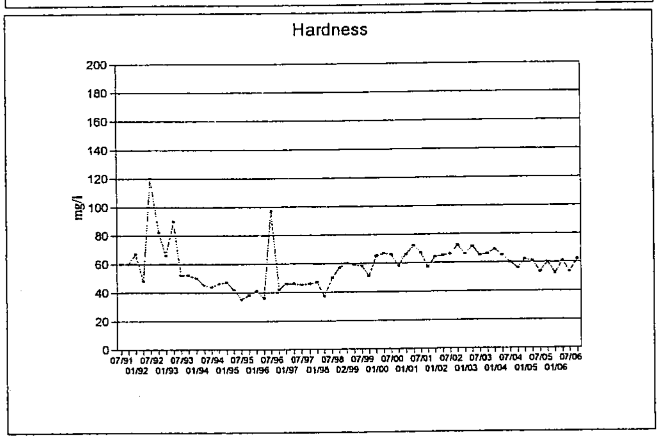

Redox
mV

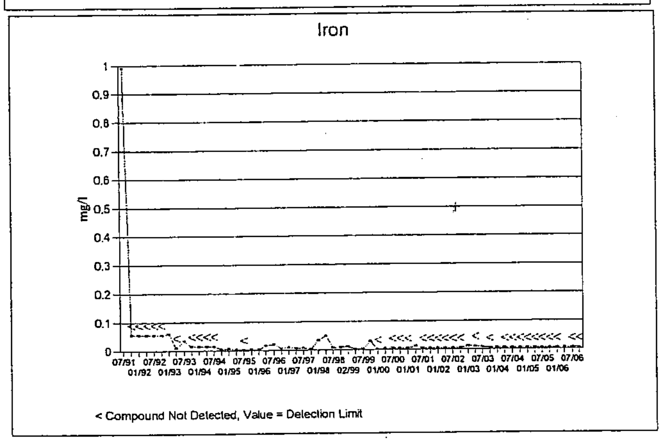
# Flambeau Mining Company
## Groundwater Quality Results

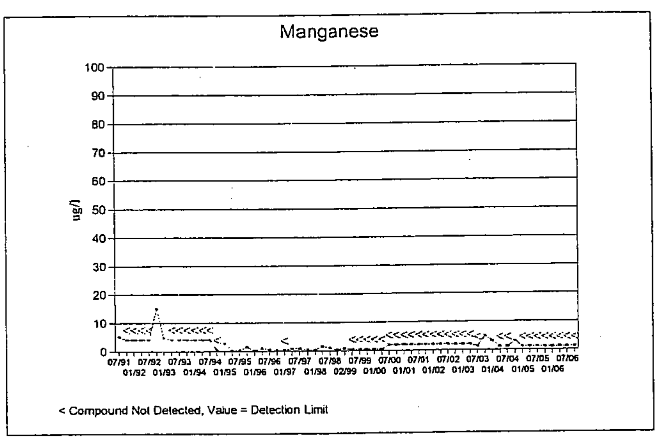
### MW-1002

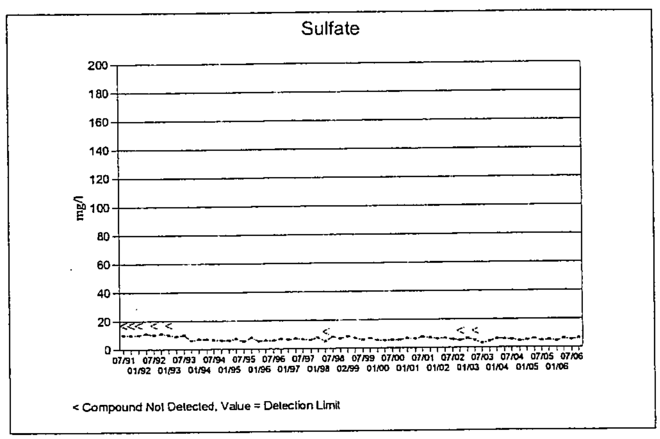


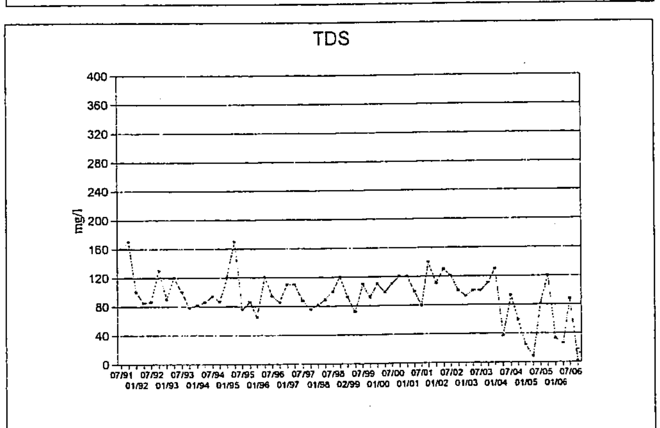



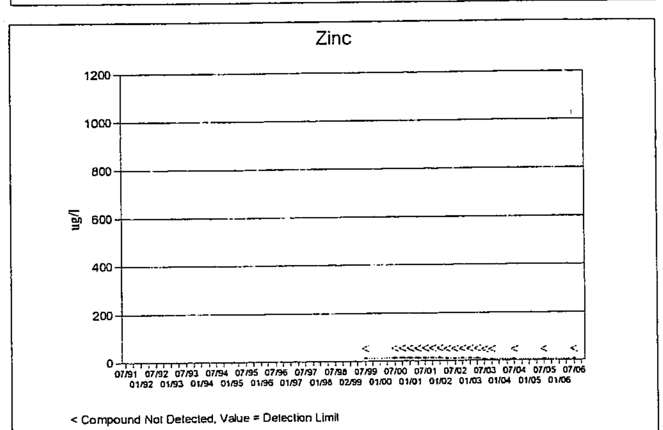



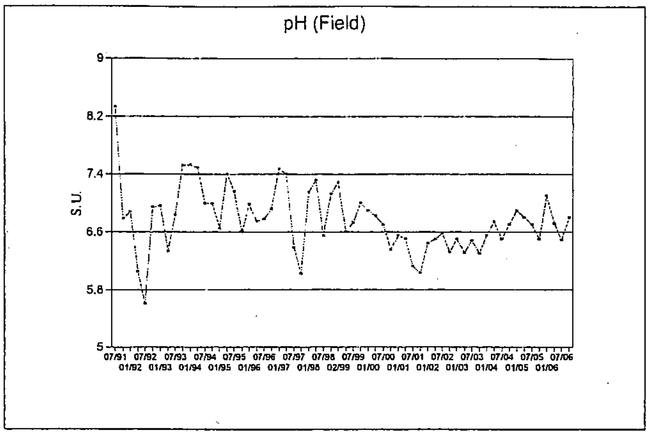



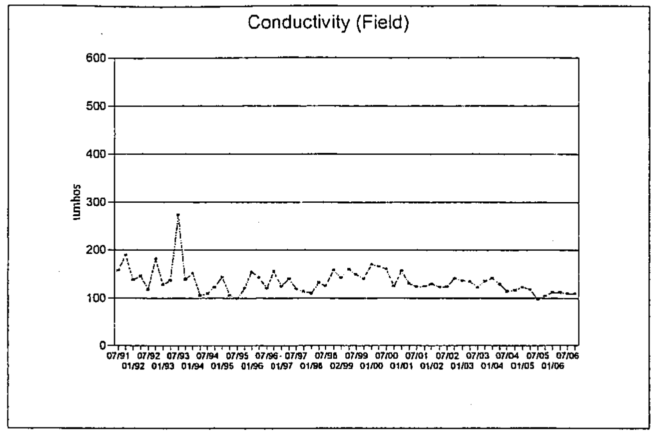



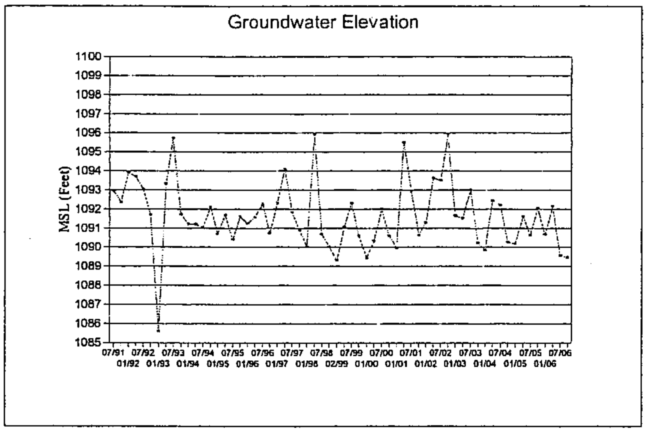



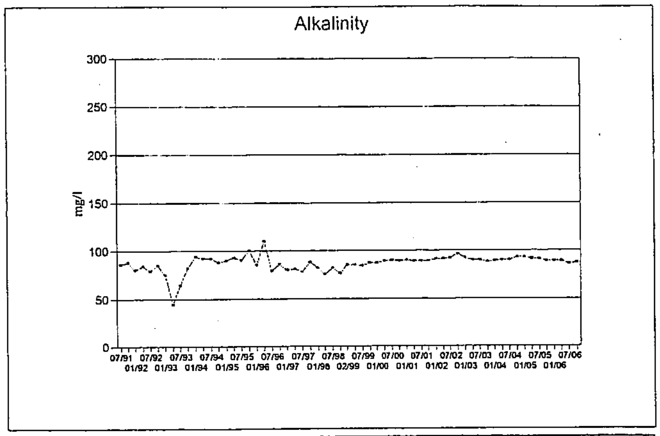
MW-1002

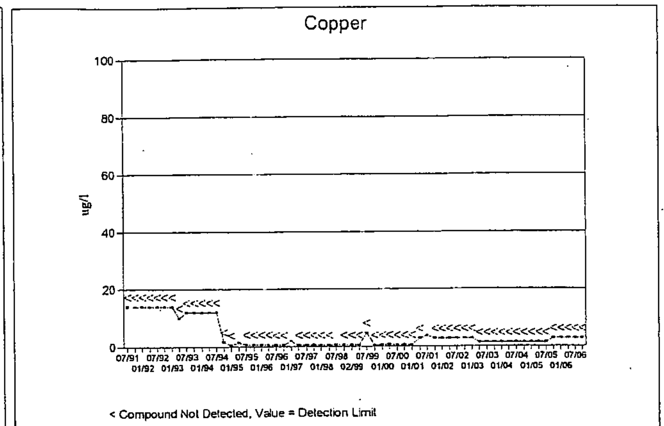

pH (Field)
S.U.
9
8.2
7.4
6.6
5.8
5


Conductivity (Field)
umhos
600
500
400
300
200
100
0


Groundwater Elevation
MSL (Feet)
1100
1099
1098
1097
1096
1095
1094
1093
1092
1091
1090
1089
1088
1087
1086
1085

## MW-1002G


Alkalinity
mg/l


Copper
ug/l
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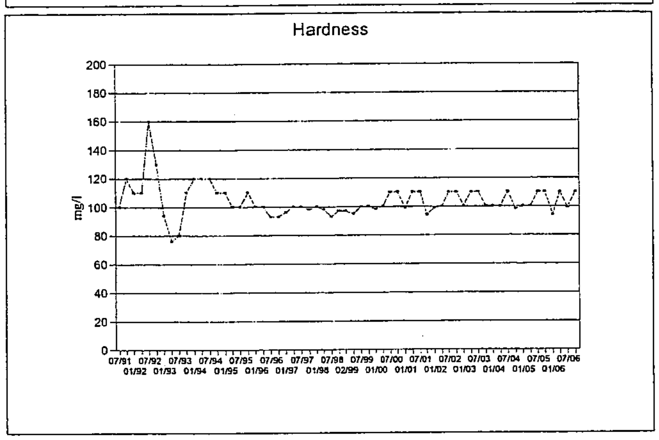
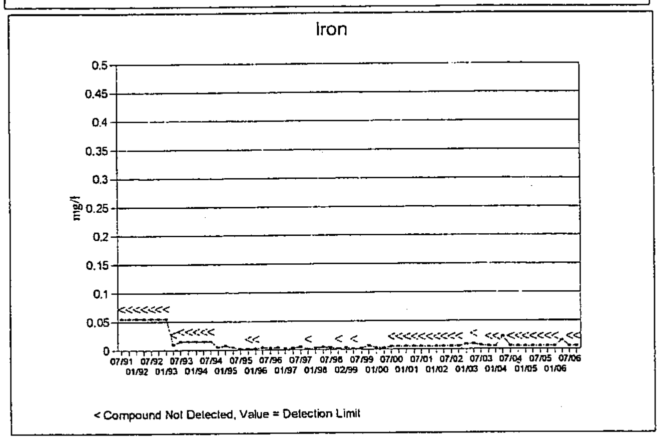

Hardness
mg/l


Iron
mg/l
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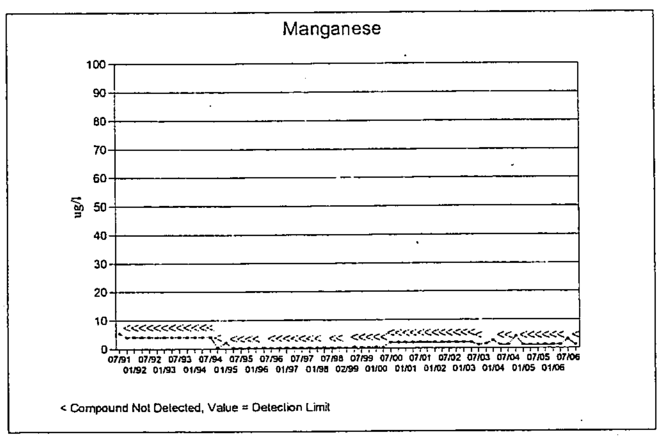
Manganese
ug/l
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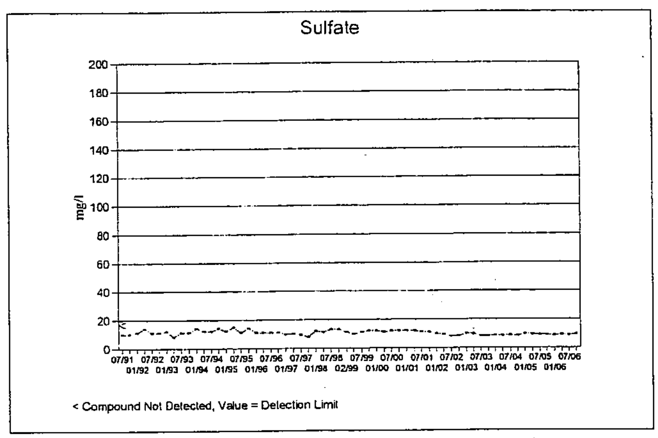
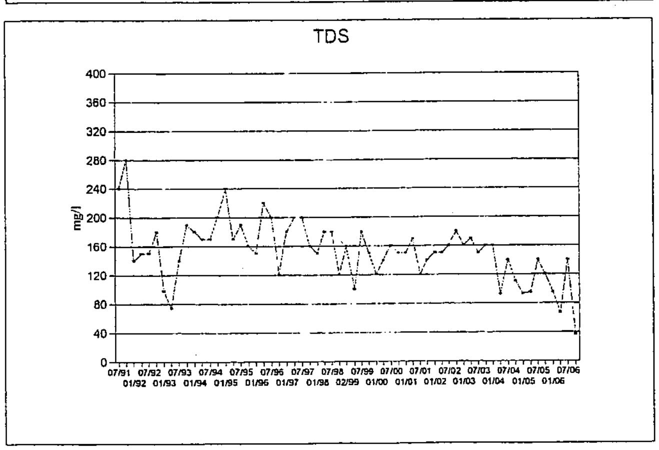
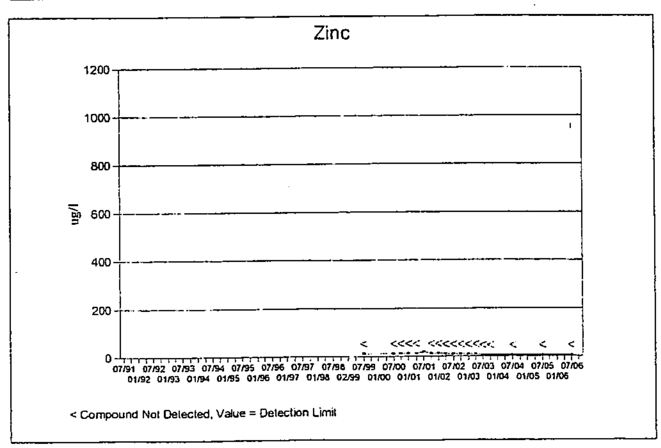
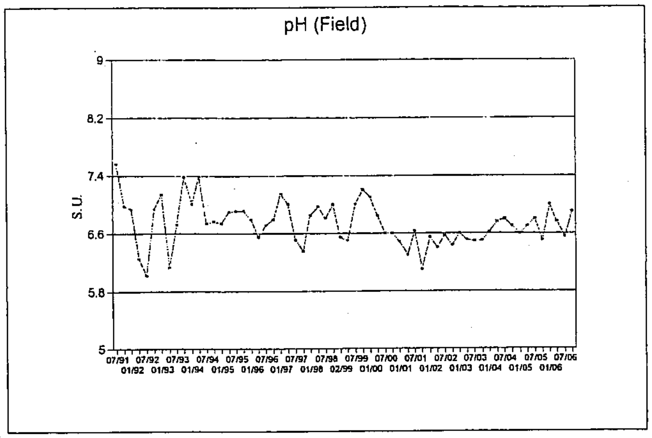

Sulfate
mg/l
< Compound Not Detected, Value = Detection Limit

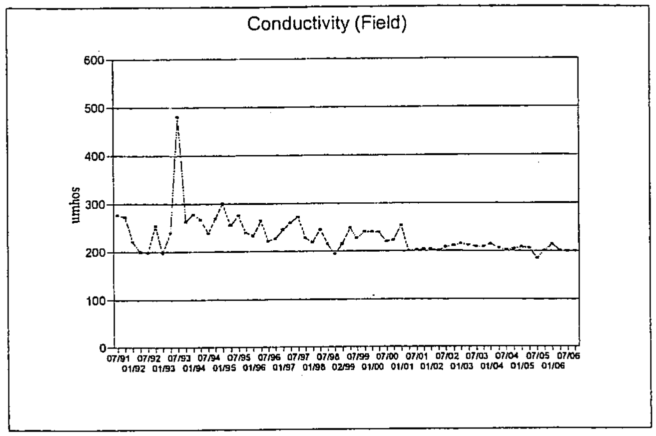

TDS
mg/l

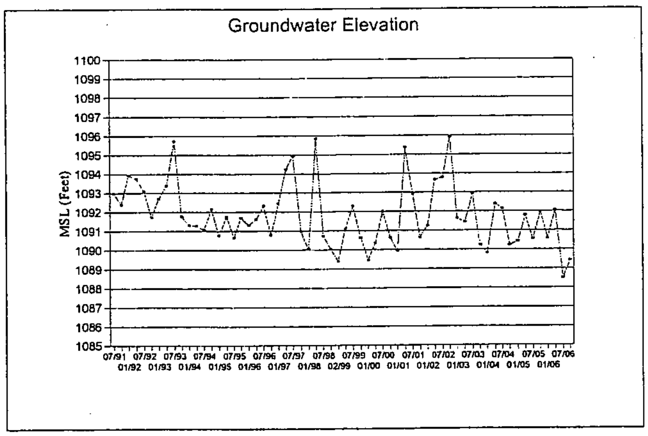

Zinc
ug/l
< Compound Not Detected, Value = Detection Limit

Flambeau Mining Company
Groundwater Quality Results

MW-1002G

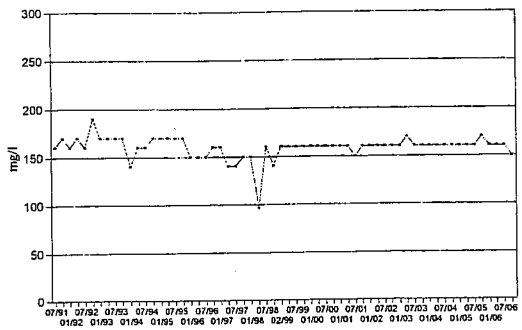


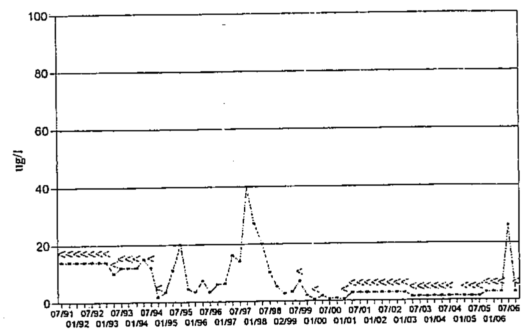



## MW-1004P

### Alkalinity

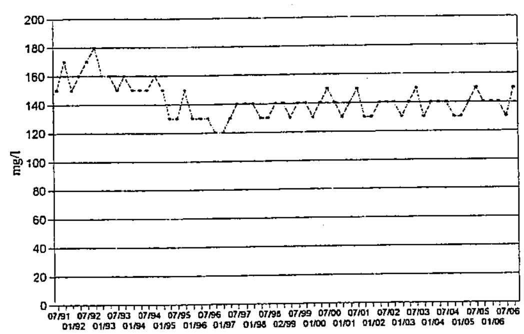



### Copper

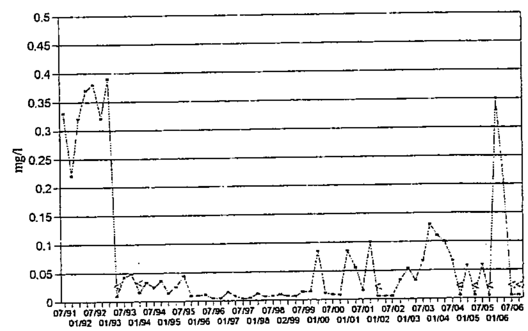



< Compound Not Detected, Value = Detection Limit

### Hardness

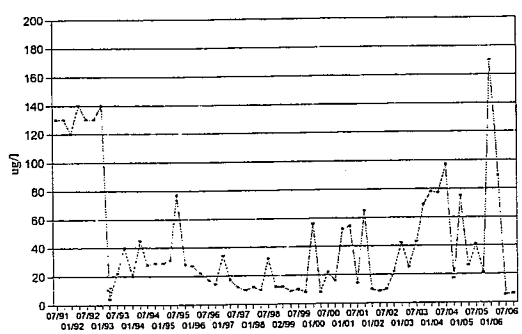



### Iron



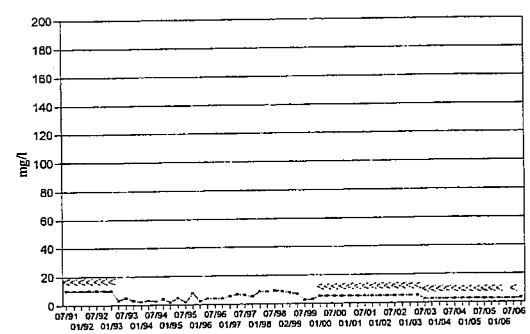

< Compound Not Detected, Value = Detection Limit

### Manganese



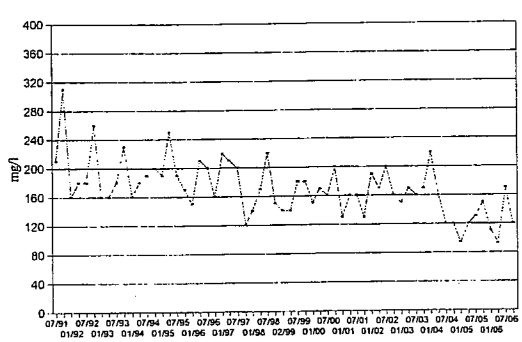

< Compound Not Detected, Value = Detection Limit

### Sulfate

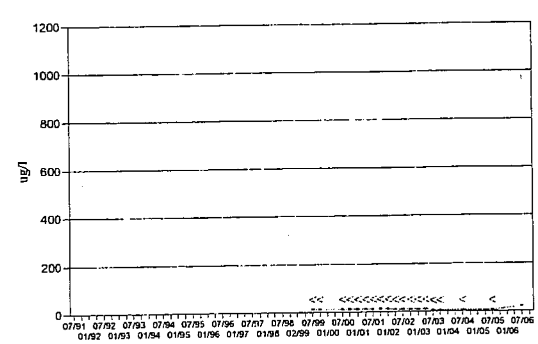



< Compound Not Detected, Value = Detection Limit

### TDS

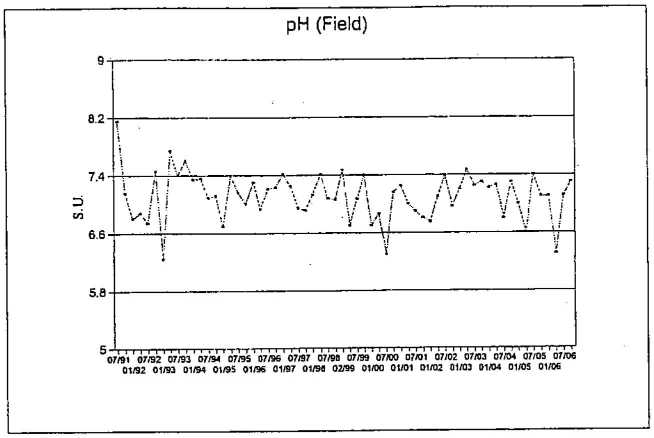


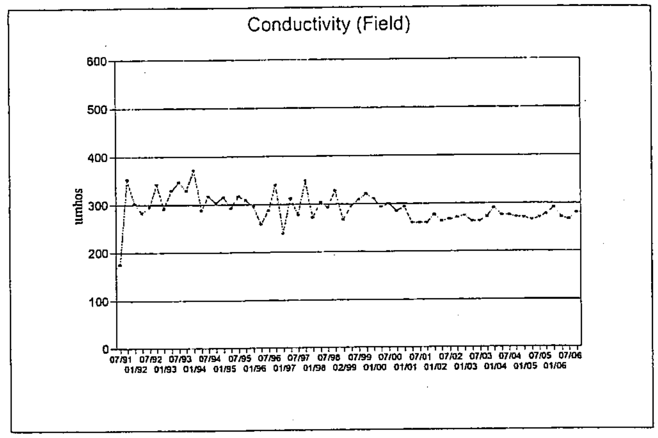

### Zinc

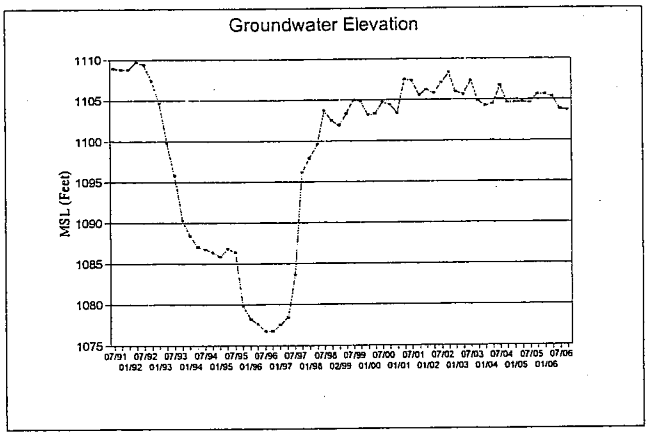


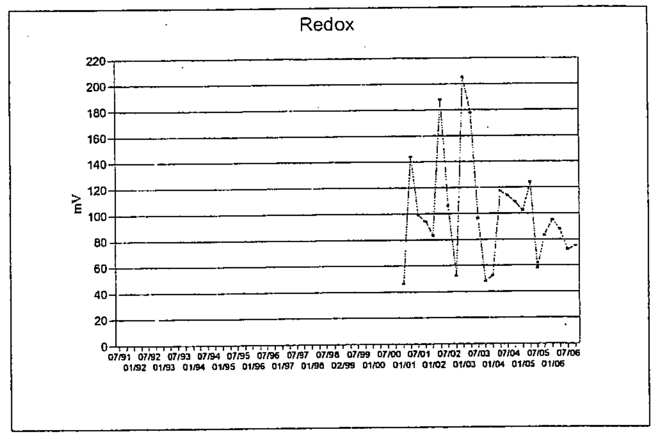

< Compound Not Detected, Value = Detection Limit

## MW-1004P

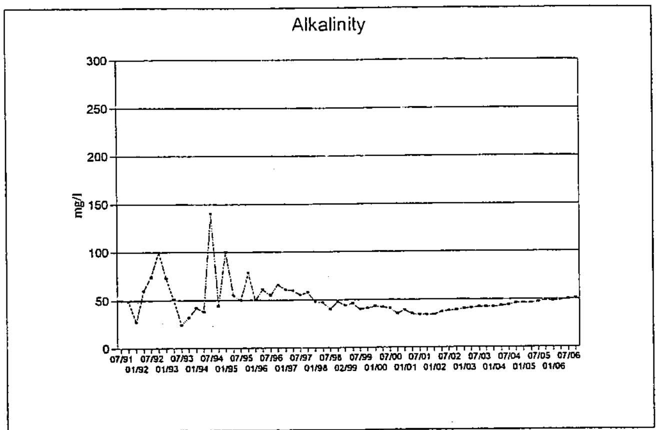

pH (Field)
S.U.
9
8.2
7.4
6.6
5.8
5

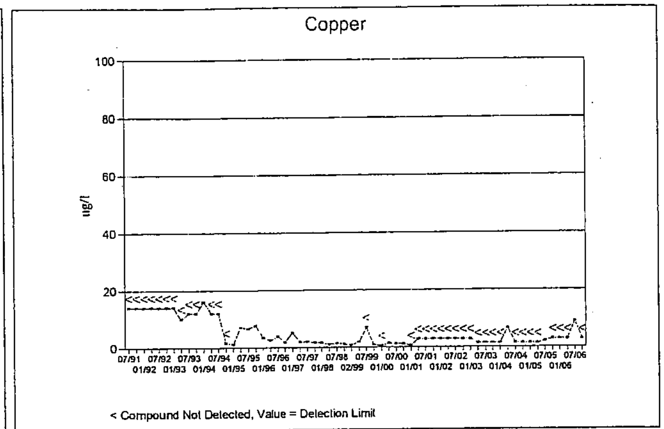

Conductivity (Field)
umhos
600
500
400
300
200
100
0

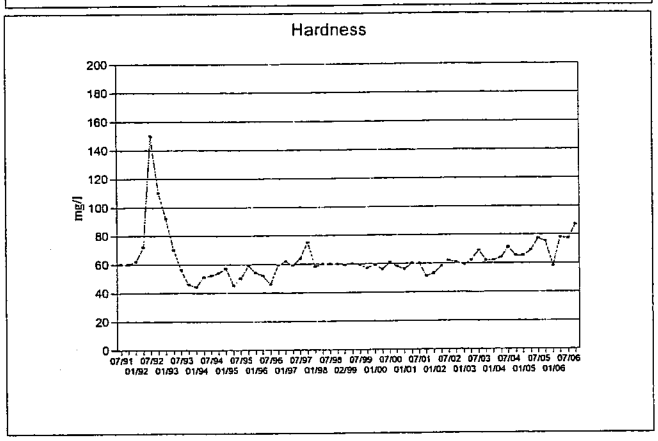

Groundwater Elevation
MSL (Feet)
1110
1105
1100
1095
1090
1085
1080
1075

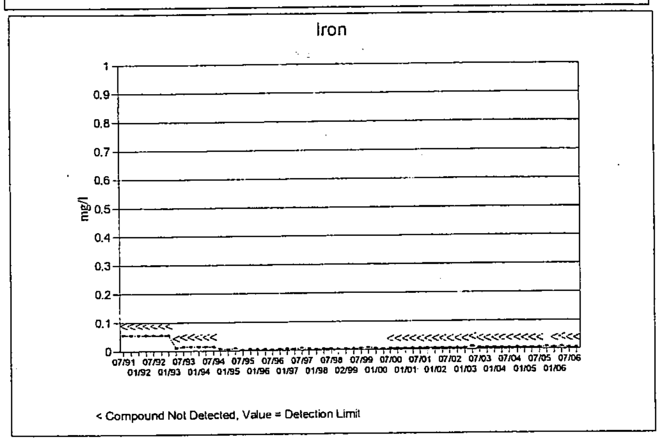

Redox
mV
220
200
180
160
140
120
100
80
60
40
20
0

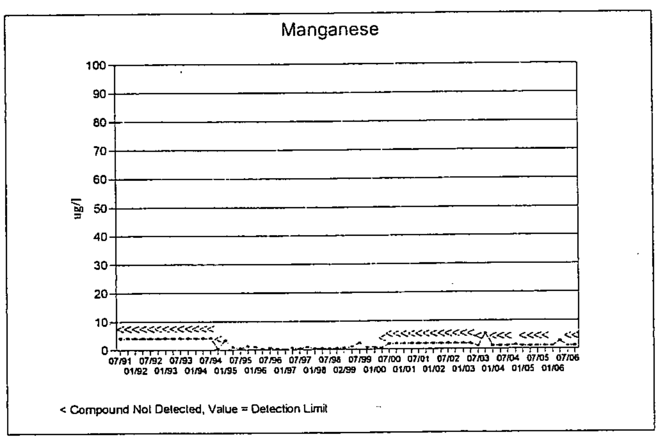
## MW-1004S

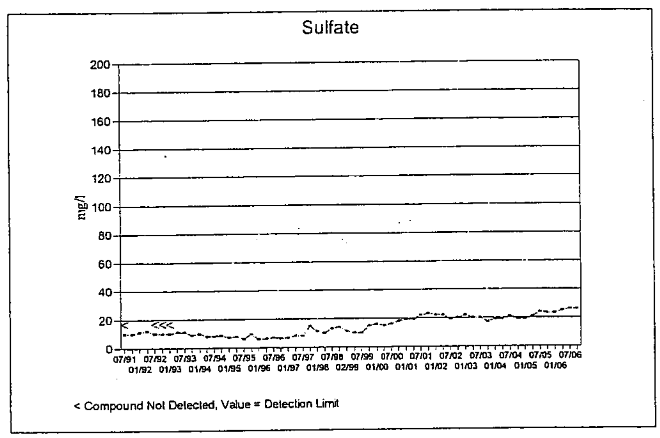

Alkalinity
mg/l

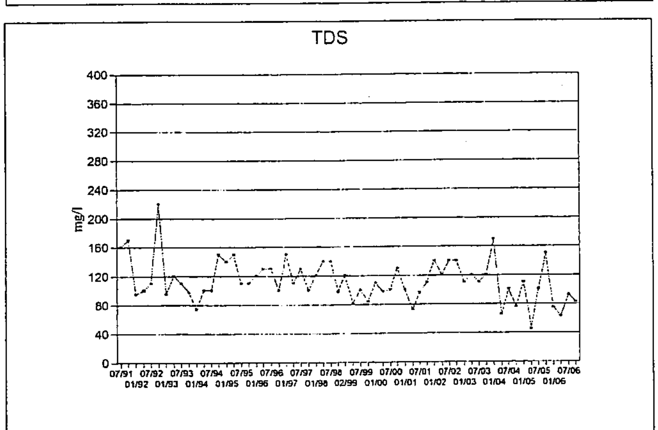

Copper
ug/l
< Compound Not Detected, Value = Detection Limit

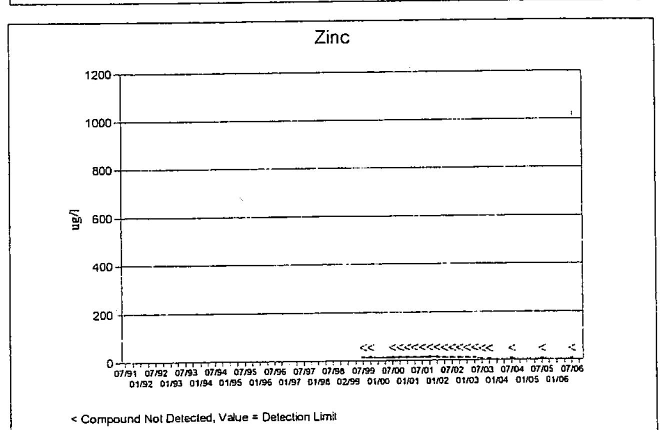

Hardness
mg/l


Iron
mg/l
< Compound Not Detected, Value = Detection Limit


Manganese
ug/l
< Compound Not Detected, Value = Detection Limit

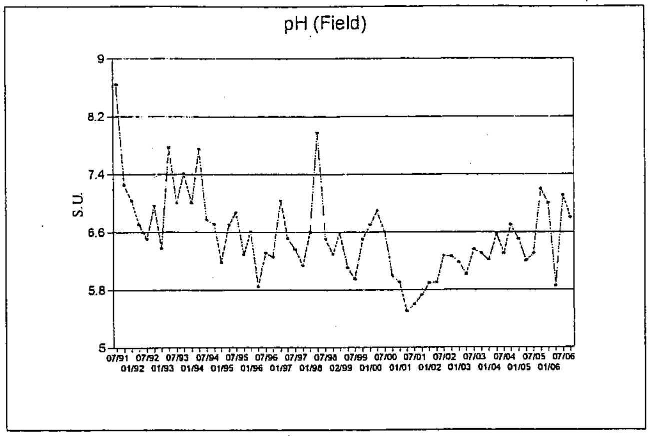

Sulfate
mg/l
< Compound Not Detected, Value = Detection Limit

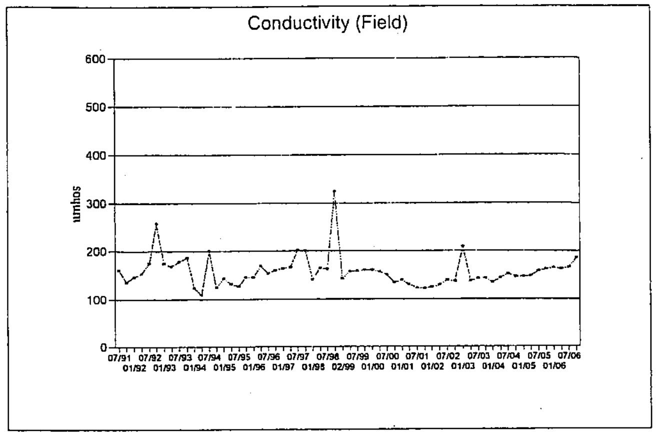

TDS
mg/l

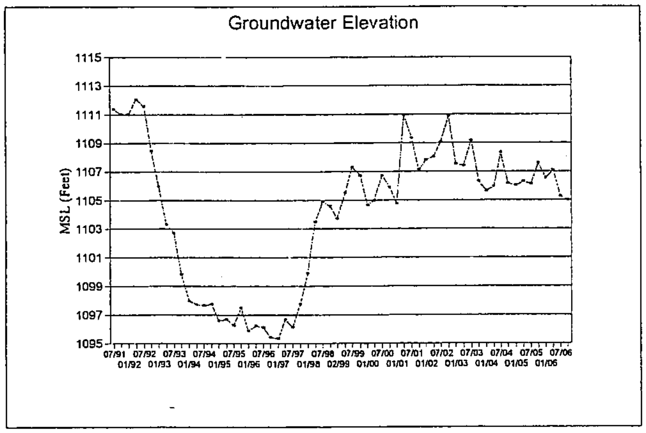

Zinc
ug/l
< Compound Not Detected, Value = Detection Limit

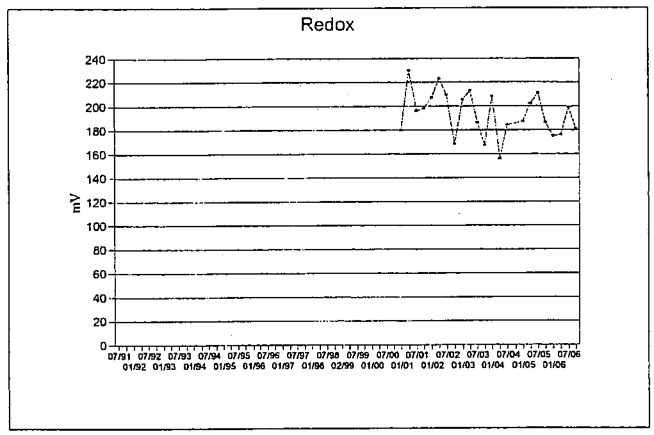
Flambeau Mining Company
Groundwater Quality Results

MW-1004S



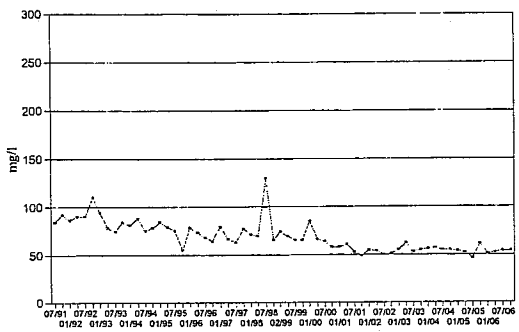



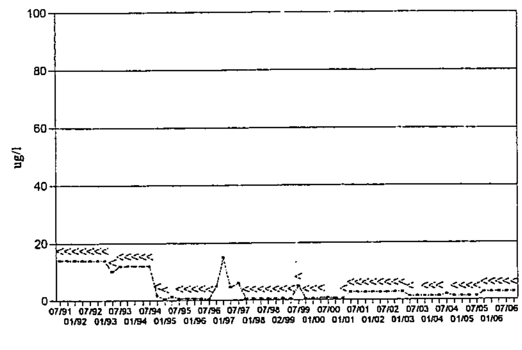



## MW-1005

Alkalinity

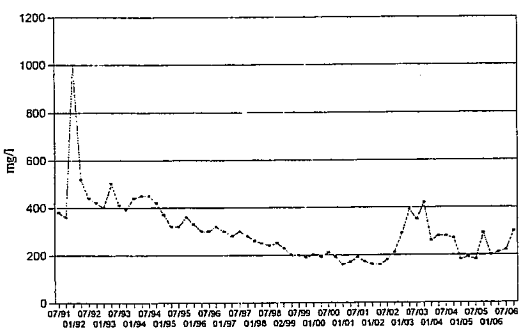



Copper

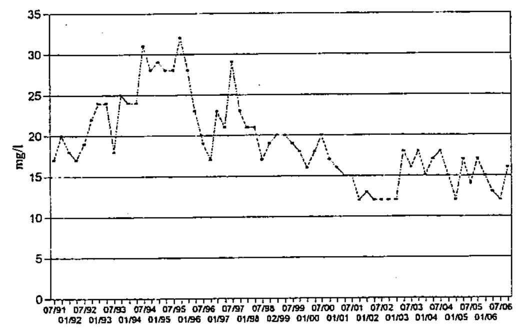



< Compound Not Detected, Value = Detection Limit

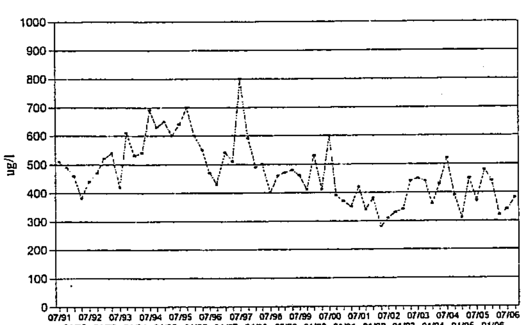
Hardness



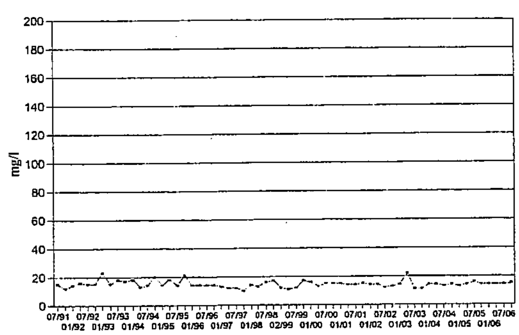

Iron



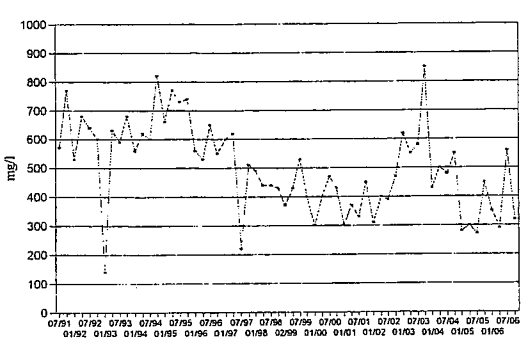

Manganese



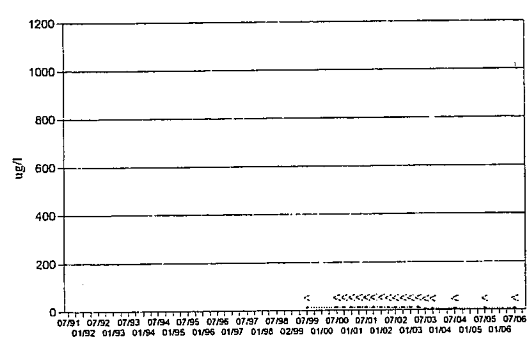

Sulfate




TDS




Zinc

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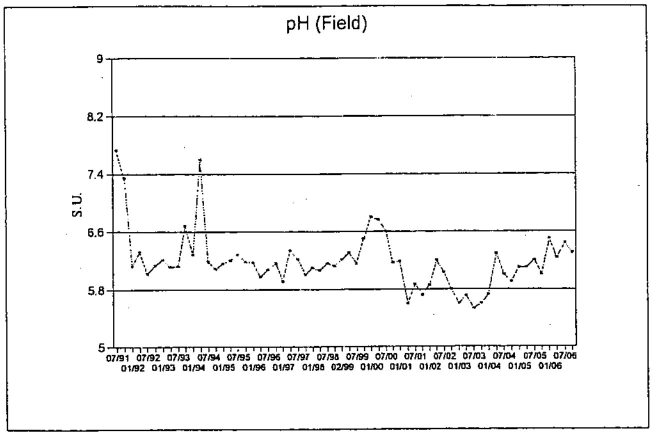
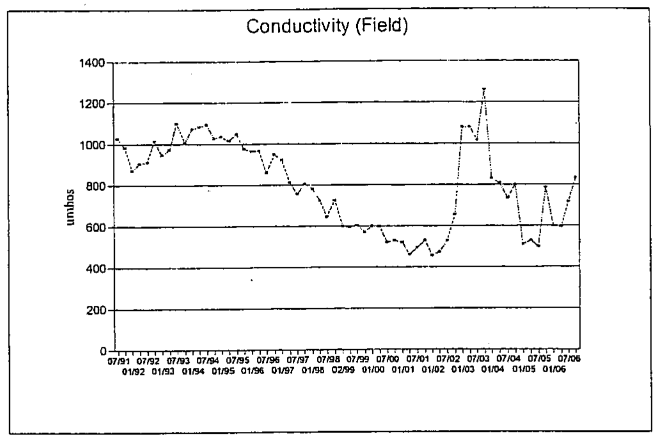
MW-1005


pH (Field)
S.U.
9
8.2
7.4
6.6
5.8
5
07/91 07/92 07/93 07/94 07/95 07/96 07/97 07/98 07/99 07/00 07/01 07/02 07/03 07/04 07/05 07/06
01/92 01/93 01/94 01/95 01/96 01/97 01/98 02/99 01/00 01/01 01/02 01/03 01/04 01/05 01/06


Conductivity (Field)
umhos
1400
1200
1000
800
600
400
200
0
07/91 07/92 07/93 07/94 07/95 07/96 07/97 07/98 07/99 07/00 07/01 07/02 07/03 07/04 07/05 07/06
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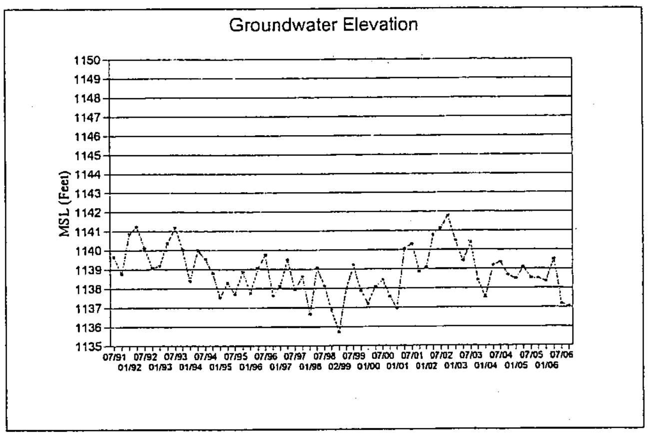
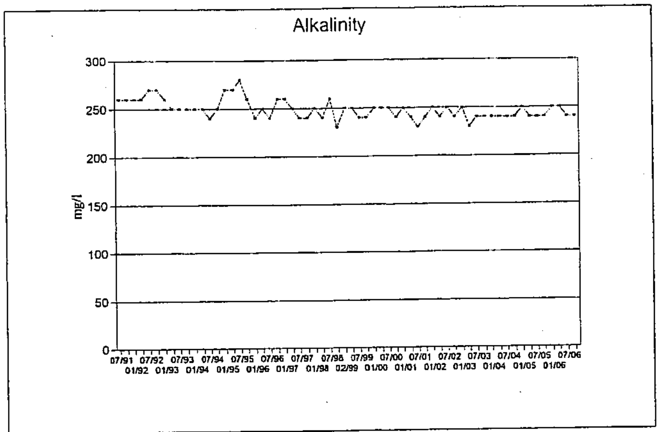
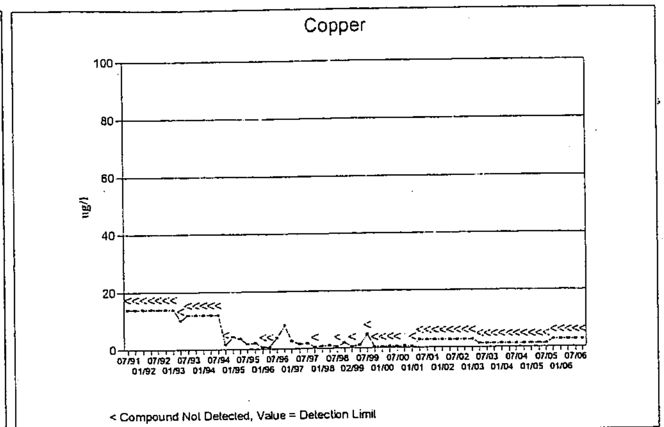
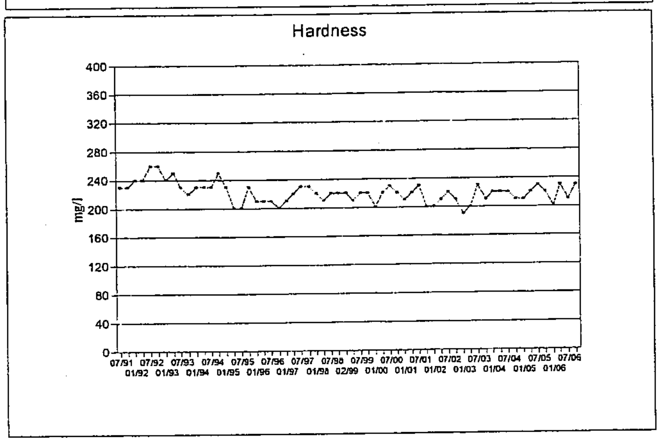
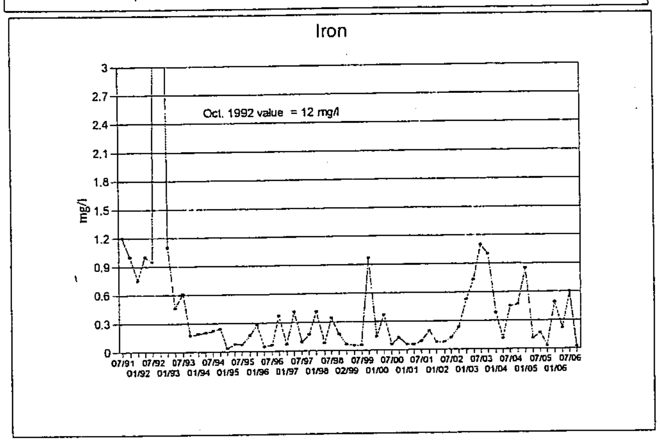

Groundwater Elevation
MSL (Feet)
1150
1149
1148
1147
1146
1145
1144
1143
1142
1141
1140
1139
1138
1137
1136
1135
07/91 07/92 07/93 07/94 07/95 07/96 07/97 07/98 07/99 07/00 07/01 07/02 07/03 07/04 07/05 07/06
01/92 01/93 01/94 01/95 01/96 01/97 01/98 02/99 01/00 01/01 01/02 01/03 01/04 01/05 01/06

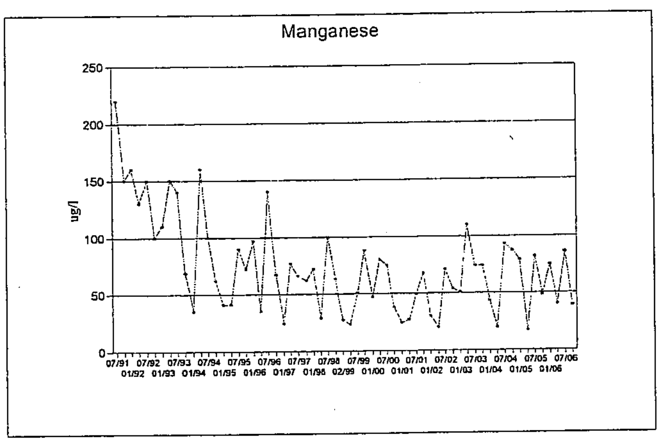
MW-1005P

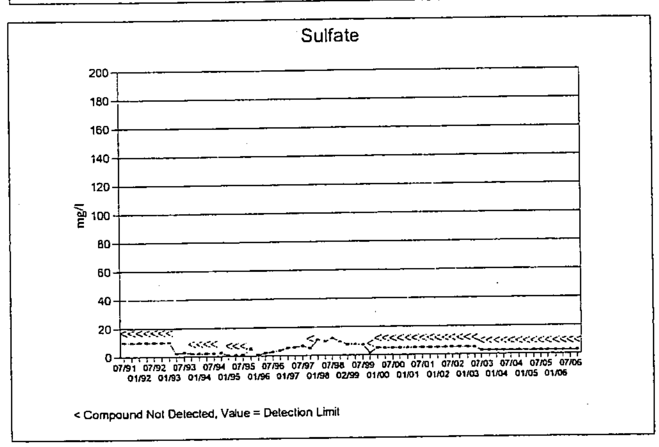

Alkalinity
mg/l

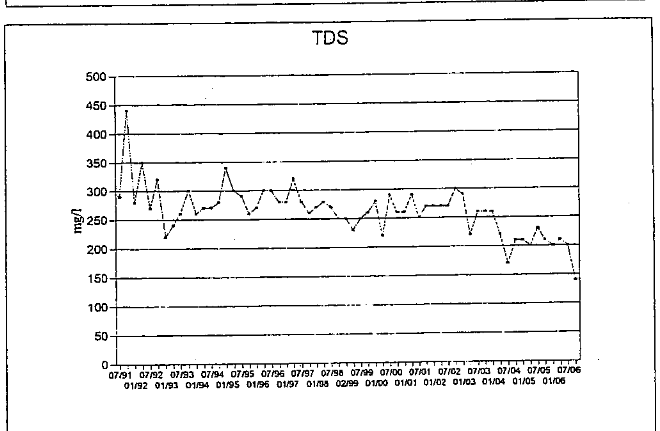

Copper
ug/l
< Compound Not Detected, Value = Detection Limit

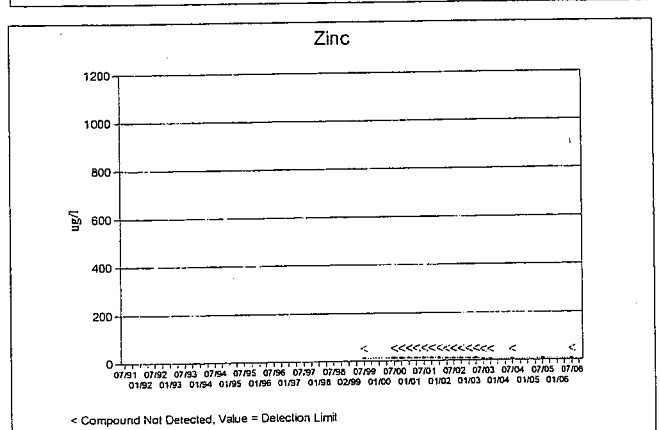

Hardness
mg/l


Iron
mg/l
Oct. 1992 value = 12 mg/l

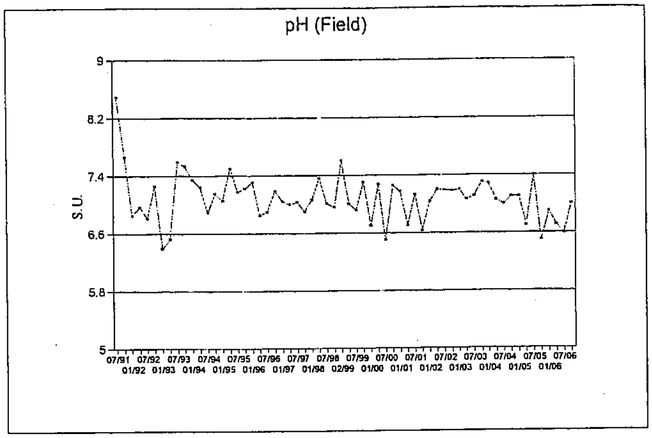

Manganese
ug/l

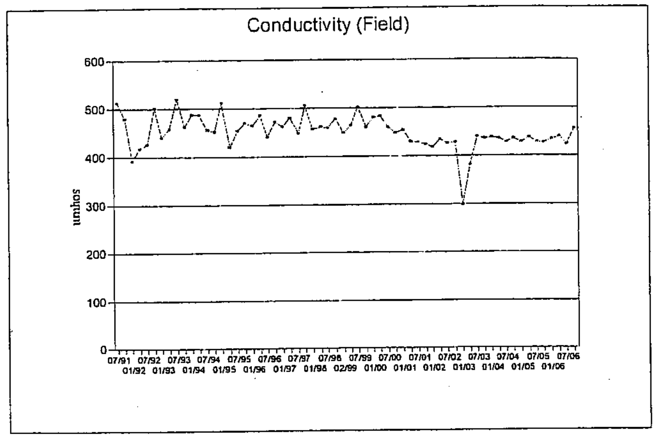

Sulfate
mg/l
< Compound Not Detected, Value = Detection Limit

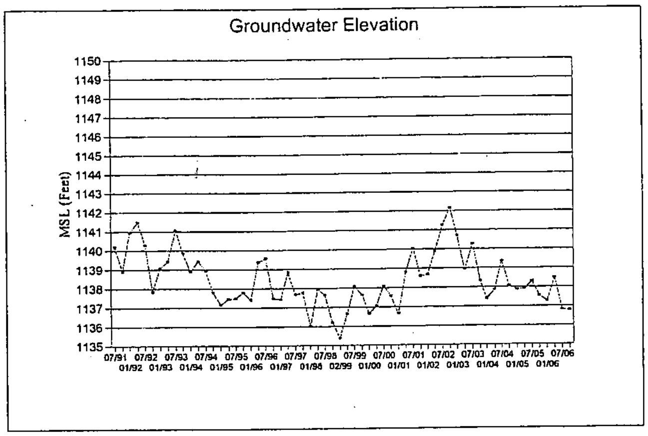

TDS
mg/l

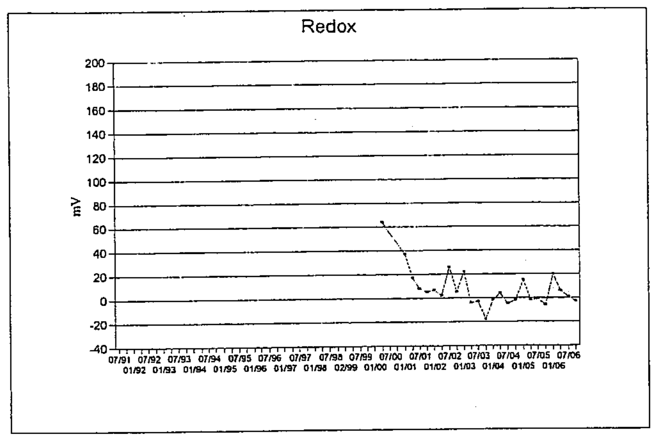

Zinc
ug/l
< Compound Not Detected, Value = Detection Limit

MW-1005P

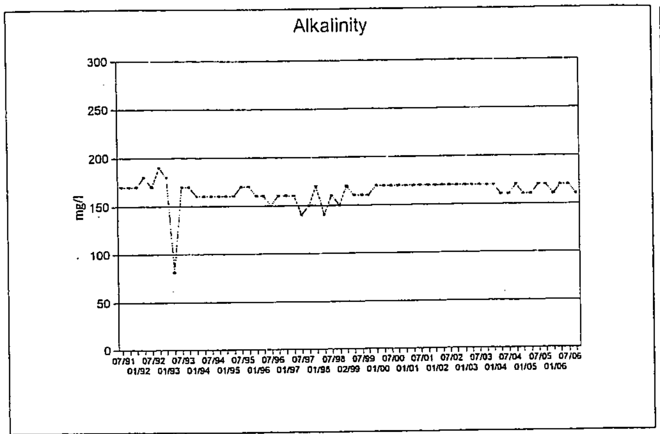

pH (Field)
S.U.
9
8.2
7.4
6.6
5.8
5

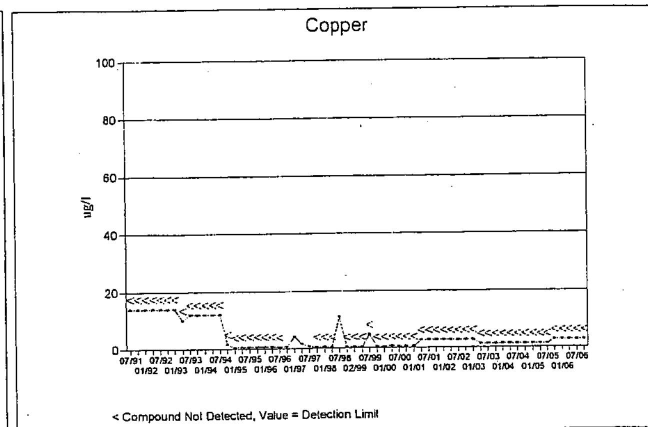

Conductivity (Field)
umhos
600
500
400
300
200
100
0

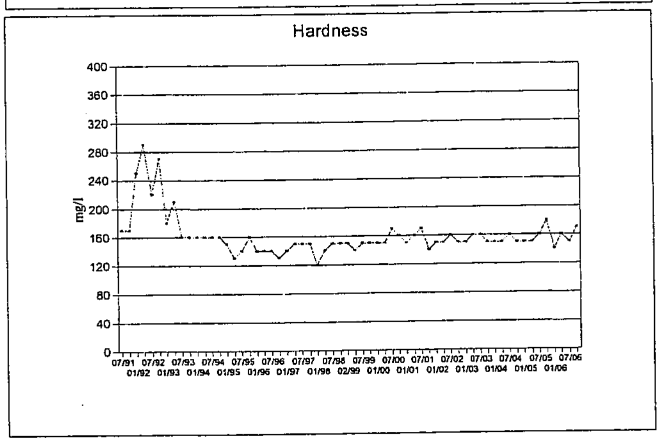

Groundwater Elevation
MSL (Feet)
1150
1149
1148
1147
1146
1145
1144
1143
1142
1141
1140
1139
1138
1137
1136
1135

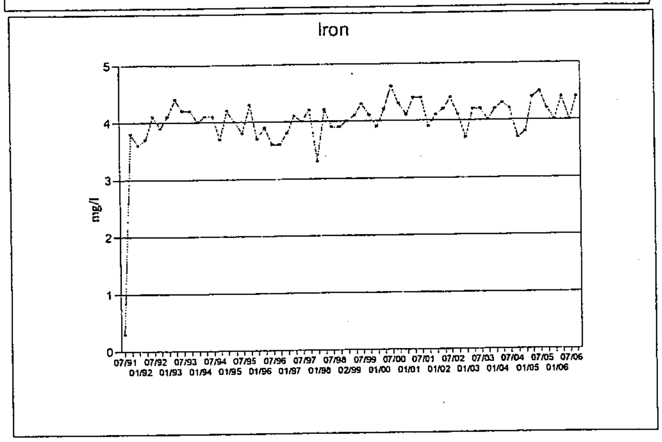

Redox
mV
200
180
160
140
120
100
80
60
40
20
0
-20
-40

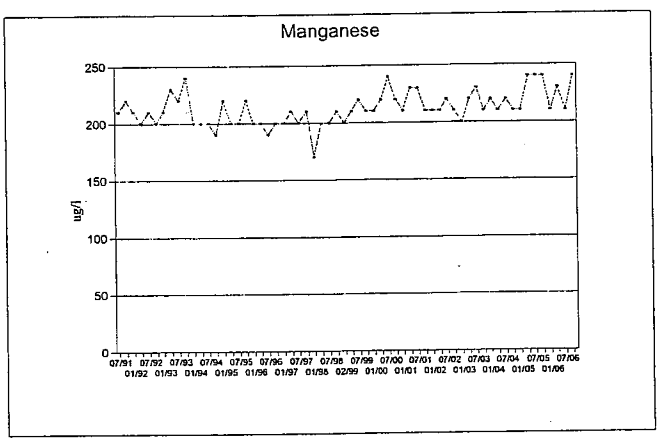
## MW-1005S

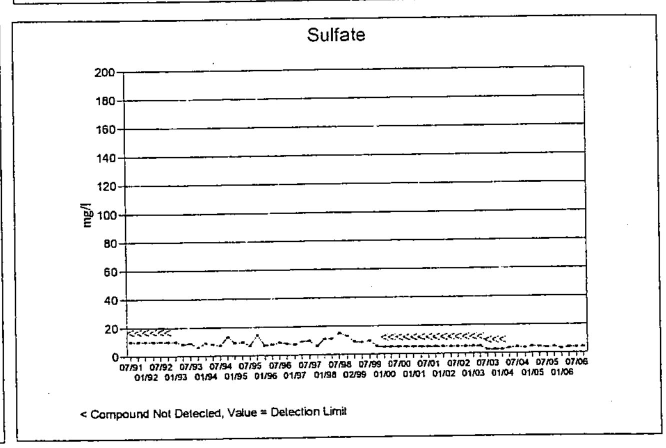


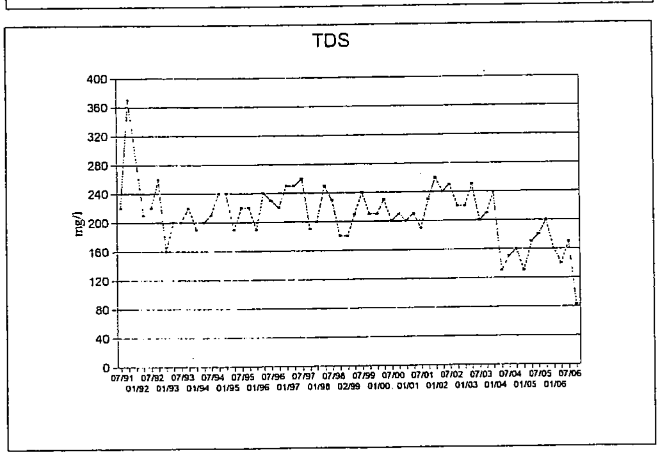



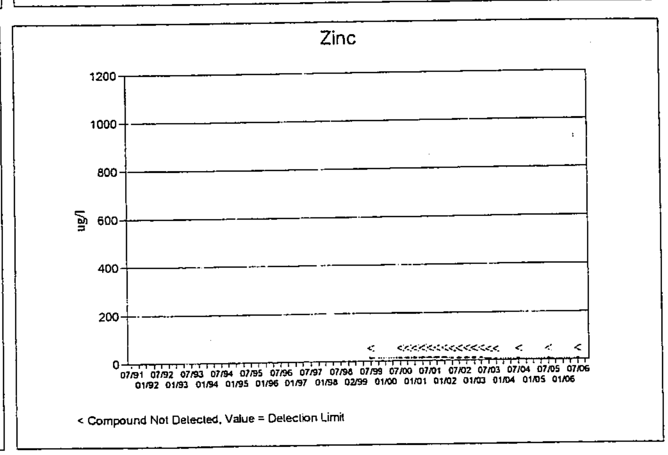



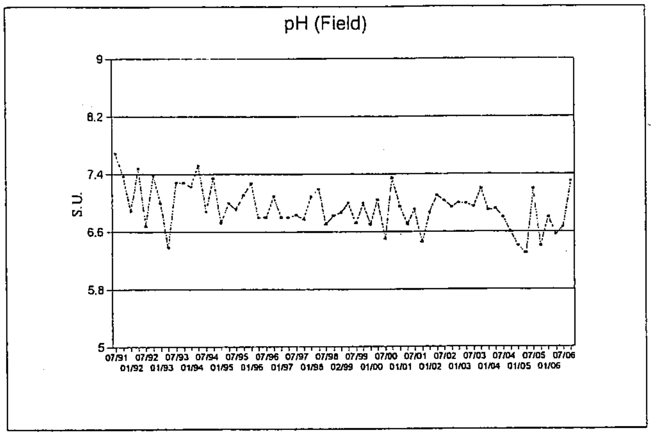



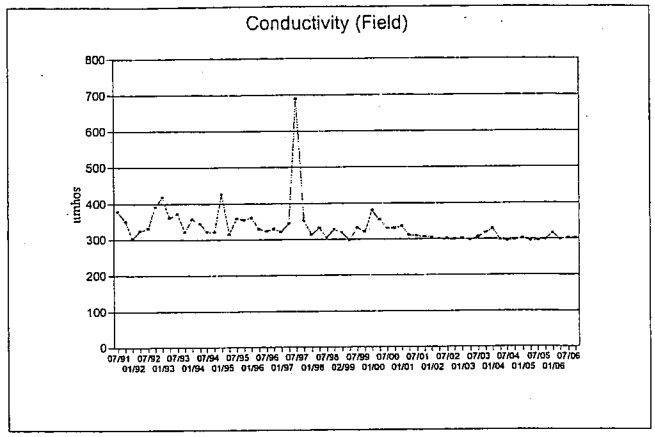



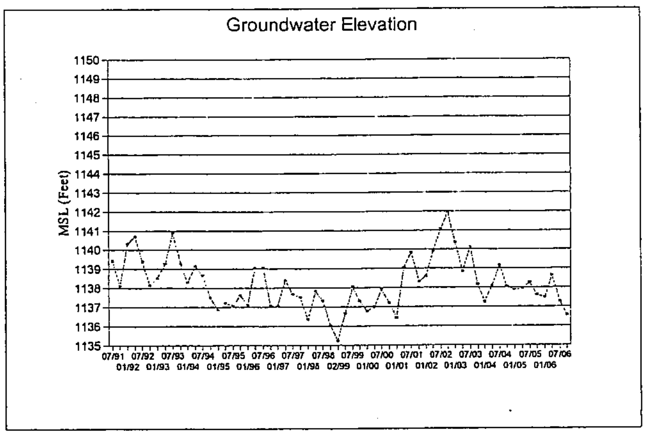


Created By: SGL Checked By: DAT

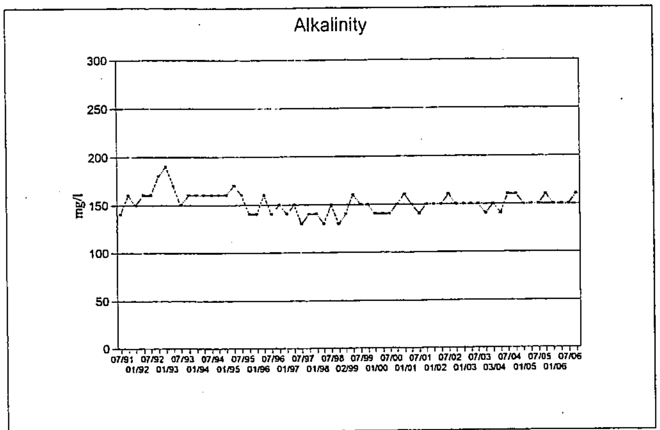
## MW-1005S

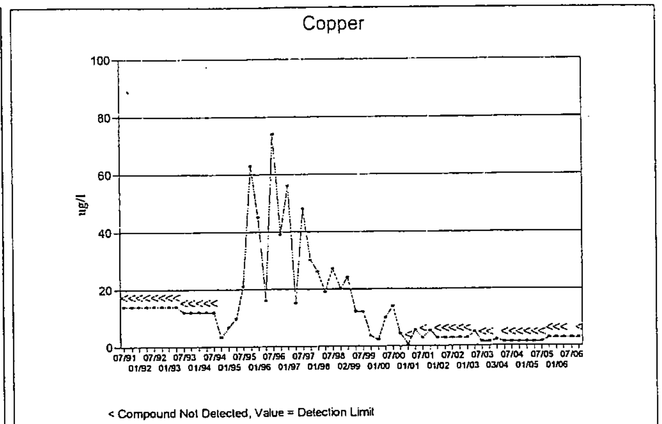

pH (Field)
S.U.


Conductivity (Field)
umhos


Groundwater Elevation
MSL (Feet)

## MW-1010P


Alkalinity
mg/l


Copper
ug/l
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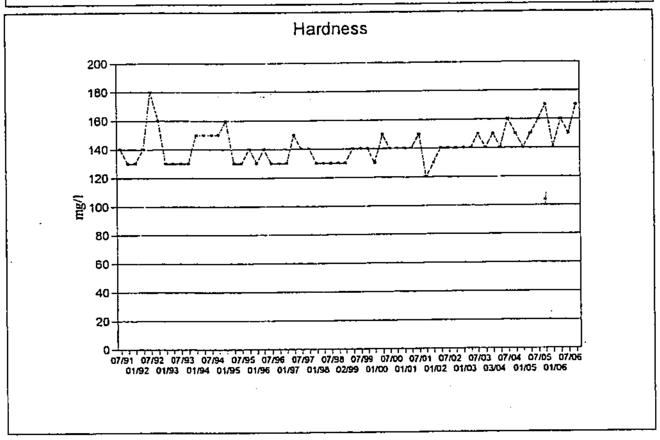
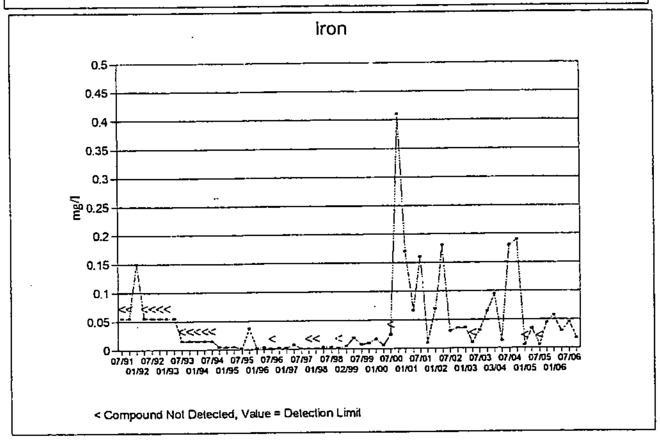

Hardness
mg/l


Iron
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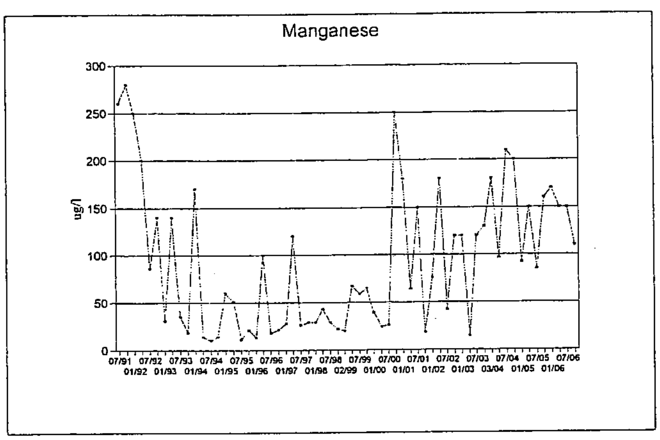
Manganese
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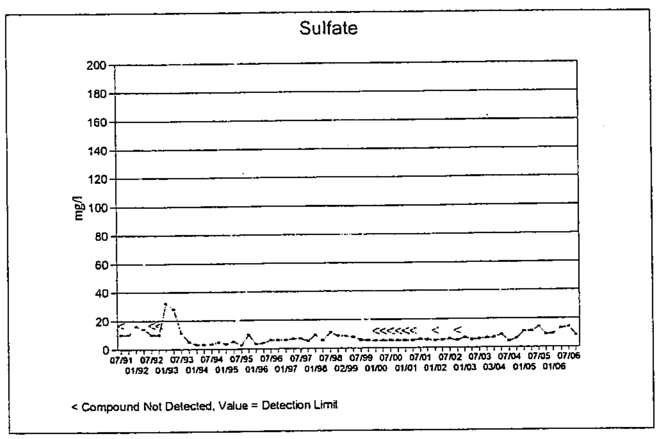
Sulfate
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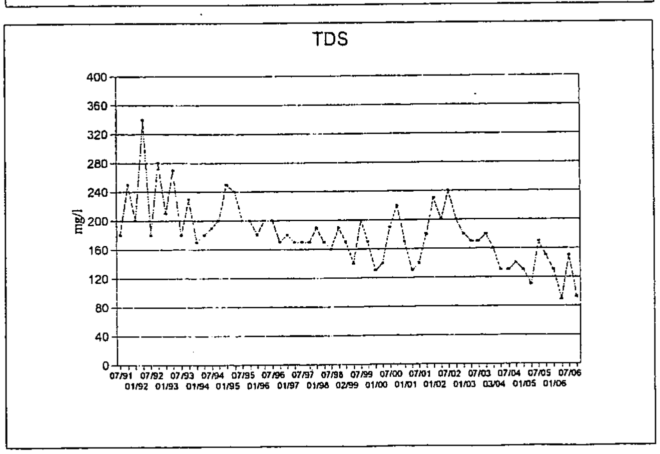
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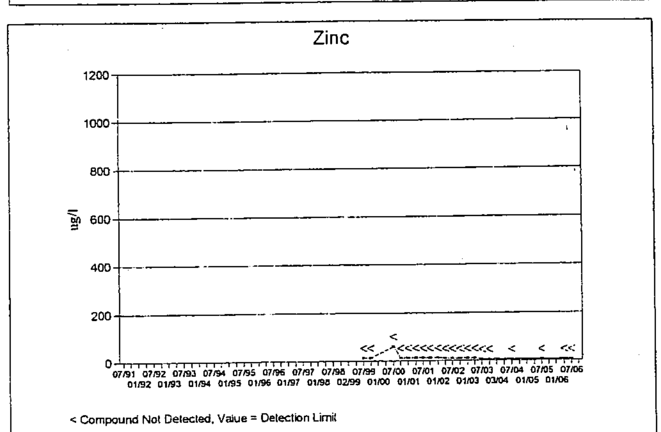
Zinc
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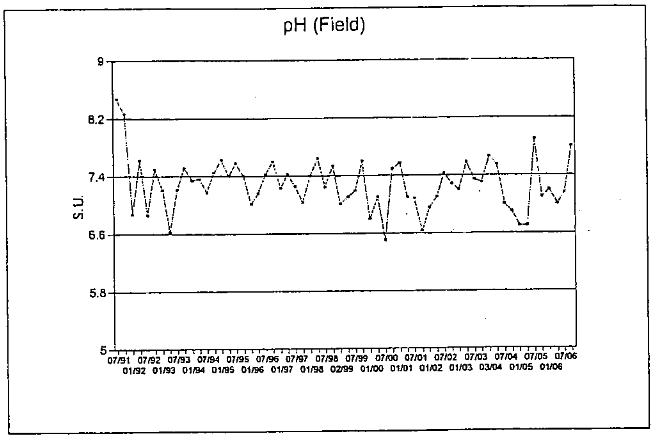
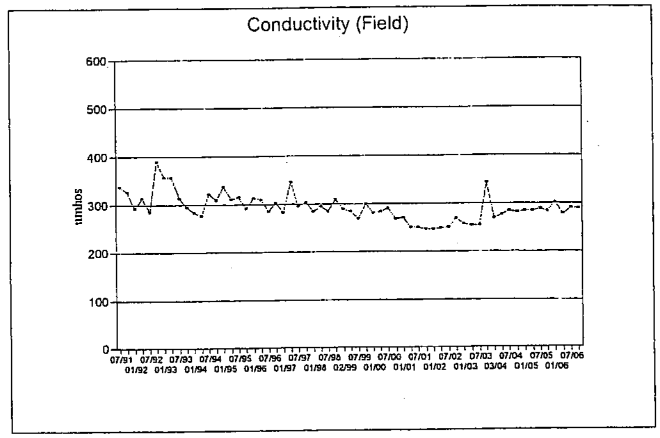
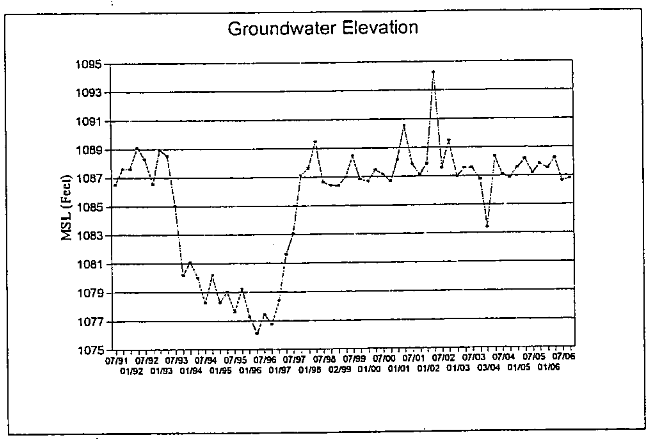
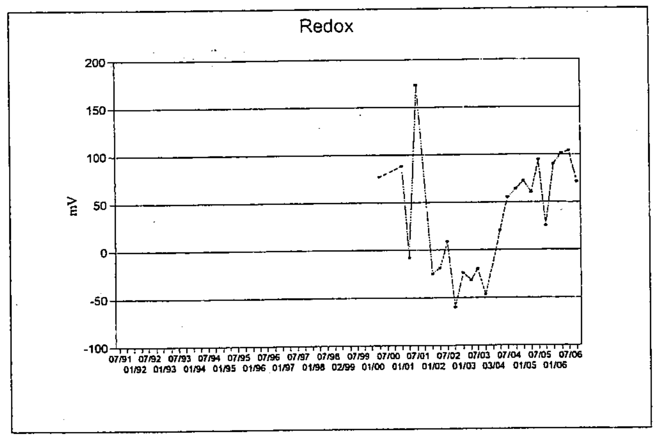
# Flambeau Mining Company
# Groundwater Quality Results

## MW-1010P



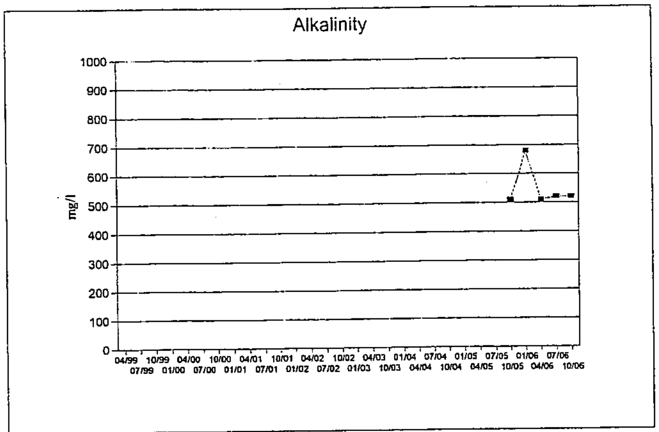



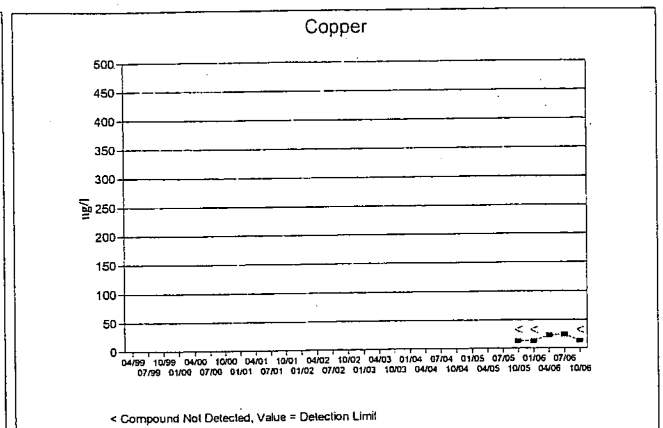



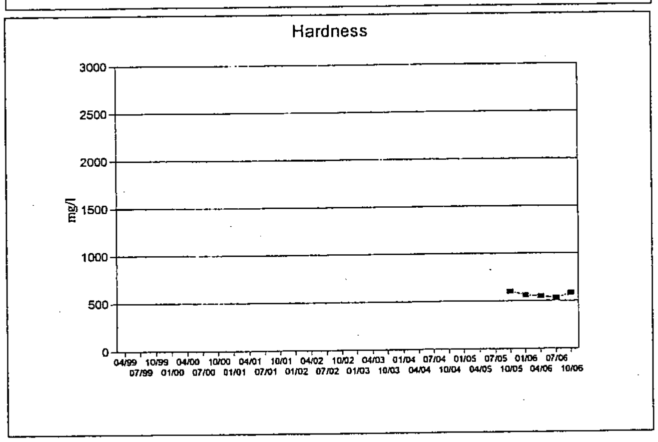



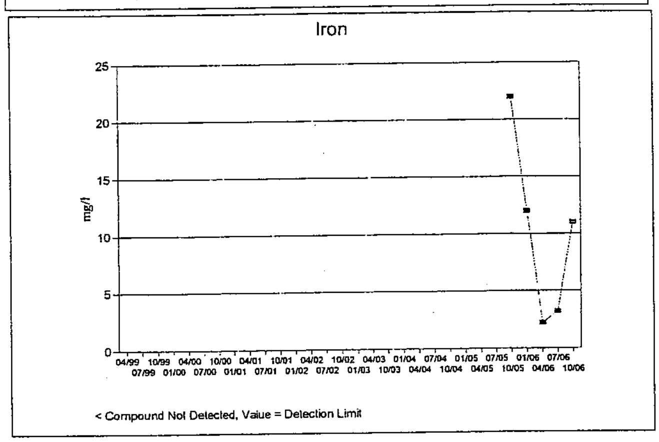
Flambeau Mining Company
Groundwater Quality Results

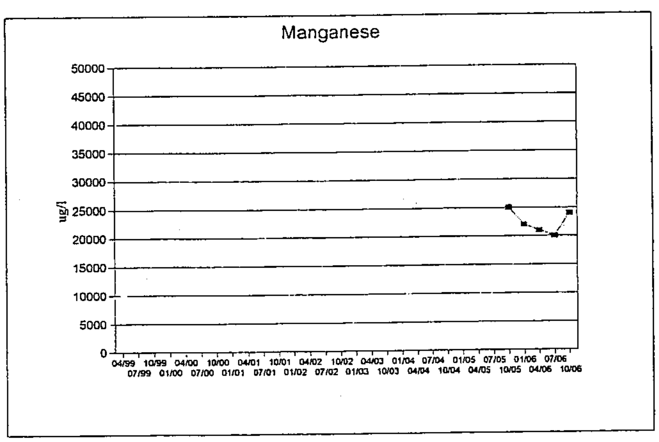
MW-1013 (In-Pit Well)

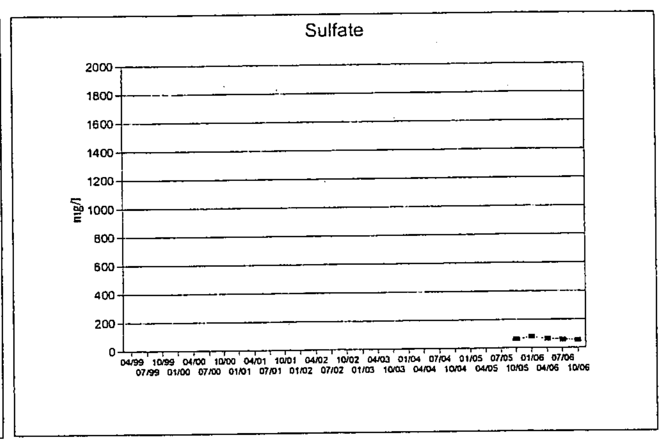


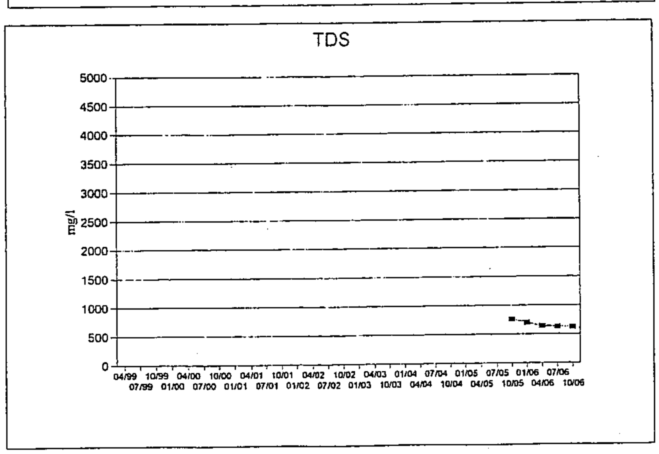



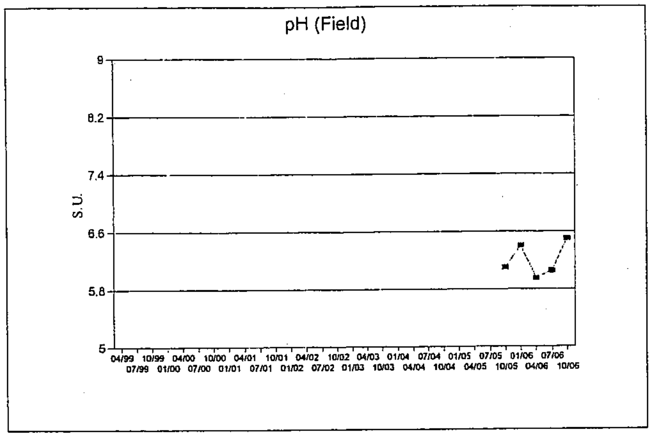



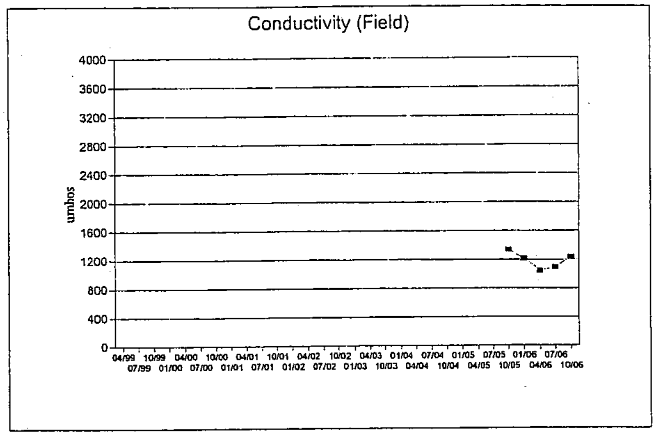



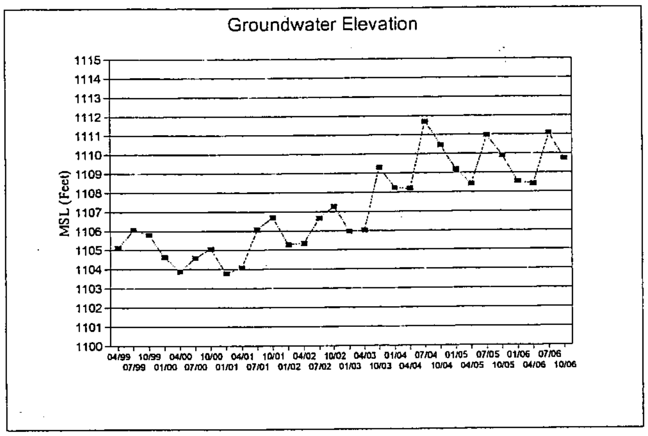



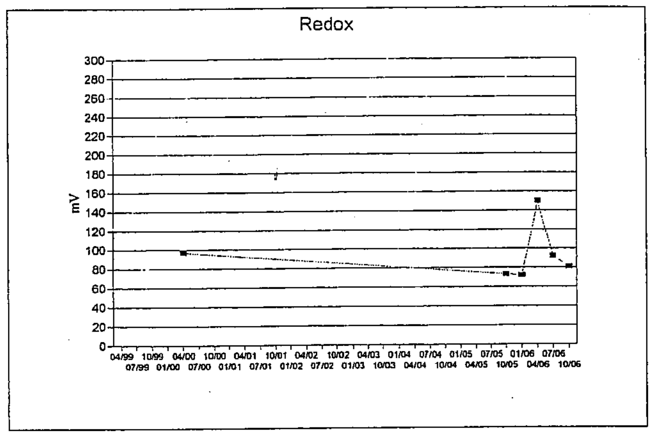



MW-1013 (In-Pit Well)



Flambeau Mining Company
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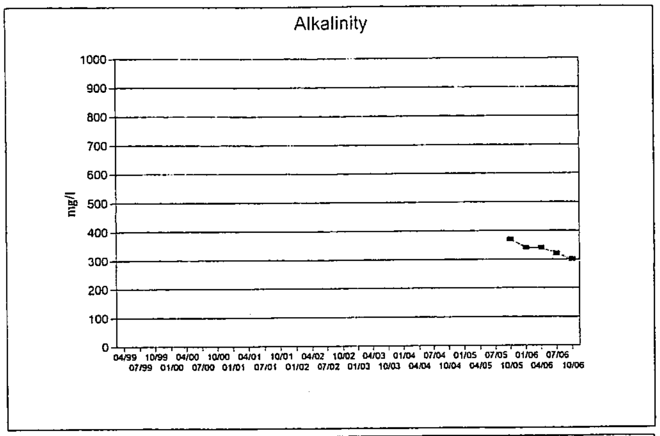
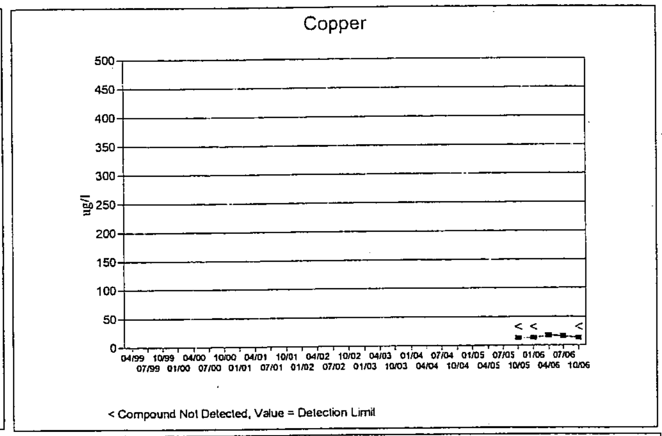
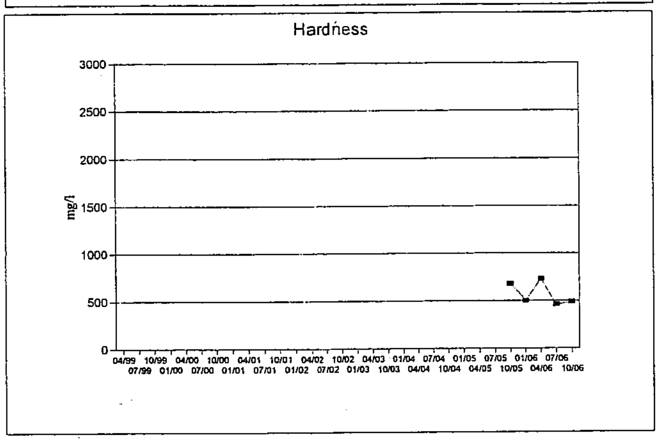
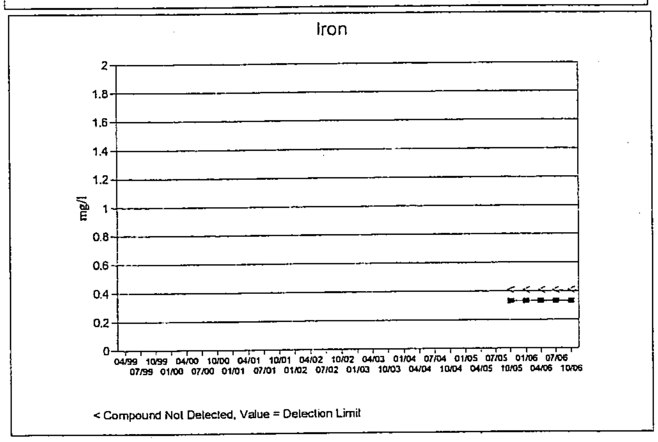
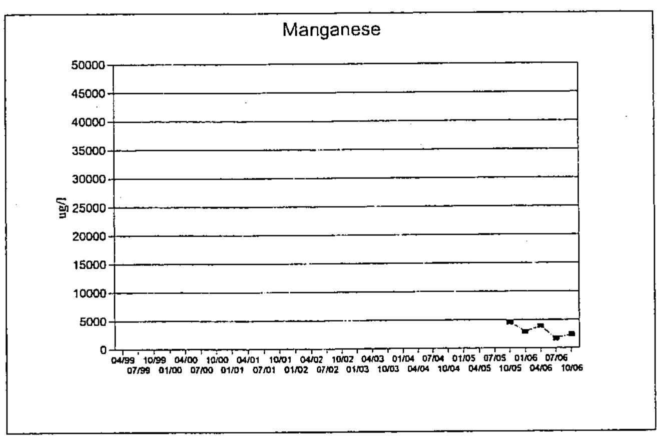
MW-1013A (In-Pit Well)

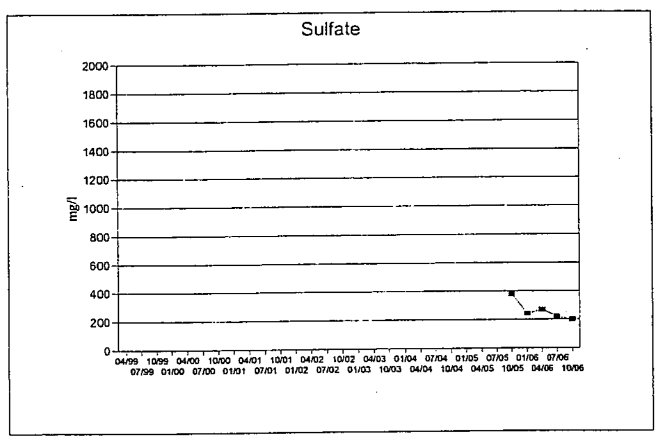


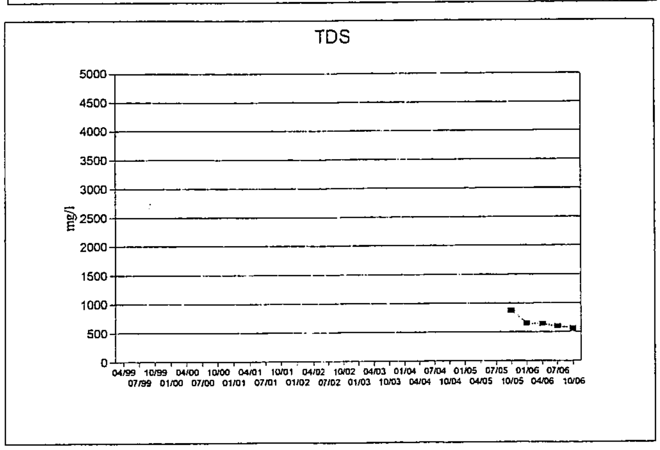



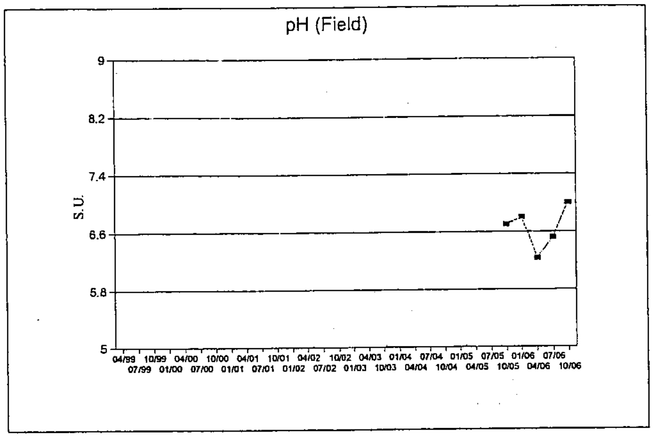



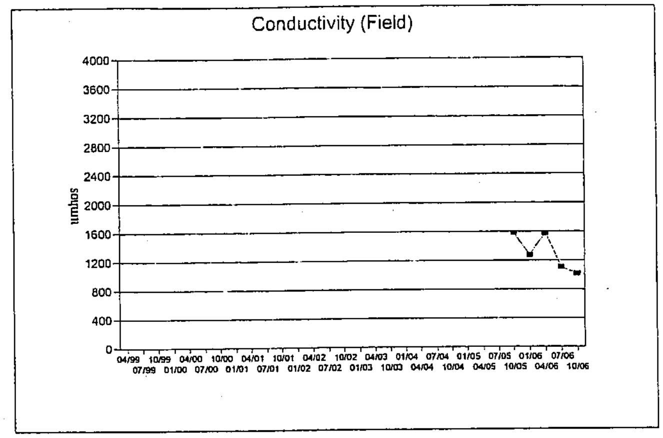



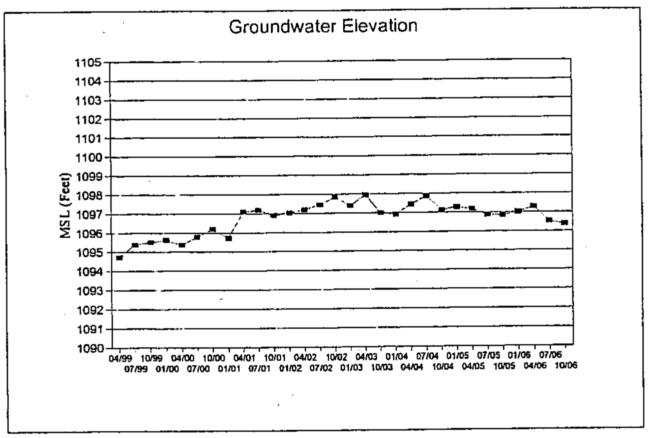



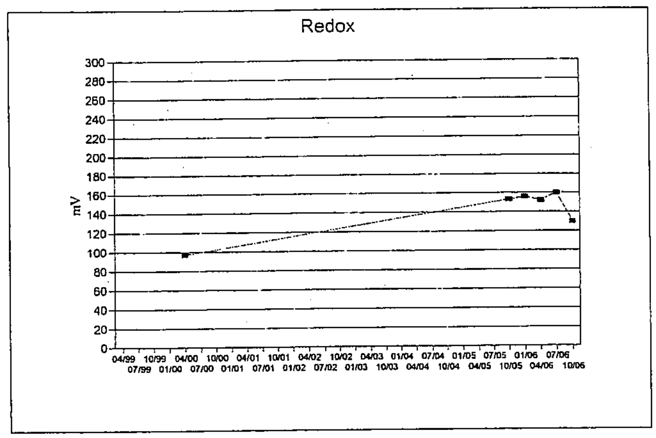
Flambeau Mining Company
Groundwater Quality Results

MW-1013A (In-Pit Well)



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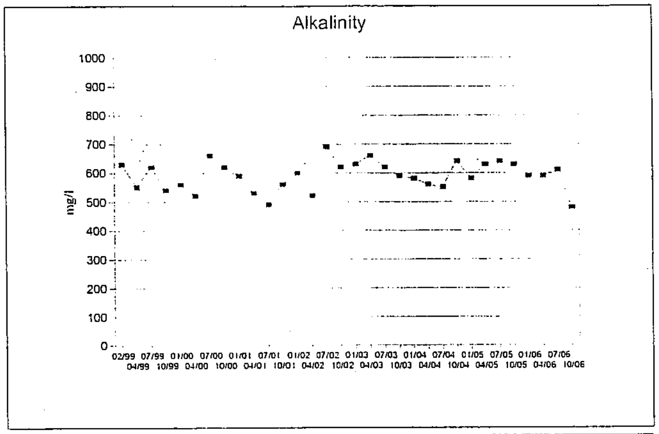


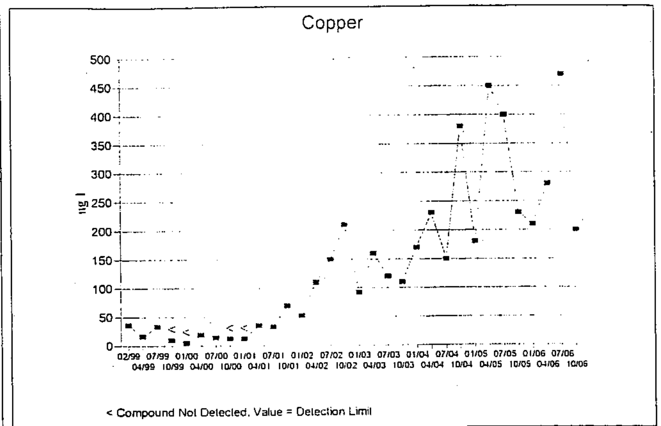


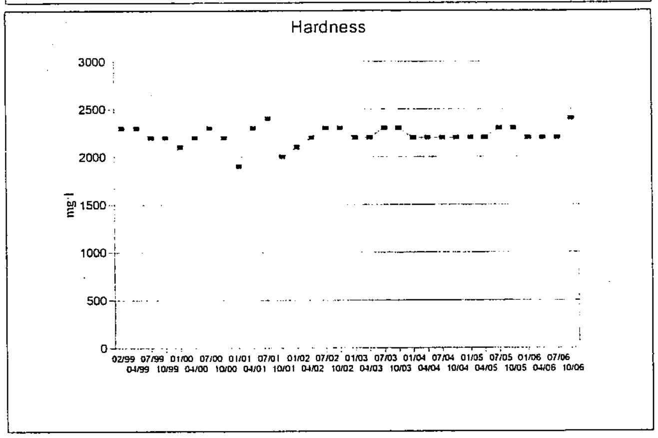


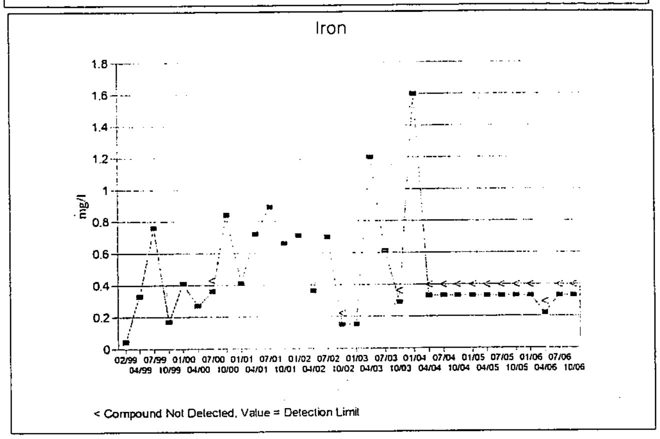


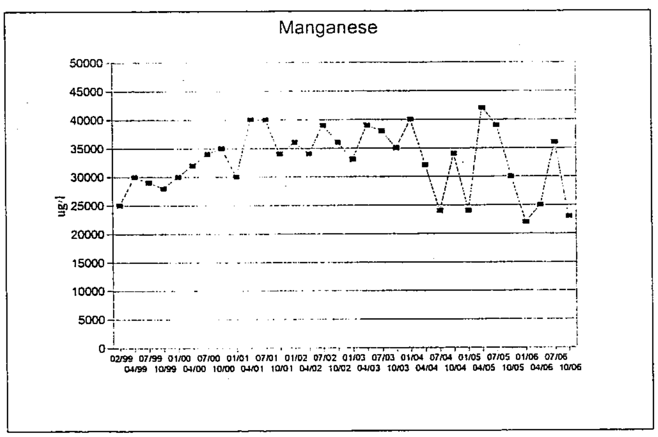


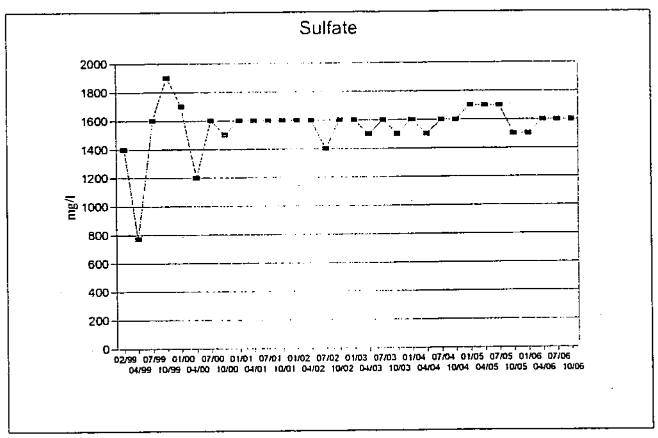


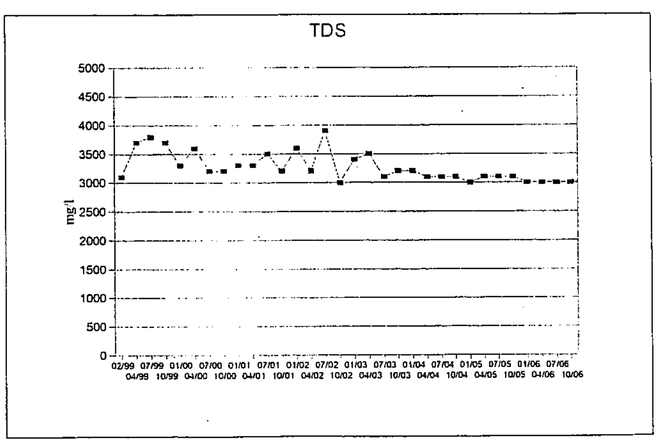


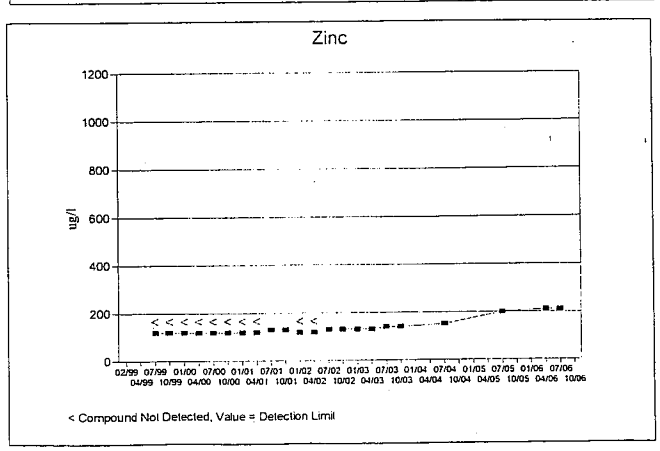

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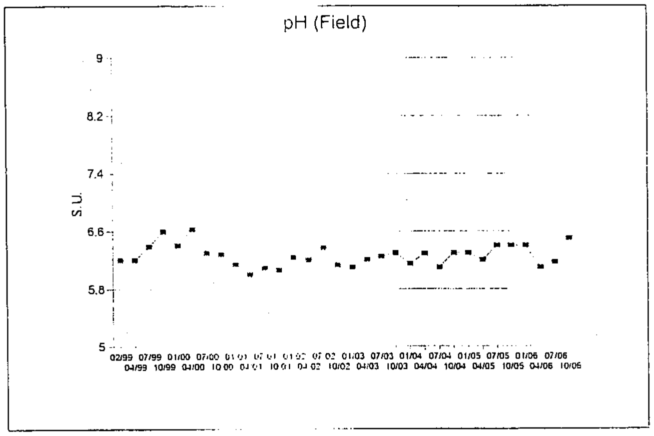


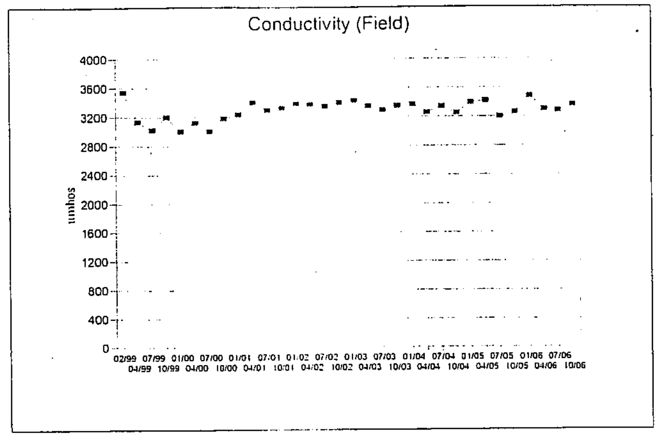


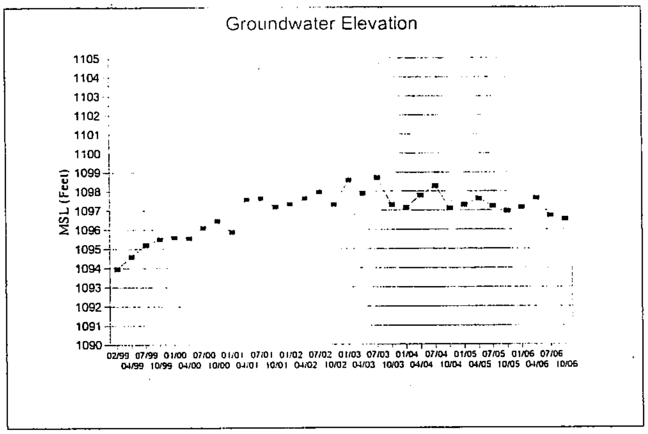


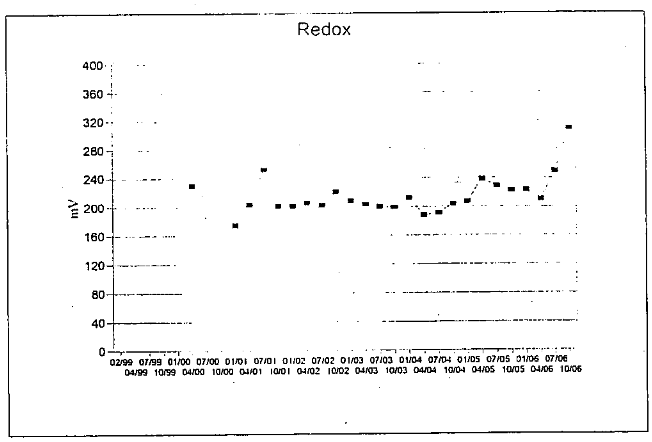

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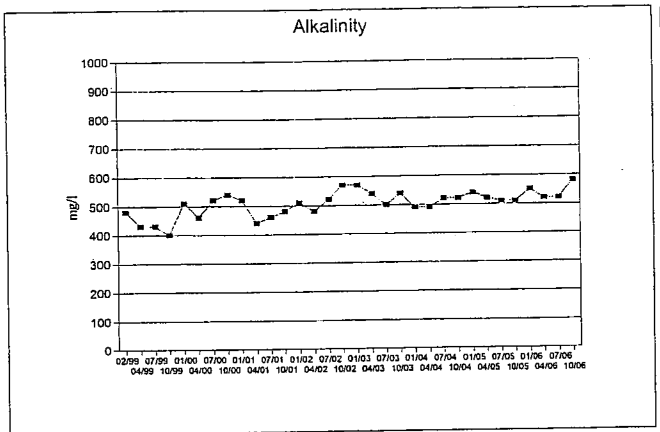
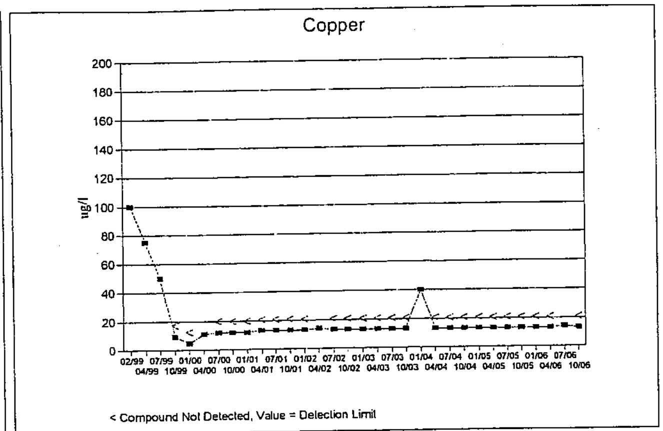
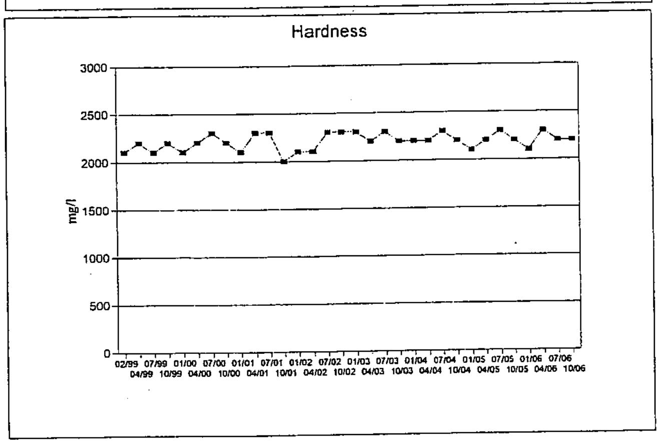
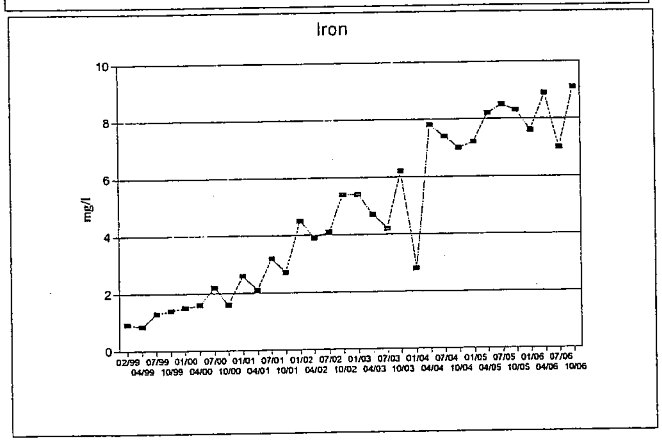
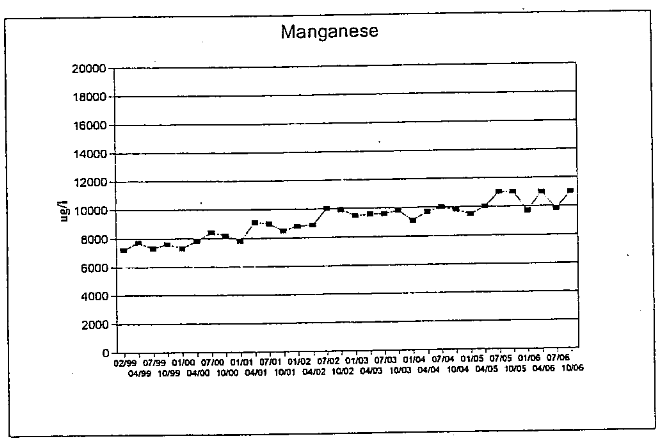
MW-1013C (In-Pit Well)

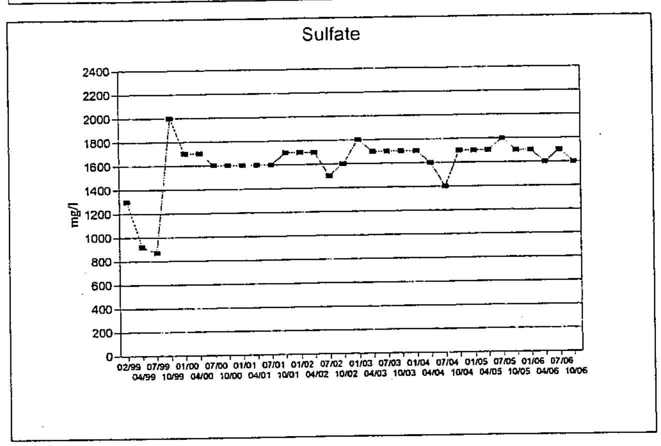


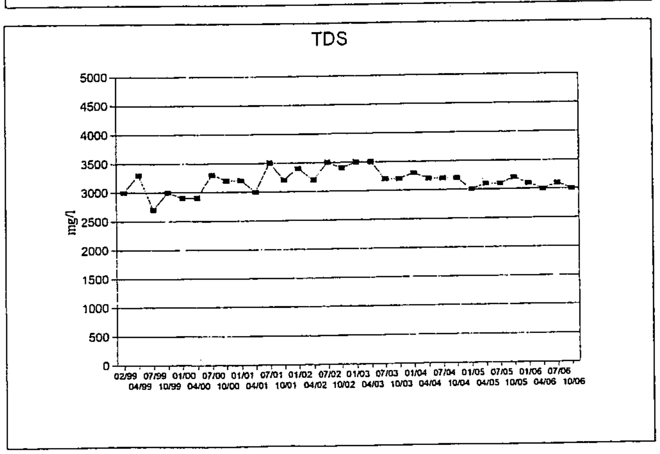



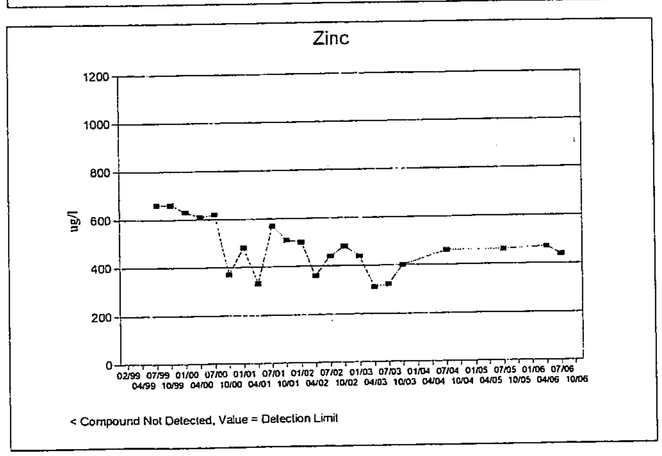





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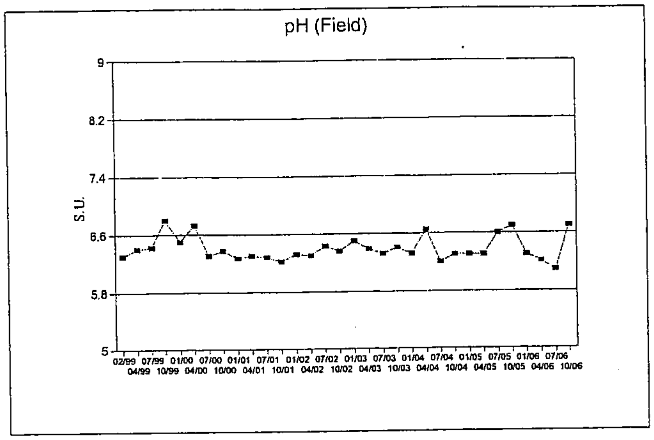
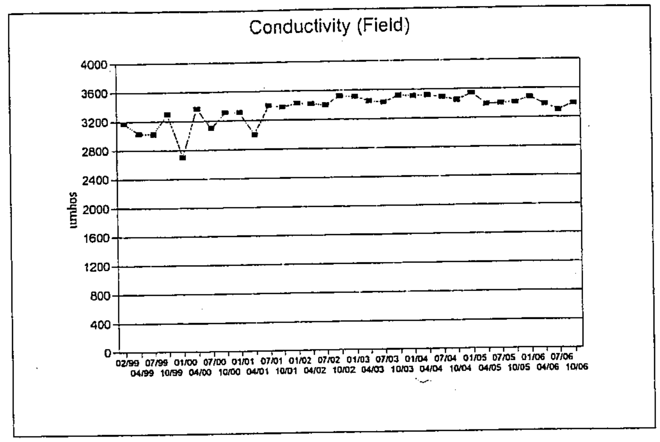
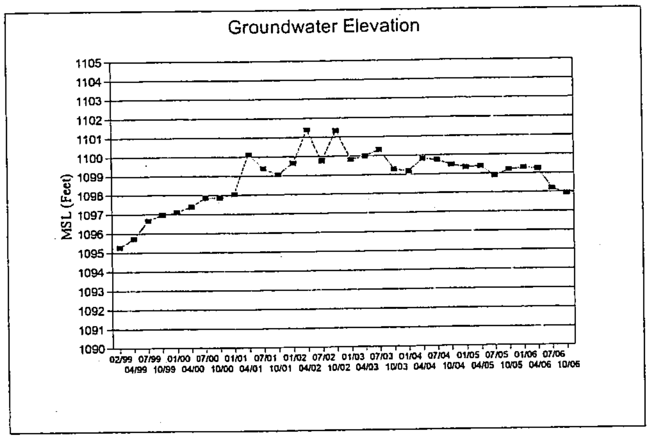
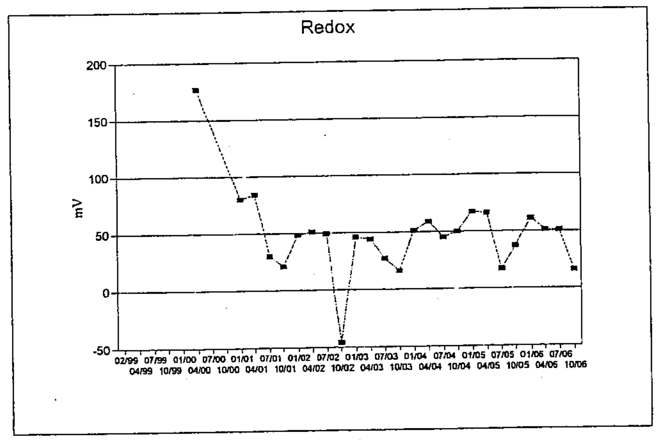
MW-1013C (In-Pit Well)



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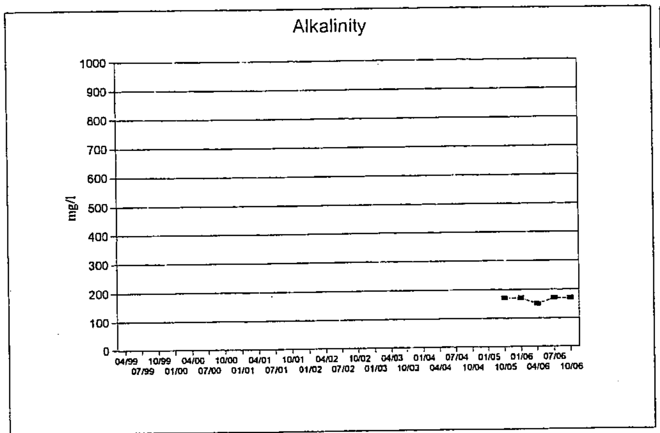


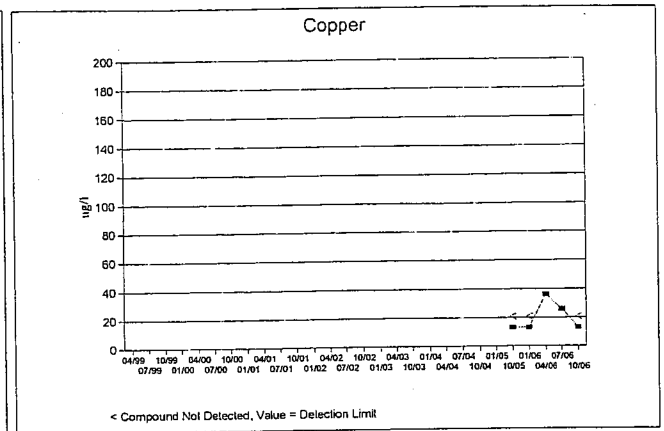


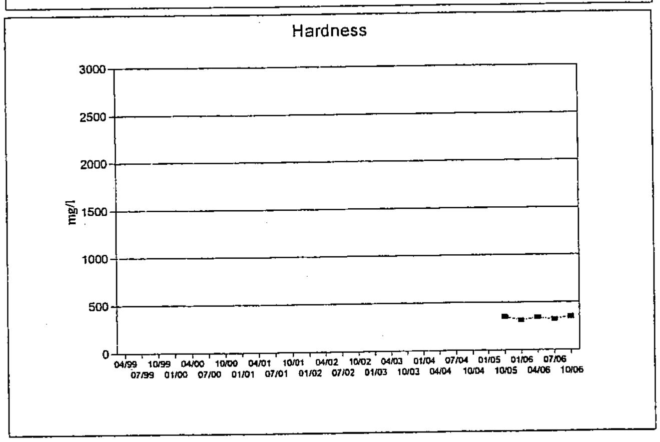


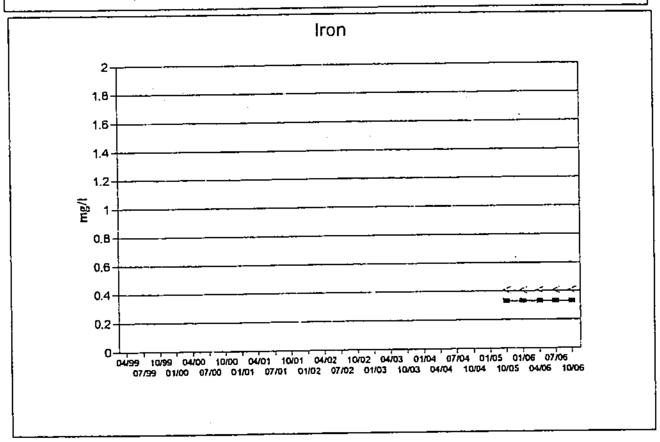


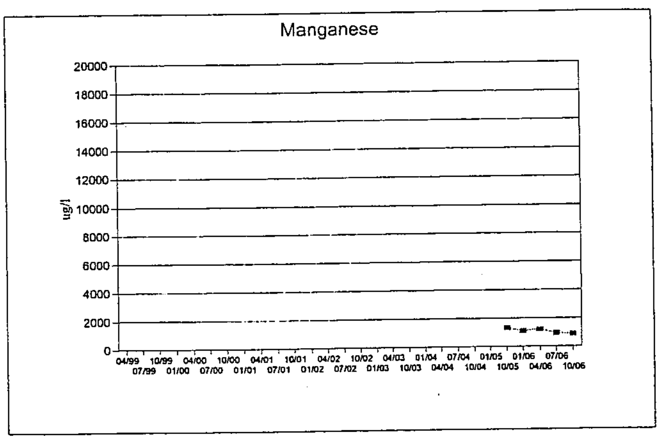


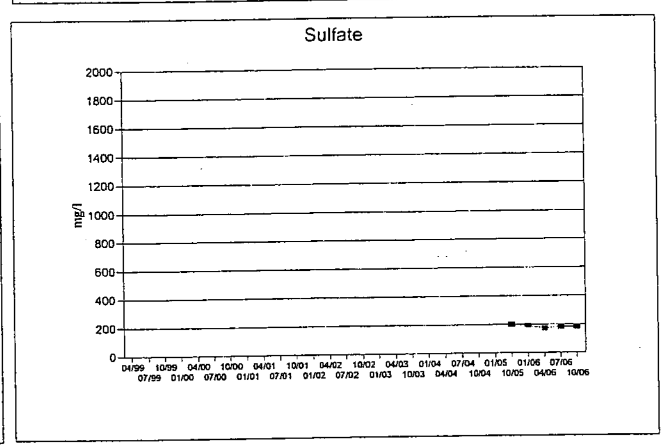


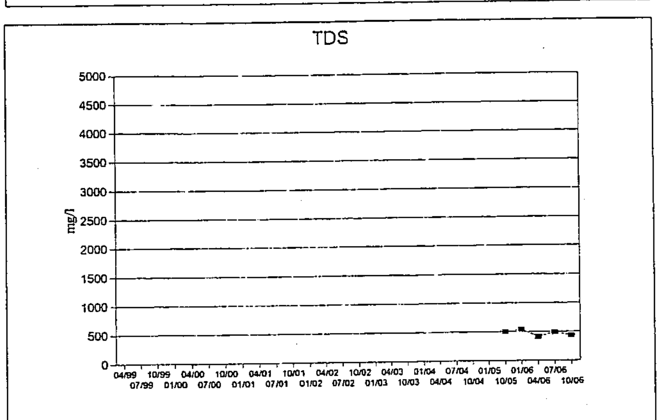

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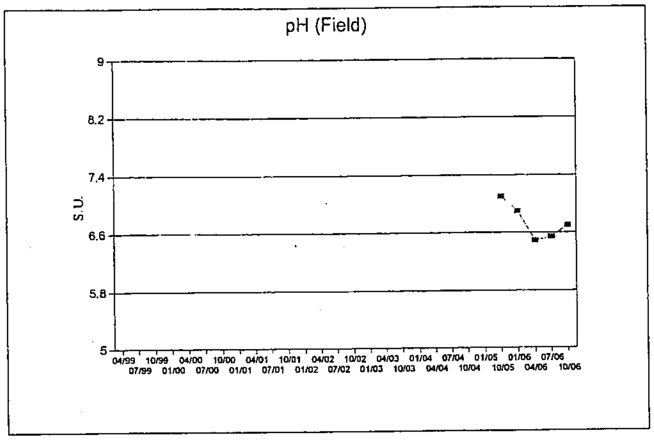
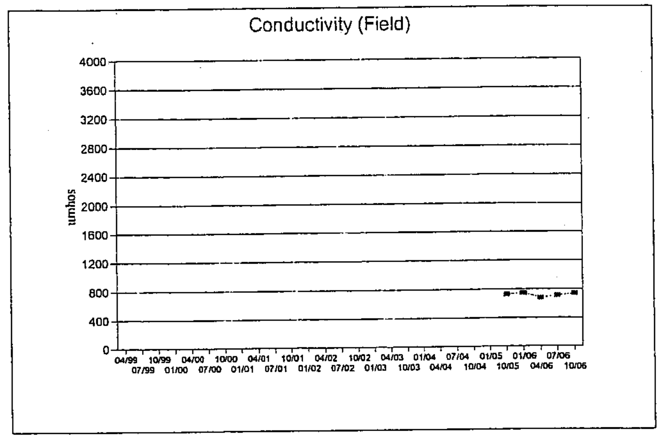
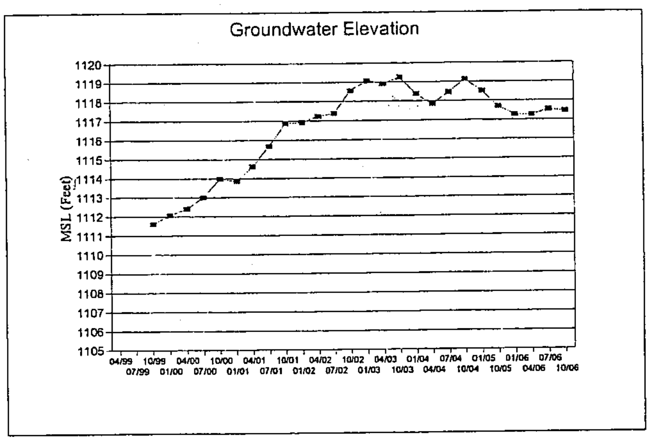
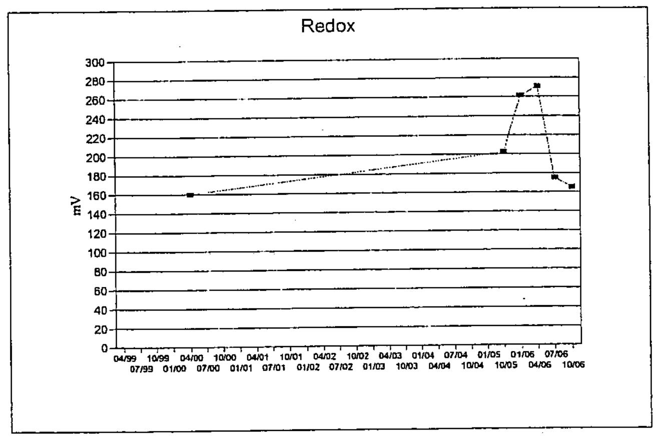
## Groundwater Quality Results

### MW-1014 (In-Pit Well)



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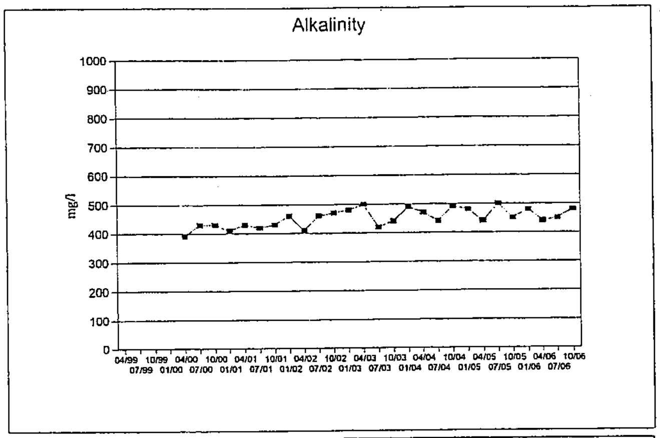
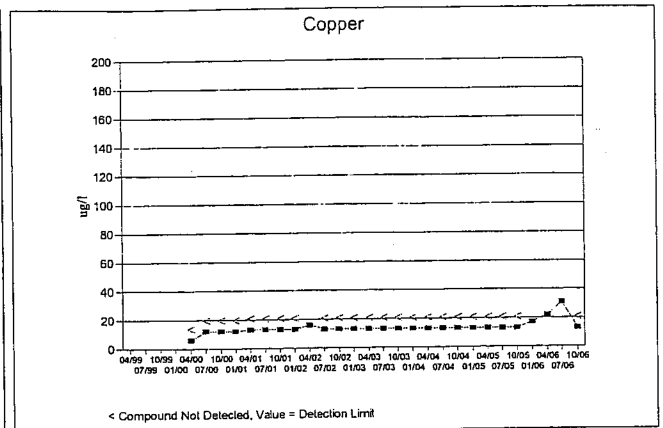
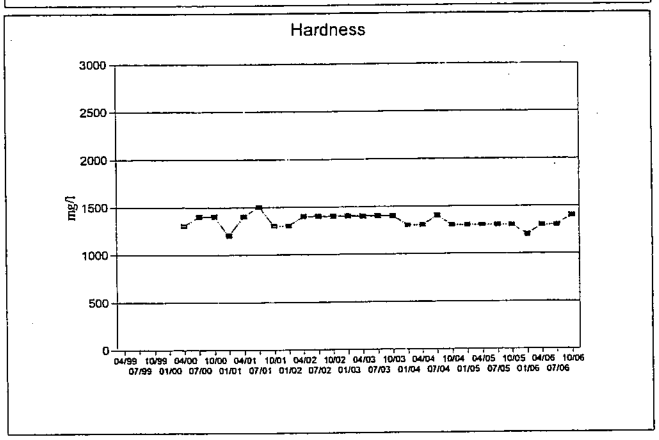
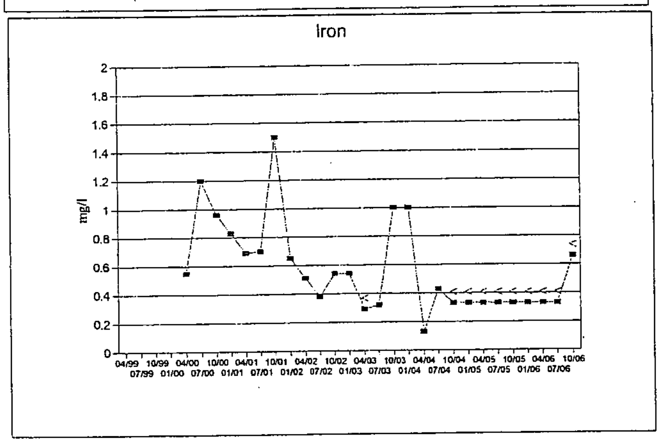
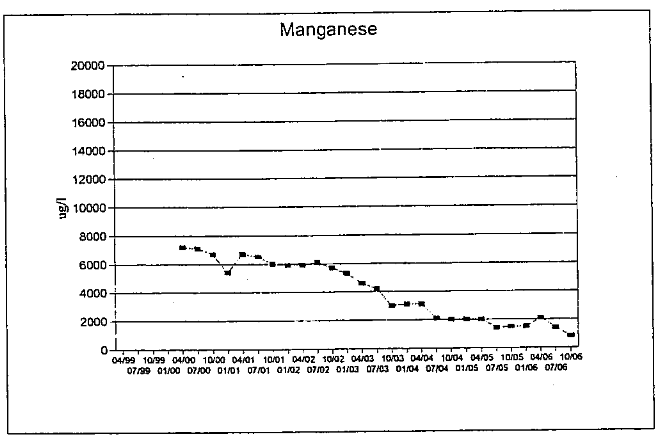
MW-1014A (In-Pit Well)

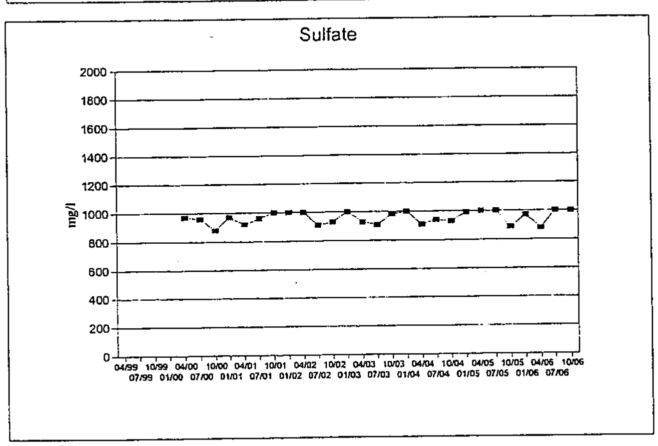


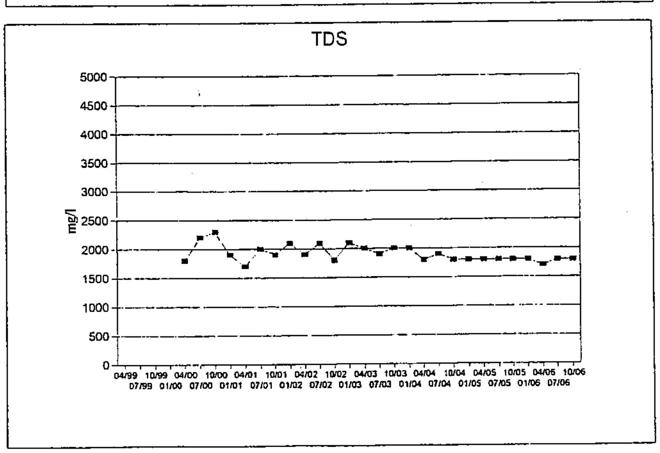



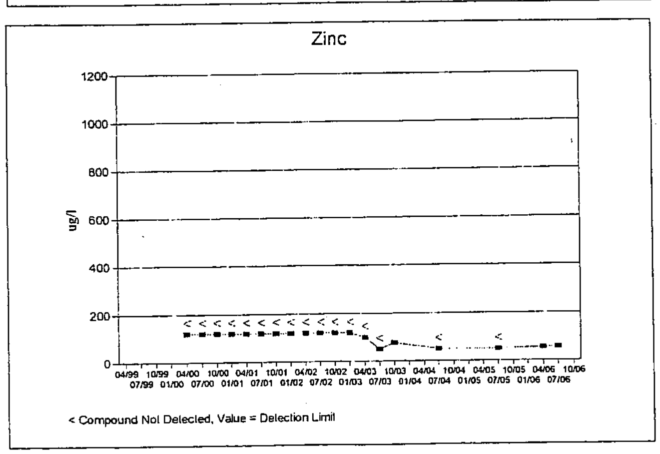





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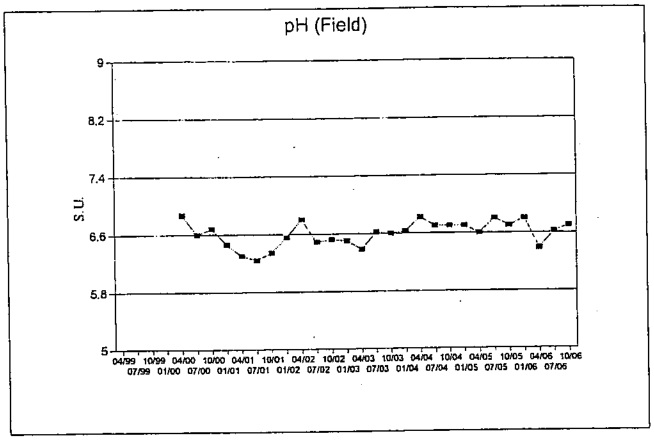
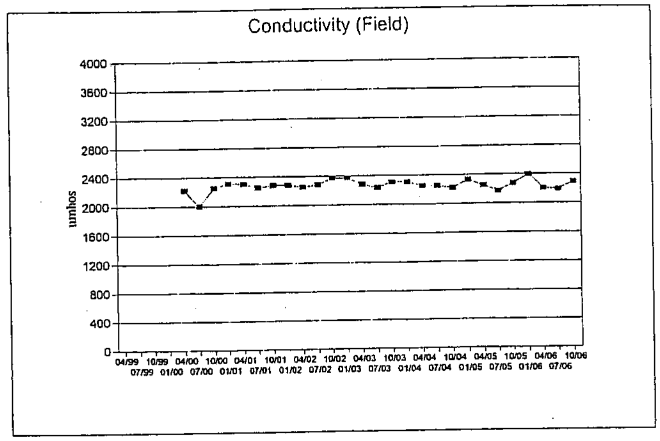
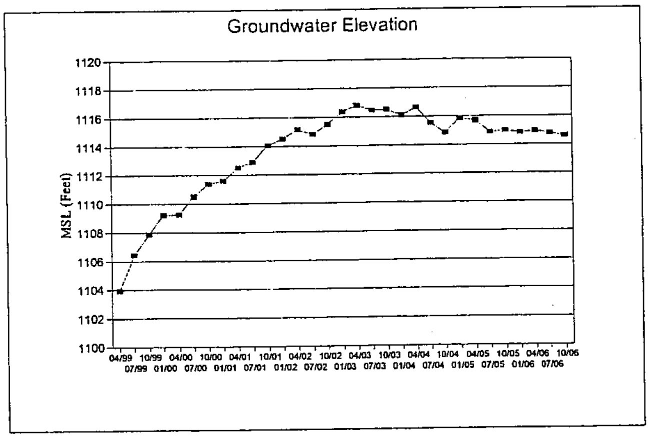
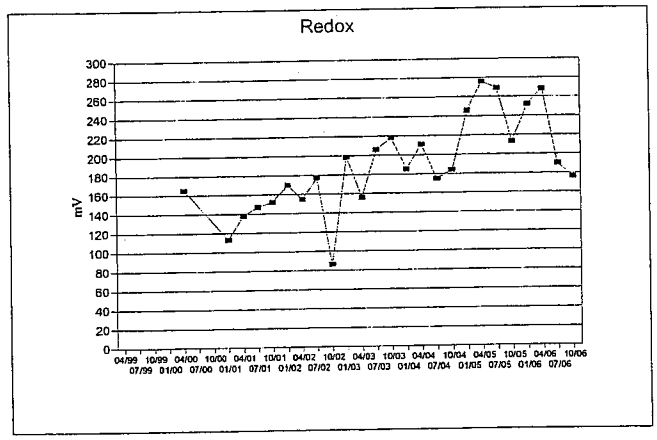
# Flambeau Mining Company
## Groundwater Quality Results

### MW-1014A (In-Pit Well)



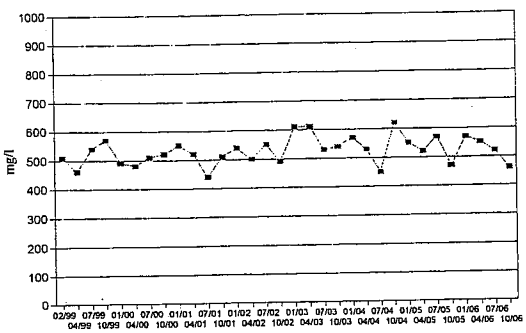



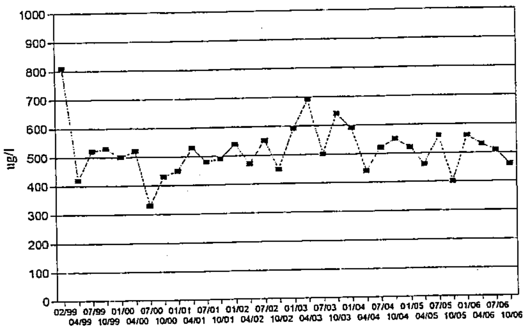



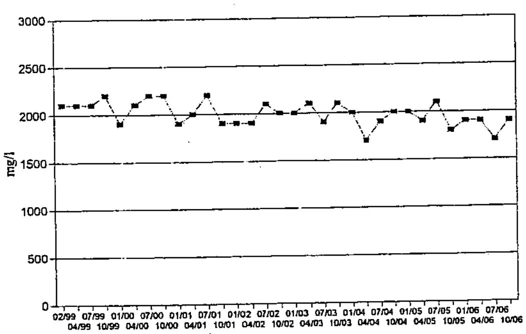



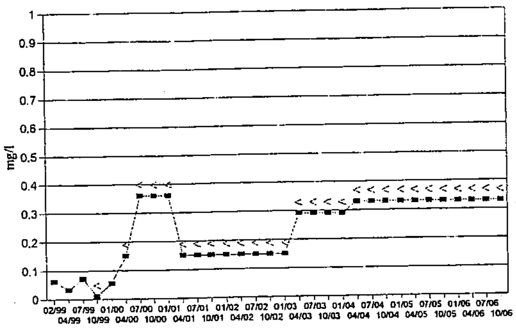
Flambeau Mining Company
Groundwater Quality Results

MW-1014B (In-Pit Well)

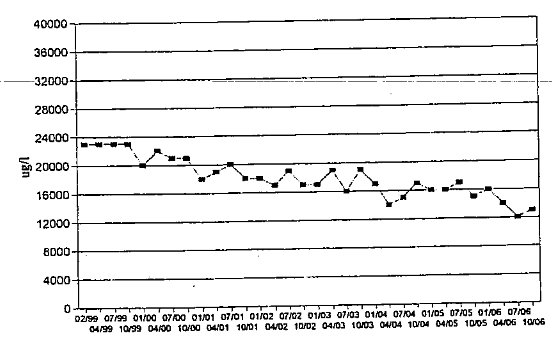
Alkalinity


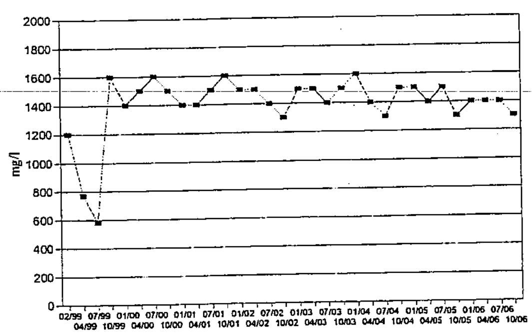

Copper


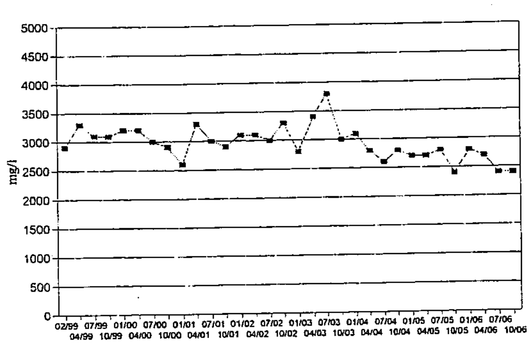

Hardness


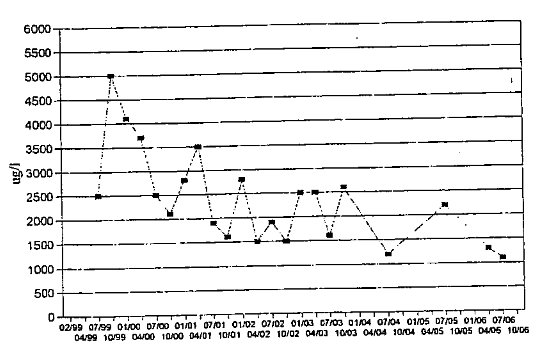

Iron



< Compound Not Detected, Value = Detection Limit

Manganese



Sulfate


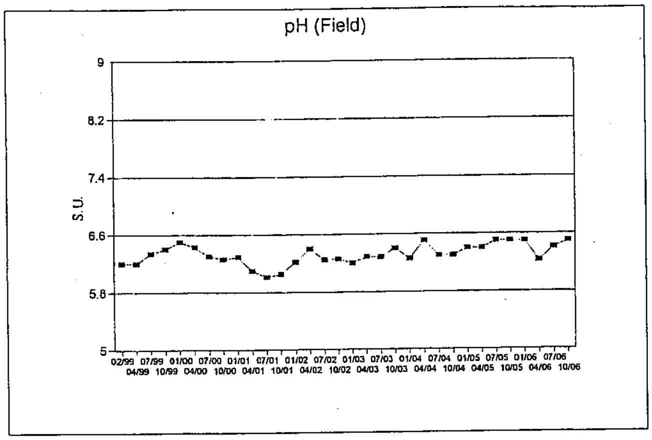

TDS


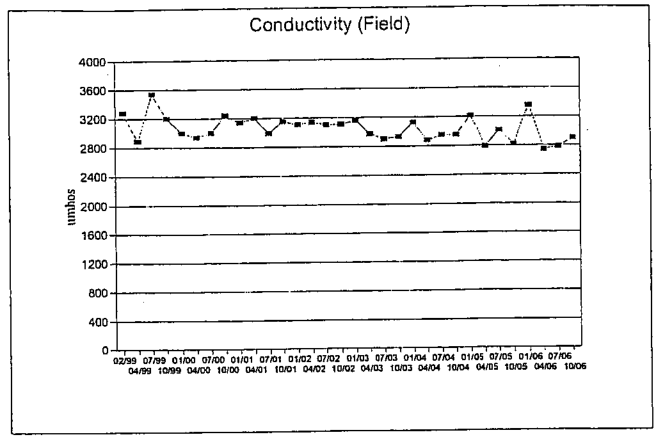

Zinc


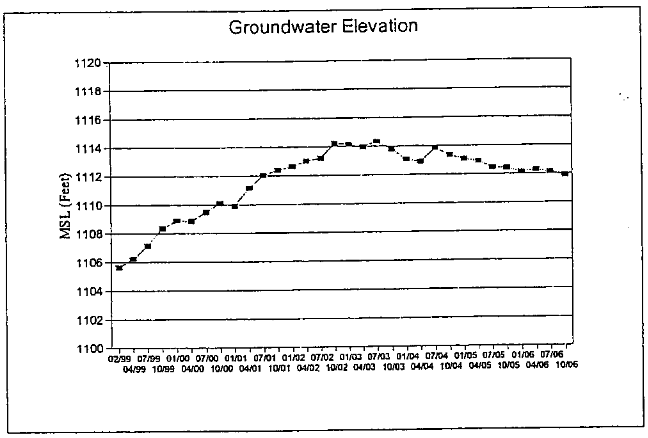


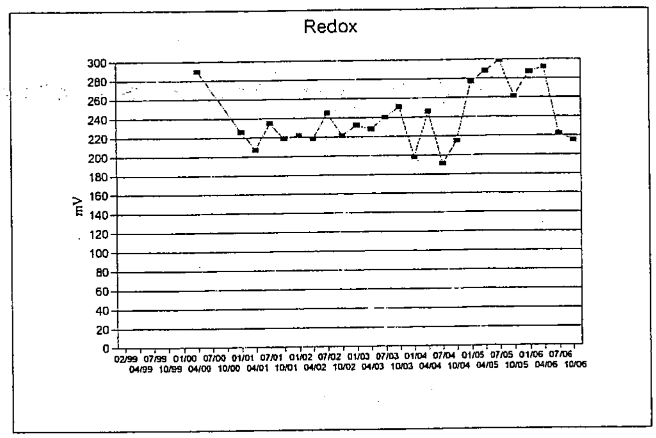

Created By: SGL Checked By: DAT

MW-1014B (In-Pit Well)



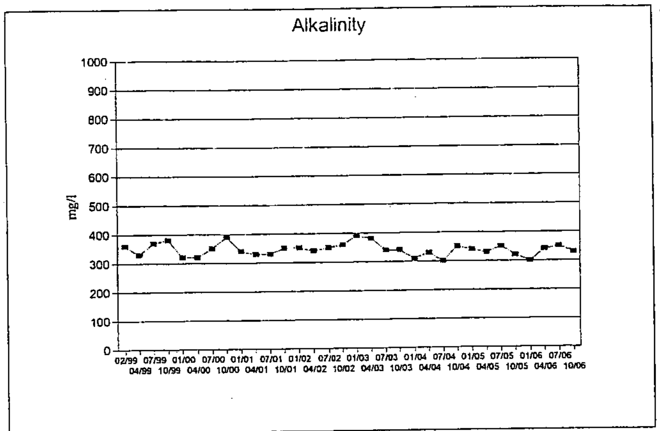



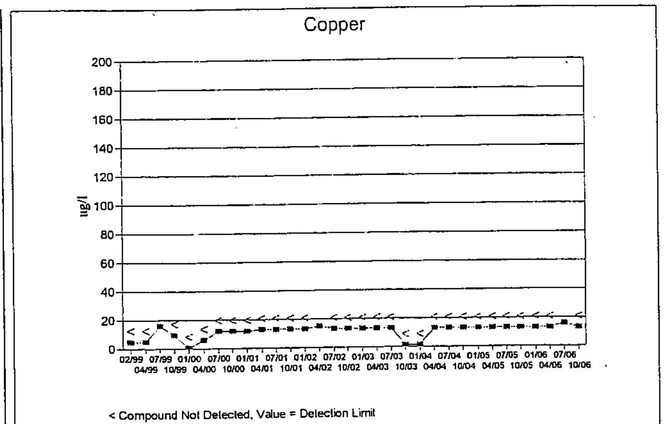



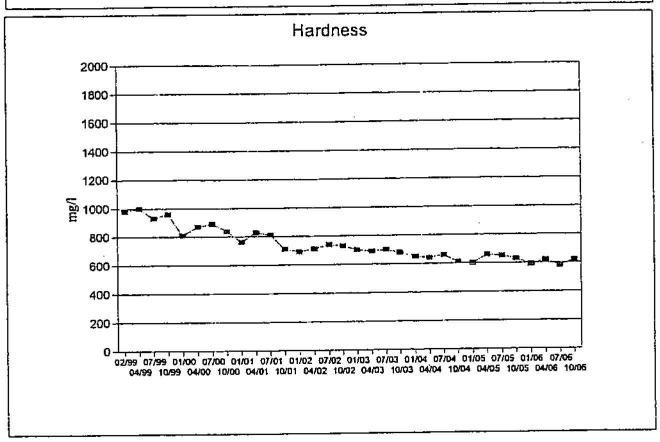



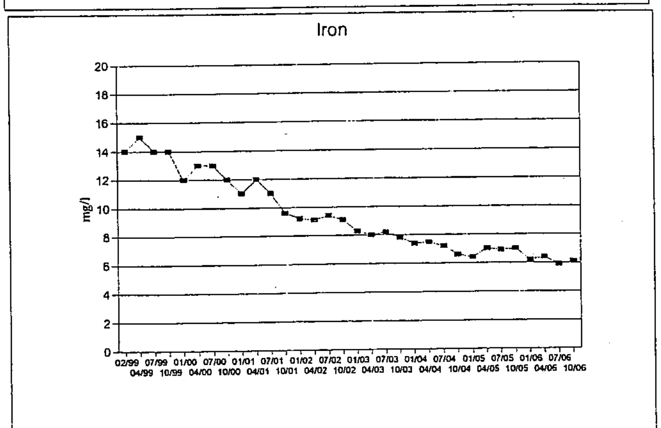
Flambeau Mining Company
Groundwater Quality Results

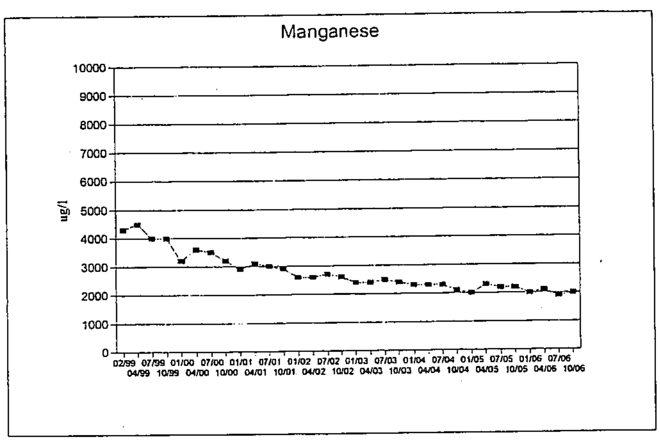
MW-1014C (In-Pit Well)

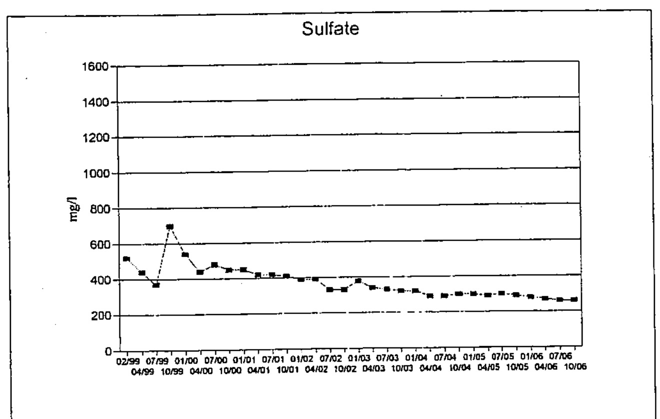


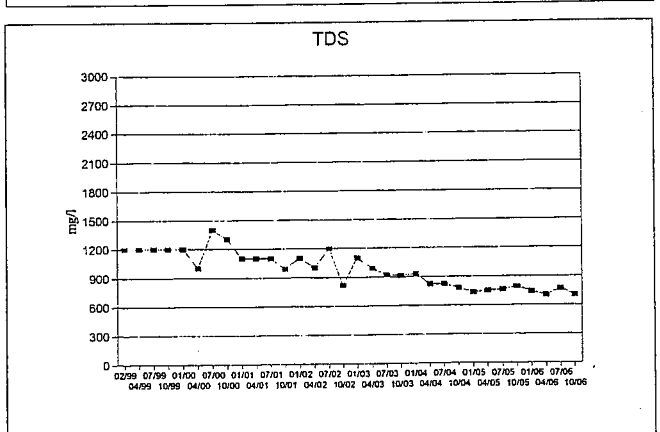



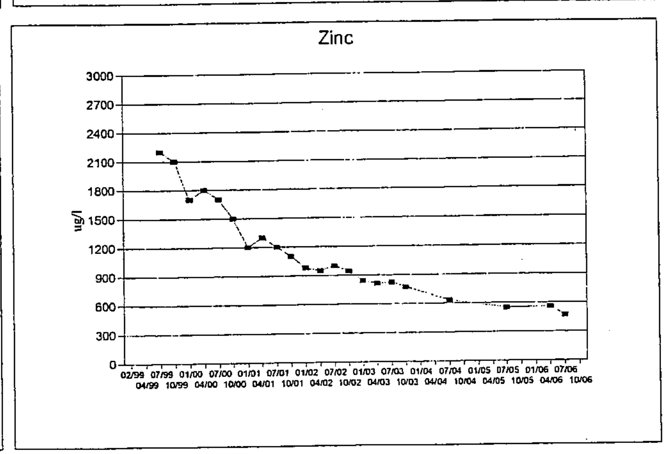



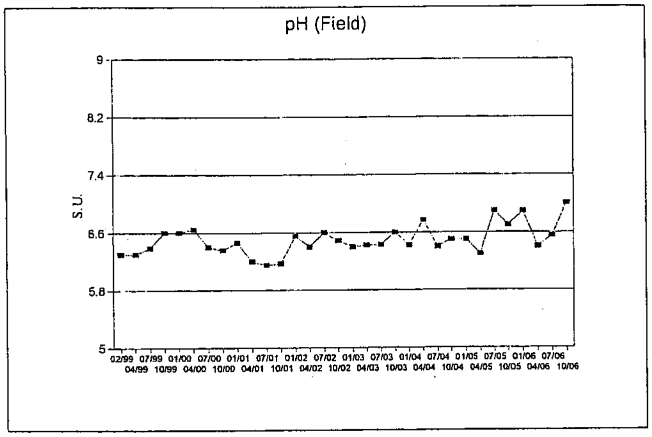



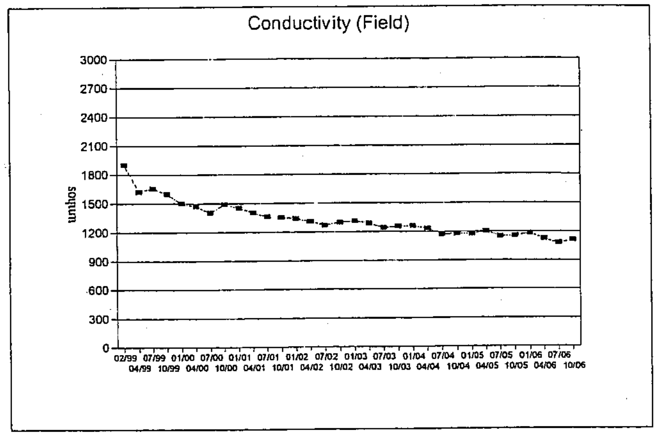



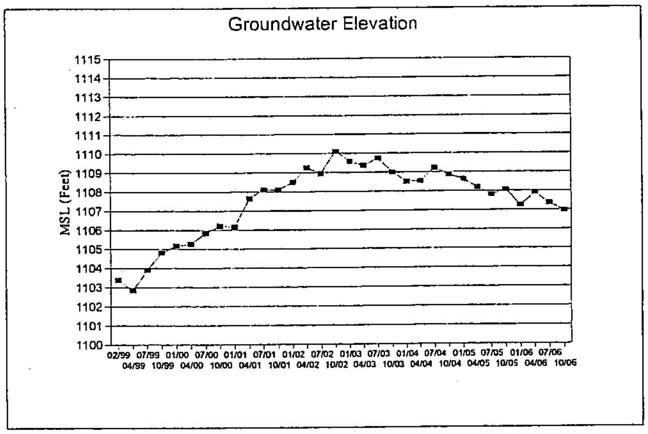



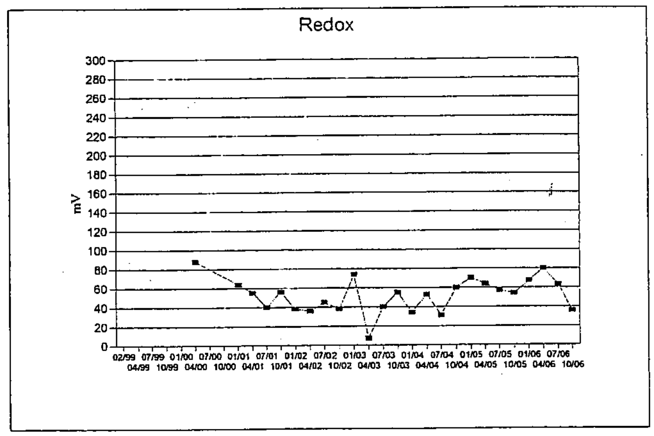



MW-1014C (In-Pit Well)



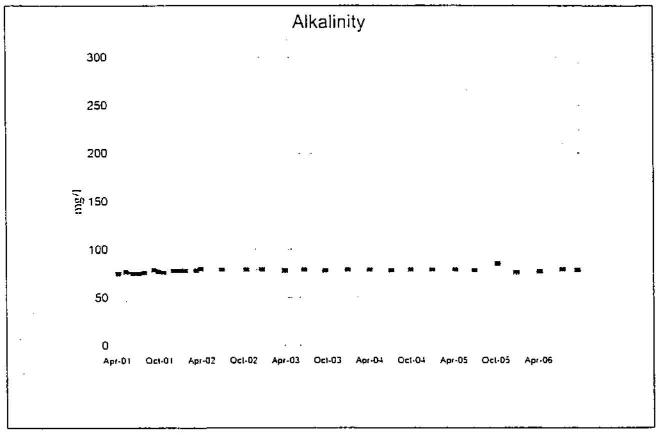



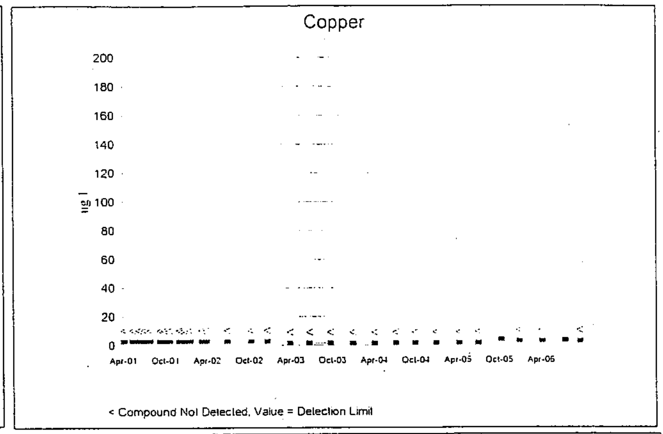



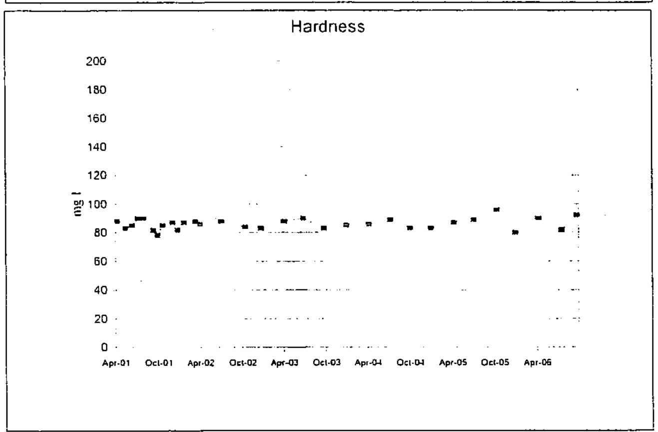



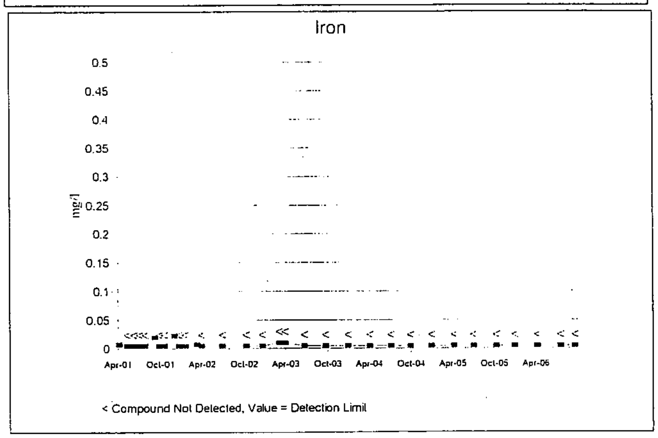
Flambeau Mining Company
Groundwater Quality Results

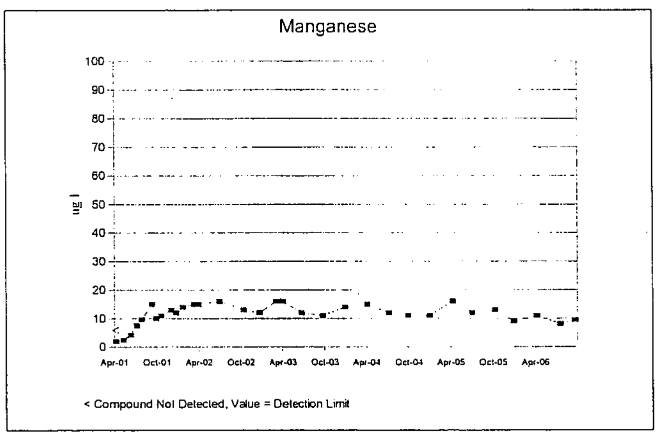
MW-1015A

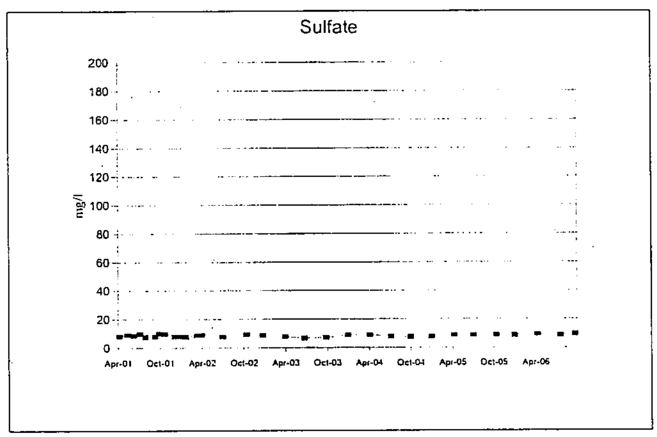


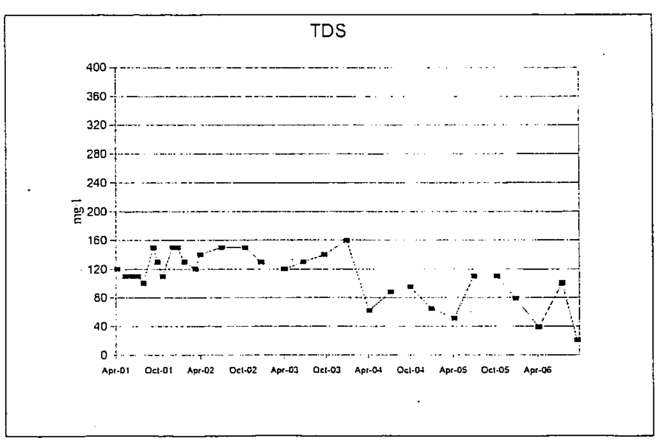



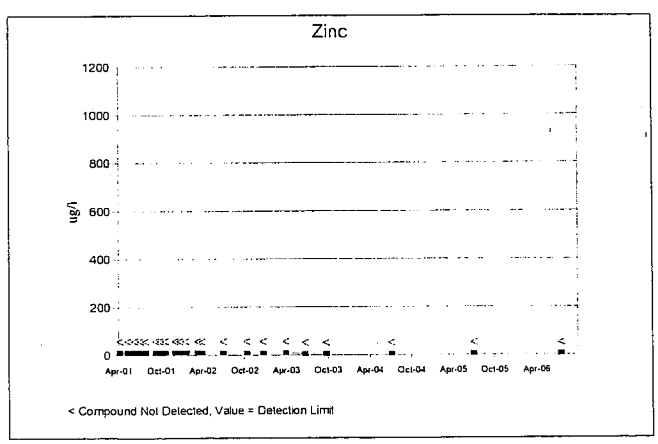



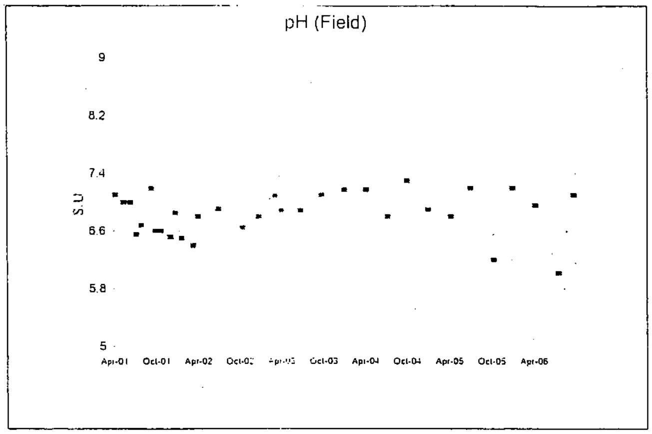



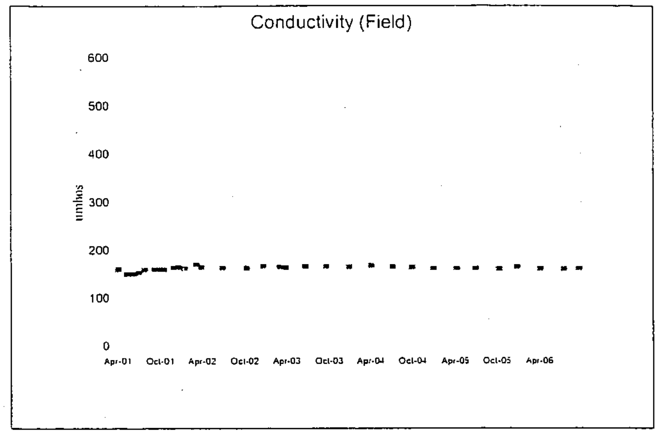



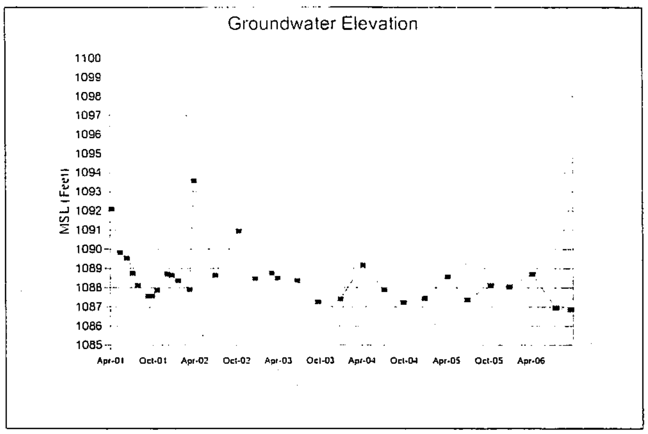



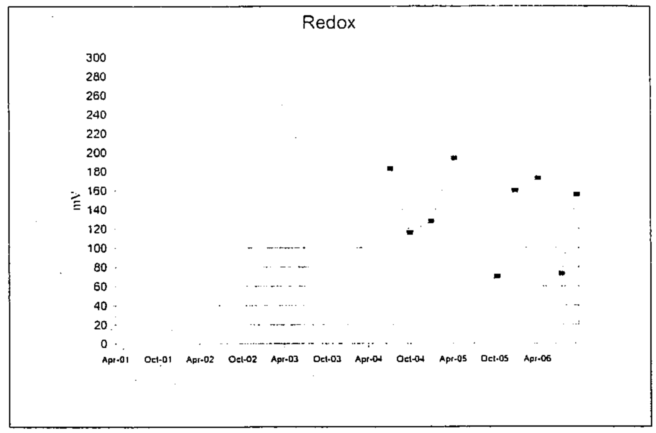



MW-1015A


pH (Field)
9
8.2
7.4
6.6
5.8
5
S.U
Apr-01
Oct-01
Apr-02
Oct-02
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06

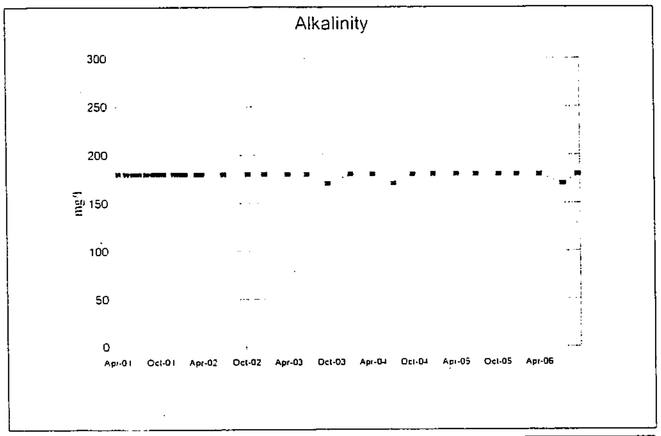

Conductivity (Field)
600
500
400
300
200
100
0
umhos
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06

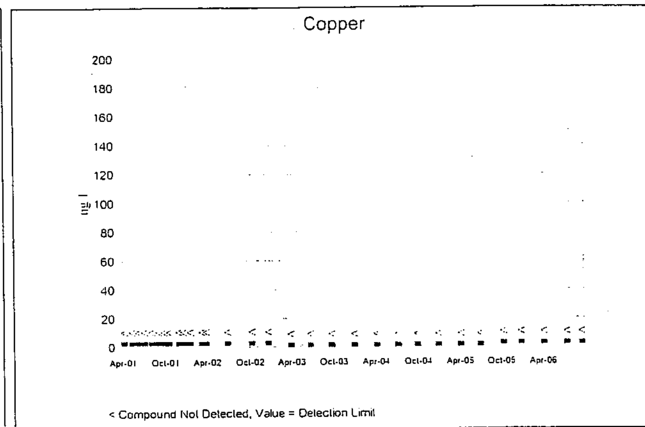

Groundwater Elevation
1100
1099
1098
1097
1096
1095
1094
1093
1092
1091
1090
1089
1088
1087
1086
1085
MSL (Feet)
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06

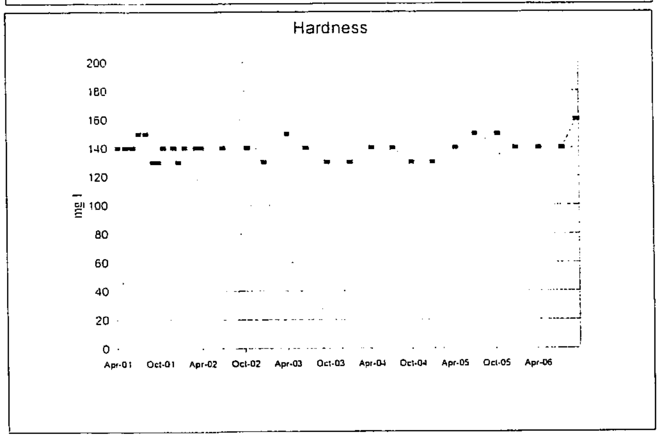

Redox
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
mV
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06

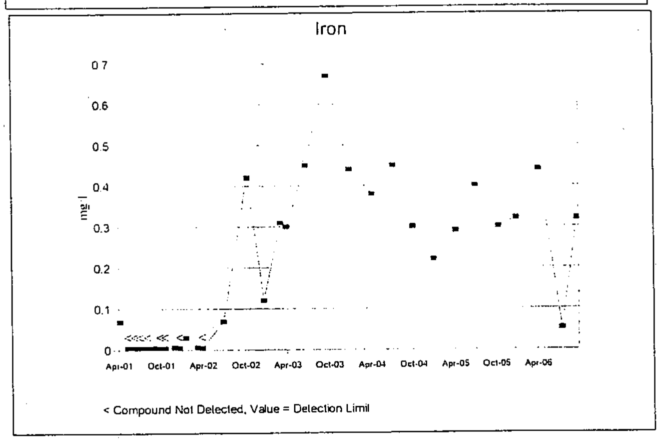
Flambeau Mining Company
Groundwater Quality Results

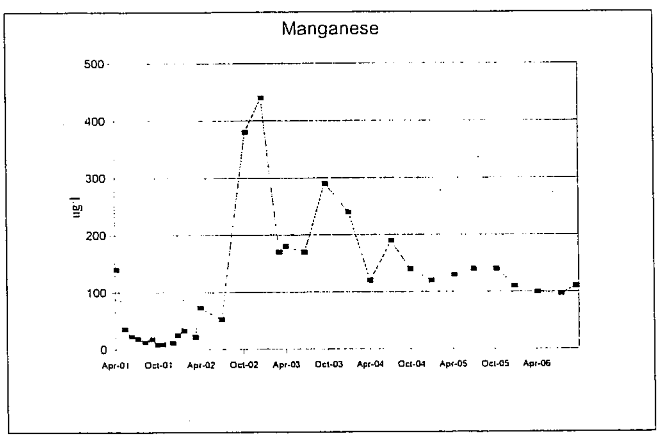
MW-1015B

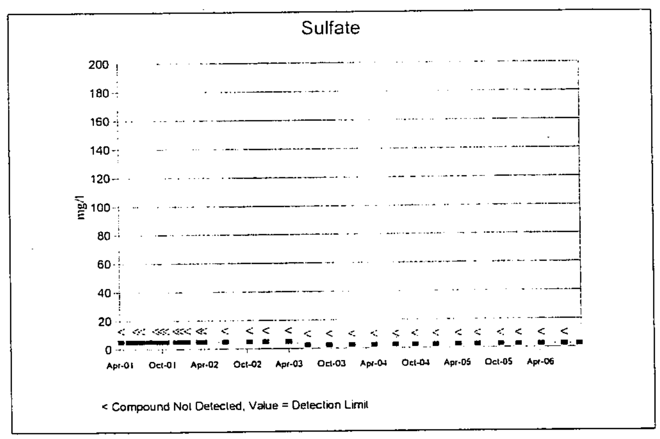


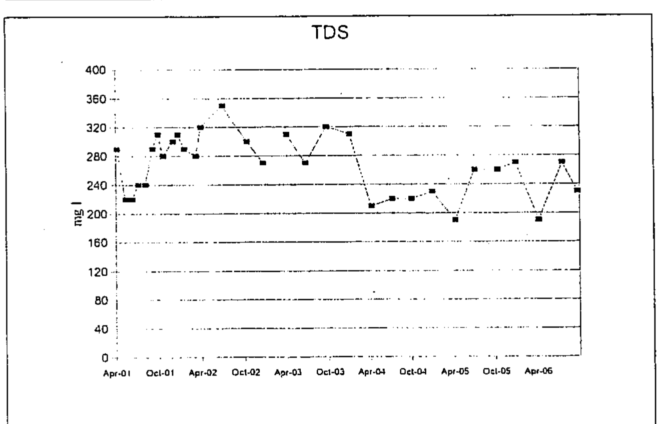



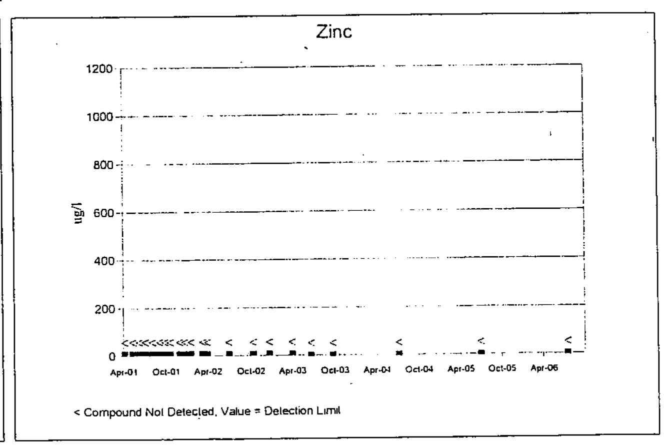



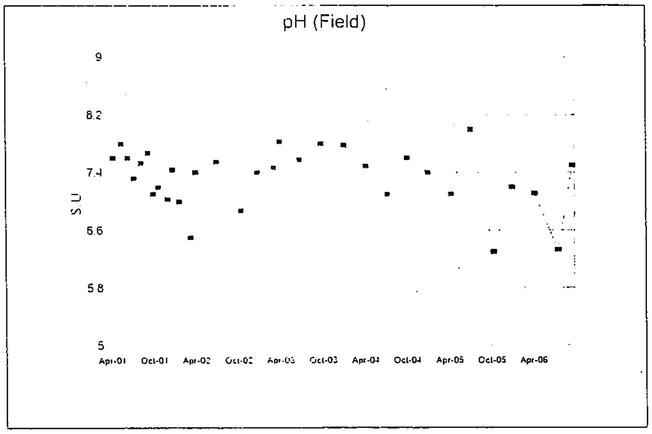



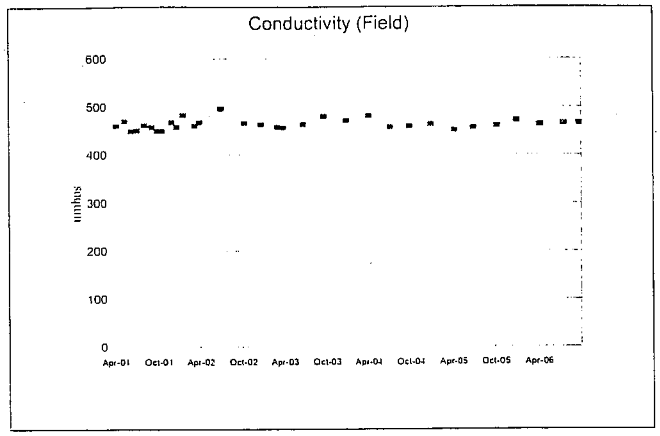



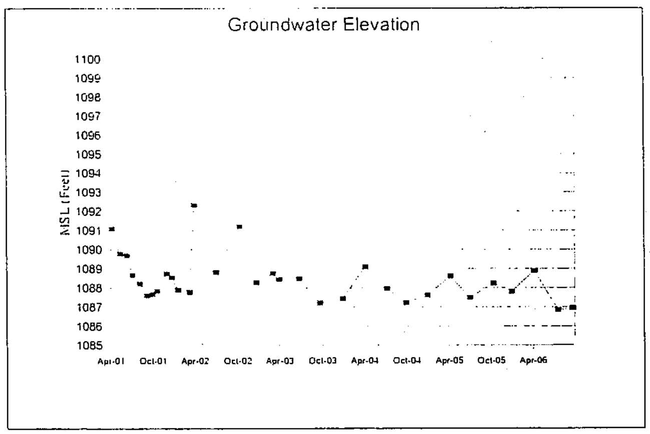



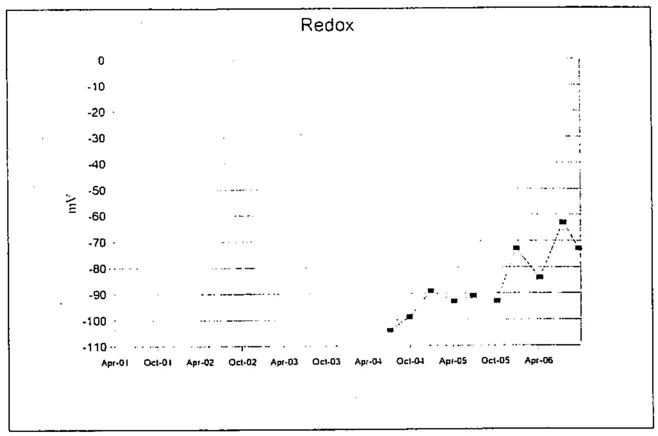



## MW-1015B


pH (Field)
9
8.2
7.4
6.6
5.8
5
S U
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06


Conductivity (Field)
600
500
400
300
200
100
0
umhos
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06


Groundwater Elevation
1100
1099
1098
1097
1096
1095
1094
1093
1092
1091
1090
1089
1088
1087
1086
1085
MSL (Feet)
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06


Redox
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
mV
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/91 | | | | | | | | | | | | | |
| | MW-1000PR | 65 | < 14 | 84 | 0.65 | 850 | < 10 | 190 | | 8.39 | 225 | | 1089.14 |
| | MW-1002 | 50 | < 14 | 60 | 0.99 | 5.1 | < 10 | 160 | | 8.33 | 157 | | 1092.94 |
| | MW-1002G | 86 | < 14 | 100 | < 0.055 | 5.4 | < 10 | 240 | | 7.56 | 277 | | 1092.97 |
| | MW-1004P | 160 | < 14 | 150 | 0.33 | 130 | < 10 | 210 | | 8.15 | 175 | | 1108.93 |
| | MW-1004S | 50 | < 14 | 60 | < 0.055 | < 4 | < 10 | 160 | | 8.64 | 161 | | 1111.39 |
| | MW-1005 | 84 | < 14 | 380 | 17 | 510 | 15 | 570 | | 7.73 | 1028 | | 1139.65 |
| | MW-1005P | 260 | < 14 | 230 | 1.2 | 220 | < 10 | 290 | | 8.49 | 512 | | 1140.19 |
| | MW-1005S | 170 | < 14 | 170 | 0.3 | 210 | < 10 | 220 | | 7.68 | 377 | | 1139.43 |
| | MW-1010P | 140 | < 14 | 140 | < 0.055 | 260 | < 10 | 180 | | 8.47 | 337 | | 1086.50 |
| 10/91 | | | | | | | | | | | | | |
| | MW-1000PR | 90 | < 14 | 110 | 0.84 | 880 | < 10 | 160 | | 7.41 | 327 | | 1089.51 |
| | MW-1002 | 49 | < 14 | 60 | < 0.055 | < 4 | < 10 | 170 | | 6.78 | 189 | | 1092.36 |
| | MW-1002G | 88 | < 14 | 120 | < 0.055 | < 4 | 10 | 280 | | 6.98 | 272 | | 1092.40 |
| | MW-1004P | 170 | < 14 | 170 | 0.22 | 130 | < 10 | 310 | | 7.15 | 352 | | 1108.79 |
| | MW-1004S | 49 | < 14 | 60 | < 0.055 | < 4 | 10 | 170 | | 7.25 | 135 | | 1111.00 |
| | MW-1005 | 92 | < 14 | 360 | 20 | 490 | 12 | 770 | | 7.34 | 981 | | 1138.75 |
| | MW-1005P | 260 | < 14 | 230 | 1 | 150 | < 10 | 440 | | 7.66 | 479 | | 1138.88 |
| | MW-1005S | 170 | < 14 | 170 | 3.8 | 220 | < 10 | 370 | | 7.37 | 351 | | 1138.10 |
| | MW-1010P | 160 | < 14 | 130 | < 0.055 | 280 | 10 | 250 | | 8.26 | 326 | | 1087.62 |
| 01/92 | | | | | | | | | | | | | |
| | MW-1000PR | 88 | < 14 | 110 | 1.7 | 820 | 11 | 120 | | 5.75 | 190 | | 1090.15 |
| | MW-1002 | 47 | < 14 | 67 | < 0.055 | < 4 | < 10 | 100 | | 6.88 | 138 | | 1093.90 |
| | MW-1002G | 80 | < 14 | 110 | < 0.055 | < 4 | 11 | 140 | | 6.93 | 221 | | 1093.93 |
| | MW-1004P | 160 | < 14 | 150 | 0.32 | 120 | < 10 | 160 | | 6.8 | 302 | | 1108.79 |
| | MW-1004S | 27 | < 14 | 62 | < 0.055 | < 4 | 11 | 95 | | 7.03 | 146 | | 1111.00 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | | Cu (ug/l) | Hard (mg/l) | | Fe (mg/l) | | Mn (ug/l) | | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/92 | | | | | | | | | | | | | | | | | |
| | MW-1005 | 86 | < | 14 | 1000 | | 18 | | 460 | | 14 | 530 | | 6.12 | 870 | | 1140.86 |
| | MW-1005P | 260 | < | 14 | 240 | | 0.75 | | 160 | < | 10 | 280 | | 6.85 | 391 | | 1140.95 |
| | MW-1005S | 170 | < | 14 | 250 | | 3.6 | | 210 | < | 10 | | | 6.88 | 303 | | 1140.32 |
| | MW-1010P | 150 | < | 14 | 130 | | 0.15 | | 250 | | 16 | 200 | | 6.87 | 292 | | 1087.60 |
| 04/92 | | | | | | | | | | | | | | | | | |
| | MW-1000PR | 84 | < | 14 | 88 | | 1.3 | | 830 | | 14 | 120 | | 6.91 | 183.2 | | 1091.67 |
| | MW-1002 | 49 | < | 14 | 48 | < | 0.055 | < | 4 | | 11 | 85 | | 6.05 | 145 | | 1093.70 |
| | MW-1002G | 84 | < | 14 | 110 | < | 0.055 | < | 4 | | 14 | 150 | | 6.25 | 199 | | 1093.75 |
| | MW-1004P | 170 | < | 14 | 160 | | 0.37 | | 140 | < | 10 | 180 | | 6.88 | 282 | | 1109.72 |
| | MW-1004S | 60 | < | 14 | 72 | < | 0.055 | < | 4 | | 12 | 100 | | 6.7 | 153 | | 1112.05 |
| | MW-1005 | 90 | < | 14 | 520 | | 17 | | 380 | | 16 | 680 | | 6.32 | 905 | | 1141.23 |
| | MW-1005P | 260 | < | 14 | 240 | | 1 | | 130 | < | 10 | 350 | | 6.97 | 417 | | 1141.48 |
| | MW-1005S | 180 | < | 14 | 290 | | 3.7 | | 200 | < | 10 | 210 | | 7.48 | 324 | | 1140.71 |
| | MW-1010P | 160 | < | 14 | 140 | < | 0.055 | | 200 | | 14 | 340 | | 7.62 | 314 | | 1089.08 |
| 07/92 | | | | | | | | | | | | | | | | | |
| | MW-1000PR | 81 | | 14 | 120 | | 0.47 | | 730 | | 12 | 140 | | 6.64 | 194 | | 1088.87 |
| | MW-1002 | 41 | < | 14 | 120 | < | 0.055 | < | 4 | < | 10 | 87 | | 5.61 | 118 | | 1093.04 |
| | MW-1002G | 79 | < | 14 | 160 | < | 0.055 | < | 4 | | 11 | 150 | | 6.02 | 198 | | 1093.09 |
| | MW-1004P | 160 | < | 14 | 170 | | 0.38 | | 130 | < | 10 | 180 | | 6.74 | 295 | | 1109.39 |
| | MW-1004S | 74 | < | 14 | 150 | < | 0.055 | < | 4 | < | 10 | 110 | | 6.5 | 175 | | 1111.58 |
| | MW-1005 | 90 | < | 14 | 440 | | 19 | | 440 | | 15 | 640 | | 6.01 | 912 | | 1140.11 |
| | MW-1005P | 270 | < | 14 | 260 | | 0.95 | | 150 | < | 10 | 270 | | 6.81 | 426 | | 1140.29 |
| | MW-1005S | 170 | < | 14 | 220 | | 4.1 | | 210 | < | 10 | 220 | | 6.68 | 331 | | 1139.40 |
| | MW-1010P | 160 | < | 14 | 180 | < | 0.055 | | 86 | < | 10 | 180 | | 6.86 | 285 | | 1088.28 |
| 10/92 | | | | | | | | | | | | | | | | | |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/92 | | | | | | | | | | | | | |
| | MW-1000PR | 95 | < 14 | 100 | 0.8 | 780 | 12 | 160 | | 6.9 | 201 | | 1089.22 |
| | MW-1002 | 53 | < 14 | 82 | < 0.055 | 15 | 11 | 130 | | 6.94 | 181 | | 1091.69 |
| | MW-1002G | 85 | < 14 | 130 | < 0.055 | < 4 | 11 | 180 | | 6.94 | 254 | | 1091.73 |
| | MW-1004P | 190 | < 14 | 180 | 0.32 | 130 | < 10 | 260 | | 7.46 | 342 | | 1107.39 |
| | MW-1004S | 100 | < 14 | 110 | < 0.055 | < 4 | < 10 | 220 | | 6.96 | 258 | | 1108.44 |
| | MW-1005 | 110 | < 14 | 420 | 22 | 470 | 15 | 600 | | 6.13 | 1013 | | 1139.07 |
| | MW-1005P | 270 | < 14 | 260 | 12 | 100 | < 10 | 320 | | 7.26 | 501 | | 1137.84 |
| | MW-1005S | 190 | < 14 | 270 | 3.9 | 200 | < 10 | 260 | | 7.38 | 391 | | 1138.13 |
| | MW-1010P | 180 | < 14 | 160 | < 0.055 | 140 | < 10 | 280 | | 7.49 | 389 | | 1086.55 |
| 01/93 | | | | | | | | | | | | | |
| | MW-1000PR | 84 | < 14 | 88 | 0.15 | 710 | < 10 | 100 | | 6.22 | 203 | | 1091.62 |
| | MW-1002 | 53 | < 14 | 66 | 0.059 | 4.7 | < 10 | 90 | | 6.96 | 127 | | 1085.62 |
| | MW-1002G | 75 | < 14 | 94 | < 0.055 | < 4 | 12 | 98 | | 7.14 | 197 | | 1092.69 |
| | MW-1004P | 170 | < 14 | 160 | 0.39 | 140 | < 10 | 160 | | 6.24 | 291 | | 1104.64 |
| | MW-1004S | 73 | < 14 | 92 | < 0.055 | < 4 | < 10 | 95 | | 6.37 | 174 | | 1105.97 |
| | MW-1005 | 94 | < 14 | 400 | 24 | 520 | 23 | 140 | | 6.21 | 945 | | 1139.18 |
| | MW-1005P | 260 | < 14 | 240 | 1.1 | 110 | < 10 | 220 | | 6.39 | 440 | | 1139.08 |
| | MW-1005S | 180 | < 14 | 180 | 4.1 | 210 | 10 | 160 | | 6.99 | 418 | | 1138.52 |
| | MW-1010P | 190 | < 14 | 130 | < 0.055 | 31 | 32 | 210 | | 7.21 | 357 | | 1088.95 |
| 04/93 | | | | | | | | | | | | | |
| | MW-1000PR | 82 | 20 | 90 | 0.27 | 940 | 12 | 130 | | 6.24 | 198 | | 1089.06 |
| | MW-1002 | 66 | < 10 | 90 | < 0.01 | < 4 | 9 | 120 | | 6.33 | 136 | | 1093.34 |
| | MW-1002G | 44 | < 10 | 76 | < 0.01 | < 4 | 8 | 74 | | 6.13 | 239 | | 1093.38 |
| | MW-1004P | 170 | < 10 | 160 | < 0.01 | < 4 | 3 | 160 | | 7.74 | 329 | | 1099.76 |
| | MW-1004S | 51 | < 10 | 70 | < 0.01 | < 4 | 11 | 120 | | 7.77 | 168 | | 1103.31 |

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/93 | | | | | | | | | | | | | |
| | MW-1005 | 78 | < 10 | 500 | 24 | 540 | 15 | 630 | | 6.11 | 971 | | 1140.35 |
| | MW-1005P | 250 | < 10 | 250 | 0.46 | 150 | 2 | 240 | | 6.52 | 458 | | 1139.42 |
| | MW-1005S | 81 | < 10 | 210 | 4.4 | 230 | 8 | 200 | | 6.38 | 360 | | 1139.26 |
| | MW-1010P | 170 | < 14 | 130 | 0.055 | 140 | 28 | 270 | | 6.62 | 357 | | 1088.51 |
| 07/93 | | | | | | | | | | | | | |
| | MW-1000PR | 82 | 16 | 86 | 0.061 | 730 | 15 | 140 | | 6.6 | 217 | | 1079.77 |
| | MW-1002 | 42 | < 12 | 52 | 0.034 | < 4 | 10 | 100 | | 6.83 | 273 | | 1095.73 |
| | MW-1002G | 64 | < 12 | 80 | < 0.015 | < 4 | 11 | 140 | | 6.72 | 480 | | 1095.72 |
| | MW-1004P | 170 | < 12 | 150 | 0.042 | 22 | 5 | 180 | | 7.4 | 347 | | 1095.77 |
| | MW-1004S | 24 | < 12 | 56 | < 0.015 | < 4 | 11 | 110 | | 7 | 178 | | 1102.69 |
| | MW-1005 | 74 | < 12 | 410 | 18 | 420 | 18 | 590 | | 6.12 | 1100 | | 1141.19 |
| | MW-1005P | 250 | < 12 | 230 | 0.61 | 140 | 3 | 260 | | 7.59 | 519 | | 1141.08 |
| | MW-1005S | 170 | < 12 | 160 | 4.2 | 220 | 9 | 200 | | 7.28 | 372 | | 1140.88 |
| | MW-1010P | 150 | < 12 | 130 | < 0.015 | 35 | 11 | 180 | | 7.21 | 313 | | 1085.01 |
| 10/93 | | | | | | | | | | | | | |
| | MW-1000PR | 62 | 13 | 120 | 0.032 | 910 | 12 | 110 | | 7.03 | 233 | | 1074.86 |
| | MW-1002 | 42 | < 12 | 52 | < 0.015 | < 4 | 6 | 78 | | 7.52 | 138 | | 1091.71 |
| | MW-1002G | 82 | < 12 | 110 | < 0.015 | < 4 | 11 | 190 | | 7.38 | 262 | | 1091.77 |
| | MW-1004P | 170 | < 12 | 160 | 0.048 | 40 | 3 | 230 | | 7.61 | 329 | | 1090.27 |
| | MW-1004S | 32 | < 12 | 46 | < 0.015 | < 4 | 9 | 98 | | 7.41 | 186 | | 1099.82 |
| | MW-1005 | 84 | < 12 | 390 | 25 | 610 | 17 | 680 | | 6.68 | 1005 | | 1140.03 |
| | MW-1005P | 250 | < 12 | 220 | 0.17 | 69 | < 2 | 300 | | 7.53 | 462 | | 1139.85 |
| | MW-1005S | 170 | < 12 | 160 | 4.2 | 240 | 6 | 220 | | 7.28 | 321 | | 1139.29 |
| | MW-1010P | 160 | < 12 | 130 | < 0.015 | 18 | 5 | 230 | | 7.51 | 294 | | 1080.16 |
| 01/94 | | | | | | | | | | | | | |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/94 | | | | | | | | | | | | | |
| | MW-1000PR | 43 | 22 | 54 | < 0.015 | 340 | 12 | 70 | | 6.86 | 135 | | 1073.75 |
| | MW-1002 | 39 | < 12 | 50 | < 0.015 | < 4 | 7 | 82 | | 7.53 | 151 | | 1091.21 |
| | MW-1002G | 94 | < 12 | 120 | < 0.015 | < 4 | 14 | 180 | | 7.01 | 278 | | 1091.31 |
| | MW-1004P | 140 | < 12 | 150 | < 0.015 | 20 | 2 | 160 | | 7.34 | 371 | | 1088.40 |
| | MW-1004S | 42 | 16 | 44 | < 0.015 | < 4 | 10 | 74 | | 7 | 123 | | 1097.96 |
| | MW-1005 | 81 | < 12 | 440 | 24 | 530 | 18 | 560 | | 6.28 | 1072 | | 1138.39 |
| | MW-1005P | 250 | < 12 | 230 | 0.19 | 35 | < 2 | 260 | | 7.34 | 487 | | 1138.88 |
| | MW-1005S | 160 | < 12 | 160 | 4 | 200 | 9 | 190 | | 7.22 | 357 | | 1138.29 |
| | MW-1010P | 160 | < 12 | 150 | < 0.015 | 170 | 3 | 170 | | 7.34 | 283 | | 1081.09 |
| 04/94 | | | | | | | | | | | | | |
| | MW-1000PR | 44 | 23 | 54 | 0.021 | 500 | 12 | 95 | | 7.74 | 124 | | 1071.98 |
| | MW-1002 | 35 | < 12 | 45 | < 0.015 | < 4 | 7 | 86 | | 7.49 | 105 | | 1091.21 |
| | MW-1002G | 92 | < 12 | 120 | < 0.015 | < 4 | 12 | 170 | | 7.39 | 267 | | 1091.27 |
| | MW-1004P | 160 | 15 | 150 | 0.033 | 45 | 3 | 180 | | 7.36 | 287 | | 1087.03 |
| | MW-1004S | 38 | < 12 | 51 | < 0.015 | < 4 | 8 | 100 | | 7.75 | 109 | | 1097.72 |
| | MW-1005 | 88 | < 12 | 450 | 24 | 540 | 13 | 620 | | 7.6 | 1082 | | 1140.00 |
| | MW-1005P | 250 | < 12 | 230 | 0.2 | 160 | < 2 | 270 | | 7.24 | 487 | | 1139.44 |
| | MW-1005S | 160 | < 12 | 160 | 4.1 | 200 | 8 | 200 | | 7.52 | 344 | | 1139.14 |
| | MW-1010P | 160 | < 12 | 150 | < 0.015 | 14 | 3 | 180 | | 7.36 | 276 | | 1080.00 |
| 07/94 | | | | | | | | | | | | | |
| | MW-1000PR | 39 | 17 | 49 | 0.026 | 420 | 11 | 90 | | 7.47 | 132.6 | | 1071.01 |
| | MW-1002 | 31 | < 12 | 44 | < 0.015 | < 4 | 6.6 | 94 | | 7 | 109.4 | | 1091.02 |
| | MW-1002G | 92 | < 12 | 120 | < 0.015 | < 4 | 12 | 170 | | 6.74 | 238 | | 1091.07 |
| | MW-1004P | 160 | < 12 | 150 | 0.024 | 28 | 2.5 | 190 | | 7.09 | 317 | | 1086.74 |
| | MW-1004S | 140 | < 12 | 52 | < 0.015 | < 4 | 8 | 100 | | 6.77 | 200 | | 1097.66 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/94 | | | | | | | | | | | | | |
| | MW-1005 | 75 | < 12 | 450 | 31 | 690 | 14 | 600 | | 6.18 | 1093 | | 1139.53 |
| | MW-1005P | 240 | < 12 | 230 | 0.22 | 100 | < 2 | 270 | | 6.89 | 456 | | 1138.96 |
| | MW-1005S | 160 | < 12 | 160 | 4.1 | 200 | 7.2 | 210 | | 6.88 | 322 | | 1138.65 |
| | MW-1010P | 160 | < 12 | 150 | < 0.015 | 10 | 3.4 | 190 | | 7.17 | 322 | | 1078.27 |
| 10/94 | | | | | | | | | | | | | |
| | MW-1000PR | 34 | 58 | 36 | 0.047 | 360 | 17 | 120 | | 7.17 | 115.9 | | 1071.03 |
| | MW-1002 | 38 | < 1.6 | 46 | 0.0056 | < 0.47 | 6.1 | 87 | | 6.99 | 122 | | 1092.12 |
| | MW-1002G | 88 | < 1.6 | 110 | 0.0054 | < 0.47 | 14 | 200 | | 6.77 | 269 | | 1092.18 |
| | MW-1004P | 170 | < 1.6 | 160 | 0.035 | 29 | 3.9 | 200 | | 7.12 | 303 | | 1086.36 |
| | MW-1004S | 44 | < 1.6 | 54 | 0.0064 | < 0.47 | 8.6 | 150 | | 6.71 | 123.5 | | 1097.75 |
| | MW-1005 | 78 | < 1.6 | 420 | 28 | 630 | 20 | 820 | | 6.08 | 1028 | | 1138.79 |
| | MW-1005P | 250 | < 1.6 | 250 | 0.24 | 62 | 2.5 | 280 | | 7.15 | 452 | | 1137.79 |
| | MW-1005S | 160 | < 1.6 | 160 | 3.7 | 190 | 13 | 240 | | 7.34 | 320 | | 1137.49 |
| | MW-1010P | 160 | 3.2 | 150 | 0.0046 | 14 | 4.5 | 200 | | 7.45 | 309 | | 1080.17 |
| 01/95 | | | | | | | | | | | | | |
| | MW-1000PR | 30 | 52 | 36 | 0.12 | 290 | 9 | 88 | | 7.14 | 115.6 | | 1068.79 |
| | MW-1002 | 38 | < 0.47 | 47 | 0.0073 | 2.7 | 6.2 | 120 | | 6.65 | 143.2 | | 1090.71 |
| | MW-1002G | 90 | < 0.47 | 110 | 0.0072 | 2.1 | 12 | 240 | | 6.74 | 301 | | 1090.77 |
| | MW-1004P | 170 | 3.3 | 150 | 0.014 | 29 | 1.7 | 190 | | 6.69 | 315 | | 1085.81 |
| | MW-1004S | 100 | 1.1 | 57 | 0.0049 | 3.4 | 7.1 | 140 | | 6.18 | 142.4 | | 1096.59 |
| | MW-1005 | 84 | < 0.47 | 370 | 29 | 650 | 14 | 660 | | 6.16 | 1035 | | 1137.52 |
| | MW-1005P | 270 | 4.4 | 230 | 0.035 | 41 | < 0.56 | 340 | | 7.05 | 511 | | 1137.14 |
| | MW-1005S | 160 | < 0.47 | 150 | 4.2 | 220 | 8.9 | 240 | | 6.72 | 425 | | 1136.86 |
| | MW-1010P | 160 | 6.7 | 160 | 0.004 | 60 | 3.3 | 250 | | 7.63 | 337 | | 1078.26 |
| 04/95 | | | | | | | | | | | | | |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/95 | | | | | | | | | | | | | |
| | MW-1000PR | 38 | 58 | 35 | 0.026 | 320 | 14 | 90 | | 7.4 | 106 | | 1070.00 |
| | MW-1002 | 42 | 2 | 42 | 0.0039 | 0.27 | 7.3 | 170 | | 7.4 | 106 | | 1091.70 |
| | MW-1002G | 93 | 1.4 | 100 | 0.0044 | < 0.086 | 15 | 170 | | 6.9 | 255 | | 1091.77 |
| | MW-1004P | 170 | 11 | 130 | 0.025 | 31 | 4.7 | 250 | | 7.4 | 292 | | 1086.80 |
| | MW-1004S | 55 | 7 | 45 | 0.0087 | 0.87 | 7.8 | 150 | | 6.7 | 131 | | 1096.68 |
| | MW-1005 | 79 | 1.3 | 320 | 28 | 600 | 18 | 770 | | 6.2 | 1014 | | 1138.27 |
| | MW-1005P | 270 | 3.7 | 200 | 0.078 | 41 | < 0.56 | 300 | | 7.5 | 420 | | 1137.45 |
| | MW-1005S | 160 | < 0.68 | 130 | 4 | 200 | 9.3 | 190 | | 7 | 315 | | 1137.20 |
| | MW-1010P | 170 | 9.7 | 130 | 0.005 | 51 | 5 | 240 | | 7.4 | 311 | | 1079.01 |
| 07/95 | | | | | | | | | | | | | |
| | MW-1000PR | 34 | 43 | 36 | 0.0096 | 240 | 10 | 99 | | 8.08 | 115.7 | | 1070.99 |
| | MW-1002 | 33 | 0.97 | 35 | < 0.0017 | 0.42 | 5.3 | 76 | | 7.16 | 99 | | 1090.41 |
| | MW-1002G | 90 | < 0.68 | 100 | 0.0019 | < 0.086 | 11 | 190 | | 6.91 | 275 | | 1090.65 |
| | MW-1004P | 170 | 20 | 130 | 0.044 | 77 | 1.8 | 190 | | 7.16 | 317 | | 1086.38 |
| | MW-1004S | 50 | 6.6 | 50 | 0.0031 | 0.5 | 6.2 | 110 | | 6.87 | 126.3 | | 1096.28 |
| | MW-1005 | 75 | < 0.68 | 320 | 28 | 640 | 14 | 730 | | 6.28 | 1049 | | 1137.69 |
| | MW-1005P | 280 | 1.8 | 200 | 0.071 | 90 | < 0.56 | 290 | | 7.17 | 454 | | 1137.47 |
| | MW-1005S | 170 | < 0.68 | 140 | 3.8 | 200 | 6.9 | 220 | | 6.91 | 358 | | 1137.06 |
| | MW-1010P | 160 | 21 | 130 | 0.0017 | 11 | 2.4 | 200 | | 7.58 | 315 | | 1077.61 |
| 10/95 | | | | | | | | | | | | | |
| | MW-1000PR | 36 | 61 | 39 | 0.027 | 110 | 11 | 75 | | 7.32 | 118.8 | | 1071.39 |
| | MW-1002 | 30 | 1.6 | 38 | 0.004 | 1.4 | 7.9 | 86 | | 6.6 | 120 | | 1091.61 |
| | MW-1002G | 100 | < 0.68 | 110 | < 0.0017 | < 0.086 | 14 | 160 | | 6.91 | 239 | | 1091.68 |
| | MW-1004P | 170 | 4.3 | 150 | 0.0086 | 28 | 8.1 | 170 | | 7.01 | 308 | | 1079.81 |
| | MW-1004S | 79 | 7.6 | 59 | 0.004 | 1.3 | 9.4 | 110 | | 6.28 | 144.9 | | 1097.49 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/95 | | | | | | | | | | | | | |
| | MW-1005 | 55 | < 0.68 | 360 | 32 | 700 | 21 | 740 | | 6.18 | 976 | | 1138.86 |
| | MW-1005P | 260 | 2.1 | 230 | 0.17 | 72 | 5.3 | 260 | | 7.22 | 470 | | 1137.79 |
| | MW-1005S | 170 | < 0.68 | 160 | 4.3 | 220 | 14 | 220 | | 7.11 | 354 | | 1137.60 |
| | MW-1010P | 140 | 63 | 140 | 0.037 | 21 | 9.6 | 200 | | 7.4 | 291 | | 1079.23 |
| 01/96 | | | | | | | | | | | | | |
| | MW-1000PR | 27 | 49 | 33 | 0.011 | 54 | 8.5 | 87 | | 6.86 | 112.4 | | 1069.64 |
| | MW-1002 | 35 | < 0.68 | 41 | 0.0031 | 0.12 | 5.4 | 65 | | 6.98 | 153.7 | | 1091.25 |
| | MW-1002G | 85 | < 0.68 | 100 | < 0.0017 | < 0.086 | 11 | 150 | | 6.79 | 232 | | 1091.31 |
| | MW-1004P | 150 | 3.3 | 130 | 0.0094 | 27 | 2.3 | 150 | | 7.3 | 295 | | 1078.22 |
| | MW-1004S | 50 | 3.4 | 54 | 0.0038 | 1.1 | 5.8 | 120 | | 6.61 | 144.9 | | 1095.89 |
| | MW-1005 | 78 | < 0.68 | 330 | 28 | 600 | 14 | 560 | | 6.17 | 963 | | 1137.72 |
| | MW-1005P | 240 | < 0.68 | 210 | 0.28 | 97 | 0.93 | 270 | | 7.31 | 464 | | 1137.39 |
| | MW-1005S | 160 | < 0.68 | 140 | 3.7 | 200 | 7 | 190 | | 7.27 | 360 | | 1137.09 |
| | MW-1010P | 140 | 45 | 130 | 0.0023 | 13 | 3.4 | 180 | | 7.01 | 313 | | 1077.28 |
| 04/96 | | | | | | | | | | | | | |
| | MW-1000PR | 53 | 31 | 40 | 0.018 | 64 | 16 | 130 | | 7.07 | 149.4 | | 1066.96 |
| | MW-1002 | 32 | 1.7 | 36 | 0.017 | 0.98 | 5.9 | 120 | | 6.75 | 142.2 | | 1091.57 |
| | MW-1002G | 110 | < 0.68 | 100 | 0.0039 | 0.14 | 11 | 220 | | 6.55 | 264 | | 1091.63 |
| | MW-1004P | 150 | 7.3 | 130 | 0.011 | 22 | 4.2 | 210 | | 6.93 | 258 | | 1077.65 |
| | MW-1004S | 61 | 2.6 | 52 | 0.0048 | 0.32 | 6.2 | 130 | | 5.84 | 168.2 | | 1096.23 |
| | MW-1005 | 73 | < 0.68 | 300 | 23 | 550 | 14 | 530 | | 5.97 | 967 | | 1139.05 |
| | MW-1005P | 250 | < 0.68 | 210 | 0.049 | 35 | 2.2 | 300 | | 6.85 | 486 | | 1139.37 |
| | MW-1005S | 160 | < 0.68 | 140 | 3.9 | 200 | 7.6 | 240 | | 6.8 | 329 | | 1139.04 |
| | MW-1010P | 160 | 16 | 140 | 0.0036 | 100 | 3.8 | 200 | | 7.16 | 309 | | 1076.11 |
| 07/96 | | | | | | | | | | | | | |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/96 | | | | | | | | | | | | | |
| | MW-1000PR | 35 | 33 | 38 | 0.0066 | 120 | 9.3 | 140 | | 7.26 | 113.5 | | 1070.33 |
| | MW-1002 | 34 | 1.6 | 97 | 0.021 | 0.5 | 5.9 | 94 | | 6.78 | 119.6 | | 1092.26 |
| | MW-1002G | 79 | < 0.54 | 93 | 0.0038 | < 0.18 | 11 | 200 | | 6.71 | 221 | | 1092.33 |
| | MW-1004P | 150 | 3.3 | 130 | 0.0047 | 17 | 4.3 | 200 | | 7.21 | 287 | | 1076.74 |
| | MW-1004S | 55 | 3.9 | 46 | 0.0023 | 0.72 | 6.9 | 130 | | 6.31 | 153.5 | | 1096.12 |
| | MW-1005 | 68 | < 0.54 | 300 | 19 | 470 | 14 | 650 | | 6.07 | 858 | | 1139.74 |
| | MW-1005P | 240 | 3.9 | 210 | 0.064 | 140 | 2.6 | 300 | | 6.9 | 441 | | 1139.57 |
| | MW-1005S | 150 | < 0.54 | 140 | 3.6 | 190 | 8.8 | 230 | | 6.8 | 323 | | 1139.05 |
| | MW-1010P | 140 | 74 | 130 | < 0.001 | 18 | 5.9 | 200 | | 7.42 | 285 | | 1077.43 |
| 10/96 | | | | | | | | | | | | | |
| | MW-1000PR | 38 | 57 | 36 | 0.01 | 140 | 7.1 | 76 | | 7.37 | 108.5 | | 1068.99 |
| | MW-1002 | 41 | 3.5 | 42 | 0.0063 | 0.2 | 6.9 | 85 | | 6.92 | 155.1 | | 1090.73 |
| | MW-1002G | 86 | < 0.54 | 93 | 0.0039 | < 0.18 | 11 | 120 | | 6.79 | 226 | | 1090.78 |
| | MW-1004P | 160 | 5.9 | 120 | 0.0042 | 14 | 4.2 | 160 | | 7.23 | 340 | | 1076.74 |
| | MW-1004S | 66 | 1.8 | 59 | 0.0049 | 0.29 | 6.5 | 100 | | 6.25 | 159.5 | | 1095.43 |
| | MW-1005 | 64 | 5 | 320 | 17 | 430 | 14 | 550 | | 6.16 | 948 | | 1137.60 |
| | MW-1005P | 260 | 8.2 | 200 | 0.37 | 67 | 3.6 | 280 | | 7.19 | 471 | | 1137.46 |
| | MW-1005S | 160 | 0.63 | 130 | 3.6 | 200 | 8.2 | 220 | | 7.09 | 329 | | 1137.07 |
| | MW-1010P | 150 | 39 | 130 | 0.0026 | 21 | 5.8 | 170 | | 7.6 | 302 | | 1076.75 |
| 01/97 | | | | | | | | | | | | | |
| | MW-1000PR | 27 | 33 | 33 | 0.0093 | 150 | 9.8 | 160 | | 7.22 | 112.4 | | 1070.35 |
| | MW-1002 | 42 | 0.99 | 46 | 0.011 | < 0.18 | 6.3 | 110 | | 7.47 | 123.8 | | 1092.32 |
| | MW-1002G | 80 | 1.9 | 96 | 0.0024 | < 0.18 | 9.6 | 180 | | 7.15 | 245 | | 1092.43 |
| | MW-1004P | 160 | 6.2 | 120 | 0.015 | 34 | 5.5 | 220 | | 7.42 | 238 | | 1077.50 |
| | MW-1004S | 61 | 5.1 | 62 | 0.0061 | 0.25 | 6.6 | 150 | | 7.03 | 163.7 | | 1095.33 |

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/97 | | | | | | | | | | | | | |
| | MW-1005 | 79 | 15 | 300 | 23 | 540 | 13 | 600 | | 5.91 | 921 | | 1138.10 |
| | MW-1005P | 260 | 2.7 | 210 | 0.073 | 24 | 5.4 | 280 | | 7.04 | 462 | | 1137.41 |
| | MW-1005S | 160 | 4 | 140 | 3.8 | 200 | 7.4 | 250 | | 6.8 | 321 | | 1137.05 |
| | MW-1010P | 140 | 56 | 130 | 0.0018 | 28 | 5.8 | 180 | | 7.23 | 282 | | 1078.40 |
| 04/97 | | | | | | | | | | | | | |
| | MW-1000PR | 36 | 32 | 43 | 0.043 | 190 | 9.9 | 160 | | 7.46 | 132.9 | | 1072.62 |
| | MW-1002 | 41 | 0.79 | 46 | 0.007 | 0.87 | 7 | 110 | | 7.4 | 140 | | 1094.09 |
| | MW-1002G | 81 | < 0.54 | 100 | 0.0029 | < 0.18 | 10 | 200 | | 7 | 260 | | 1094.21 |
| | MW-1004P | 140 | 16 | 130 | 0.008 | 17 | 6.9 | 210 | | 7.25 | 311 | | 1078.42 |
| | MW-1004S | 60 | 1.8 | 59 | 0.0049 | 0.72 | 8.2 | 110 | | 6.51 | 165.8 | | 1096.67 |
| | MW-1005 | 66 | 4.5 | 280 | 21 | 510 | 12 | 620 | | 6.34 | 812 | | 1139.51 |
| | MW-1005P | 250 | 1.6 | 220 | 0.41 | 77 | 5.8 | 320 | | 7 | 480 | | 1138.85 |
| | MW-1005S | 160 | 1.6 | 150 | 4.1 | 210 | 9.5 | 250 | | 6.8 | 344 | | 1138.40 |
| | MW-1010P | 150 | 15 | 150 | 0.008 | 120 | 6.7 | 170 | | 7.43 | 346 | | 1081.61 |
| 07/97 | | | | | | | | | | | | | |
| | MW-1000PR | 33 | 29 | 39 | 0.0079 | 61 | 7.8 | 110 | | 6.72 | 107.1 | | 1073.70 |
| | MW-1002 | 30 | 1.3 | 45 | 0.0087 | 0.8 | 6.6 | 88 | | 6.38 | 118.4 | | 1091.83 |
| | MW-1002G | 78 | < 0.54 | 100 | 0.0051 | < 0.18 | 9.3 | 200 | | 6.51 | 271 | | 1094.93 |
| | MW-1004P | 140 | 14 | 140 | 0.0035 | 12 | 6.5 | 200 | | 6.94 | 277 | | 1083.61 |
| | MW-1004S | 55 | 2 | 64 | 0.0091 | 0.38 | 8 | 130 | | 6.36 | 202 | | 1096.13 |
| | MW-1005 | 63 | 5.9 | 300 | 29 | 800 | 12 | 220 | | 6.22 | 755 | | 1137.92 |
| | MW-1005P | 240 | 2 | 230 | 0.087 | 66 | 6.7 | 280 | | 7.03 | 448 | | 1137.66 |
| | MW-1005S | 140 | 0.71 | 150 | 4 | 200 | 9.8 | 260 | | 6.83 | 689 | | 1137.65 |
| | MW-1010P | 130 | 48 | 140 | 0.001 | 26 | 7 | 170 | | 7.25 | 295 | | 1083.07 |
| 10/97 | | | | | | | | | | | | | |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/97 | | | | | | | | | | | | | |
| | MW-1000PR | 40 | 34 | 45 | 0.0044 | 110 | 5.9 | 82 | | 6.55 | 132 | | 1087.37 |
| | MW-1002 | 40 | 0.86 | 46 | 0.003 | 0.52 | 6 | 76 | | 6.02 | 114 | | 1090.89 |
| | MW-1002G | 88 | < 0.54 | 98 | < 0.001 | < 0.18 | 7.8 | 160 | | 6.35 | 228 | | 1090.97 |
| | MW-1004P | 150 | 40 | 140 | 0.0047 | 10 | 5.3 | 120 | | 6.91 | 349 | | 1096.14 |
| | MW-1004S | 58 | 1.6 | 75 | 0.0057 | 0.93 | 15 | 100 | | 6.13 | 201 | | 1097.72 |
| | MW-1005 | 77 | < 0.54 | 280 | 23 | 590 | 10 | 510 | | 6 | 804 | | 1138.61 |
| | MW-1005P | 240 | < 0.54 | 230 | 0.17 | 62 | < 5 | 260 | | 6.9 | 505 | | 1137.77 |
| | MW-1005S | 150 | < 0.54 | 150 | 4.2 | 210 | 6.2 | 190 | | 6.77 | 351 | | 1137.49 |
| | MW-1010P | 140 | 30 | 140 | < 0.001 | 29 | 5.1 | 170 | | 7.03 | 303 | | 1087.13 |
| 01/98 | | | | | | | | | | | | | |
| | MW-1000PR | 54 | 40 | 110 | 0.0061 | 490 | 180 | 96 | | 6.47 | 576 | | 1087.51 |
| | MW-1002 | 40 | 1.4 | 47 | 0.034 | 0.26 | 7.6 | 82 | | 7.15 | 109.8 | | 1090.00 |
| | MW-1002G | 82 | < 0.54 | 100 | 0.0034 | < 0.18 | 12 | 150 | | 6.85 | 218 | | 1090.06 |
| | MW-1004P | 150 | 27 | 140 | 0.012 | 12 | 8.8 | 140 | | 7.13 | 271 | | 1097.86 |
| | MW-1004S | 48 | 1.6 | 58 | 0.0027 | 0.3 | 11 | 120 | | 6.6 | 140.1 | | 1099.89 |
| | MW-1005 | 71 | < 0.54 | 260 | 21 | 490 | 14 | 490 | | 6.1 | 782 | | 1136.65 |
| | MW-1005P | 250 | 0.73 | 220 | 0.41 | 72 | 11 | 270 | | 7.06 | 456 | | 1136.00 |
| | MW-1005S | 170 | < 0.54 | 120 | 3.3 | 170 | 11 | 200 | | 7.09 | 313 | | 1136.35 |
| | MW-1010P | 140 | 26 | 130 | < 0.001 | 29 | 9.2 | 190 | | 7.4 | 284 | | 1087.61 |
| 04/98 | | | | | | | | | | | | | |
| | MW-1000PR | 93 | 98 | 470 | 0.044 | 3000 | 310 | 770 | | 6.69 | 888 | | 1089.61 |
| | MW-1002 | 30 | 0.86 | 37 | 0.05 | 1.7 | < 5 | 89 | | 7.32 | 131.7 | | 1095.91 |
| | MW-1002G | 75 | < 0.54 | 98 | 0.0047 | 0.21 | 11 | 180 | | 6.97 | 245 | | 1095.83 |
| | MW-1004P | 96 | 20 | 130 | 0.0064 | 9.9 | 8.5 | 170 | | 7.41 | 303 | | 1099.54 |
| | MW-1004S | 47 | 0.92 | 60 | 0.0049 | 0.52 | 10 | 140 | | 7.97 | 164.6 | | 1103.49 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/98 | | | | | | | | | | | | | |
| | MW-1005 | 69 | < 0.54 | 250 | 21 | 500 | 13 | 440 | | 6.06 | 725 | | 1139.07 |
| | MW-1005P | 240 | 1.1 | 210 | 0.077 | 29 | 9.6 | 280 | | 7.36 | 461 | | 1137.92 |
| | MW-1005S | 140 | < 0.54 | 140 | 4.2 | 200 | 11 | 250 | | 7.19 | 332 | | 1137.81 |
| | MW-1010P | 130 | 19 | 130 | 0.0034 | 43 | 5.6 | 170 | | 7.64 | 294 | | 1089.49 |
| 07/98 | | | | | | | | | | | | | |
| | MW-1000PR | 71 | 66 | 480 | 0.076 | 1800 | 350 | 250 | | 6.28 | 1097 | | 1086.30 |
| | MW-1002 | 44 | 0.9 | 50 | 0.0077 | 0.92 | 8.2 | 100 | | 6.55 | 124.8 | | 1090.67 |
| | MW-1002G | 82 | 0.69 | 93 | 0.0038 | < 0.18 | 13 | 180 | | 6.81 | 215 | | 1090.72 |
| | MW-1004P | 160 | 10 | 130 | 0.0077 | 32 | 9.2 | 220 | | 7.08 | 292 | | 1103.73 |
| | MW-1004S | 40 | 1.4 | 60 | 0.0054 | 0.29 | 13 | 140 | | 6.5 | 162.3 | | 1104.89 |
| | MW-1005 | 130 | < 0.54 | 240 | 17 | 400 | 16 | 440 | | 6.16 | 644 | | 1138.11 |
| | MW-1005P | 260 | < 0.54 | 220 | 0.34 | 100 | 12 | 270 | | 7.01 | 458 | | 1137.63 |
| | MW-1005S | 160 | 11 | 150 | 3.9 | 200 | 15 | 230 | | 6.7 | 305 | | 1137.32 |
| | MW-1010P | 150 | 27 | 130 | 0.0034 | 29 | 11 | 160 | | 7.24 | 284 | | 1086.64 |
| 10/98 | | | | | | | | | | | | | |
| | MW-1000PR | 100 | 53 | 570 | 0.012 | 2000 | 480 | 960 | | 6.24 | 1338 | | 1086.24 |
| | MW-1002 | 52 | 0.56 | 57 | 0.0096 | 0.4 | 6.9 | 120 | | 7.13 | 158 | | 1090.03 |
| | MW-1002G | 76 | < 0.54 | 97 | < 0.001 | < 0.18 | 13 | 120 | | 7 | 194 | | 1090.04 |
| | MW-1004P | 140 | 5 | 140 | 0.0094 | 12 | 8.6 | 150 | | 7.06 | 327 | | 1102.49 |
| | MW-1004S | 48 | 1.1 | 60 | 0.0029 | 0.45 | 14 | 98 | | 6.29 | 324 | | 1104.57 |
| | MW-1005 | 65 | < 0.54 | 250 | 19 | 460 | 17 | 430 | | 6.12 | 724 | | 1136.87 |
| | MW-1005P | 230 | 1.9 | 220 | 0.17 | 63 | 9.4 | 250 | | 6.96 | 477 | | 1136.19 |
| | MW-1005S | 150 | < 0.54 | 150 | 3.9 | 210 | 13 | 180 | | 6.82 | 327 | | 1136.02 |
| | MW-1010P | 130 | 20 | 130 | < 0.001 | 22 | 8.6 | 190 | | 7.53 | 309 | | 1086.42 |
| 02/99 | | | | | | | | | | | | | |

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02/99 | | | | | | | | | | | | | | |
| | MW-1000PR | | 120 | 37 | 760 | 1.2 | 4800 | 560 | 1200 | | 6.15 | 1293 | | 1086.21 |
| | MW-1002 | | 54 | < 0.54 | 60 | 0.012 | 0.71 | 8.3 | 92 | | 7.29 | 142.9 | | 1089.33 |
| | MW-1002G | | 85 | < 0.54 | 97 | 0.0035 | 0.24 | 11 | 160 | | 6.54 | 215 | | 1089.39 |
| | MW-1004P | | 160 | 2.6 | 140 | 0.007 | 12 | 7.6 | 140 | | 7.47 | 267 | | 1101.91 |
| | MW-1004P | (Dup) | 160 | 2.8 | 140 | 0.0069 | 12 | 7.6 | 170 | | | | | |
| | MW-1004S | | 44 | 0.6 | 59 | 0.005 | 0.62 | 11 | 120 | | 6.59 | 141.8 | | 1103.70 |
| | MW-1005 | | 74 | < 0.54 | 230 | 20 | 470 | 12 | 370 | | 6.21 | 598 | | 1135.69 |
| | MW-1005P | | 250 | < 0.54 | 220 | 0.066 | 27 | 7.8 | 250 | | 7.6 | 449 | | 1135.35 |
| | MW-1005S | | 170 | < 0.54 | 150 | 4 | 200 | 8.9 | 180 | | 6.87 | 319 | | 1135.21 |
| | MW-1010P | | 140 | 24 | 130 | 0.0046 | 20 | 8.3 | 170 | | 7.01 | 288 | | 1086.37 |
| | MW-1013B | | 630 | 36 | 2300 | 0.045 | 25000 | 1400 | 3100 | | 6.2 | 3540 | | 1093.95 |
| | MW-1013C | | 480 | 100 | 2100 | 0.92 | 7200 | 1300 | 3000 | | 6.3 | 3170 | | 1095.27 |
| | MW-1014B | | 510 | 810 | 2100 | 0.062 | 23000 | 1200 | 2900 | | 6.2 | 3280 | | 1105.62 |
| | MW-1014C | | 360 | < 4.7 | 980 | 14 | 4300 | 520 | 1200 | | 6.3 | 1900 | | 1103.39 |
| 04/99 | | | | | | | | | | | | | | |
| | MW-1000PR | | 120 | 54 | 740 | 1.2 | 5300 | 440 | 1300 | | 6.2 | 1319 | | 1086.61 |
| | MW-1000PR | (Dup) | 120 | 55 | 770 | 1.3 | 5300 | 340 | 1200 | | | | | |
| | MW-1002 | | 52 | 0.51 | 59 | 0.0018 | < 0.41 | 7.3 | 72 | | 6.6 | 160 | | 1091.06 |
| | MW-1002G | | 85 | < 0.47 | 95 | < 0.001 | < 0.41 | 9.8 | 100 | | 6.5 | 248 | | 1091.10 |
| | MW-1004P | | 160 | 3.2 | 130 | 0.0066 | 9 | 6.6 | 140 | | 6.7 | 294 | | 1103.29 |
| | MW-1004S | | 46 | 1.7 | 60 | 0.0037 | 0.87 | 10 | 82 | | 6.1 | 157 | | 1105.50 |
| | MW-1005 | | 69 | < 0.47 | 200 | 20 | 480 | 11 | 430 | | 6.3 | 596 | | 1137.97 |
| | MW-1005P | | 250 | 1.1 | 210 | 0.049 | 23 | 7.8 | 230 | | 7 | 464 | | 1136.65 |
| | MW-1005S | | 160 | < 0.47 | 140 | 4.1 | 210 | 8.6 | 210 | | 7 | 297 | | 1136.65 |
| | MW-1010P | | 160 | 12 | 140 | 0.019 | 67 | 7.6 | 140 | | 7.1 | 284 | | 1086.95 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/99 | | | | | | | | | | | | | | | | | |
| | MW-1013 | | | | | | | | | | | | | | | | 1105.11 |
| | MW-1013A | | | | | | | | | | | | | | | | 1094.73 |
| | MW-1013B | | 550 | | 16 | 2300 | 0.33 | | 30000 | 770 | 3700 | | | 6.2 | 3130 | | 1094.58 |
| | MW-1013C | | 430 | | 75 | 2200 | 0.84 | | 7700 | 920 | 3300 | | | 6.4 | 3030 | | 1095.73 |
| | MW-1014 | | | | | | | | | | | | | | | | |
| | MW-1014A | | | | | | | | | | | | | | | | 1103.93 |
| | MW-1014B | | 460 | | 420 | 2100 | 0.033 | | 23000 | 770 | 3300 | | | 6.2 | 2890 | | 1106.23 |
| | MW-1014C | | 330 | < | 4.7 | 1000 | 15 | | 4500 | 440 | 1200 | | | 6.3 | 1623 | | 1102.83 |
| 07/99 | | | | | | | | | | | | | | | | | |
| | MW-1000PR | | 130 | | 130 | 770 | 3.3 | | 5400 | 380 | 1300 | | 890 | 6.09 | 1310 | | 1087.96 |
| | MW-1000PR | (Dup) | 120 | | 97 | 770 | 3.2 | | 5600 | 350 | 1300 | | 880 | | | | |
| | MW-1002 | | 50 | < | 4.7 | 58 | 0.0027 | < | 0.41 | 5.9 | 110 | < | 12 | 6.73 | 148.6 | | 1092.31 |
| | MW-1002G | | 84 | < | 4.7 | 100 | 0.0022 | < | 0.41 | 11 | 180 | < | 12 | 7 | 227 | | 1092.30 |
| | MW-1004P | | 160 | < | 6.9 | 140 | 0.014 | | 10 | 2.7 | 180 | < | 12 | 7.07 | 308 | | 1104.97 |
| | MW-1004S | | 40 | < | 6.9 | 59 | 0.0068 | | 2.3 | 10 | 100 | < | 12 | 5.94 | 157.9 | | 1107.29 |
| | MW-1005 | | 65 | < | 4.7 | 200 | 19 | | 460 | 12 | 530 | < | 12 | 6.15 | 603 | | 1139.21 |
| | MW-1005P | | 240 | < | 4.7 | 220 | 0.054 | | 51 | 7.3 | 250 | < | 12 | 6.91 | 501 | | 1138.09 |
| | MW-1005S | | 160 | < | 4.7 | 150 | 4.3 | | 220 | 9.5 | 240 | < | 12 | 6.72 | 331 | | 1138.05 |
| | MW-1010P | | 150 | | 12 | 140 | 0.0074 | | 59 | 5.5 | 200 | < | 12 | 7.19 | 269 | | 1088.46 |
| | MW-1013 | | | | | | | | | | | | | | | | 1106.07 |
| | MW-1013A | | | | | | | | | | | | | | | | 1095.38 |
| | MW-1013B | | 620 | | 33 | 2200 | 0.76 | | 29000 | 1600 | 3800 | < | 120 | 6.39 | 3020 | | 1095.20 |
| | MW-1013C | | 430 | | 50 | 2100 | 1.3 | | 7300 | 870 | 2700 | | 660 | 6.42 | 3020 | | 1096.67 |
| | MW-1014 | | | | | | | | | | | | | | | | |
| | MW-1014A | | | | | | | | | | | | | | | | 1106.42 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/99 | | | | | | | | | | | | | |
| | MW-1014B | 540 | 520 | 2100 | 0.072 | 23000 | 580 | 3100 | 2500 | 6.34 | 3540 | | 1107.13 |
| | MW-1014C | 370 | 16 | 930 | 14 | 4000 | 370 | 1200 | 2200 | 6.39 | 1657 | | 1103.90 |
| 10/99 | | | | | | | | | | | | | |
| | MW-1000PR | 130 | 17 | 760 | 3.6 | 5200 | 680 | 1100 | 730 | 6.7 | 1400 | | 1086.75 |
| | MW-1002 | 46 | < 0.47 | 51 | 0.029 | < 0.41 | 6.9 | 91 | | 7 | 140 | | 1090.59 |
| | MW-1002G | 87 | < 0.47 | 100 | 0.0061 | < 0.41 | 12 | 150 | | 7.2 | 240 | | 1090.62 |
| | MW-1004P | 160 | 1.9 | 140 | 0.014 | 8.1 | 2.8 | 180 | < 12 | 7.4 | 320 | | 1104.88 |
| | MW-1004S | 41 | 0.83 | 57 | 0.0089 | 0.63 | 15 | 84 | < 12 | 6.5 | 160 | | 1106.69 |
| | MW-1005 | 65 | < 0.47 | 190 | 18 | 410 | 17 | 400 | | 6.5 | 570 | | 1137.86 |
| | MW-1005P | 240 | < 0.47 | 220 | 0.97 | 88 | < 1.5 | 260 | | 7.3 | 460 | | 1137.64 |
| | MW-1005S | 160 | < 0.47 | 150 | 4.1 | 210 | 5.6 | 210 | | 7. | 320 | | 1137.32 |
| | MW-1010P | 150 | 3.5 | 140 | 0.0096 | 65 | 5.3 | 170 | < 12 | 7.6 | 300 | | 1086.81 |
| | MW-1010P (Dup) | 140 | 0.84 | 140 | 0.011 | 130 | 5.2 | 170 | < 12 | | | | |
| | MW-1013 | | | | | | | | | | | | 1105.80 |
| | MW-1013A | | | | | | | | | | | | 1095.51 |
| | MW-1013B | 540 | < 9.4 | 2200 | 0.17 | 28000 | 1900 | 3700 | < 120 | 6.6 | 3200 | | 1095.49 |
| | MW-1013C | 400 | < 9.4 | 2200 | 1.4 | 7600 | 2000 | 3000 | 660 | 6.8 | 3300 | | 1096.97 |
| | MW-1014 | | | | | | | | | | | | 1111.60 |
| | MW-1014A | | | | | | | | | | | | 1107.87 |
| | MW-1014B | 570 | 530 | 2200 | < 0.01 | 23000 | 1600 | 3100 | 5000 | 6.4 | 3200 | | 1108.33 |
| | MW-1014C | 380 | < 9.4 | 960 | 14 | 4000 | 700 | 1200 | 2100 | 6.6 | 1600 | | 1104.81 |
| 01/00 | | | | | | | | | | | | | |
| | MW-1000PR | 140 | 1.9 | 670 | 4.4 | 4100 | 610 | 1000 | | 6.3 | 1300 | | 1086.61 |
| | MW-1002 | 57 | < 0.47 | 65 | < 0.001 | < 0.41 | 5.6 | 110 | | 6.9 | 170 | | 1089.42 |
| | MW-1002G | 87 | < 0.47 | 98 | 0.0031 | < 0.41 | 12 | 120 | | 7.1 | 240 | | 1089.43 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/00 | | | | | | | | | | | | | | |
| | MW-1004P | | 160 | < 0.47 | 130 | 0.085 | 56 | < 5 | 150 | | 6.7 | 310 | | 1103.16 |
| | MW-1004S | | 43 | < 0.47 | 59 | 0.0051 | 0.65 | 16 | 110 | | 6.7 | 160 | | 1104.64 |
| | MW-1005 | | 85 | < 0.47 | 200 | 16 | 530 | 16 | 300 | | 6.8 | 600 | | 1137.18 |
| | MW-1005P | | 250 | < 0.47 | 200 | 0.14 | 47 | < 5 | 280 | | 6.7 | 480 | | 1136.65 |
| | MW-1005S | | 170 | < 0.47 | 150 | 3.9 | 210 | < 5 | 210 | | 6.7 | 380 | | 1136.76 |
| | MW-1010P | | 140 | 2.2 | 130 | 0.017 | 39 | < 5 | 130 | | 6.8 | 280 | | 1086.65 |
| | MW-1013 | | | | | | | | | | | | | 1104.64 |
| | MW-1013A | | | | | | | | | | | | | 1095.62 |
| | MW-1013B | | 560 | < 4.7 | 2100 | 0.41 | 30000 | 1700 | 3300 | < 120 | 6.4 | 3000 | | 1095.59 |
| | MW-1013C | | 510 | < 4.7 | 2100 | 1.5 | 7300 | 1700 | 2900 | 630 | 6.5 | 2700 | | 1097.10 |
| | MW-1014 | | | | | | | | | | | | | 1112.07 |
| | MW-1014A | | | | | | | | | | | | | 1109.22 |
| | MW-1014B | | 490 | 500 | 1900 | 0.055 | 20000 | 1400 | 3200 | 4100 | 6.5 | 3000 | | 1108.88 |
| | MW-1014C | | 320 | < 0.47 | 810 | 12 | 3200 | 540 | 1200 | 1700 | 6.6 | 1500 | | 1105.18 |
| | MW-1014C | (Dup) | 300 | < 0.47 | 820 | 11 | 3100 | 560 | 1300 | 1600 | | | | |
| 04/00 | | | | | | | | | | | | | | |
| | MW-1000PR | | 140 | 19 | 720 | 3.4 | 3800 | 560 | 920 | | 6.93 | 1274 | | 1087.26 |
| | MW-1000PR | (Dup) | 150 | 18 | 700 | 4.3 | 4000 | 550 | 1000 | | | | | |
| | MW-1002 | | 55 | 0.91 | 67 | 0.0039 | < 0.41 | 5.2 | 98 | | 6.82 | 166 | | 1090.33 |
| | MW-1002G | | 89 | < 0.6 | 100 | 0.0027 | < 0.41 | 11 | 140 | | 6.84 | 239 | | 1090.34 |
| | MW-1004P | | 160 | 1.7 | 140 | 0.012 | 7.9 | < 5 | 170 | | 6.86 | 293 | | 1103.32 |
| | MW-1004S | | 42 | 1.3 | 56 | 0.0027 | < 0.41 | 15 | 98 | | 6.9 | 156.3 | | 1104.96 |
| | MW-1005 | | 66 | < 0.67 | 190 | 18 | 410 | 13 | 400 | | 6.76 | 598 | | 1138.07 |
| | MW-1005P | | 250 | < 0.6 | 220 | 0.37 | 80 | < 5 | 220 | | 7.27 | 483 | 64 | 1137.05 |
| | MW-1005S | | 170 | < 0.6 | 150 | 4.2 | 220 | < 5 | 230 | | 7.04 | 354 | | 1136.99 |

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/00 | | | | | | | | | | | | | | |
| | MW-1010P | | 140 | 9.9 | 150 | 0.0066 | 24 | < 5 | 140 | | 7.1 | 283 | 77 | 1087.46 |
| | MW-1013 | | | | | | | | | | | | 97 | 1103.87 |
| | MW-1013A | | | | | | | | | | | | 97 | 1095.36 |
| | MW-1013B | | 520 | 19 | 2200 | 0.27 | 32000 | 1200 | 3600 | < 120 | 6.63 | 3120 | 230 | 1095.54 |
| | MW-1013C | | 460 | 11 | 2200 | 1.6 | 7800 | 1700 | 2900 | 610 | 6.73 | 3370 | 177 | 1097.39 |
| | MW-1014 | | | | | | | | | | | | 160 | 1112.41 |
| | MW-1014A | | 390 | < 6 | 1300 | 0.55 | 7200 | 970 | 1800 | < 120 | 6.87 | 2220 | 165 | 1109.24 |
| | MW-1014B | | 480 | 520 | 2100 | < 0.15 | 22000 | 1500 | 3200 | 3700 | 6.43 | 2940 | 290 | 1108.85 |
| | MW-1014C | | 320 | < 6 | 870 | 13 | 3600 | 440 | 1000 | 1800 | 6.65 | 1470 | 88 | 1105.25 |
| 07/00 | | | | | | | | | | | | | | |
| | MW-1000PR | | 140 | 7.3 | 710 | 2.3 | 5000 | 550 | 930 | 620 | 6.3 | 1200 | | 1087.30 |
| | MW-1002 | | 52 | < 0.53 | 66 | < 0.005 | < 2 | 5.7 | 110 | < 12 | 6.7 | 160 | | 1092.01 |
| | MW-1002G | | 90 | < 0.53 | 110 | < 0.005 | < 2 | 12 | 160 | < 12 | 6.6 | 220 | | 1092.00 |
| | MW-1004P | | 160 | 0.65 | 150 | 0.0086 | 22 | < 5 | 160 | < 12 | 6.3 | 300 | | 1104.69 |
| | MW-1004S | | 41 | 1.2 | 61 | < 0.005 | < 2 | 16 | 100 | < 12 | 6.6 | 150 | | 1106.70 |
| | MW-1005 | | 64 | 0.7 | 210 | 20 | 600 | 15 | 470 | < 12 | 6.6 | 520 | | 1138.43 |
| | MW-1005P | | 250 | < 0.53 | 230 | 0.058 | 75 | < 5 | 290 | < 12 | 6.5 | 460 | | 1138.08 |
| | MW-1005S | | 170 | < 0.53 | 170 | 4.6 | 240 | < 5 | 200 | < 12 | 6.5 | 330 | | 1137.92 |
| | MW-1010P | | 140 | 14 | 140 | < 0.025 | 26 | < 5 | 190 | < 60 | 6.5 | 290 | | 1087.16 |
| | MW-1010P | (Dup) | 150 | 9.9 | 140 | 0.012 | 40 | < 5 | 160 | < 12 | | | | |
| | MW-1013 | | | | | | | | | | | | | 1104.58 |
| | MW-1013A | | | | | | | | | | | | | 1095.79 |
| | MW-1013B | | 660 | 14 | 2300 | < 0.36 | 34000 | 1600 | 3200 | < 120 | 6.3 | 3000 | | 1096.09 |
| | MW-1013C | | 520 | < 12 | 2300 | 2.2 | 8400 | 1600 | 3300 | 620 | 6.3 | 3100 | | 1097.84 |
| | MW-1014 | | | | | | | | | | | | | 1113.00 |

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/00 | | | | | | | | | | | | | |
| | MW-1014A | 430 | < 12 | 1400 | 1.2 | 7100 | 960 | 2200 | < 120 | 6.6 | 2000 | | 1110.50 |
| | MW-1014B | 510 | 330 | 2200 | < 0.36 | 21000 | 1600 | 3000 | 2500 | 6.3 | 3000 | | 1109.47 |
| | MW-1014C | 350 | < 12 | 890 | 13 | 3500 | 480 | 1400 | 1700 | 6.4 | 1400 | | 1105.82 |
| 10/00 | | | | | | | | | | | | | |
| | MW-1000PR | 170 | < 2.6 | 680 | 6.6 | 4200 | 460 | 1100 | 900 | 6.19 | 1189 | | 1086.79 |
| | MW-1002 | 47 | < 0.53 | 58 | < 0.005 | < 2 | 5.7 | 120 | < 12 | 6.35 | 125 | | 1090.59 |
| | MW-1002G | 89 | < 0.53 | 110 | < 0.005 | < 2 | 12 | 150 | < 12 | 6.6 | 223 | | 1090.62 |
| | MW-1004P | 160 | 0.8 | 140 | 0.008 | 16 | < 5 | 200 | < 12 | 7.16 | 284 | | 1104.41 |
| | MW-1004P (Dup) | 160 | < 0.53 | 140 | 0.17 | 79 | < 5 | 200 | < 12 | | | | |
| | MW-1004S | 35 | 1 | 58 | < 0.005 | < 2 | 18 | 130 | < 12 | 5.99 | 134.1 | | 1105.87 |
| | MW-1005 | 58 | 0.58 | 190 | 17 | 390 | 15 | 430 | < 12 | 6.17 | 530 | | 1137.55 |
| | MW-1005P | 240 | 0.74 | 220 | 0.13 | 38 | < 5 | 260 | < 12 | 7.26 | 448 | | 1137.56 |
| | MW-1005S | 170 | < 0.53 | 160 | 4.3 | 220 | < 5 | 210 | < 12 | 7.34 | 330 | | 1137.20 |
| | MW-1010P | 150 | 4.3 | 140 | 0.41 | 250 | < 5 | 220 | < 12 | 7.49 | 268 | | 1086.67 |
| | MW-1013 | | | | | | | | | | | | 1105.06 |
| | MW-1013A | | | | | | | | | | | | 1096.20 |
| | MW-1013B | 620 | < 12 | 2200 | 0.84 | 35000 | 1500 | 3200 | < 120 | 6.28 | 3180 | | 1096.45 |
| | MW-1013C | 540 | < 12 | 2200 | 1.6 | 8200 | 1600 | 3200 | 370 | 6.37 | 3310 | | 1097.86 |
| | MW-1014 | | | | | | | | | | | | 1113.98 |
| | MW-1014A | 430 | < 12 | 1400 | 0.96 | 6700 | 880 | 2300 | < 120 | 6.68 | 2250 | | 1111.39 |
| | MW-1014B | 520 | 430 | 2200 | < 0.36 | 21000 | 1500 | 2900 | 2100 | 6.26 | 3240 | | 1110.09 |
| | MW-1014C | 390 | < 12 | 840 | 12 | 3200 | 450 | 1300 | 1500 | 6.36 | 1490 | | 1106.21 |
| 01/01 | | | | | | | | | | | | | |
| | MW-1000PR | 180 | < 2.6 | 610 | 6.8 | 3700 | 440 | 1000 | 810 | 6.13 | 1192 | 143 | 1088.39 |
| | MW-1002 | 58 | < 0.53 | 66 | < 0.005 | < 2 | 6.7 | 120 | < 12 | 6.55 | 156.3 | | 1089.93 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/01 | | | | | | | | | | | | | | |
| | MW-1002G | | 90 | < 0.53 | 99 | < 0.005 | < 2 | 12 | 150 | < 12 | 6.48 | 253 | | 1089.93 |
| | MW-1004P | | 160 | < 0.53 | 130 | 0.085 | 52 | < 5 | 130 | < 12 | 7.25 | 293 | 46 | 1103.37 |
| | MW-1004S | | 39 | < 0.53 | 56 | < 0.005 | < 2 | 19 | 100 | < 12 | 5.9 | 139.3 | 180 | 1104.73 |
| | MW-1005 | | 58 | < 0.53 | 160 | 16 | 370 | 15 | 300 | < 12 | 6.18 | 520 | | 1136.92 |
| | MW-1005P | | 250 | < 0.53 | 210 | 0.058 | 24 | < 5 | 260 | < 12 | 7.17 | 454 | 37 | 1136.65 |
| | MW-1005S | | 170 | < 0.53 | 150 | 4.1 | 210 | < 5 | 200 | < 12 | 6.95 | 335 | | 1136.42 |
| | MW-1010P | | 160 | < 0.53 | 140 | 0.17 | 180 | < 5 | 170 | < 12 | 7.57 | 270 | 88 | 1088.16 |
| | MW-1013 | | | | | | | | | | | | | 1103.78 |
| | MW-1013A | | | | | | | | | | | | | 1095.72 |
| | MW-1013B | | 590 | < 12 | 1900 | 0.41 | 30000 | 1600 | 3300 | < 120 | 6.14 | 3230 | 174 | 1095.86 |
| | MW-1013C | | 520 | < 12 | 2100 | 2.6 | 7800 | 1600 | 3200 | 480 | 6.27 | 3310 | 80 | 1098.03 |
| | MW-1013C | (Dup) | 470 | < 12 | 2000 | 2.5 | 7700 | 1600 | 3000 | 470 | | | | |
| | MW-1014 | | | | | | | | | | | | | 1113.86 |
| | MW-1014A | | 410 | < 12 | 1200 | 0.83 | 5400 | 970 | 1900 | < 120 | 6.46 | 2310 | 113 | 1111.59 |
| | MW-1014B | | 550 | 450 | 1900 | < 0.36 | 18000 | 1400 | 2600 | 2800 | 6.29 | 3140 | 226 | 1109.89 |
| | MW-1014C | | 340 | < 12 | 760 | 11 | 2900 | 450 | 1100 | 1200 | 6.46 | 1452 | 64 | 1106.15 |
| 04/01 | | | | | | | | | | | | | | |
| | MW-1000PR | | 170 | 14 | 650 | 1.3 | 2900 | 480 | 910 | 600 | 5.9 | 1200 | 175 | 1091.12 |
| | MW-1002 | | 60 | < 2.7 | 72 | 0.012 | < 2 | 6.4 | 99 | < 12 | 6.5 | 130 | | 1095.48 |
| | MW-1002G | | 89 | < 2.7 | 110 | < 0.005 | < 2 | 12 | 170 | < 12 | 6.3 | 200 | | 1095.38 |
| | MW-1002G | (Dup) | 89 | < 2.7 | 110 | < 0.005 | < 2 | 11 | 200 | < 12 | | | | |
| | MW-1004P | | 160 | < 2.7 | 140 | 0.055 | 54 | < 5 | 160 | < 12 | 7 | 260 | 144 | 1107.47 |
| | MW-1004S | | 35 | < 2.7 | 60 | < 0.005 | < 2 | 19 | 73 | < 12 | 5.5 | 130 | 230 | 1110.93 |
| | MW-1005 | | 61 | < 2.7 | 170 | 15 | 350 | 14 | 370 | < 12 | 5.6 | 460 | | 1140.04 |
| | MW-1005P | | 240 | < 2.7 | 220 | 0.055 | 27 | < 5 | 290 | < 12 | 6.7 | 430 | 17 | 1138.80 |

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/01 | | | | | | | | | | | | | | |
| | MW-1005S | | 170 | < 2.7 | 160 | 4.4 | 230 | < 5 | 210 | < 12 | 6.7 | 310 | | 1139.04 |
| | MW-1010P | | 150 | 5.5 | 140 | 0.066 | 64 | < 5 | 130 | < 12 | 7.1 | 250 | -8 | 1090.56 |
| | MW-1013 | | | | | | | | | | | | | 1104.08 |
| | MW-1013A | | | | | | | | | | | | | 1097.10 |
| | MW-1013B | | 530 | 35 | 2300 | 0.72 | 40000 | 1600 | 3300 | < 120 | 6 | 3400 | 203 | 1097.57 |
| | MW-1013C | | 440 | < 13 | 2300 | 2.1 | 9100 | 1600 | 3000 | 330 | 6.3 | 3000 | 84 | 1100.12 |
| | MW-1014 | | | | | | | | | | | | | 1114.62 |
| | MW-1014A | | 430 | < 13 | 1400 | 0.69 | 6700 | 920 | 1700 | < 120 | 6.3 | 2300 | 138 | 1112.51 |
| | MW-1014B | | 520 | 530 | 2000 | < 0.15 | 19000 | 1400 | 3300 | 3500 | 6.1 | 3200 | 207 | 1111.14 |
| | MW-1014C | | 330 | < 13 | 830 | 12 | 3100 | 420 | 1100 | 1300 | 6.2 | 1400 | 55 | 1107.65 |
| | MW-1014C | (Dup) | | | | | | | | | | | | |
| | MW-1015A | | 75 | < 2.7 | 88 | 0.0082 | < 2 | 8.2 | 120 | < 12 | 7.1 | 160 | | 1092.09 |
| | MW-1015B | | 180 | < 2.7 | 140 | 0.069 | 140 | < 5 | 290 | < 12 | 7.6 | 460 | | 1091.09 |
| 05/01 | | | | | | | | | | | | | | |
| | MW-1015A | | 77 | < 2.7 | 83 | < 0.005 | 2.5 | 9.2 | 110 | < 12 | 7 | 150 | | 1089.83 |
| | MW-1015B | | 180 | < 2.7 | 140 | < 0.005 | 36 | 5.1 | 220 | < 12 | 7.8 | 470 | | 1089.79 |
| 06/01 | | | | | | | | | | | | | | |
| | MW-1015A | | 75 | < 2.7 | 85 | < 0.005 | 4.2 | 8.4 | 110 | < 12 | 7 | 150 | | 1089.53 |
| | MW-1015B | | 180 | < 2.7 | 140 | < 0.005 | 23 | < 5 | 220 | < 12 | 7.6 | 450 | | 1089.69 |
| 07/01 | | | | | | | | | | | | | | |
| | MW-1000PR | | 180 | < 13 | 660 | 7.1 | 3900 | 450 | 950 | 860 | 5.99 | 1130 | 147 | 1087.88 |
| | MW-1002 | | 54 | < 2.7 | 67 | < 0.005 | < 2 | 7.6 | 79 | < 12 | 6.12 | 123 | | 1092.93 |
| | MW-1002G | | 89 | 3.6 | 110 | < 0.005 | < 2 | 11 | 120 | 19 | 6.63 | 202 | | 1092.90 |
| | MW-1004P | | 150 | < 2.7 | 150 | 0.015 | 14 | < 5 | 160 | < 12 | 6.9 | 260 | 99 | 1107.30 |
| | MW-1004S | | 34 | < 2.7 | 60 | < 0.005 | < 2 | 22 | 96 | < 12 | 5.6 | 122 | 196 | 1109.33 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/01 | | | | | | | | | | | | | | |
| | MW-1005 | | 53 | < 2.7 | 190 | 15 | 420 | 14 | 330 | < 12 | 5.87 | 493 | | 1140.32 |
| | MW-1005P | | 230 | < 2.7 | 230 | 0.087 | 49 | < 5 | 250 | < 12 | 7.13 | 428 | 8 | 1140.03 |
| | MW-1005P | (Dup) | 240 | < 2.7 | 230 | 0.77 | 80 | < 5 | 210 | < 12 | | | | |
| | MW-1005S | | 170 | < 2.7 | 170 | 4.4 | 230 | < 5 | 190 | < 12 | 6.91 | 308 | | 1139.84 |
| | MW-1010P | | 140 | < 2.7 | 150 | 0.16 | 150 | 6 | 140 | < 12 | 7.08 | 250 | 173 | 1087.82 |
| | MW-1013 | | | | | | | | | | | | | 1106.08 |
| | MW-1013A | | | | | | | | | | | | | 1097.19 |
| | MW-1013B | | 490 | 33 | 2400 | 0.89 | 40000 | 1600 | 3500 | 130 | 6.09 | 3290 | 252 | 1097.63 |
| | MW-1013C | | 460 | < 13 | 2300 | 3.2 | 9000 | 1600 | 3500 | 570 | 6.28 | 3400 | 30 | 1099.39 |
| | MW-1014 | | | | | | | | | | | | | 1115.67 |
| | MW-1014A | | 420 | < 13 | 1500 | 0.7 | 6500 | 960 | 2000 | < 120 | 6.24 | 2250 | 147 | 1112.88 |
| | MW-1014B | | 440 | 480 | 2200 | < 0.15 | 20000 | 1500 | 3000 | 1900 | 6.01 | 2990 | 235 | 1112.02 |
| | MW-1014C | | 330 | < 13 | 810 | 11 | 3000 | 420 | 1100 | 1200 | 6.15 | 1360 | 40 | 1108.11 |
| | MW-1015A | | 75 | < 2.7 | 90 | < 0.005 | 7.5 | 9.8 | 110 | < 12 | 6.55 | 153 | | 1088.74 |
| | MW-1015B | | 180 | < 2.7 | 150 | < 0.005 | 19 | < 5 | 240 | < 12 | 7.32 | 451 | | 1088.67 |
| 08/01 | | | | | | | | | | | | | | |
| | MW-1015A | | 76 | < 2.7 | 90 | < 0.005 | 9.7 | 7.6 | 100 | < –12 | 6.68 | 158.7 | | 1088.12 |
| | MW-1015B | | 180 | < 2.7 | 150 | < 0.005 | 13 | 5.3 | 240 | < 12 | 7.53 | 462 | | 1088.21 |
| 09/01 | | | | | | | | | | | | | | |
| | MW-1015A | | 79 | < 2.7 | 82 | 0.02 | 15 | 7.8 | 150 | < 12 | 7.19 | 159.9 | | 1087.55 |
| | MW-1015B | | 180 | < 2.7 | 130 | 0.0052 | 18 | < 5 | 290 | < 12 | 7.67 | 458 | | 1087.59 |
| 10/01 | | | | | | | | | | | | | | |
| | MW-1000PR | | 190 | < 13 | 560 | 2.8 | 3300 | 450 | 940 | 440 | 5.97 | 1109 | 163 | 1087.26 |
| | MW-1002 | | 53 | < 2.7 | 57 | < 0.005 | < 2 | 7.1 | 140 | < 12 | 6.03 | 123.3 | | 1090.63 |
| | MW-1002G | | 89 | < 2.7 | 94 | < 0.005 | < 2 | 11 | 140 | < 12 | 6.1 | 203 | | 1090.63 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/01 | | | | | | | | | | | | | | |
| | MW-1004P | | 160 | < 2.7 | 130 | 0.1 | 65 | < 5 | 130 | < 12 | 6.81 | 260 | 94 | 1105.50 |
| | MW-1004S | | 34 | < 2.7 | 51 | < 0.005 | < 2 | 23 | 110 | < 12 | 5.73 | 121.3 | 198 | 1107.06 |
| | MW-1004S | (Dup) | 33 | < 2.7 | 50 | < 0.005 | < 2 | 23 | 110 | < 12 | | | | |
| | MW-1005 | | 49 | < 2.7 | 170 | 12 | 340 | 15 | 450 | < 12 | 5.72 | 530 | | 1138.85 |
| | MW-1005P | | 240 | < 2.7 | 200 | 0.2 | 68 | < 5 | 270 | < 12 | 6.63 | 424 | 5 | 1138.59 |
| | MW-1005S | | 170 | < 2.7 | 140 | 3.9 | 210 | < 5 | 230 | < 12 | 6.45 | 306 | | 1138.31 |
| | MW-1010P | | 150 | 5.3 | 120 | 0.0097 | 18 | 5.4 | 180 | < 12 | 6.63 | 246 | | 1087.10 |
| | MW-1013 | | | | | | | | | | | | | 1106.69 |
| | MW-1013A | | | | | | | | | | | | | 1096.90 |
| | MW-1013B | | 560 | 69 | 2000 | 0.66 | 34000 | 1600 | 3200 | 130 | 6.06 | 3320 | 201 | 1097.19 |
| | MW-1013C | | 480 | < 13 | 2000 | 2.7 | 8500 | 1700 | 3200 | 510 | 6.22 | 3380 | 21 | 1099.04 |
| | MW-1014 | | | | | | | | | | | | | 1116.86 |
| | MW-1014A | | 430 | < 13 | 1300 | 1.5 | 6000 | 1000 | 1900 | < 120 | 6.34 | 2280 | 152 | 1114.03 |
| | MW-1014B | | 510 | 490 | 1900 | < 0.15 | 18000 | 1600 | 2900 | 1600 | 6.05 | 3150 | 219 | 1112.38 |
| | MW-1014C | | 350 | < 13 | 710 | 9.6 | 2900 | 410 | 990 | 1100 | 6.17 | 1354 | 56 | 1108.10 |
| | MW-1015A | | 77 | < 2.7 | 78 | < 0.005 | 10 | 10 | 130 | < 12 | 6.6 | 160 | | 1087.58 |
| | MW-1015B | | 180 | < 2.7 | 130 | < 0.005 | 8.6 | < 5 | 310 | < 12 | 7.1 | 450 | | 1087.67 |
| 11/01 | | | | | | | | | | | | | | |
| | MW-1015A | | 76 | < 2.7 | 85 | < 0.005 | 11 | 9.7 | 110 | < 12 | 6.6 | 160 | | 1087.86 |
| | MW-1015B | | 180 | < 2.7 | 140 | < 0.005 | 8.9 | < 5 | 280 | < 12 | 7.2 | 450 | | 1087.84 |
| 12/01 | | | | | | | | | | | | | | |
| | MW-1015A | | 78 | < 2.7 | 87 | 0.023 | 13 | 7.8 | 150 | < 12 | 6.52 | 163.5 | | 1088.72 |
| | MW-1015B | | 180 | < 2.7 | 140 | 0.0069 | 11 | < 5 | 300 | < 12 | 7.03 | 468 | | 1088.74 |
| 01/02 | | | | | | | | | | | | | | |
| | MW-1000PR | | 190 | < 13 | 570 | 6.2 | 3500 | 440 | 970 | 690 | 6.09 | 1099 | 176 | 1088.25 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/02 | | | | | | | | | | | | | | |
| | MW-1002 | | 59 | < 2.7 | 64 | < 0.005 | < 2 | 6.4 | 110 | < 12 | 6.44 | 129.3 | | 1091.30 |
| | MW-1002G | | 91 | < 2.7 | 99 | < 0.005 | < 2 | 10 | 150 | < 12 | 6.54 | 203 | | 1091.25 |
| | MW-1004P | | 160 | < 2.7 | 130 | < 0.005 | 9.6 | < 5 | 190 | < 12 | 6.75 | 276 | 83 | 1106.20 |
| | MW-1004P | (Dup) | 160 | < 2.7 | 130 | 0.0061 | 11 | < 5 | 200 | < 12 | | | | |
| | MW-1004S | | 34 | < 2.7 | 53 | < 0.005 | < 2 | 22 | 140 | < 12 | 5.89 | 124.1 | 207 | 1107.79 |
| | MW-1005 | | 55 | < 2.7 | 160 | 13 | 380 | 14 | 310 | < 12 | 5.86 | 455 | | 1139.08 |
| | MW-1005P | | 250 | < 2.7 | 200 | 0.077 | 30 | < 5 | 270 | < 12 | 7.03 | 418 | 7 | 1138.67 |
| | MW-1005S | | 170 | < 2.7 | 150 | 4.1 | 210 | < 5 | 260 | < 12 | 6.86 | 304 | | 1138.59 |
| | MW-1010P | | 150 | < 2.7 | 130 | 0.069 | 76 | < 5 | 230 | < 12 | 6.95 | 246 | -25 | 1087.87 |
| | MW-1013 | | | | | | | | | | | | | 1105.28 |
| | MW-1013A | | | | | | | | | | | | | 1097.02 |
| | MW-1013B | | 600 | 52 | 2100 | 0.71 | 36000 | 1600 | 3600 | < 120 | 6.24 | 3380 | 201 | 1097.33 |
| | MW-1013C | | 510 | < 13 | 2100 | 4.5 | 8800 | 1700 | 3400 | 500 | 6.32 | 3430 | 48 | 1099.65 |
| | MW-1014 | | | | | | | | | | | | | 1116.91 |
| | MW-1014A | | 460 | < 13 | 1300 | 0.65 | 5900 | 1000 | 2100 | < 120 | 6.55 | 2280 | 170 | 1114.51 |
| | MW-1014B | | 540 | 540 | 1900 | < 0.15 | 18000 | 1500 | 3100 | 2800 | 6.22 | 3110 | 222 | 1112.61 |
| | MW-1014C | | 350 | < 13 | 690 | 9.2 | 2600 | 390 | 1100 | 980 | 6.55 | 1341 | 38 | 1108.48 |
| | MW-1015A | | 78 | < 2.7 | 82 | < 0.005 | 12 | 7.8 | 150 | < 12 | 6.85 | 164.2 | | 1088.65 |
| | MW-1015B | | 180 | < 2.7 | 130 | < 0.005 | 25 | < 5 | 310 | < 12 | 7.44 | 458 | | 1088.54 |
| 02/02 | | | | | | | | | | | | | | |
| | MW-1015A | | 78 | < 2.7 | 87 | < 0.005 | 14 | 7.6 | 130 | < 12 | 6.5 | 162 | | 1088.38 |
| | MW-1015B | | 180 | < 2.7 | 140 | 0.03 | 33 | < 5 | 290 | < 12 | 7 | 483 | | 1087.90 |
| 03/02 | | | | | | | | | | | | | | |
| | MW-1015A | | 78 | < 2.7 | 88 | 0.0074 | 15 | 8.8 | 120 | < 12 | 6.4 | 170 | | 1087.91 |
| | MW-1015B | | 180 | < 2.7 | 140 | 0.0066 | 22 | < 5 | 280 | < 12 | 6.5 | 460 | | 1087.79 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/02 | | | | | | | | | | | | | | |
| | MW-1000PR | | 190 | < 13 | 570 | 2.6 | 2800 | 430 | 970 | 410 | 6.2 | 1088 | 153 | 1094.71 |
| | MW-1002 | | 61 | < 2.7 | 65 | < 0.005 | < 2 | 6.8 | 130 | < 10 | 6.5 | 122 | | 1093.61 |
| | MW-1002 | (Dup) | 60 | < 2.7 | 65 | < 0.005 | < 2 | 7 | 130 | < 10 | | | | |
| | MW-1002G | | 91 | < 2.7 | 100 | < 0.005 | < 2 | 9.4 | 150 | < 10 | 6.4 | 201 | | 1093.66 |
| | MW-1004P | | 160 | < 2.7 | 140 | 0.0053 | 8.3 | < 5 | 170 | < 10 | 7.1 | 263 | 188 | 1105.74 |
| | MW-1004S | | 37 | < 2.7 | 58 | < 0.005 | < 2 | 22 | 120 | < 10 | 5.9 | 129 | 223 | 1108.04 |
| | MW-1005 | | 54 | < 2.7 | 160 | 12 | 280 | 14 | 400 | < 10 | 6.2 | 472 | | 1140.78 |
| | MW-1005P | | 240 | < 2.7 | 210 | 0.076 | 20 | < 5 | 270 | < 10 | 7.2 | 434 | 2 | 1139.89 |
| | MW-1005S | | 170 | < 2.7 | 150 | 4.2 | 210 | < 5 | 240 | < 10 | 7.1 | 300 | | 1139.89 |
| | MW-1010P | | 150 | < 2.7 | 140 | 0.18 | 180 | 5.5 | 200 | < 10 | 7.1 | 249 | -19 | 1094.26 |
| | MW-1013 | | | | | | | | | | | | | 1105.35 |
| | MW-1013A | | | | | | | | | | | | | 1097.18 |
| | MW-1013B | | 520 | 110 | 2200 | 0.36 | 34000 | 1600 | 3200 | < 120 | 6.2 | 3370 | 205 | 1097.63 |
| | MW-1013C | | 480 | 14 | 2100 | 3.9 | 8900 | 1700 | 3200 | 360 | 6.3 | 3420 | 51 | 1101.39 |
| | MW-1014 | | | | | | | | | | | | | 1117.24 |
| | MW-1014A | | 410 | 16 | 1400 | 0.51 | 5900 | 1000 | 1900 | < 120 | 6.8 | 2250 | 155 | 1115.15 |
| | MW-1014B | | 500 | 470 | 1900 | < 0.15 | 17000 | 1500 | 3100 | 1500 | 6.4 | 3140 | 218 | 1113.00 |
| | MW-1014C | | 340 | 15 | 710 | 9.1 | 2600 | 390 | 1000 | 950 | 6.4 | 1310 | 36 | 1109.25 |
| | MW-1015A | | 80 | < 2.7 | 86 | < 0.005 | 15 | 9 | 140 | < 10 | 6.8 | 164 | | 1093.59 |
| | MW-1015B | | 180 | < 2.7 | 140 | < 0.005 | 73 | < 5 | 320 | < 10 | 7.4 | 467 | | 1092.33 |
| 07/02 | | | | | | | | | | | | | | |
| | MW-1000PR | | 200 | < 13 | 610 | 6.2 | 3600 | 380 | 1000 | 640 | 6.28 | 1093 | 157 | 1087.66 |
| | MW-1002 | | 59 | < 2.7 | 66 | < 0.005 | < 2 | 5.8 | 120 | < 10 | 6.58 | 123.7 | | 1093.51 |
| | MW-1002G | | 92 | < 2.7 | 110 | < 0.005 | < 2 | 8.1 | 160 | < 10 | 6.57 | 208 | | 1093.78 |
| | MW-1004P | | 160 | < 2.7 | 140 | 0.0056 | 9.7 | < 5 | 200 | < 10 | 7.39 | 267 | 106 | 1107.04 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/02 | | | | | | | | | | | | | | |
| | MW-1004S | | 38 | < 2.7 | 62 | < 0.005 | < 2 | 19 | 140 | < 10 | 6.27 | 138.4 | 209 | 1109.07 |
| | MW-1005 | | 50 | < 2.7 | 180 | 12 | 310 | 12 | 390 | < 10 | 6.03 | 528 | | 1141.12 |
| | MW-1005P | | 250 | < 2.7 | 220 | 0.12 | 71 | < 5 | 270 | < 10 | 7.19 | 426 | 26 | 1141.25 |
| | MW-1005S | | 170 | < 2.7 | 160 | 4.4 | 220 | < 5 | 250 | < 10 | 7.03 | 302 | | 1141.05 |
| | MW-1010P | | 160 | < 2.7 | 140 | 0.03 | 42 | 5.8 | 240 | < 10 | 7.43 | 250 | 9 | 1087.55 |
| | MW-1013 | | | | | | | | | | | | | 1106.66 |
| | MW-1013A | | | | | | | | | | | | | 1097.44 |
| | MW-1013B | | 690 | 150 | 2300 | 0.7 | 39000 | 1400 | 3900 | 130 | 6.37 | 3340 | 202 | 1097.95 |
| | MW-1013C | | 520 | < 13 | 2300 | 4.1 | 10000 | 1500 | 3500 | 440 | 6.43 | 3400 | 49 | 1099.76 |
| | MW-1014 | | | | | | | | | | | | | 1117.37 |
| | MW-1014A | | 460 | < 13 | 1400 | 0.38 | 6100 | 910 | 2100 | < 120 | 6.49 | 2280 | 177 | 1114.80 |
| | MW-1014A | (Dup) | 480 | < 13 | 1500 | 0.42 | 6400 | 910 | 2200 | < 120 | | | | |
| | MW-1014B | | 550 | 550 | 2100 | < 0.15 | 19000 | 1400 | 3000 | 1900 | 6.25 | 3100 | 245 | 1113.19 |
| | MW-1014C | | 350 | < 13 | 740 | 9.4 | 2700 | 330 | 1200 | 1000 | 6.6 | 1269 | 45 | 1108.93 |
| | MW-1015A | | 79 | < 2.7 | 88 | < 0.005 | 16 | 7.7 | 150 | < 10 | 6.91 | 162.8 | | 1088.64 |
| | MW-1015B | | 180 | < 2.7 | 140 | 0.069 | 53 | < 5 | 350 | < 10 | 7.55 | 496 | | 1088.82 |
| 10/02 | | | | | | | | | | | | | | |
| | MW-1000PR | | 200 | < 13 | 600 | 7.4 | 3400 | 370 | 870 | 690 | 6.14 | 1088 | 90 | 1090.89 |
| | MW-1002 | | 68 | < 2.7 | 72 | < 0.005 | < 2 | < 5 | 100 | < 10 | 6.32 | 140.5 | | 1095.93 |
| | MW-1002G | | 96 | < 2.7 | 110 | < 0.005 | < 2 | 8.2 | 180 | < 10 | 6.43 | 211 | | 1095.89 |
| | MW-1004P | | 160 | < 2.7 | 140 | 0.033 | 22 | < 5 | 160 | < 10 | 6.96 | 270 | 52 | 1108.31 |
| | MW-1004S | | 39 | < 2.7 | 61 | < 0.005 | < 2 | 20 | 140 | < 10 | 6.26 | 135.7 | 168 | 1110.88 |
| | MW-1005 | | 51 | < 2.7 | 210 | 12 | 330 | 13 | 470 | < 10 | 5.8 | 655 | | 1141.78 |
| | MW-1005 | (Dup) | 50 | < 2.7 | 210 | 12 | 320 | 12 | 510 | < 10 | | | | |
| | MW-1005P | | 240 | < 2.7 | 210 | 0.23 | 54 | < 5 | 300 | < 10 | 7.18 | 428 | 5 | 1142.14 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/02 | | | | | | | | | | | | | |
| | MW-1005S | 170 | < 2.7 | 150 | 4.1 | 210 | < 5 | 220 | < 10 | 6.94 | 300 | | 1141.94 |
| | MW-1010P | 150 | < 2.7 | 140 | 0.035 | 120 | < 5 | 200 | < 10 | 7.28 | 269 | -60 | 1089.49 |
| | MW-1013 | | | | | | | | | | | | 1107.28 |
| | MW-1013A | | | | | | | | | | | | 1097.85 |
| | MW-1013B | 620 | 210 | 2300 | < 0.15 | 36000 | 1600 | 3000 | 130 | 6.13 | 3390 | 221 | 1097.30 |
| | MW-1013C | 570 | < 13 | 2300 | 5.4 | 9900 | 1600 | 3400 | 480 | 6.36 | 3520 | -46 | 1101.33 |
| | MW-1014 | | | | | | | | | | | | 1118.56 |
| | MW-1014A | 470 | < 13 | 1400 | 0.54 | 5700 | 930 | 1800 | < 120 | 6.52 | 2370 | 86 | 1115.50 |
| | MW-1014B | 490 | 450 | 2000 | < 0.15 | 17000 | 1300 | 3300 | 1500 | 6.26 | 3110 | 221 | 1114.21 |
| | MW-1014C | 360 | < 13 | 730 | 9.1 | 2600 | 330 | 810 | 940 | 6.49 | 1299 | 38 | 1110.10 |
| | MW-1015A | 79 | < 2.7 | 84 | < 0.005 | 13 | 9.1 | 150 | < 10 | 6.65 | 162.4 | | 1090.94 |
| | MW-1015B | 180 | < 2.7 | 140 | 0.42 | 380 | < 5 | 300 | < 10 | 6.87 | 466 | | 1091.21 |
| 01/03 | | | | | | | | | | | | | |
| | MW-1000PR | 200 | < 13 | 590 | 6.7 | 3200 | 390 | 990 | 700 | 6.2 | 1080 | 170 | 1087.45 |
| | MW-1002 | 65 | < 2.7 | 66 | 0.012 | < 2 | 6.4 | 92 | < 10 | 6.5 | 136 | | 1091.65 |
| | MW-1002G | 92 | < 2.7 | 100 | 0.0089 | < 2 | 9.9 | 160 | < 10 | 6.6 | 215 | | 1091.63 |
| | MW-1004P | 160 | < 2.7 | 130 | 0.053 | 42 | < 5 | 150 | < 10 | 7.2 | 274 | 205 | 1105.93 |
| | MW-1004S | 40 | < 2.7 | 59 | < 0.005 | < 2 | 22 | 110 | < 10 | 6.18 | 208 | 205 | 1107.52 |
| | MW-1005 | 55 | < 2.7 | 290 | 12 | 340 | 14 | 620 | < 10 | 5.6 | 1079 | | 1140.47 |
| | MW-1005P | 250 | < 2.7 | 190 | 0.52 | 51 | < 5 | 290 | < 10 | 7.2 | 298 | 22 | 1140.70 |
| | MW-1005S | 170 | < 2.7 | 150 | 3.7 | 200 | < 5 | 220 | < 10 | 7 | 301 | | 1140.35 |
| | MW-1010P | 150 | < 2.7 | 140 | 0.036 | 120 | 7 | 180 | < 10 | 7.2 | 257 | -24 | 1086.94 |
| | MW-1013 | | | | | | | | | | | | 1105.97 |
| | MW-1013A | | | | | | | | | | | | 1097.39 |
| | MW-1013B | 630 | 92 | 2200 | 0.15 | 33000 | 1600 | 3400 | 130 | 6.1 | 3420 | 208 | 1098.58 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/03 | | | | | | | | | | | | | |
| | MW-1013C | 570 | < 13 | 2300 | 5.4 | 9500 | 1800 | 3500 | 440 | 6.5 | 3510 | 46 | 1099.80 |
| | MW-1014 | | | | | | | | | | | | 1119.07 |
| | MW-1014A | 480 | < 13 | 1400 | 0.54 | 5300 | 1000 | 2100 | < 120 | 6.5 | 2370 | 198 | 1116.36 |
| | MW-1014B | 610 | 590 | 2000 | < 0.15 | 17000 | 1500 | 2800 | 2500 | 6.2 | 3160 | 232 | 1114.14 |
| | MW-1014C | 390 | < 13 | 700 | 8.3 | 2400 | 380 | 1100 | 840 | 6.4 | 1311 | 74 | 1109.58 |
| | MW-1014C (Dup) | 370 | < 13 | 690 | 8.3 | 2400 | 370 | 1000 | 860 | | | | |
| | MW-1015A | 79 | < 2.7 | 83 | < 0.005 | 12 | 8.5 | 130 | < 10 | 6.8 | 167 | | 1088.46 |
| | MW-1015B | 180 | < 2.7 | 130 | 0.12 | 440 | < 5 | 270 | < 10 | 7.4 | 463 | | 1088.27 |
| 03/03 | | | | | | | | | | | | | |
| | MW-1015A | | | | < 0.01 | 16 | | | | 7.09 | 164.4 | | 1088.75 |
| | MW-1015B | | | | 0.31 | 170 | | | | 7.47 | 458 | | 1088.76 |
| 04/03 | | | | | | | | | | | | | |
| | MW-1000PR | 200 | < 6.7 | 570 | 5.1 | 3200 | 380 | 920 | 680 | 6.23 | 1047 | 154 | 1087.83 |
| | MW-1002 | 68 | < 1.3 | 71 | < 0.01 | < 2 | < 5 | 100 | < 10 | 6.31 | 133.6 | | 1091.51 |
| | MW-1002G | 90 | < 1.3 | 110 | < 0.01 | < 2 | 9.5 | 170 | < 10 | 6.51 | 212 | | 1091.43 |
| | MW-1004P | 170 | < 1.3 | 140 | 0.032 | 25 | < 5 | 170 | < 10 | 7.47 | 262 | 178 | 1105.58 |
| | MW-1004S | 41 | < 1.3 | 62 | < 0.01 | < 2 | 20 | 120 | < 10 | 6.01 | 136.7 | 213 | 1107.39 |
| | MW-1005 | 62 | < 1.3 | 390 | 18 | 440 | 22 | 550 | < 10 | 5.71 | 1080 | | 1139.42 |
| | MW-1005P | 230 | < 1.3 | 200 | 0.73 | 110 | < 5 | 220 | < 10 | 7.06 | 381 | -4 | 1138.93 |
| | MW-1005S | 170 | < 1.3 | 160 | 4.2 | 220 | < 5 | 250 | < 10 | 6.99 | 298 | | 1138.82 |
| | MW-1010P | 150 | 4.8 | 140 | < 0.01 | 14 | 5.3 | 170 | < 10 | 7.58 | 253 | -32 | 1087.55 |
| | MW-1013 | | | | | | | | | | | | 1106.02 |
| | MW-1013A | | | | | | | | | | | | 1097.95 |
| | MW-1013B | 660 | 160 | 2200 | 1.2 | 39000 | 1500 | 3500 | 130 | 6.21 | 3340 | 203 | 1097.87 |
| | MW-1013C | 540 | < 13 | 2200 | 4.7 | 9600 | 1700 | 3500 | 310 | 6.39 | 3450 | 44 | 1099.98 |

## Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/03 | | | | | | | | | | | | | | |
| | MW-1014 | | | | | | | | | | | | | 1118.91 |
| | MW-1014A | | 500 | < 13 | 1400 | < 0.29 | 4600 | 930 | 2000 | < 100 | 6.38 | 2280 | 156 | 1116.82 |
| | MW-1014B | | 610 | 690 | 2100 | < 0.29 | 19000 | 1500 | 3400 | 2500 | 6.29 | 2970 | 228 | 1113.96 |
| | MW-1014C | | 380 | < 13 | 690 | 8 | 2400 | 340 | 990 | 810 | 6.42 | 1287 | 7 | 1109.35 |
| | MW-1015A | | 78 | < 1.3 | 88 | < 0.01 | 16 | 7.7 | 120 | < 10 | 6.89 | 163.3 | | 1088.49 |
| | MW-1015B | | 180 | < 1.3 | 150 | 0.3 | 180 | < 5 | 310 | < 10 | 7.83 | 456 | | 1088.45 |
| | MW-1015B | (Dup) | 190 | < 1.3 | 140 | 0.21 | 250 | < 5 | 320 | < 10 | | | | |
| 07/03 | | | | | | | | | | | | | | |
| | MW-1000PR | | 200 | < 6.7 | 580 | 6.6 | 3200 | 360 | 810 | 730 | 6.26 | 1027 | 150 | 1087.76 |
| | MW-1002 | | 63 | < 1.3 | 65 | 0.0079 | < 1 | 2.9 | 100 | < 5 | 6.48 | 121.8 | | 1093.00 |
| | MW-1002G | | 90 | < 1.3 | 110 | 0.0066 | < 1 | 8 | 150 | < 5 | 6.49 | 209 | | 1092.92 |
| | MW-1004P | | 160 | < 1.3 | 150 | 0.066 | 43 | < 2.5 | 160 | < 5 | 7.25 | 263 | 96 | 1107.30 |
| | MW-1004S | | 42 | < 1.3 | 69 | < 0.005 | < 1 | 20 | 110 | < 5 | 6.36 | 141.9 | 186 | 1109.16 |
| | MW-1005 | | 53 | 1.4 | 350 | 16 | 450 | 11 | 580 | < 5 | 5.53 | 1014 | | 1140.38 |
| | MW-1005P | | 240 | < 1.3 | 230 | 1.1 | 74 | < 2.5 | 260 | < 5 | 7.11 | 439 | -3 | 1140.27 |
| | MW-1005S | | 170 | < 1.3 | 160 | 4.2 | 230 | < 2.5 | 200 | < 5 | 6.95 | 305 | | 1140.12 |
| | MW-1010P | | 150 | < 1.3 | 150 | 0.031 | 120 | 5.9 | 170 | < 5 | 7.34 | 255 | -20 | 1087.54 |
| | MW-1013B | | 620 | 120 | 2300 | 0.61 | 38000 | 1600 | 3100 | 140 | 6.25 | 3290 | 200 | 1098.71 |
| | MW-1013B | (Dup) | 580 | 110 | 2300 | 0.36 | 37000 | 1500 | 3100 | 130 | | | | |
| | MW-1013C | | 500 | < 13 | 2300 | 4.2 | 9600 | 1700 | 3200 | 320 | 6.32 | 3430 | 27 | 1100.31 |
| | MW-1014A | | 420 | < 13 | 1400 | 0.32 | 4200 | 910 | 1900 | < 50 | 6.62 | 2230 | 206 | 1116.45 |
| | MW-1014B | | 530 | 500 | 1900 | < 0.29 | 16000 | 1400 | 3800 | 1600 | 6.28 | 2900 | 240 | 1114.33 |
| | MW-1014C | | 340 | < 13 | 700 | 8.2 | 2500 | 330 | 920 | 820 | 6.43 | 1239 | 40 | 1109.74 |
| | MW-1015A | | 79 | < 1.3 | 90 | < 0.005 | 12 | 6.6 | 130 | < 5 | 6.89 | 166.3 | | 1088.38 |
| | MW-1015B | | 180 | < 1.3 | 140 | 0.45 | 170 | < 2.5 | 270 | < 5 | 7.58 | 463 | | 1088.49 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/03 | | | | | | | | | | | | | | |
| | MW-1000PR | | 210 | < 6.7 | 560 | 6.5 | 3100 | 350 | 810 | 700 | 6.2 | 1040 | 166 | 1086.98 |
| | MW-1002 | | 65 | < 1.3 | 66 | < 0.005 | 4.9 | 4.6 | 110 | < 5 | 6.3 | 135 | | 1090.23 |
| | MW-1002G | | 88 | < 1.3 | 100 | < 0.005 | 1.5 | 8 | 160 | < 5 | 6.5 | 209 | | 1090.23 |
| | MW-1004P | | 160 | < 1.3 | 130 | 0.13 | 69 | < 2.5 | 170 | < 5 | 7.3 | 272 | 48 | 1104.84 |
| | MW-1004S | | 42 | < 1.3 | 62 | < 0.005 | 5.4 | 17 | 120 | < 5 | 6.3 | 143 | 167 | 1106.29 |
| | MW-1005 | | 55 | < 1.3 | 420 | 18 | 440 | 11 | 850 | < 5 | 5.6 | 1260 | | 1138.41 |
| | MW-1005P | | 240 | < 1.3 | 210 | 1 | 74 | < 2.5 | 260 | < 5 | 7.3 | 436 | -18 | 1138.32 |
| | MW-1005S | | 170 | < 1.3 | 150 | 4 | 210 | < 2.5 | 210 | < 5 | 7.2 | 317 | | 1138.15 |
| | MW-1010P | | 140 | < 1.3 | 140 | 0.064 | 130 | 6.4 | 180 | < 5 | 7.3 | 343 | -47 | 1086.76 |
| | MW-1013 | | | | | | | | | | | | | 1109.30 |
| | MW-1013A | | | | | | | | | | | | | 1097.00 |
| | MW-1013B | | 590 | 110 | 2300 | < 0.29 | 35000 | 1500 | 3200 | 140 | 6.3 | 3350 | 199 | 1097.29 |
| | MW-1013B | (Dup) | 550 | 140 | 2200 | 0.83 | 37000 | 1500 | 3200 | 150 | | | | |
| | MW-1013C | | 540 | < 13 | 2200 | 6.2 | 9800 | 1700 | 3200 | 400 | 6.4 | 3520 | 16 | 1099.27 |
| | MW-1014 | | | | | | | | | | | | | 1119.25 |
| | MW-1014A | | 440 | < 13 | 1400 | 1 | 3000 | 980 | 2000 | 77 | 6.6 | 2310 | 218 | 1116.50 |
| | MW-1014B | | 540 | 640 | 2100 | < 0.29 | 19000 | 1500 | 3000 | 2600 | 6.4 | 2930 | 251 | 1113.77 |
| | MW-1014C | | 340 | < 1.3 | 680 | 7.8 | 2400 | 320 | 910 | 770 | 6.6 | 1256 | 55 | 1109.01 |
| | MW-1015A | | 78 | < 1.3 | 83 | < 0.005 | 11 | 7.1 | 140 | < 5 | 7.1 | 167 | | 1087.24 |
| | MW-1015B | | 170 | < 1.3 | 130 | 0.67 | 290 | < 2.5 | 320 | < 5 | 7.8 | 480 | | 1087.21 |
| 01/04 | | | | | | | | | | | | | | |
| | MW-1000PR | | 210 | < 6.7 | 530 | 4.3 | 2900 | 360 | 790 | | 6.25 | 1065 | 98 | 1087.59 |
| | MW-1002 | | 64 | < 1.3 | 69 | 0.006 | 3.1 | 6.1 | 130 | | 6.55 | 141.5 | | 1089.83 |
| | MW-1002G | | 89 | < 1.3 | 100 | < 0.005 | 2.6 | 8.6 | 160 | | 6.62 | 215 | | 1089.80 |
| | MW-1004P | | 160 | < 1.3 | 140 | 0.11 | 78 | < 2.5 | 220 | | 7.22 | 290 | 52 | 1104.24 |

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/04 | | | | | | | | | | | | | |
| | MW-1004S | 42 | < 1.3 | 62 | < 0.005 | < 1 | 19 | 170 | | 6.21 | 133.7 | 208 | 1105.62 |
| | MW-1005 | 56 | < 1.3 | 260 | 15 | 360 | 14 | 430 | | 5.73 | 829 | | 1137.52 |
| | MW-1005 (Dup) | 58 | < 1.3 | 270 | 19 | 540 | 14 | 510 | | | | | |
| | MW-1005P | 240 | < 1.3 | 220 | 0.38 | 43 | < 2.5 | 260 | | 7.28 | 438 | -2 | 1137.38 |
| | MW-1005S | 170 | < 1.3 | 150 | 4.2 | 220 | < 2.5 | 240 | | 6.9 | 329 | | 1137.23 |
| | MW-1013 | | | | | | | | | | | | 1108.22 |
| | MW-1013A | | | | | | | | | | | | 1096.91 |
| | MW-1013B | 580 | 170 | 2200 | 1.6 | 40000 | 1600 | 3200 | | 6.15 | 3370 | 212 | 1097.13 |
| | MW-1013C | 490 | 40 | 2200 | 2.8 | 9100 | 1700 | 3300 | | 6.32 | 3510 | 51 | 1099.18 |
| | MW-1014 | | | | | | | | | | | | 1118.37 |
| | MW-1014A | 490 | < 13 | 1300 | 1 | 3100 | 1000 | 2000 | | 6.63 | 2310 | 185 | 1116.08 |
| | MW-1014B | 570 | 590 | 2000 | < 0.29 | 17000 | 1600 | 3100 | | 6.26 | 3130 | 198 | 1113.07 |
| | MW-1014C | 310 | < 1.3 | 650 | 7.4 | 2300 | 320 | 930 | | 6.42 | 1259 | 34 | 1108.52 |
| | MW-1015A | 79 | < 1.3 | 85 | < 0.005 | 14 | 8.7 | 160 | | 7.17 | 165.1 | | 1087.39 |
| | MW-1015B | 180 | < 1.3 | 130 | 0.44 | 240 | < 2.5 | 310 | | 7.78 | 471 | | 1087.43 |
| 03/04 | | | | | | | | | | | | | |
| | MW-1010P | 150 | 2.1 | 150 | 0.095 | 180 | 6.9 | 160 | | 7.66 | 269 | | 1083.41 |
| 04/04 | | | | | | | | | | | | | |
| | MW-1000PR | 210 | < 6.7 | 530 | 7 | 2900 | 330 | 720 | | 6.73 | 1025 | 105 | 1088.38 |
| | MW-1000PR DNR Split | 205 | 2.1 | 540 | 6.6 | 3010 | 363 | 750 | 623 | | | | |
| | MW-1002 | 61 | < 1.3 | 65 | < 0.005 | < 1 | 6 | 37 | | 6.74 | 128.4 | | 1092.45 |
| | MW-1002G | 90 | < 1.3 | 100 | 0.022 | < 1 | 8.3 | 92 | | 6.76 | 206 | | 1092.38 |
| | MW-1004P | 160 | < 1.3 | 140 | 0.1 | 77 | < 2.5 | 160 | | 7.26 | 275 | 117 | 1104.46 |
| | MW-1004S | 43 | 6.4 | 64 | < 0.005 | < 1 | 19 | 66 | | 6.58 | 143.3 | 156 | 1105.94 |
| | MW-1005 | 57 | < 1.3 | 280 | 17 | 430 | 14 | 500 | | 6.29 | 807 | | 1139.18 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/04 | | | | | | | | | | | | | |
| | MW-1005P | 240 | < 1.3 | 220 | 0.11 | 20 | < 2.5 | 220 | | 7.05 | 436 | 4 | 1137.86 |
| | MW-1005S | 160 | < 1.3 | 150 | 4.3 | 210 | 3.7 | 130 | | 6.92 | 298 | | 1138.11 |
| | MW-1010P | 140 | < 1.3 | 140 | 0.013 | 97 | 8.8 | 130 | | 7.55 | 276 | 20 | 1088.35 |
| | MW-1010P DNR Split | 144 | 1.6 | 145 | < 0.1 | 92 | 7.8 | 178 | < 16 | | | | |
| | MW-1013 | | | | | | | | | | | | 1108.20 |
| | MW-1013A | | | | | | | | | | | | 1097.43 |
| | MW-1013B | 560 | 230 | 2200 | < 0.33 | 32000 | 1500 | 3100 | | 6.29 | 3260 | 188 | 1097.77 |
| | MW-1013C | 490 | < 13 | 2200 | 7.8 | 9700 | 1600 | 3200 | | 6.65 | 3520 | 59 | 1099.81 |
| | MW-1013C DNR Split | 527 | 2.3 | 2180 | 7.2 | 9830 | 1840 | 3210 | 454 | | | | |
| | MW-1014 | | | | | | | | | | | | 1117.83 |
| | MW-1014A | 470 | < 13 | 1300 | 0.13 | 3100 | 910 | 1800 | | 6.82 | 2250 | 211 | 1116.64 |
| | MW-1014A DNR Split | 463 | 6 | 1320 | 0.1 | 3050 | 1040 | 1920 | < 16 | | | | |
| | MW-1014B | 530 | 440 | 1700 | < 0.33 | 14000 | 1400 | 2800 | | 6.51 | 2880 | 246 | 1112.89 |
| | MW-1014B (Dup) | 570 | 440 | 1700 | < 0.33 | 14000 | 1400 | 2800 | | | | | |
| | MW-1014B DNR Split | 461 | 492 | 1920 | < 0.1 | 18800 | 1480 | 2530 | 1470 | | | | |
| | MW-1014C | 330 | < 13 | 640 | 7.5 | 2300 | 290 | 820 | | 6.77 | 1233 | 53 | 1108.53 |
| | MW-1014C DNR Split | | 1.2 | 657 | 6.9 | 2220 | 330 | 868 | 638 | | | | |
| | MW-1015A | 79 | < 1.3 | 86 | < 0.005 | 15 | 9 | 62 | | 7.17 | 167.7 | | 1089.17 |
| | MW-1015B | 180 | < 1.3 | 140 | 0.38 | 120 | < 2.5 | 210 | | 7.49 | 481 | | 1089.08 |
| 07/04 | | | | | | | | | | | | | |
| | MW-1000PR | 200 | 28 | 530 | 2.3 | 2800 | 310 | 690 | 830 | 6.1 | 998 | 146 | 1087.40 |
| | MW-1002 | 53 | < 1.3 | 60 | < 0.005 | < 1 | 5.6 | 93 | < 5 | 6.5 | 114 | | 1092.22 |
| | MW-1002G | 90 | < 1.3 | 110 | < 0.005 | < 1 | 8.7 | 140 | < 5 | 6.8 | 202 | | 1092.14 |
| | MW-1004P | 160 | < 1.3 | 140 | 0.066 | 97 | < 2.5 | 120 | < 5 | 6.8 | 275 | 114 | 1106.69 |
| | MW-1004S | 44 | < 1.3 | 71 | < 0.005 | < 1 | 21 | 100 | < 5 | 6.3 | 152 | 184 | 1108.33 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/04 | | | | | | | | | | | | | |
| | MW-1005 | 55 | 1.9 | 280 | 18 | 520 | 13 | 480 | < 5 | 6 | 733 | | 1139.35 |
| | MW-1005P | 240 | < 1.3 | 220 | 0.45 | 93 | < 2.5 | 170 | < 5 | 7 | 428 | -5 | 1139.37 |
| | MW-1005S | 160 | < 1.3 | 160 | 4.2 | 220 | 4.2 | 150 | < 5 | 6.8 | 294 | | 1139.16 |
| | MW-1010P | 160 | < 1.3 | 160 | 0.18 | 210 | 4.3 | 130 | < 5 | 7 | 284 | 55 | 1087.09 |
| | MW-1013 | | | | | | | | | | | | 1111.69 |
| | MW-1013A | | | | | | | | | | | | 1097.86 |
| | MW-1013B | 550 | 150 | 2200 | < 0.33 | 24000 | 1600 | 3100 | 150 | 6.1 | 3340 | 191 | 1098.27 |
| | MW-1013C | 520 | < 13 | 2300 | 7.4 | 10000 | 1400 | 3200 | 460 | 6.2 | 3490 | 45 | 1099.75 |
| | MW-1013C (Dup) | 490 | < 13 | 2200 | 7.3 | 10000 | 1600 | 3200 | 460 | | | | |
| | MW-1014 | | | | | | | | | | | | 1118.45 |
| | MW-1014A | 440 | < 13 | 1400 | 0.43 | 2100 | 940 | 1900 | < 50 | 6.7 | 2250 | 175 | 1115.52 |
| | MW-1014B | 450 | 520 | 1900 | < 0.33 | 15000 | 1300 | 2600 | 1200 | 6.3 | 2950 | 191 | 1113.85 |
| | MW-1014C | 300 | < 13 | 660 | 7.2 | 2300 | 290 | 820 | 630 | 6.4 | 1171 | 31 | 1109.22 |
| | MW-1015A | 78 | < 1.3 | 89 | < 0.005 | 12 | 7.7 | 88 | < 5 | 6.8 | 165 | 183 | 1087.88 |
| | MW-1015B | 170 | < 1.3 | 140 | 0.45 | 190 | < 2.5 | 220 | < 5 | 7.1 | 458 | -104 | 1087.97 |
| 10/04 | | | | | | | | | | | | | |
| | MW-1000PR | 210 | 15 | 500 | 0.37 | 2700 | 320 | 670 | | 6.4 | 970 | | 1087.16 |
| | MW-1002 | 56 | < 1.3 | 56 | < 0.005 | 3 | 4.6 | 59 | | 6.7 | 116 | | 1090.26 |
| | MW-1002G | 93 | < 1.3 | 98 | < 0.005 | 4.1 | 8.4 | 110 | | 6.7 | 204 | | 1090.23 |
| | MW-1004P | 160 | 1.5 | 130 | < 0.005 | 17 | < 2.5 | 120 | | 7.3 | 271 | 109 | 1104.65 |
| | MW-1004S | 46 | < 1.3 | 65 | < 0.005 | 1.3 | 19 | 76 | | 6.7 | 146 | | 1106.13 |
| | MW-1005 | 55 | < 1.3 | 270 | 15 | 390 | 14 | 550 | | 5.9 | 799 | | 1138.67 |
| | MW-1005P | 240 | < 1.3 | 210 | 0.47 | 87 | < 2.5 | 210 | | 7.1 | 436 | -2 | 1138.05 |
| | MW-1005S | 170 | < 1.3 | 150 | 3.7 | 210 | 3.6 | 160 | | 6.6 | 298 | | 1138.06 |
| | MW-1010P | 160 | < 1.3 | 150 | 0.19 | 200 | 6.1 | 140 | | 6.9 | 281 | 64 | 1086.86 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/04 | | | | | | | | | | | | | | |
| | MW-1013 | | | | | | | | | | | | | 1110.47 |
| | MW-1013A | | | | | | | | | | | | | 1097.11 |
| | MW-1013B | | 640 | 380 | 2200 | < 0.33 | 34000 | 1600 | 3100 | | 6.3 | 3250 | 204 | 1097.10 |
| | MW-1013C | | 520 | < 13 | 2200 | 7 | 9800 | 1700 | 3200 | | 6.3 | 3450 | 50 | 1099.48 |
| | MW-1014 | | | | | | | | | | | | | 1119.12 |
| | MW-1014A | | 490 | < 13 | 1300 | < 0.33 | 2000 | 930 | 1800 | | 6.7 | 2220 | 184 | 1114.83 |
| | MW-1014B | | 620 | 550 | 2000 | < 0.33 | 17000 | 1500 | 2800 | | 6.3 | 2950 | 215 | 1113.33 |
| | MW-1014C | | 350 | < 13 | 610 | 6.6 | 2100 | 300 | 780 | | 6.5 | 1175 | 60 | 1108.87 |
| | MW-1015A | | 79 | < 1.3 | 83 | < 0.005 | 11 | 7.6 | 95 | | 7.3 | 164 | 116 | 1087.22 |
| | MW-1015B | | 180 | < 1.3 | 130 | 0.3 | 140 | < 2.5 | 220 | | 7.6 | 459 | -99 | 1087.21 |
| | MW-1015B | (Dup) | 180 | < 1.3 | 130 | 0.3 | 140 | < 2.5 | 230 | | | | | |
| 01/05 | | | | | | | | | | | | | | |
| | MW-1000PR | | 220 | 16 | 510 | 0.51 | 2500 | 310 | 660 | | 6.2 | 991 | 133 | 1087.89 |
| | MW-1002 | | 59 | < 1.3 | 62 | < 0.005 | < 1 | 5.1 | 24 | | 6.9 | 122 | | 1090.20 |
| | MW-1002G | | 93 | < 1.3 | 100 | < 0.005 | < 1 | 9.6 | 93 | | 6.6 | 208 | | 1090.42 |
| | MW-1004P | | 160 | < 1.3 | 130 | 0.058 | 75 | < 2.5 | 94 | | 7 | 270 | 102 | 1104.67 |
| | MW-1004S | | 46 | < 1.3 | 65 | < 0.005 | < 1 | 19 | 110 | | 6.5 | 146 | 187 | 1106.02 |
| | MW-1004S | (Dup) | 46 | < 1.3 | 65 | < 0.005 | < 1 | 19 | 79 | | | | | |
| | MW-1005 | | 54 | < 1.3 | 180 | 12 | 310 | 13 | 280 | | 6.1 | 510 | | 1138.48 |
| | MW-1005P | | 250 | < 1.3 | 210 | 0.85 | 79 | < 2.5 | 210 | | 7.1 | 428 | 15 | 1137.86 |
| | MW-1005S | | 160 | < 1.3 | 150 | 3.8 | 210 | 4.8 | 130 | | 6.4 | 301 | | 1137.89 |
| | MW-1010P | | 150 | < 1.3 | 140 | < 0.005 | 92 | 11 | 130 | | 6.7 | 284 | 72 | 1087.56 |
| | MW-1013 | | | | | | | | | | | | | 1109.19 |
| | MW-1013A | | | | | | | | | | | | | 1097.27 |
| | MW-1013B | | 580 | 180 | 2200 | < 0.33 | 24000 | 1700 | 3000 | | 6.3 | 3390 | 207 | 1097.29 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/05 | | | | | | | | | | | | | | |
| | MW-1013C | | 540 | < 13 | 2100 | 7.2 | 9500 | 1700 | 3000 | | 6.3 | 3540 | 67 | 1099.34 |
| | MW-1014 | | | | | | | | | | | | | 1118.50 |
| | MW-1014A | | 480 | < 13 | 1300 | < 0.33 | 2000 | 990 | 1800 | | 6.7 | 2330 | 246 | 1115.84 |
| | MW-1014B | | 550 | 520 | 2000 | < 0.33 | 16000 | 1500 | 2700 | | 6.4 | 3210 | 277 | 1113.05 |
| | MW-1014C | | 340 | < 13 | 600 | 6.4 | 2000 | 300 | 730 | | 6.5 | 1174 | 70 | 1108.62 |
| | MW-1015A | | 79 | < 1.3 | 83 | < 0.005 | 11 | 7.7 | 65 | | 6.9 | 162 | 128 | 1087.45 |
| | MW-1015B | | 180 | < 1.3 | 130 | 0.22 | 120 | < 2.5 | 230 | | 7.4 | 464 | -89 | 1087.61 |
| 04/05 | | | | | | | | | | | | | | |
| | MW-1000PR | | 210 | 17 | 530 | 0.75 | 3000 | 320 | 660 | | 6.3 | 882 | 105 | 1088.23 |
| | MW-1002 | | 56 | < 1.3 | 61 | < 0.005 | < 1 | 6.1 | 8 | | 6.8 | 117 | | 1091.64 |
| | MW-1002G | | 91 | < 1.3 | 100 | < 0.005 | < 1 | 9.2 | 95 | | 6.7 | 206 | | 1091.79 |
| | MW-1004P | | 160 | < 1.3 | 140 | < 0.005 | 26 | < 2.5 | 120 | | 6.6 | 265 | 124 | 1104.74 |
| | MW-1004S | | 46 | < 1.3 | 69 | < 0.005 | < 1 | 21 | 45 | | 6.2 | 148 | 202 | 1106.28 |
| | MW-1005 | | 52 | < 1.3 | 190 | 17 | 450 | 14 | 300 | | 6.1 | 528 | | 1139.08 |
| | MW-1005 | (Dup) | 51 | < 1.3 | 190 | 17 | 460 | 14 | 290 | | | | | |
| | MW-1005P | | 240 | < 1.3 | 220 | 0.11 | 17 | < 2.5 | 200 | | 6.7 | 437 | -2 | 1137.90 |
| | MW-1005S | | 160 | < 1.3 | 150 | 4.4 | 240 | 4.3 | 170 | | 6.3 | 294 | | 1137.95 |
| | MW-1010P | | 150 | < 1.3 | 150 | 0.034 | 150 | 11 | 110 | | 6.7 | 284 | 60 | 1088.20 |
| | MW-1013 | | | | | | | | | | | | | 1108.43 |
| | MW-1013A | | | | | | | | | | | | | 1097.16 |
| | MW-1013B | | 630 | 450 | 2200 | < 0.33 | 42000 | 1700 | 3100 | | 6.2 | 3420 | 238 | 1097.61 |
| | MW-1013C | | 520 | < 13 | 2200 | 8.2 | 10000 | 1700 | 3100 | | 6.3 | 3390 | 66 | 1099.38 |
| | MW-1014A | | 440 | < 13 | 1300 | < 0.33 | 2000 | 1000 | 1800 | | 6.6 | 2250 | 276 | 1115.68 |
| | MW-1014B | | 520 | 460 | 1900 | < 0.33 | 16000 | 1400 | 2700 | | 6.4 | 2790 | 288 | 1112.91 |
| | MW-1014C | | 330 | < 13 | 660 | 7 | 2300 | 290 | 750 | | 6.3 | 1202 | 64 | 1108.19 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/05 | | | | | | | | | | | | | |
| | MW-1015A | 79 | < 1.3 | 87 | < 0.005 | 16 | 8.6 | 51 | | 6.8 | 162 | 194 | 1088.58 |
| | MW-1015B | 180 | < 1.3 | 140 | 0.29 | 130 | < 2.5 | 190 | | 7.1 | 451 | -93 | 1088.60 |
| 07/05 | | | | | | | | | | | | | |
| | MW-1000PR | 210 | 27 | 560 | 1.5 | 2900 | 330 | 680 | 650 | 6.7 | 962 | 139 | 1087.41 |
| | MW-1002 | 47 | 1.6 | 53 | < 0.005 | < 1 | 4.9 | 82 | < 5 | 6.7 | 98 | | 1090.63 |
| | MW-1002G | 91 | < 1.3 | 110 | < 0.005 | < 1 | 8.8 | 140 | < 5 | 6.8 | 184 | | 1090.54 |
| | MW-1004P | 160 | < 1.3 | 150 | 0.059 | 41 | < 2.5 | 130 | < 5 | 7.4 | 270 | 58 | 1104.59 |
| | MW-1004S | 47 | 2 | 77 | < 0.005 | < 1 | 24 | 100 | < 5 | 6.3 | 158 | 211 | 1106.10 |
| | MW-1004S (Dup) | 47 | 2.8 | 78 | < 0.005 | < 1 | 24 | 260 | < 5 | | | | |
| | MW-1005 | 46 | < 1.3 | 180 | 14 | 370 | 16 | 270 | < 5 | 6.2 | 497 | | 1138.52 |
| | MW-1005P | 240 | < 1.3 | 230 | 0.17 | 82 | < 2.5 | 230 | 7.1 | 7.4 | 428 | -1 | 1138.30 |
| | MW-1005S | 170 | < 1.3 | 160 | 4.5 | 240 | 3.9 | 180 | < 5 | 7.2 | 296 | | 1138.25 |
| | MW-1010P | 150 | < 1.3 | 160 | < 0.005 | 85 | 14 | 170 | < 5 | 7.9 | 288 | 94 | 1087.16 |
| | MW-1013 | | | | | | | | | | | | 1110.98 |
| | MW-1013A | | | | | | | | | | | | 1096.86 |
| | MW-1013B | 640 | 400 | 2300 | < 0.33 | 39000 | 1700 | 3100 | 200 | 6.4 | 3200 | 229 | 1097.22 |
| | MW-1013C | 510 | < 13 | 2300 | 8.5 | 11000 | 1800 | 3100 | 460 | 6.6 | 3400 | 17 | 1098.89 |
| | MW-1014A | 500 | < 13 | 1300 | < 0.33 | 1400 | 1000 | 1800 | < 50 | 6.8 | 2170 | 269 | 1114.86 |
| | MW-1014B | 570 | 560 | 2100 | < 0.33 | 17000 | 1500 | 2800 | 2200 | 6.5 | 3010 | 299 | 1112.42 |
| | MW-1014C | 350 | < 13 | 650 | 6.9 | 2200 | 300 | 760 | 550 | 6.9 | 1150 | 57 | 1107.80 |
| | MW-1015A | 78 | < 1.3 | 89 | < 0.005 | 12 | 8.5 | 110 | < 5 | 7.2 | 162 | | 1087.37 |
| | MW-1015B | 180 | < 1.3 | 150 | 0.4 | 140 | < 2.5 | 260 | < 5 | 8 | 457 | -91 | 1087.49 |
| 10/05 | | | | | | | | | | | | | |
| | MW-1000PR | 210 | 25 | 580 | 0.73 | 2900 | 330 | 730 | | 6.6 | 955 | 141 | 1087.92 |
| | MW-1002 | 50 | < 2.7 | 60 | < 0.005 | < 1 | 5.2 | 120 | | 6.5 | 104 | | 1092.07 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/05 | | | | | | | | | | | | | | |
| | MW-1002G | | 89 | < 2.7 | 110 | < 0.005 | < 1 | 9 | 120 | | 6.5 | 201 | | 1091.97 |
| | MW-1004P | | 170 | < 2.7 | 140 | < 0.005 | 21 | < 2.5 | 150 | | 7.1 | 277 | 83 | 1105.61 |
| | MW-1004S | | 49 | < 2.7 | 75 | 0.008 | < 1 | 23 | 150 | | 7.2 | 162 | 186 | 1107.58 |
| | MW-1005 | | 61 | < 2.7 | 290 | 17 | 480 | 14 | 450 | | 6 | 786 | | 1138.49 |
| | MW-1005P | | 240 | < 2.7 | 220 | 0.03 | 48 | < 2.5 | 210 | | 6.5 | 427 | -6 | 1137.53 |
| | MW-1005S | | 170 | < 2.7 | 180 | 4.2 | 240 | 4.2 | 200 | | 6.4 | 298 | | 1137.60 |
| | MW-1010P | | 160 | < 2.7 | 170 | 0.044 | 160 | 8.8 | 150 | | 7.1 | 283 | 25 | 1087.81 |
| | MW-1013 | | 510 | < 13 | 600 | 22 | 25000 | 62 | 760 | | 6.1 | 1332 | 73 | 1109.89 |
| | MW-1013A | | 370 | < 13 | 680 | < 0.33 | 4500 | 380 | 870 | | 6.7 | 1576 | 153 | 1096.84 |
| | MW-1013B | | 630 | 230 | 2300 | < 0.33 | 30000 | 1500 | 3100 | | 6.4 | 3260 | 222 | 1096.98 |
| | MW-1013C | | 510 | < 13 | 2200 | 8.3 | 11000 | 1700 | 3200 | | 6.7 | 3410 | 37 | 1099.20 |
| | MW-1013C | (Dup) | 500 | < 13 | 2300 | 8.7 | 11000 | 1700 | 3100 | | | | | |
| | MW-1014 | | 170 | < 13 | 350 | < 0.33 | 1300 | 200 | 500 | | 7.1 | 726 | 202 | 1117.70 |
| | MW-1014A | | 450 | < 13 | 1300 | < 0.33 | 1500 | 890 | 1800 | | 6.7 | 2270 | 213 | 1114.97 |
| | MW-1014B | | 470 | 400 | 1800 | < 0.33 | 15000 | 1300 | 2400 | | 6.5 | 2820 | 261 | 1112.41 |
| | MW-1014C | | 320 | < 13 | 630 | 7 | 2200 | 290 | 790 | | 6.7 | 1157 | 54 | 1108.06 |
| | MW-1015A | | 85 | 3.8 | 96 | < 0.005 | 13 | 8.8 | 110 | | 6.2 | 161 | 70 | 1088.12 |
| | MW-1015B | | 180 | < 2.7 | 150 | 0.3 | 140 | < 2.5 | 260 | | 6.3 | 461 | -93 | 1088.24 |
| 01/06 | | | | | | | | | | | | | | |
| | MW-1000PR | | 210 | 58 | 480 | 0.68 | 2400 | 300 | 670 | | 6.8 | 1014 | 126 | 1087.71 |
| | MW-1002 | | 51 | < 2.7 | 52 | < 0.005 | < 1 | 4.6 | 33 | | 7.1 | 112 | | 1090.67 |
| | MW-1002G | | 89 | < 2.7 | 94 | < 0.005 | < 1 | 8.3 | 95 | | 7 | 213 | | 1090.58 |
| | MW-1004P | | 160 | < 2.7 | 140 | 0.35 | 170 | < 2.5 | 110 | | 7.1 | 290 | 95 | 1105.59 |
| | MW-1004S | | 48 | < 2.7 | 58 | < 0.005 | 1 | 23 | 75 | | 7 | 165 | 175 | 1106.51 |
| | MW-1005 | | 51 | < 2.7 | 200 | 15 | 440 | 14 | 350 | | 6.5 | 597 | | 1138.33 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/06 | | | | | | | | | | | | | | |
| | MW-1005P | | 250 | < 2.7 | 200 | 0.49 | 75 | < 2.5 | 200 | | 6.9 | 434 | 20 | 1137.24 |
| | MW-1005S | | 160 | < 2.7 | 140 | 4 | 210 | 3.2 | 160 | | 6.8 | 316 | | 1137.47 |
| | MW-1010P | | 150 | < 2.7 | 140 | 0.057 | 170 | 9.2 | 130 | | 7.2 | 301 | 90 | 1087.51 |
| | MW-1013 | | 680 | < 13 | 560 | 12 | 22000 | 79 | 700 | | 6.4 | 1211 | 72 | 1108.54 |
| | MW-1013A | | 340 | < 13 | 500 | < 0.33 | 2900 | 240 | 650 | | 6.8 | 1271 | 156 | 1097.01 |
| | MW-1013B | | 590 | 210 | 2200 | < 0.33 | 22000 | 1500 | 3000 | | 6.4 | 3480 | 223 | 1097.17 |
| | MW-1013C | | 550 | < 13 | 2100 | 7.6 | 9700 | 1700 | 3100 | | 6.3 | 3480 | 61 | 1099.30 |
| | MW-1014 | | 170 | < 13 | 310 | < 0.33 | 1100 | 190 | 540 | | 6.9 | 748 | 261 | 1117.27 |
| | MW-1014A | | 480 | 17 | 1200 | < 0.33 | 1500 | 970 | 1800 | | 6.8 | 2390 | 252 | 1114.81 |
| | MW-1014B | | 570 | 560 | 1900 | < 0.33 | 16000 | 1400 | 2800 | | 6.5 | 3350 | 287 | 1112.12 |
| | MW-1014C | | 300 | < 13 | 590 | 6.2 | 2000 | 280 | 740 | | 6.9 | 1182 | 67 | 1107.25 |
| | MW-1014C | (Dup) | 310 | < 13 | 570 | 6 | 1900 | 270 | 750 | | | | | |
| | MW-1015A | | 76 | < 2.7 | 80 | < 0.005 | 9 | 8.4 | 79 | | 7.2 | 165 | 160 | 1088.05 |
| | MW-1015B | | 180 | < 2.7 | 140 | 0.32 | 110 | < 2.5 | 270 | | 7.2 | 472 | -73 | 1087.80 |
| 04/06 | | | | | | | | | | | | | | |
| | MW-1000PR | | 210 | 30 | 530 | 0.46 | 2600 | 300 | 620 | 560 | 6.62 | 926 | 129 | 1088.35 |
| | MW-1002 | | 52 | < 2.7 | 61 | 0.006 | < 1 | 6.2 | 26 | | 6.72 | 112 | | 1092.17 |
| | MW-1002G | | 89 | < 2.7 | 110 | 0.015 | < 1 | 9.1 | 67 | | 6.76 | 201 | | 1092.06 |
| | MW-1004P | | 160 | < 2.7 | 140 | 0.2 | 89 | 2.5 | 93 | | 6.31 | 270 | 88 | 1105.34 |
| | MW-1004S | | 49 | < 2.7 | 78 | < 0.008 | 2.6 | 25 | 63 | | 5.85 | 161.6 | 176 | 1107.08 |
| | MW-1005 | | 52 | < 2.7 | 210 | 13 | 320 | 14 | 290 | | 6.23 | 596 | | 1139.51 |
| | MW-1005P | | 250 | < 2.7 | 230 | 0.22 | 40 | < 2.5 | 210 | | 6.71 | 439 | 6 | 1138.47 |
| | MW-1005S | | 170 | < 2.7 | 160 | 4.4 | 230 | 4 | 140 | | 6.56 | 298 | | 1138.64 |
| | MW-1005S | (Dup) | 170 | < 2.7 | 160 | 4.4 | 230 | 4 | 110 | | | | | |
| | MW-1010P | | 150 | < 2.7 | 160 | 0.029 | 150 | 13 | 89 | < 5 | 7 | 278 | 101 | 1088.21 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/06 | | | | | | | | | | | | | |
| | MW-1013 | 510 | 23 | 550 | 2.2 | 21000 | 65 | 640 | < 50 | 5.95 | 1040 | 150 | 1108.42 |
| | MW-1013A | 340 | 17 | 730 | < 0.33 | 3900 | 270 | 640 | 61 | 6.23 | 1571 | 152 | 1097.29 |
| | MW-1013B | 590 | 280 | 2200 | < 0.22 | 25000 | 1600 | 3000 | 210 | 6.1 | 3300 | 210 | 1097.65 |
| | MW-1013C | 520 | < 13 | 2300 | 8.9 | 11000 | 1600 | 3000 | 470 | 6.21 | 3380 | 51 | 1099.24 |
| | MW-1014 | 150 | 36 | 340 | < 0.33 | 1200 | 170 | 410 | 79 | 6.49 | 677 | 271 | 1117.25 |
| | MW-1014A | 440 | 22 | 1300 | < 0.33 | 2100 | 880 | 1700 | 55 | 6.39 | 2200 | 268 | 1114.95 |
| | MW-1014B | 550 | 530 | 1900 | < 0.33 | 14000 | 1400 | 2700 | 1300 | 6.23 | 2740 | 292 | 1112.27 |
| | MW-1014C | 340 | < 13 | 620 | 6.4 | 2100 | 270 | 700 | 560 | 6.4 | 1124 | 80 | 1107.90 |
| | MW-1015A | 77 | < 2.7 | 90 | < 0.005 | 11 | 9.1 | 39 | | 6.96 | 161.5 | 173 | 1088.71 |
| | MW-1015B | 180 | < 2.7 | 140 | 0.44 | 100 | < 2.5 | 190 | | 7.11 | 464 | -84 | 1088.89 |
| 07/06 | | | | | | | | | | | | | |
| | MW-1000PR | 270 | 21 | 480 | 0.62 | 2400 | 310 | 660 | 500 | 6.47 | 928 | 100 | 1086.96 |
| | MW-1002 | 50 | 2.9 | 53 | < 0.005 | < 1 | 5.1 | 88 | < 5 | 6.49 | 108.8 | | 1089.57 |
| | MW-1002G | 86 | < 2.7 | 99 | < 0.005 | 2.9 | 8.7 | 140 | < 5 | 6.55 | 199.4 | | 1088.49 |
| | MW-1004P | 160 | 26 | 130 | < 0.005 | 5.6 | < 2.5 | 170 | 20 | 7.11 | 266 | 72 | 1103.79 |
| | MW-1004S | 50 | 8.9 | 77 | < 0.005 | < 1 | 26 | 93 | < 5 | 7.11 | 165.3 | 199 | 1105.22 |
| | MW-1005 | 54 | < 2.7 | 220 | 12 | 340 | 14 | 560 | < 5 | 6.44 | 715 | | 1137.18 |
| | MW-1005P | 240 | < 2.7 | 210 | 0.6 | 86 | < 2.5 | 200 | < 5 | 6.59 | 423 | 1 | 1136.80 |
| | MW-1005S | 170 | < 2.7 | 150 | 4 | 210 | 3.8 | 170 | < 5 | 6.66 | 302 | | 1137.26 |
| | MW-1010P | 150 | 2.8 | 150 | 0.045 | 150 | 14 | 150 | < 5 | 7.16 | 290 | 104 | 1086.63 |
| | MW-1013 | 520 | 24 | 530 | 3.2 | 20000 | 58 | 630 | < 50 | 6.05 | 1091 | 92 | 1111.08 |
| | MW-1013 (Dup) | 560 | 29 | 520 | 3.2 | 19000 | 58 | 670 | < 50 | | | | |
| | MW-1013A | 320 | 16 | 460 | < 0.33 | 1700 | 220 | 600 | < 50 | 6.52 | 1104 | 160 | 1096.52 |
| | MW-1013B | 610 | 470 | 2200 | < 0.33 | 36000 | 1600 | 3000 | 210 | 6.17 | 3280 | 249 | 1096.73 |
| | MW-1013C | 520 | 14 | 2200 | 7 | 9800 | 1700 | 3100 | 440 | 6.09 | 3300 | 51 | 1098.20 |

# Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/06 | | | | | | | | | | | | | |
| | MW-1014 | 170 | 26 | 320 | < 0.33 | 940 | 180 | 490 | 59 | 6.54 | 713 | 175 | 1117.53 |
| | MW-1014A | 450 | 31 | 1300 | < 0.33 | 1400 | 1000 | 1800 | 57 | 6.62 | 2190 | 190 | 1114.77 |
| | MW-1014B | 520 | 510 | 1700 | < 0.33 | 12000 | 1400 | 2400 | 1100 | 6.41 | 2780 | 222 | 1112.10 |
| | MW-1014C | 350 | 16 | 580 | 5.9 | 1900 | 260 | 770 | 470 | 6.55 | 1080 | 63 | 1107.35 |
| | MW-1015A | 79 | 3.3 | 82 | < 0.005 | 8.2 | 8.6 | 100 | < 5 | 6.02 | 160.8 | 73 | 1086.95 |
| | MW-1015B | 170 | < 2.7 | 140 | 0.052 | 97 | < 2.5 | 270 | < 5 | 6.33 | 466 | -63 | 1086.84 |
| 10/06 | | | | | | | | | | | | | |
| | MW-1000PR | 210 | 12 | 550 | 0.49 | 2700 | 290 | 600 | | 7 | 948 | 108 | 1085.87 |
| | MW-1002 | 52 | < 2.7 | 62 | < 0.005 | < 1 | 6.3 | < 2 | | 6.8 | 109 | | 1089.47 |
| | MW-1002G | 87 | < 2.7 | 110 | < 0.005 | < 1 | 9.3 | 37 | | 6.9 | 200 | | 1089.42 |
| | MW-1004P | 150 | < 2.7 | 150 | < 0.005 | 6.1 | 3.1 | 120 | | 7.3 | 280 | 75 | 1103.68 |
| | MW-1004P (Dup) | 160 | < 2.7 | 150 | < 0.005 | 6.2 | 4.5 | 66 | | | | | |
| | MW-1004S | 51 | < 2.7 | 87 | < 0.005 | < 1 | 26 | 83 | | 6.8 | 185 | 181 | 1104.98 |
| | MW-1005 | 54 | < 2.7 | 300 | 16 | 380 | 15 | 320 | | 6.3 | 833 | | 1137.03 |
| | MW-1005P | 240 | < 2.7 | 230 | 0.019 | 39 | < 2.5 | 140 | | 7 | 456 | -3 | 1136.78 |
| | MW-1005S | 160 | < 2.7 | 170 | 4.4 | 240 | 4.1 | 83 | | 7.3 | 302 | | 1136.55 |
| | MW-1010P | 160 | < 2.7 | 170 | 0.017 | 110 | 8.1 | 92 | | 7.8 | 289 | 71 | 1086.79 |
| | MW-1013 | 520 | < 13 | 580 | 11 | 24000 | 55 | 620 | | 6.5 | 1233 | 81 | 1109.73 |
| | MW-1013A | 300 | < 13 | 490 | < 0.33 | 2400 | 200 | 560 | | 7 | 1015 | 130 | 1096.36 |
| | MW-1013B | 480 | 200 | 2400 | < 0.33 | 23000 | 1600 | 3000 | | 6.5 | 3360 | 309 | 1096.54 |
| | MW-1013C | 580 | < 13 | 2200 | 9.1 | 11000 | 1600 | 3000 | | 6.7 | 3390 | 16 | 1097.94 |
| | MW-1014 | 170 | < 13 | 350 | < 0.33 | 880 | 180 | 430 | | 6.7 | 739 | 165 | 1117.45 |
| | MW-1014A | 480 | < 13 | 1400 | < 0.66 | 820 | 1000 | 1800 | | 6.7 | 2290 | 176 | 1114.60 |
| | MW-1014B | 460 | 460 | 1900 | < 0.33 | 13000 | 1300 | 2400 | | 6.5 | 2900 | 215 | 1111.88 |
| | MW-1014C | 330 | < 13 | 620 | 6.1 | 2000 | 260 | 700 | | 7 | 1113 | 36 | 1106.97 |

Created By: SGL Checked By: DAT

## Historical Groundwater Results (Quarterly Parameters)

| Date | SamplePointName | Alk (mg/l) | Cu (ug/l) | Hard (mg/l) | Fe (mg/l) | Mn (ug/l) | Sulf (mg/l) | TDS (mg/l) | Zn (ug/l) | Field pH | Field Cond | Redox (mV) | Grd Water El (Feet) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/06 | | | | | | | | | | | | | |
| | MW-1015A | 78 | < 2.7 | 92 | < 0.005 | 9.5 | 9.3 | 21 | | 7.1 | 162 | 156 | 1086.85 |
| | MW-1015B | 180 | < 2.7 | 160 | 0.32 | 110 | 2.5 | 230 | | 7.5 | 466 | -73 | 1086.94 |

Created By: SGL Checked By: DAT

# Attachment 2

## Statistical Results

## Trend Graphs

## Historical Data

## (Groundwater - Annual Parameters)

## Trend Analysis Results - Groundwater (Annual Parameters)
## Oct. 1997 - Oct. 2006

| | Arsenic | Barium | Cadmium | Calcium | Chloride | Chromium | Lead | Magnesium | Mercury | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1013 | | | | | | | | | | | |
| Sample Size | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mann-Kendall S | -7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Level | 0.159 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trend | | | | | | | | | | | |
| MW-1013A | | | | | | | | | | | |
| Sample Size | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mann-Kendall S | -4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Level | 0.484 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trend | | | | | | | | | | | |
| MW-1013B | | | | | | | | | | | |
| Sample Size | 20 | 14 | 14 | 15 | 9 | 14 | 14 | 15 | 14 | 14 | 14 |
| Mann-Kendall S | -15 | 0 | -1 | 12 | 8 | -51 | 7 | -11 | 0 | -13 | -4 |
| p-Level | 0.654 | 1 | 1 | 0.592 | 0.476 | 0.004 | 0.748 | 0.626 | 1 | 0.518 | 0.872 |
| Trend | | | | | | - | | | | | |
| MW-1013C | | | | | | | | | | | |
| Sample Size | 20 | 14 | 14 | 15 | 9 | 14 | 14 | 15 | 14 | 14 | 14 |
| Mann-Kendall S | 24 | 0 | -9 | 15 | 14 | -1 | 0 | 40 | 0 | -1 | -6 |
| p-Level | 0.46 | 1 | 0.668 | 0.496 | 0.18 | 1 | 1 | 0.052 | 1 | 1 | 0.789 |
| Trend | | | | | | | | | | | |
| MW-1014 | | | | | | | | | | | |
| Sample Size | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mann-Kendall S | 0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| p-Level | 1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trend | | | | | | | | | | | |
| MW-1014A | | | | | | | | | | | |
| Sample Size | 17 | 11 | 11 | 12 | 6 | 11 | 11 | 12 | 11 | 11 | 11 |
| Mann-Kendall S | -27 | -18 | 0 | -23 | 5 | -9 | 6 | -15 | 0 | 10 | 5 |
| p-Level | 0.289 | 0.191 | 1 | 0.134 | 0.47 | 0.542 | 0.705 | 0.345 | 1 | 0.494 | 0.762 |
| Trend | | | | | | | | | | | |
| MW-1014B | | | | | | | | | | | |
| Sample Size | 20 | 14 | 14 | 15 | 9 | 14 | 14 | 15 | 14 | 14 | 14 |
| Mann-Kendall S | 19 | 0 | -79 | -38 | 0 | -2 | 0 | -52 | 0 | -32 | 10 |
| p-Level | 0.564 | 1 | 0 | 0.066 | 1 | 0.957 | 1 | 0.01 | 1 | 0.09 | 0.629 |
| Trend | | | - | | | | | - | | | |
| MW-1014C | | | | | | | | | | | |
| Sample Size | 20 | 14 | 14 | 15 | 9 | 14 | 14 | 15 | 14 | 14 | 14 |
| Mann-Kendall S | 65 | 32 | 0 | -88 | 24 | -7 | 7 | -82 | 0 | -21 | -1 |
| p-Level | 0.037 | 0.09 | 1 | 0 | 0.012 | 0.748 | 0.748 | 0 | 1 | 0.28 | 1 |
| Trend | | | | - | | | | - | | | |
| MW-1015A | | | | | | | | | | | |
| Sample Size | 24 | 17 | 17 | 7 | 2 | 17 | 17 | 7 | 17 | 17 | 17 |
| Mann-Kendall S | -12 | -120 | 0 | 0 | NA | 0 | 0 | 2 | 0 | 0 | -8 |
| p-Level | 0.788 | 0 | 1 | 1 | NA | 1 | 1 | 0.886 | 1 | 1 | 0.776 |
| Trend | | - | | | | | | | | | |
| MW-1015B | | | | | | | | | | | |
| Sample Size | 24 | 17 | 17 | 7 | 2 | 17 | 17 | 7 | 17 | 17 | 17 |
| Mann-Kendall S | 21 | -47 | 0 | 3 | NA | 0 | 0 | 7 | 0 | 0 | 0 |
| p-Level | 0.623 | 0.058 | 1 | 0.772 | NA | 1 | 1 | 0.382 | 1 | 1 | 1 |
| Trend | | | | | | | | | | | |

Notes: Overall increasing trend denoted by "+".
Overall decreasing trend denoted by "-"
Trend tests performed at a Type I (two-tailed) error rate of 0.01.

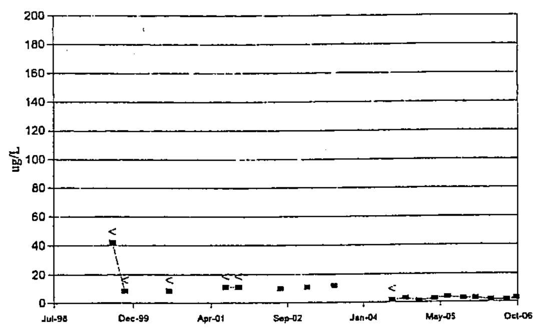
# Trend Analysis Results - Groundwater (Annual Parameters)
## Oct. 1997 - Oct. 2006

| | Arsenic | Barium | Cadmium | Calcium | Chloride | Chromium | Lead | Magnesium | Mercury | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1000PR | | | | | | | | | | | |
| Sample Size | 18 | 12 | 12 | 12 | 6 | 12 | 12 | 12 | 12 | 12 | 12 |
| Mann-Kendall S | 36 | 24 | -11 | -49 | 12 | -3 | 9 | -50 | 0 | 0 | 5 |
| p-Level | 0.188 | 0.116 | 0.503 | 0 | 0.036 | 0.893 | 0.592 | 0 | 1 | 1 | 0.789 |
| Trend | | | | - | | | | - | | | |
| MW-1002 | | | | | | | | | | | |
| Sample Size | 15 | 8 | 8 | 7 | 3 | 8 | 8 | 7 | 8 | 8 | 8 |
| Mann-Kendall S | 0 | -8 | -7 | -13 | 3 | 0 | 0 | -10 | 0 | 0 | 0 |
| p-Level | 1 | 0.398 | 0.473 | 0.07 | 6 | 1 | 1 | 0.187 | 1 | 1 | 1 |
| Trend | | | | | | | | | | | |
| MW-1002G | | | | | | | | | | | |
| Sample Size | 15 | 8 | 8 | 7 | 3 | 8 | 8 | 7 | 8 | 8 | 8 |
| Mann-Kendall S | -14 | -3 | -7 | -4 | 1 | -3 | 0 | -2 | 0 | -3 | 0 |
| p-Level | 0.527 | 0.812 | 0.473 | 0.667 | 2 | 0.812 | 1 | 0.886 | 1 | 0.812 | 1 |
| Trend | | | | | | | | | | | |
| MW-1004P | | | | | | | | | | | |
| Sample Size | 17 | 10 | 10 | 10 | 4 | 10 | 10 | 10 | 10 | 10 | 10 |
| Mann-Kendall S | 0 | 6 | -7 | 3 | 0 | -17 | 0 | 10 | 0 | 0 | 0 |
| p-Level | 1 | 0.664 | 0.6 | 0.862 | 1 | 0.156 | 1 | 0.432 | 1 | 1 | 1 |
| Trend | | | | | | | | | | | |
| MW-1004S | | | | | | | | | | | |
| Sample Size | 17 | 10 | 10 | 10 | 4 | 10 | 10 | 10 | 10 | 10 | 10 |
| Mann-Kendall S | 0 | 30 | -7 | 30 | 3 | -7 | 0 | 26 | 0 | -5 | 0 |
| p-Level | 1 | 0.007 | 0.6 | 0.007 | 0.542 | 0.6 | 1 | 0.022 | 1 | 0.728 | 1 |
| Trend | | + | | + | | | | | | | |
| MW-1005 | | | | | | | | | | | |
| Sample Size | 15 | 8 | 8 | 7 | 3 | 8 | 8 | 7 | 8 | 8 | 8 |
| Mann-Kendall S | 5 | 2 | 5 | -3 | -3 | -12 | 0 | -2 | 0 | 0 | 5 |
| p-Level | 0.846 | 0.904 | 0.634 | 0.772 | 6 | 0.178 | 1 | 0.886 | 1 | 1 | 0.634 |
| Trend | | | | | | | | | | | |
| MW-1005P | | | | | | | | | | | |
| Sample Size | 15 | 8 | 8 | 8 | 3 | 8 | 8 | 8 | 8 | 8 | 8 |
| Mann-Kendall S | -2 | -3 | -7 | -5 | 1 | -3 | 0 | -1 | 0 | 0 | 0 |
| p-Level | 0.961 | 0.812 | 0.473 | 0.634 | 2 | 0.812 | 1 | 0.952 | 1 | 1 | 1 |
| Trend | | | | | | | | | | | |
| MW-1005S | | | | | | | | | | | |
| Sample Size | 15 | 8 | 8 | 7 | 3 | 8 | 8 | 7 | 8 | 8 | 8 |
| Mann-Kendall S | 12 | -2 | 0 | -1 | 0 | -7 | 0 | 6 | 0 | -5 | 0 |
| p-Level | 0.592 | 0.904 | 1 | 1 | 0 | 0.473 | 1 | 0.472 | 1 | 0.634 | 1 |
| Trend | | | | | | | | | | | |
| MW-1010P | | | | | | | | | | | |
| Sample Size | 18 | 12 | 12 | 12 | 6 | 12 | 12 | 12 | 12 | 12 | 12 |
| Mann-Kendall S | -30 | 28 | -15 | 33 | 7 | 3 | 0 | 32 | 0 | -11 | -1 |
| p-Level | 0.277 | 0.062 | 0.345 | 0.026 | 0.272 | 0.893 | 1 | 0.032 | 1 | 0.503 | 0.973 |
| Trend | | | | | | | | | | | |

Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

MW-1000P-R

Arsenic

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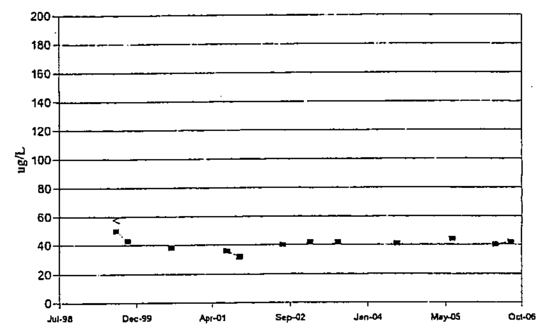
Barium

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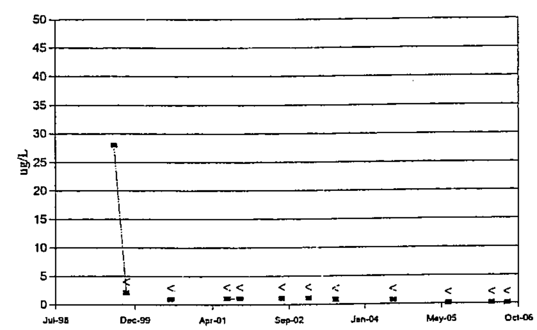
Cadmium

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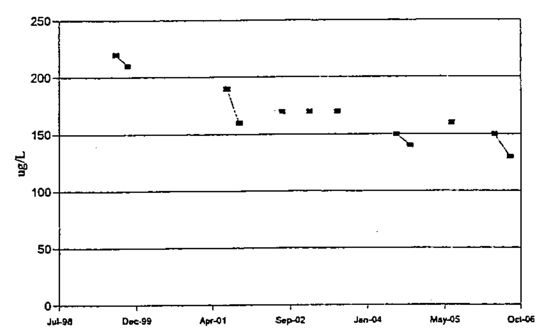
Calcium

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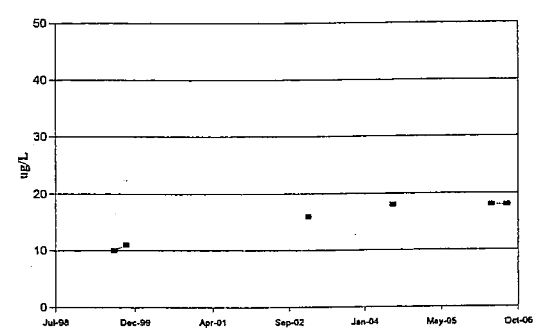
Chloride

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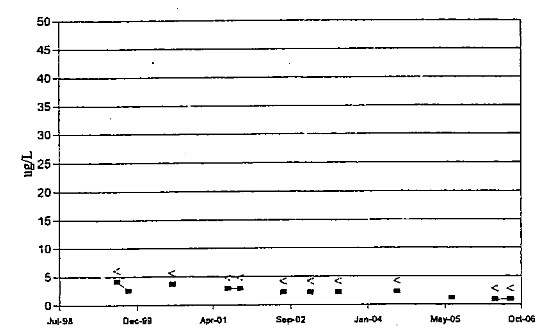
Chromium

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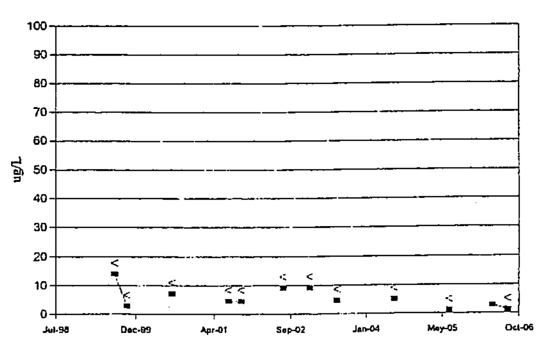
Lead

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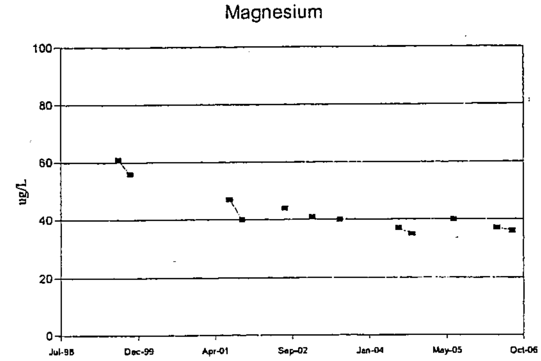
Magnesium

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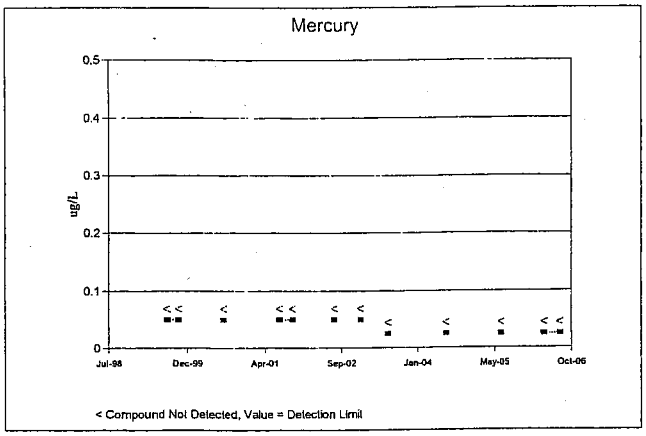
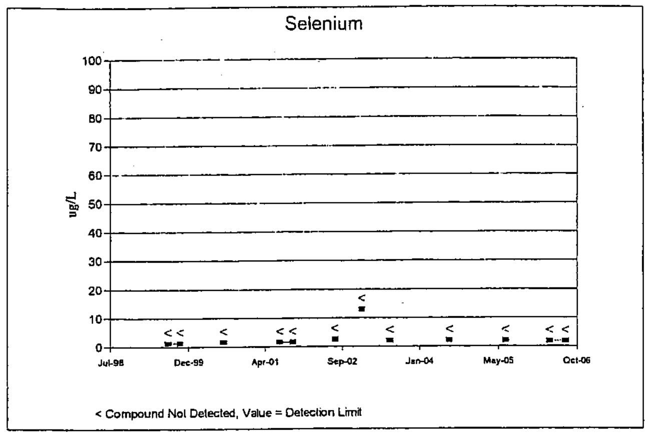
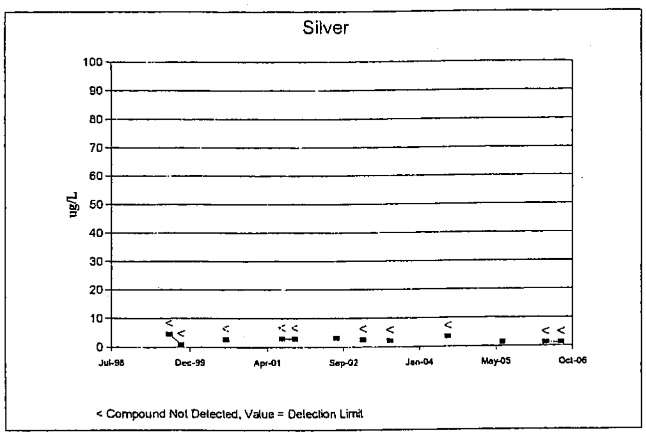
Created By: SGL Checked By: DAT

MW-1000P-R



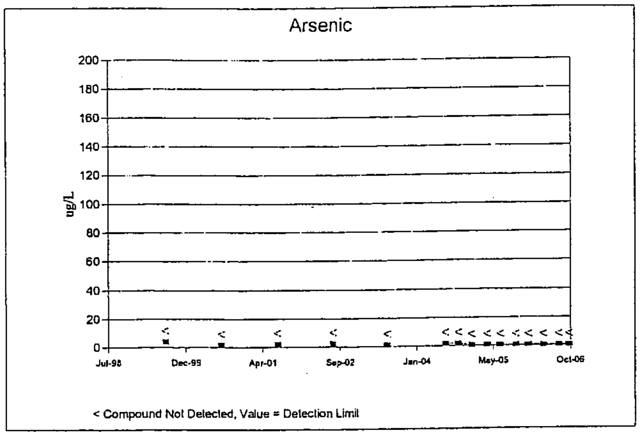



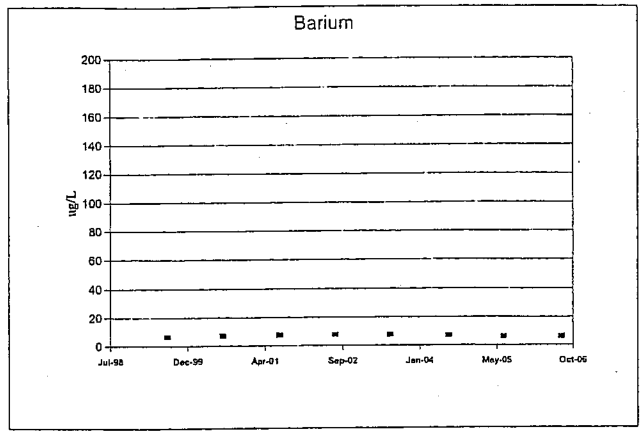


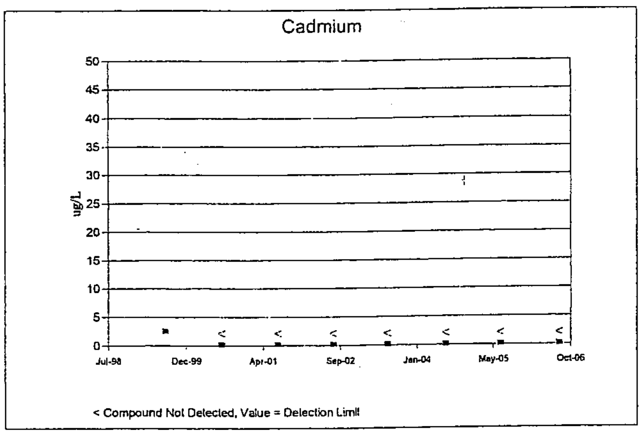
Created By: SGL Checked By: DAT

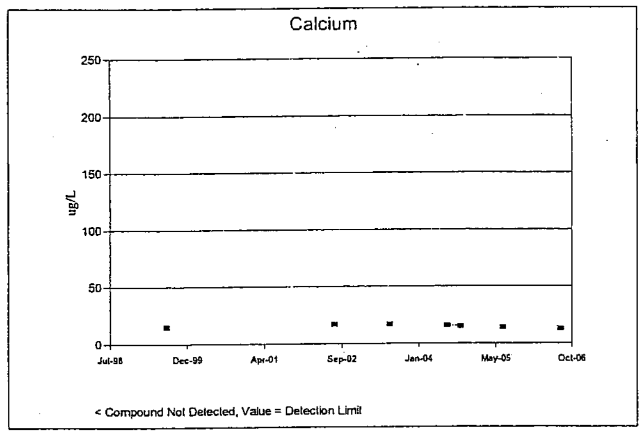
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

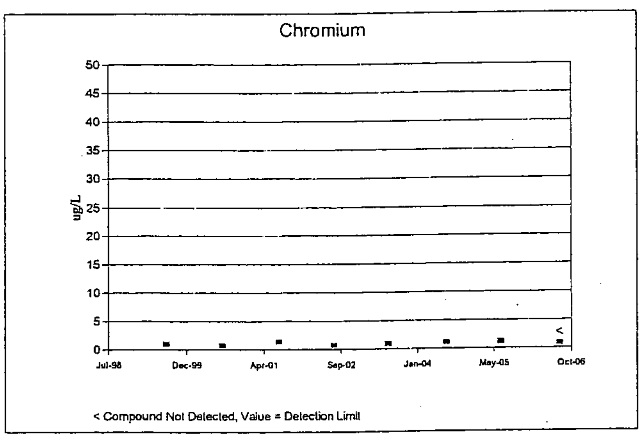
MW-1002

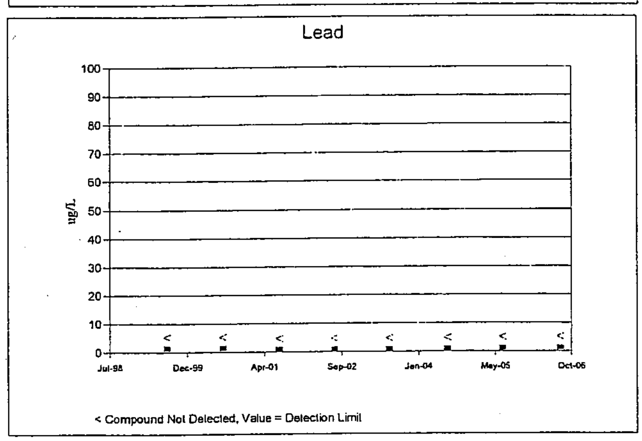


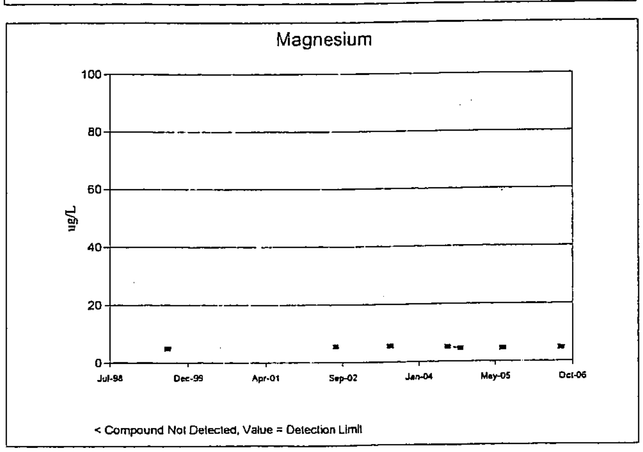



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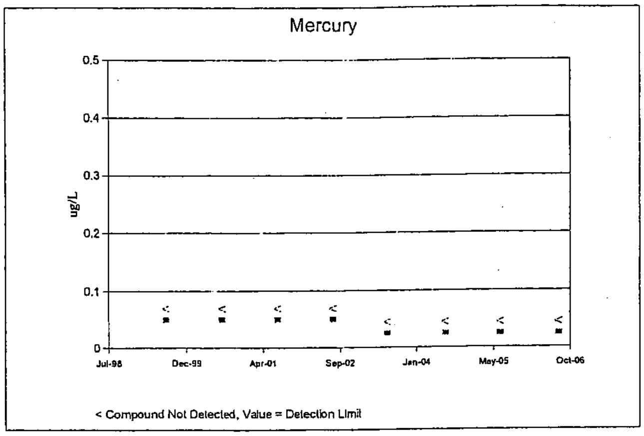
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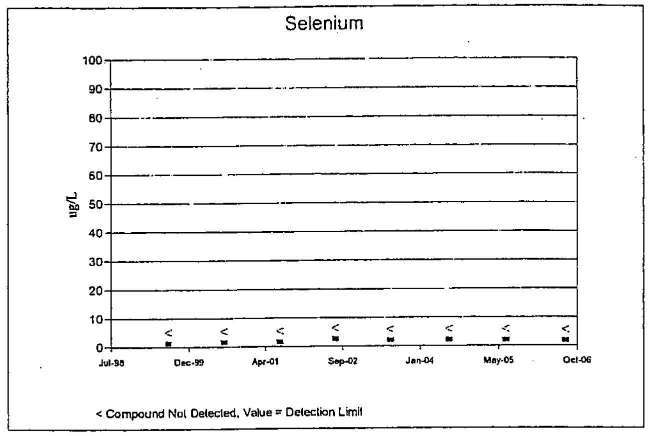
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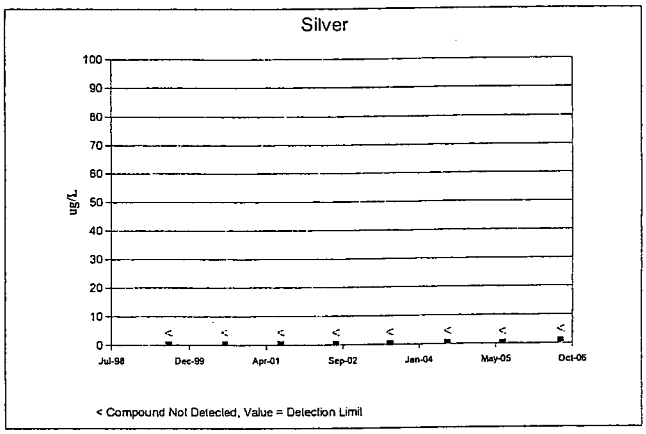
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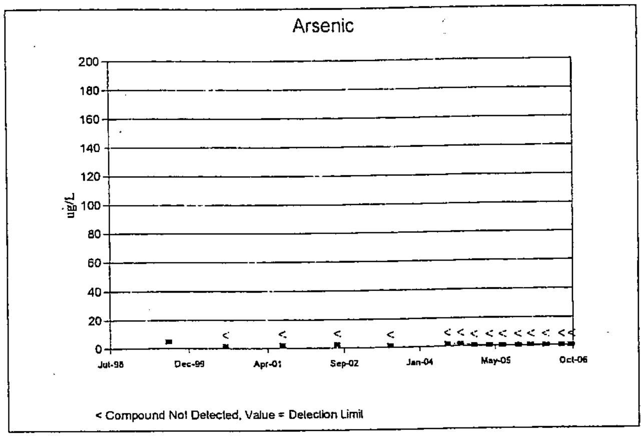
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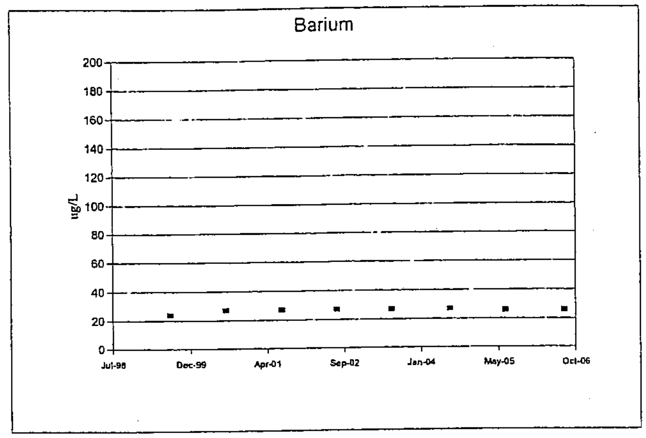
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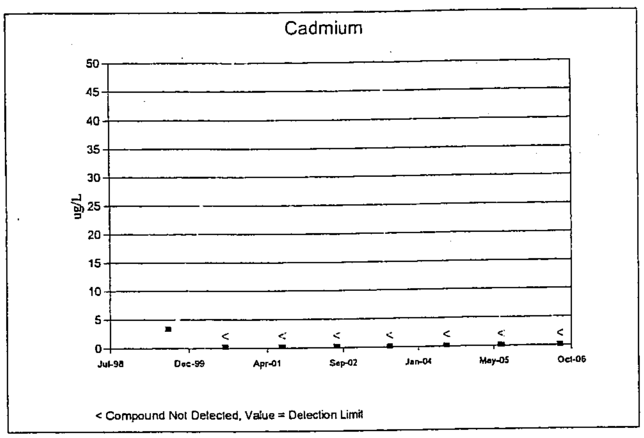
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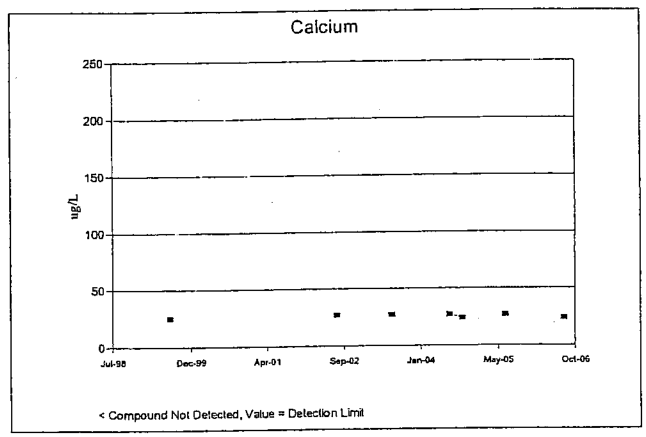
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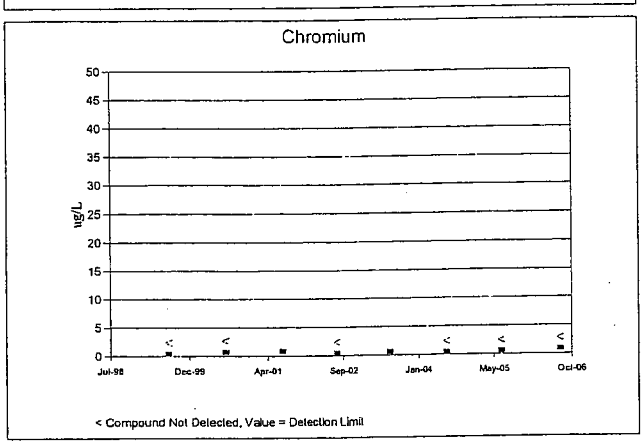
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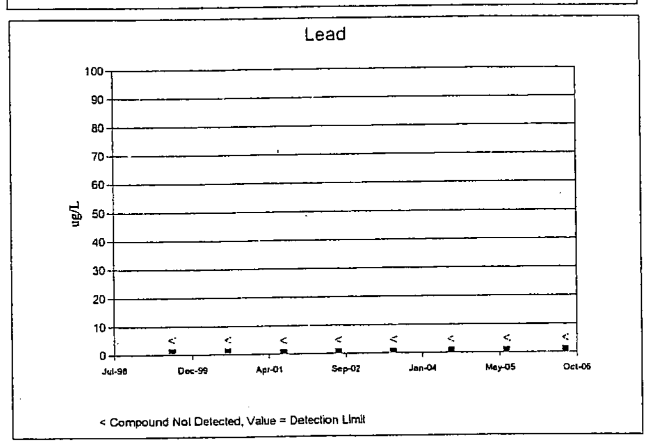
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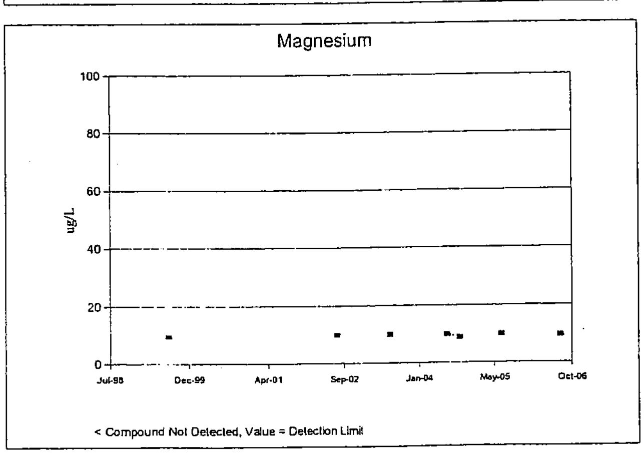
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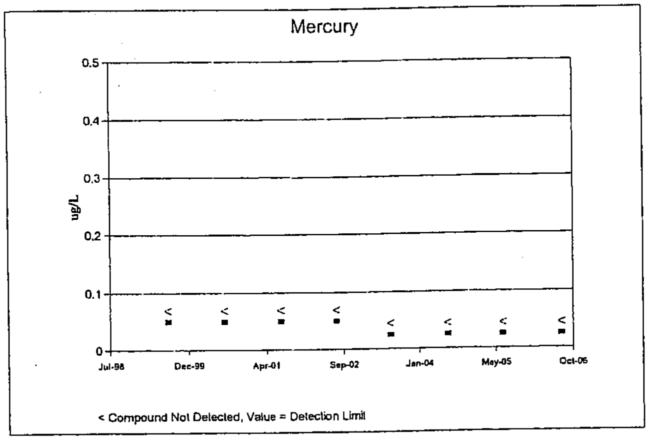
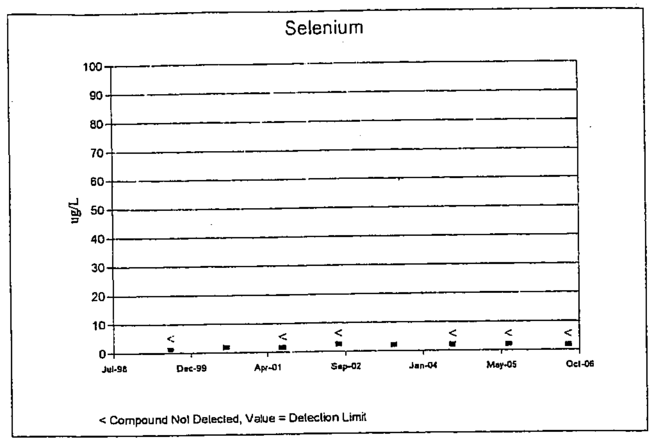
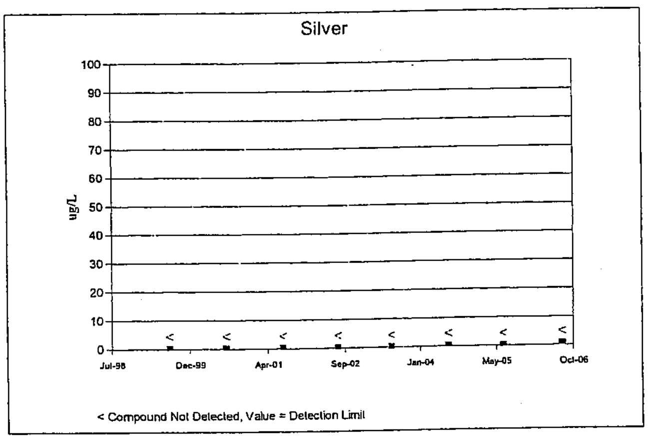
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

MW-1002G



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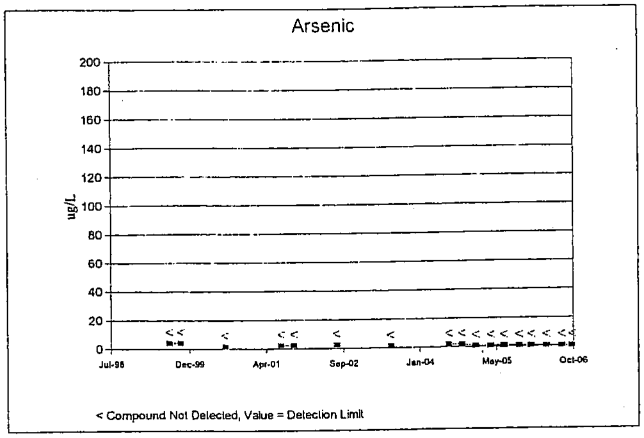


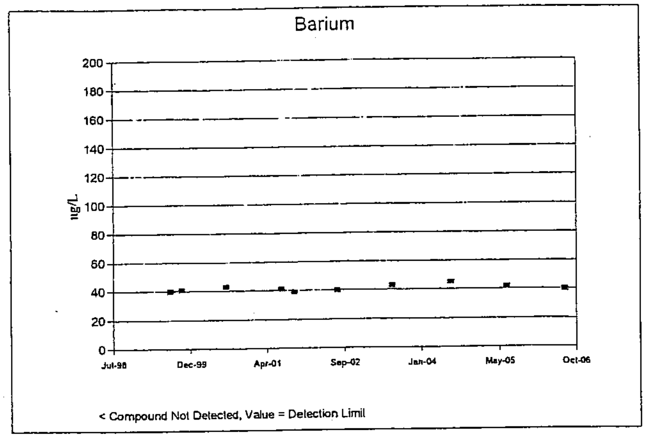


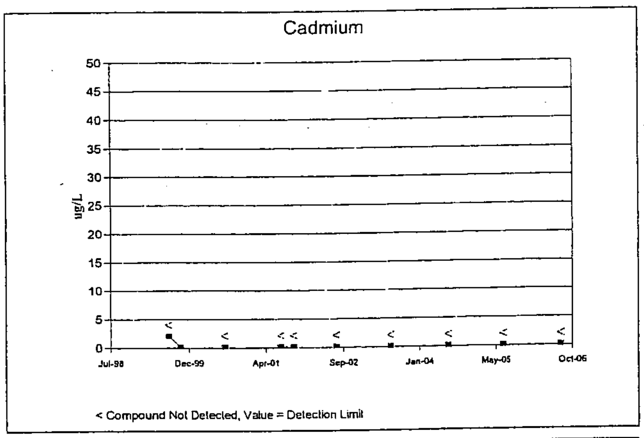


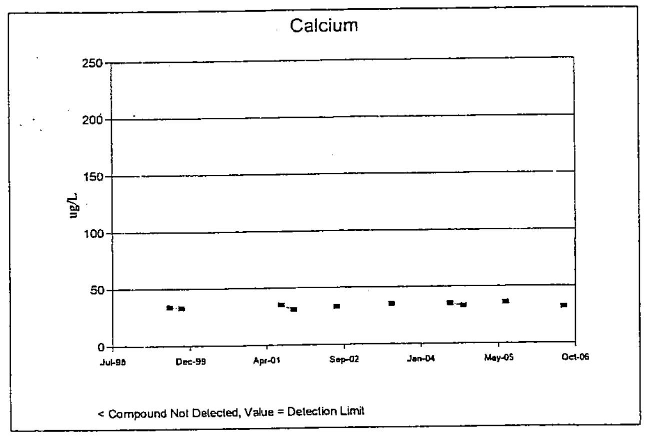


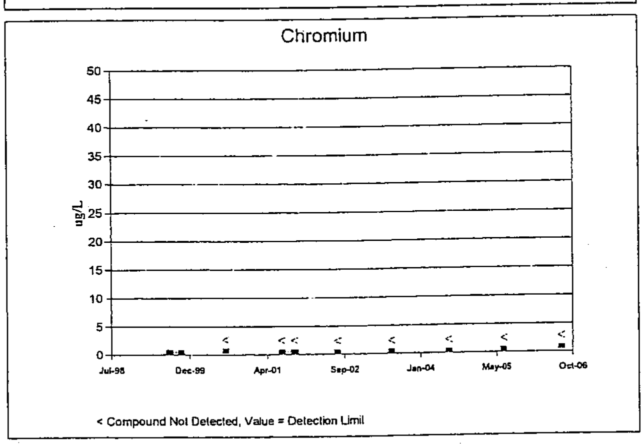


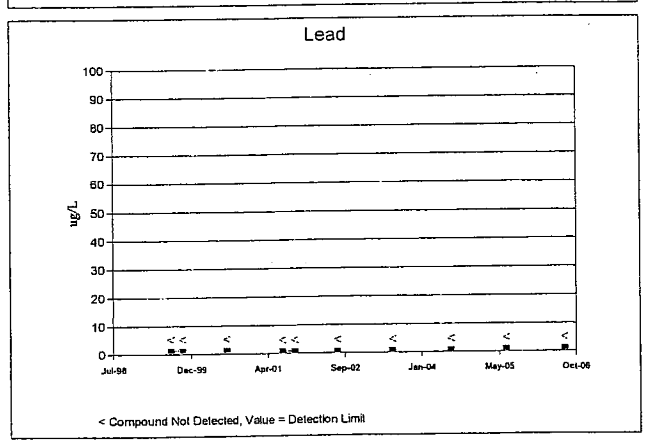


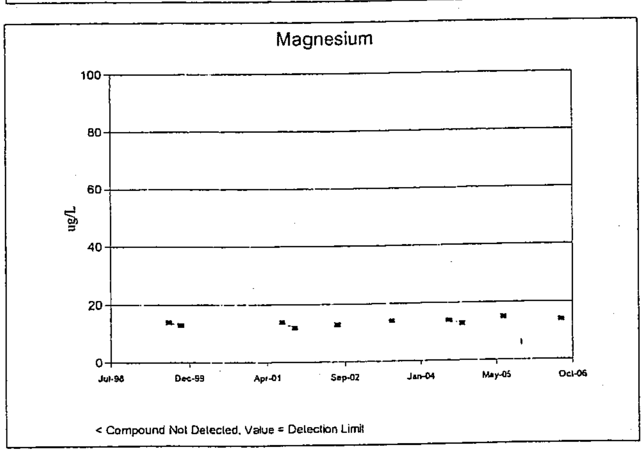



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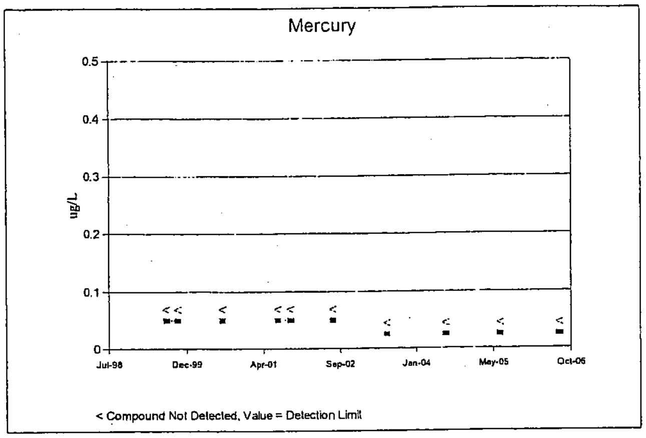
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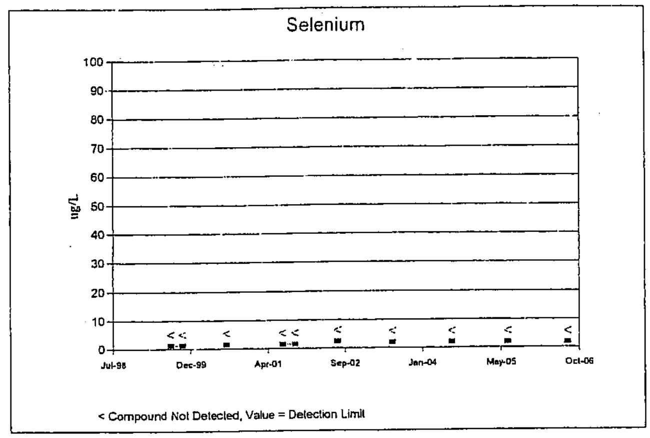
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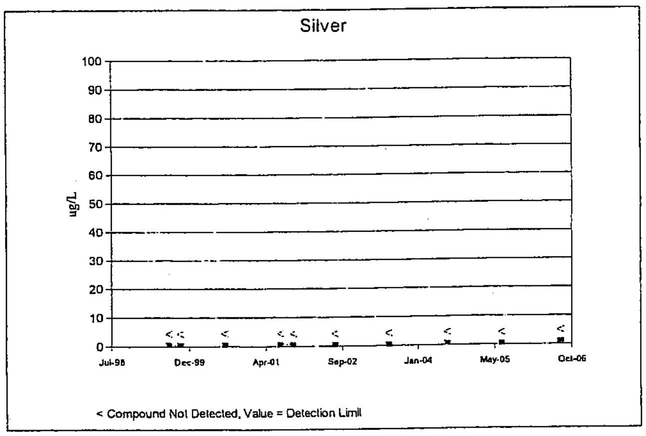
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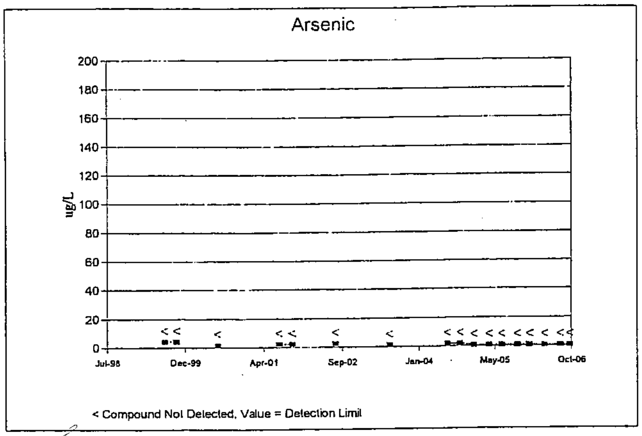
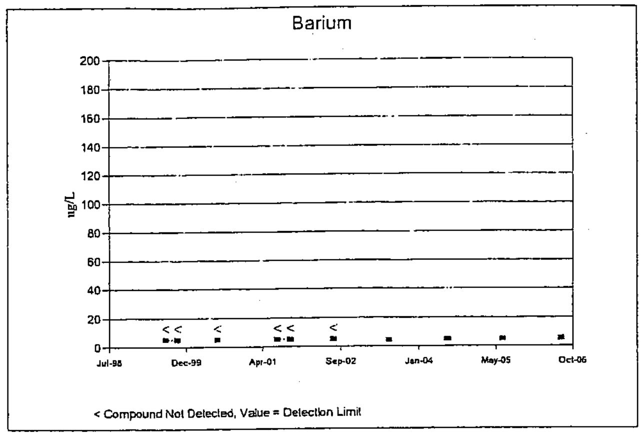
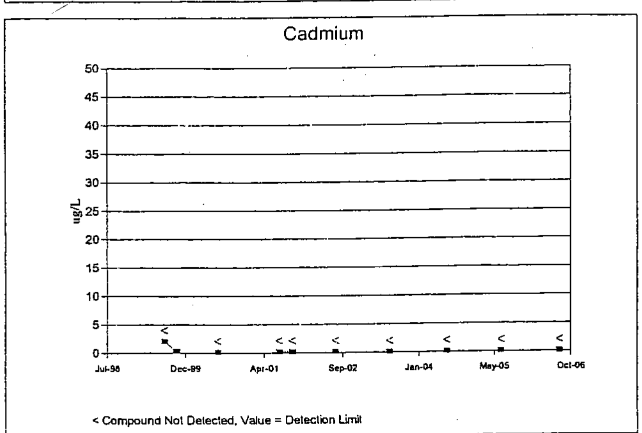
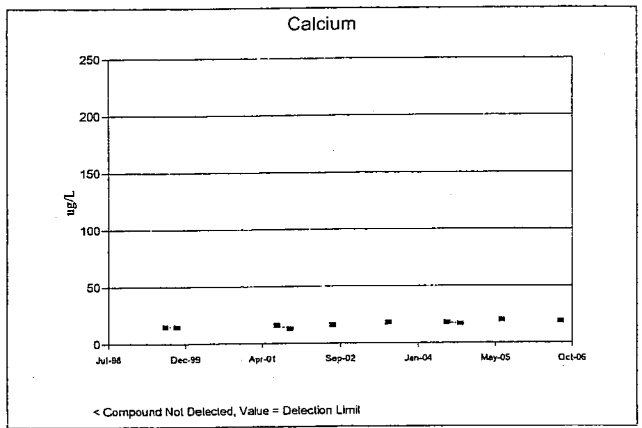
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

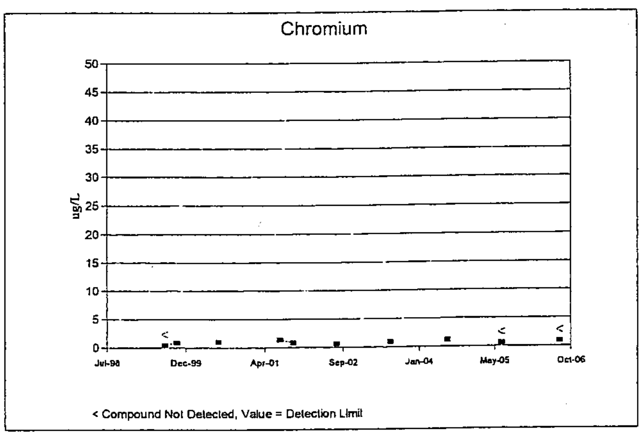
MW-1004S

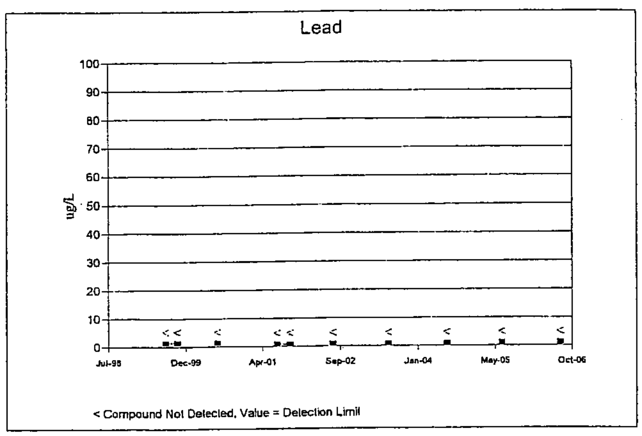


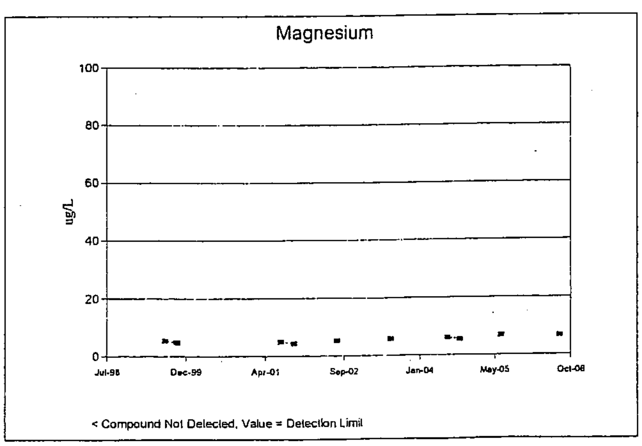





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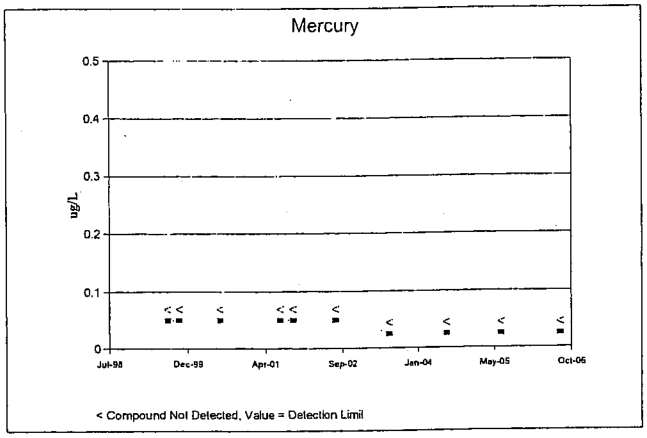
MW-1004S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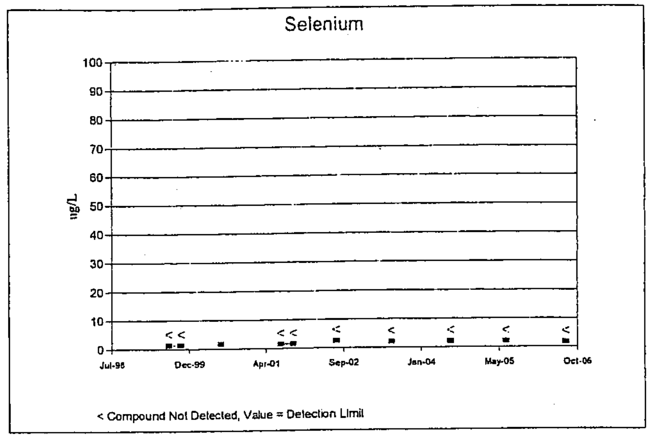
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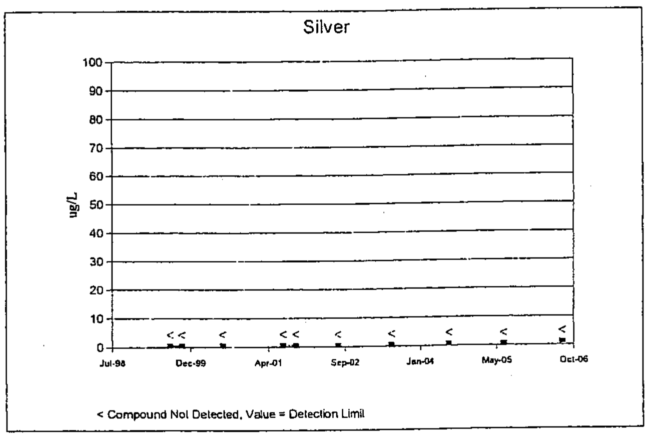
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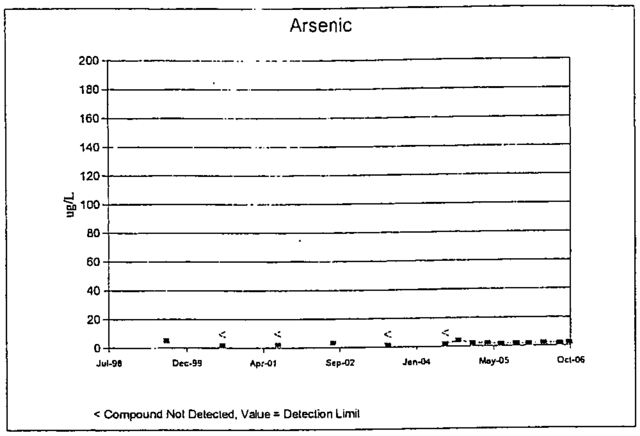
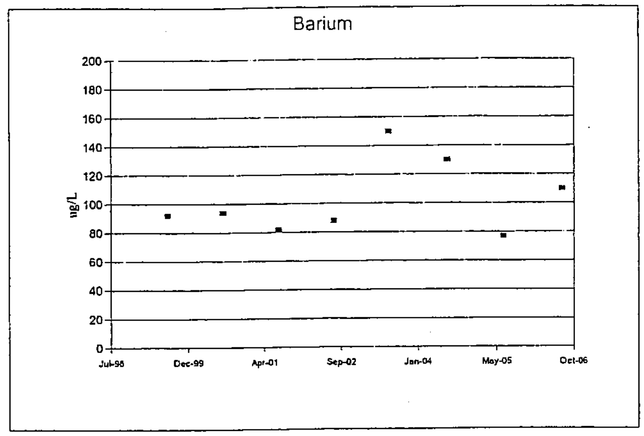
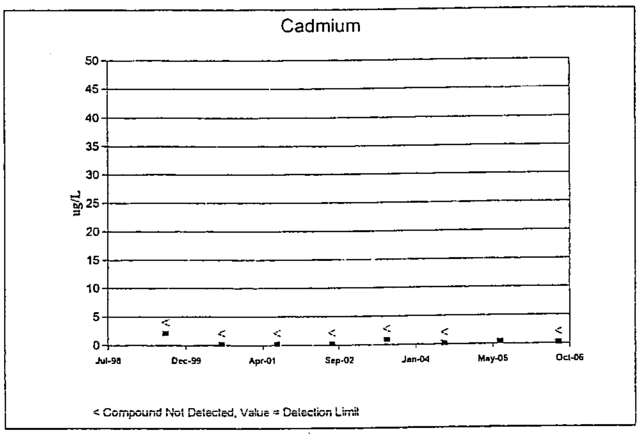
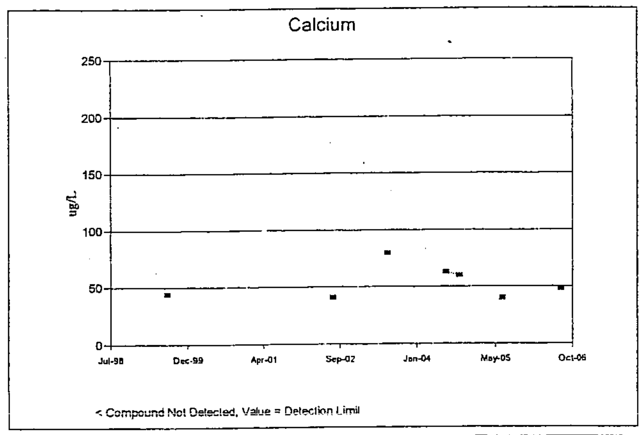
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

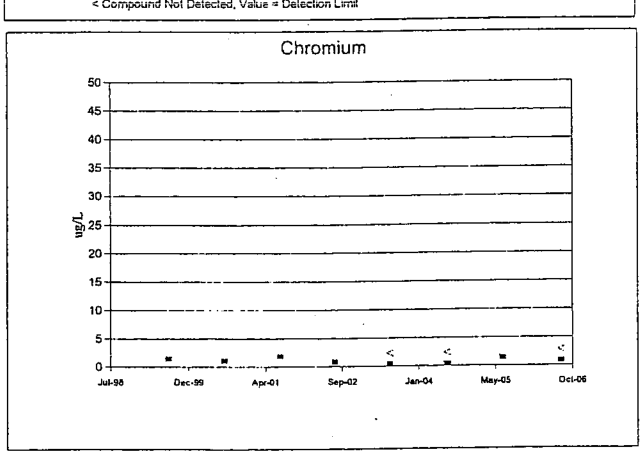
MW-1005

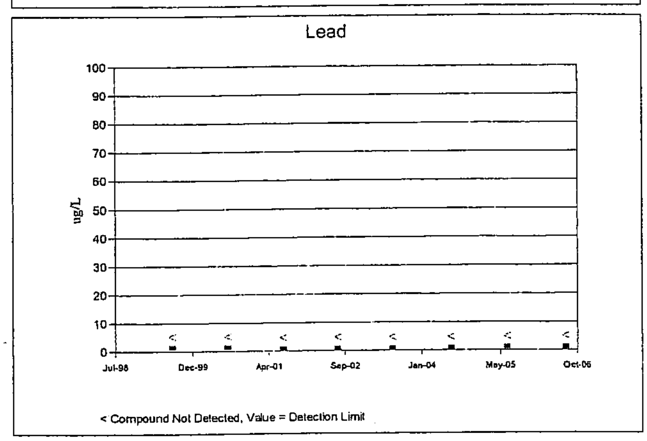


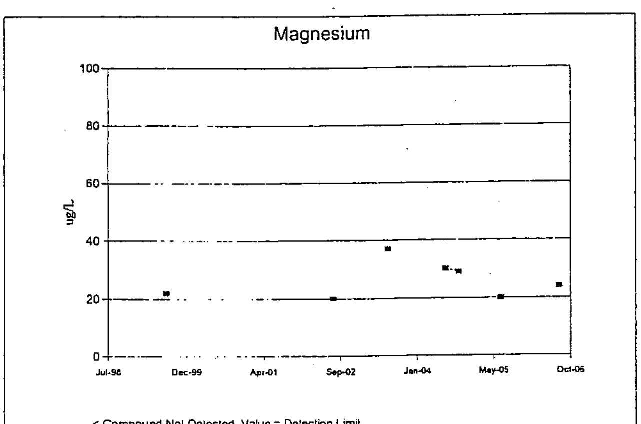



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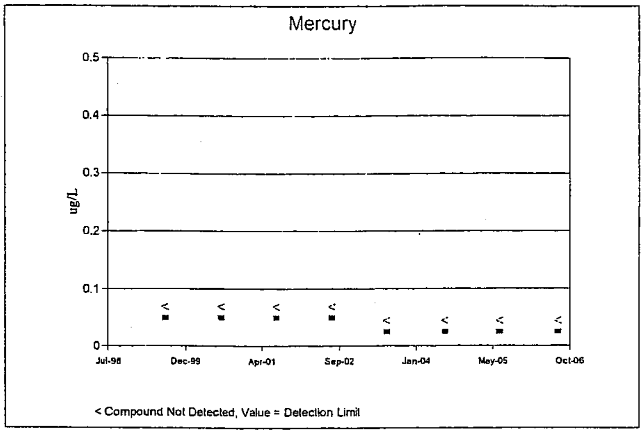
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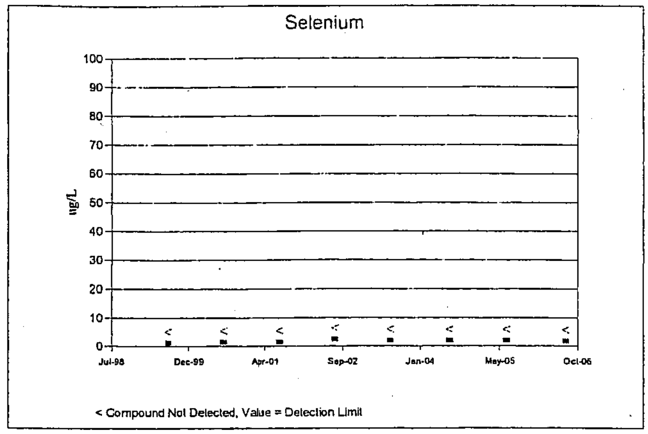
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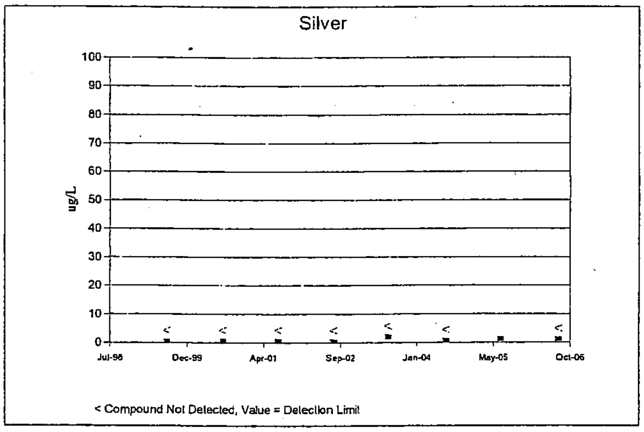
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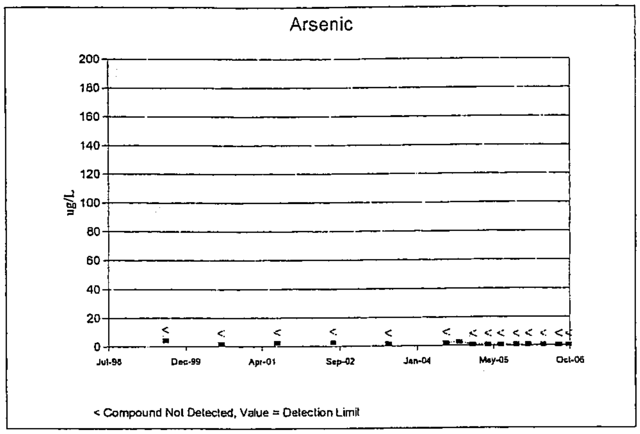
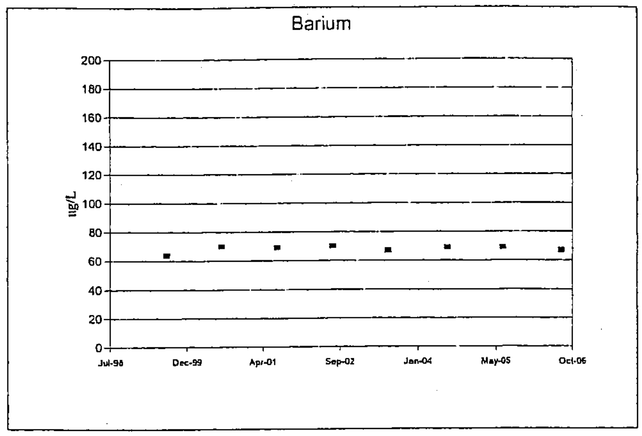
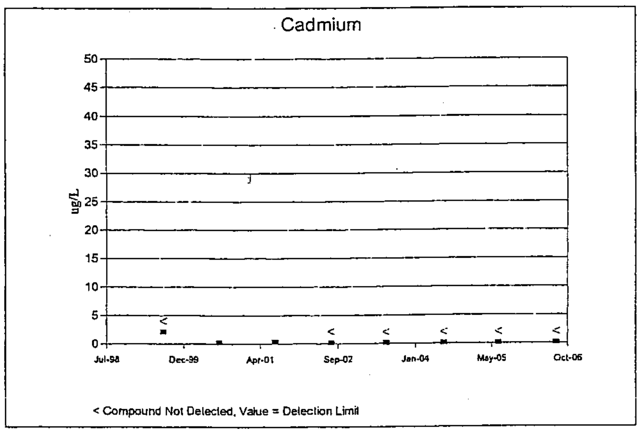
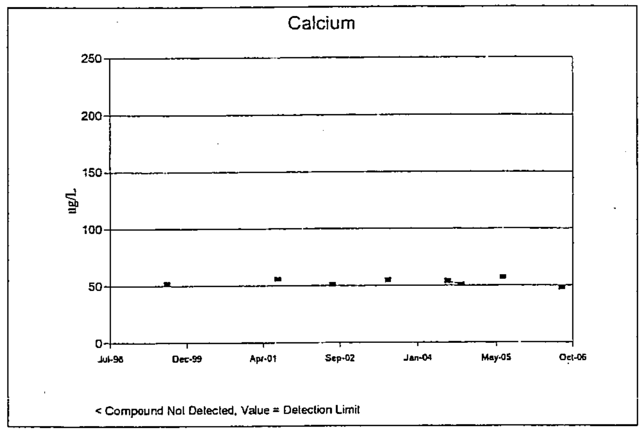
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

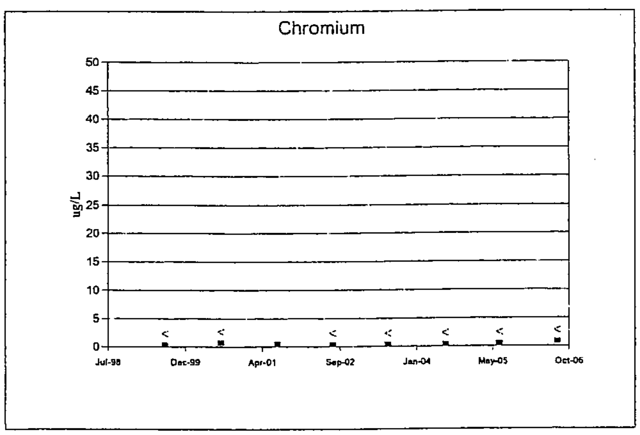
MW-1005P

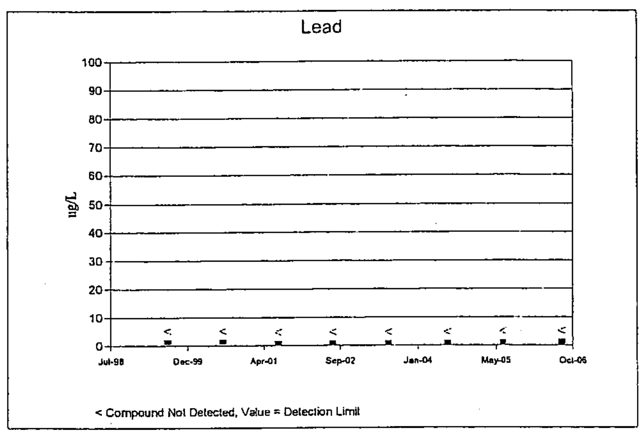


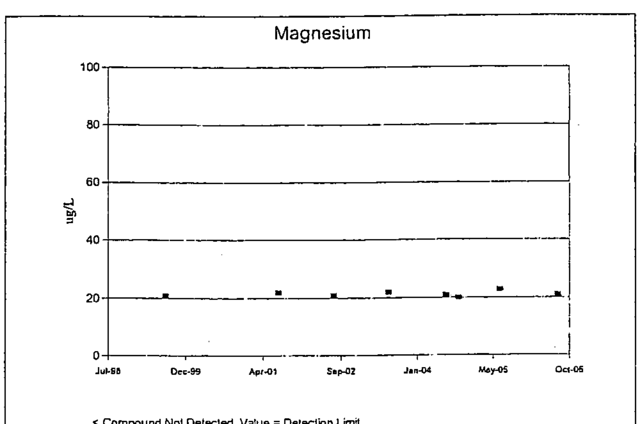



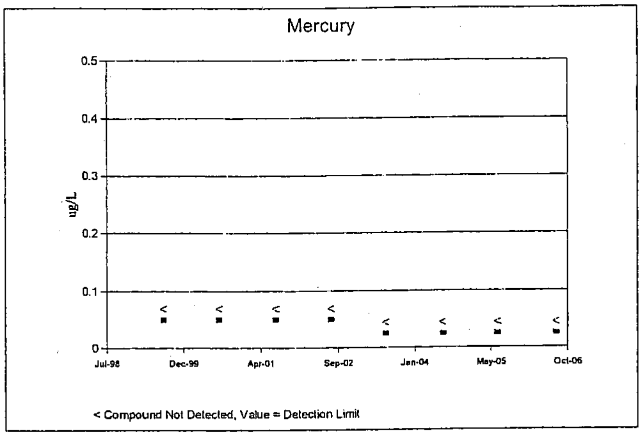



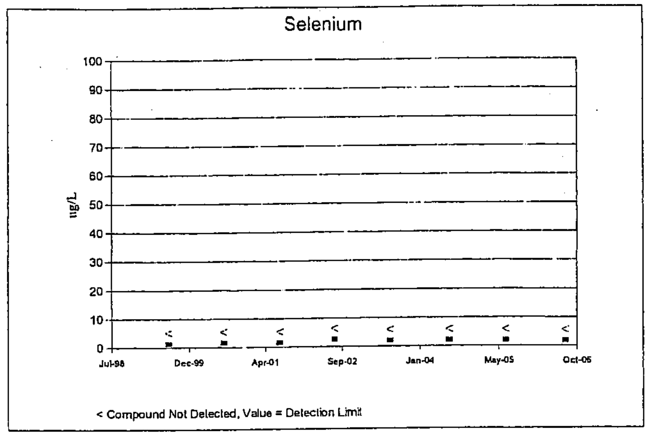



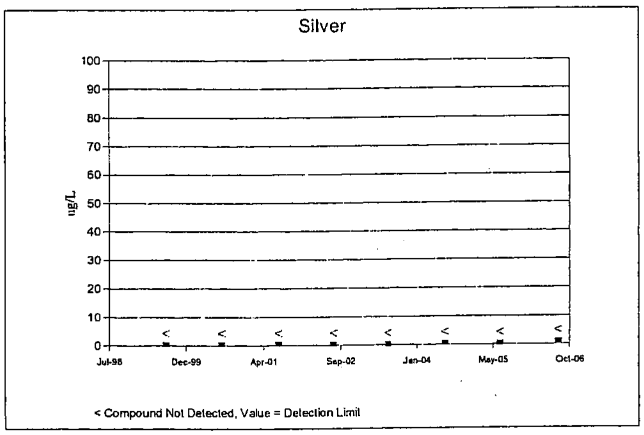



# Flambeau Mining Company
## Groundwater Quality Results (Annual Monitoring)

### MW-1005P

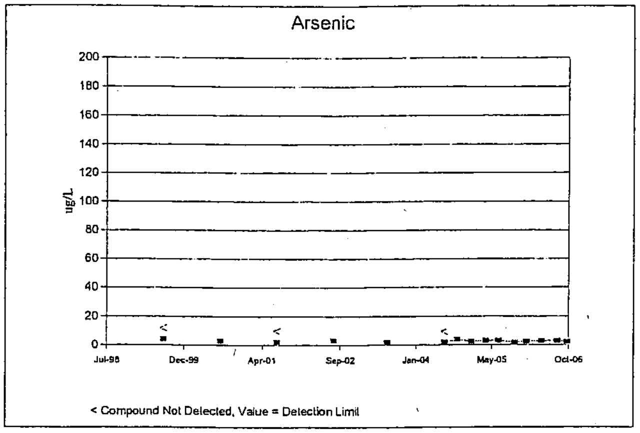


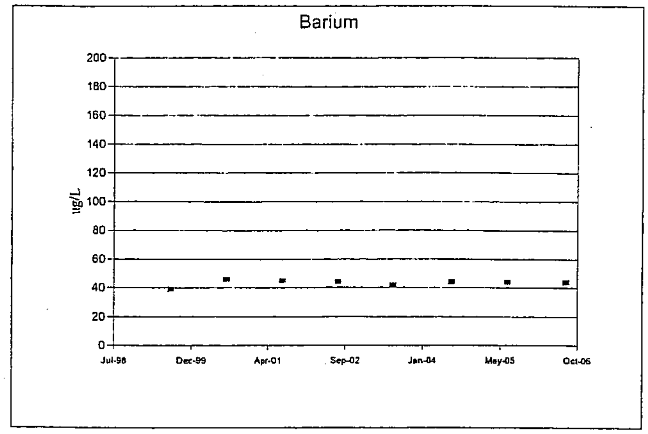



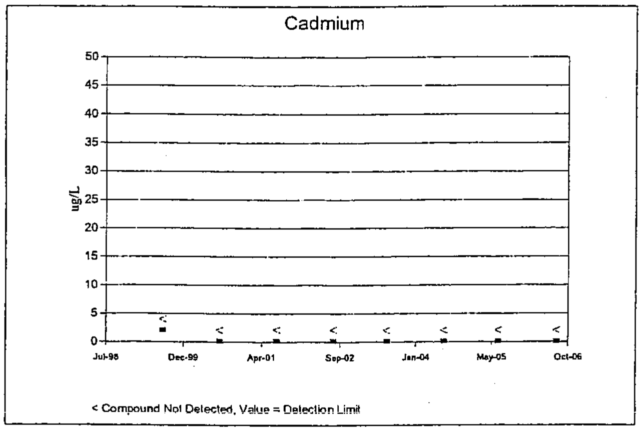



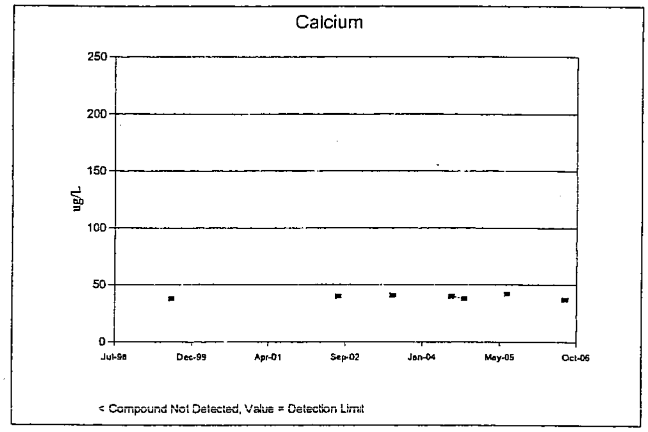
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

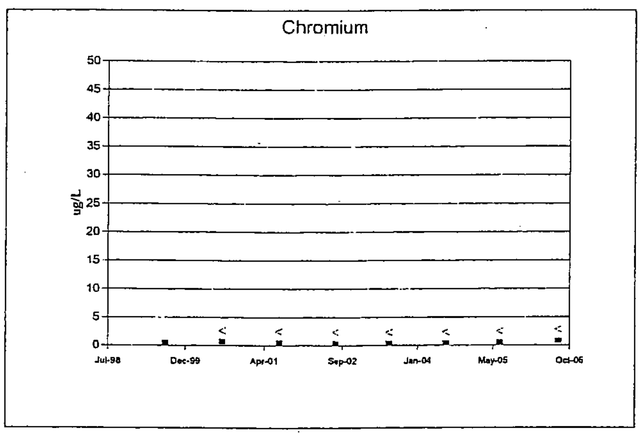
MW-1005S

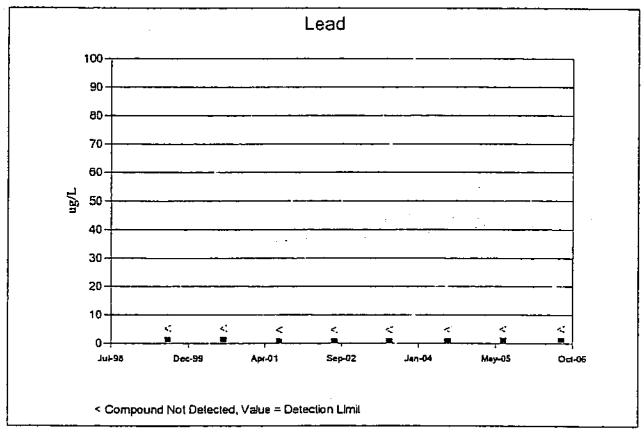


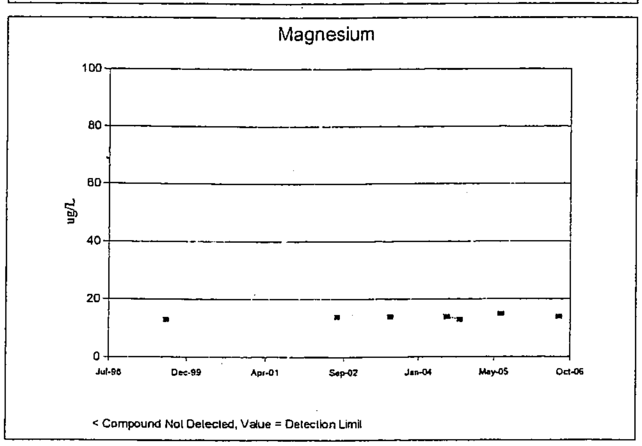





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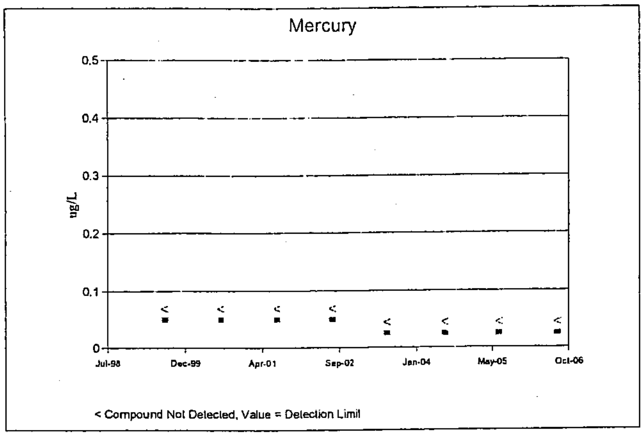
MW-1005S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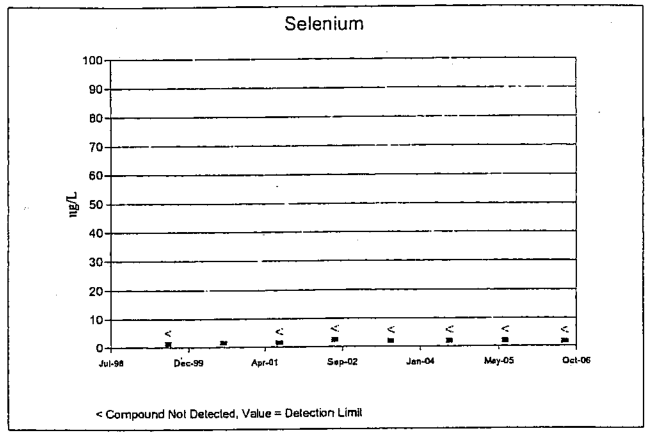
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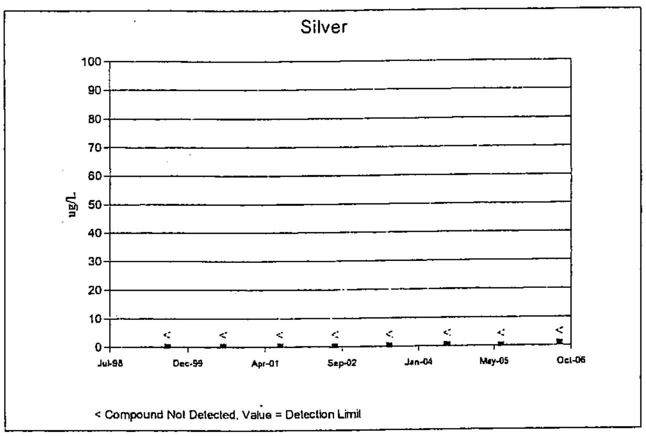
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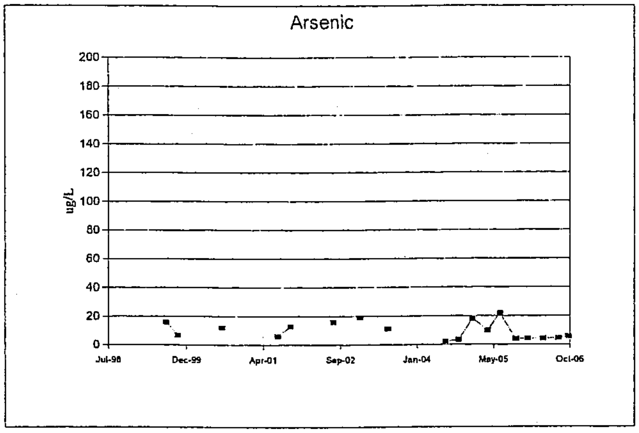
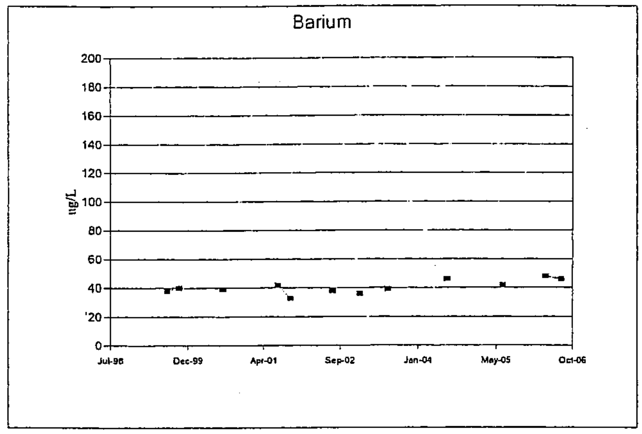
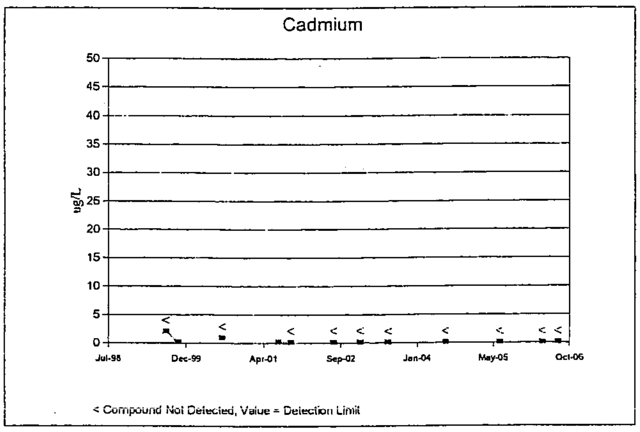
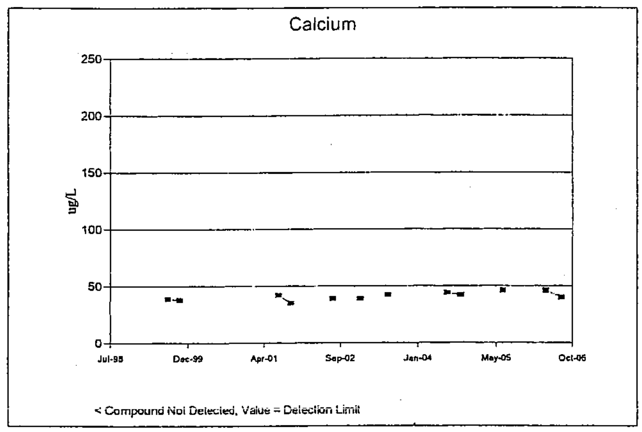
# Flambeau Mining Company
## Groundwater Quality Results (Annual Monitoring)

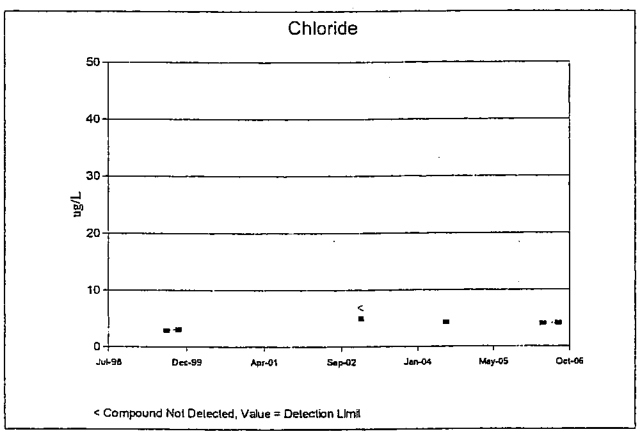
### MW-1010P

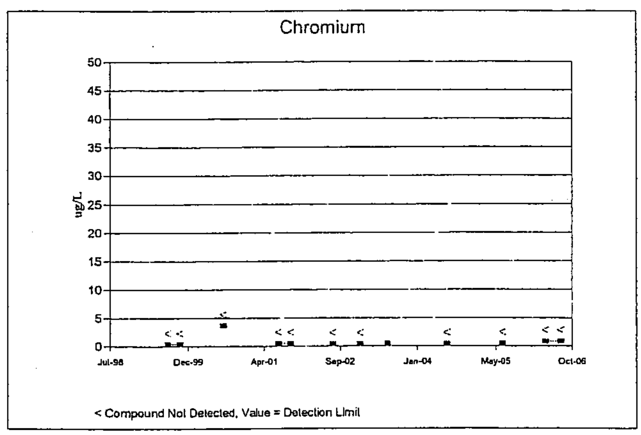


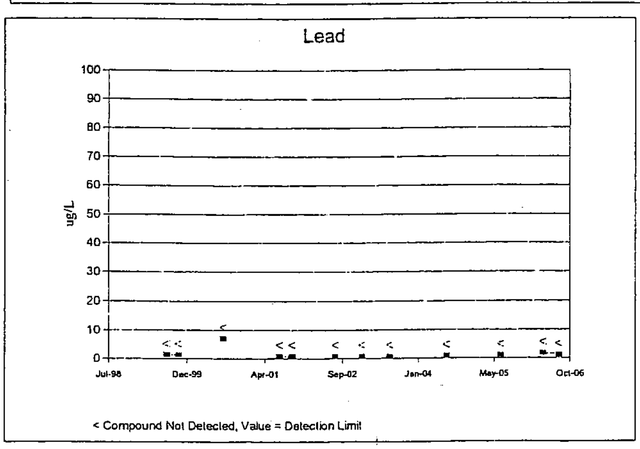



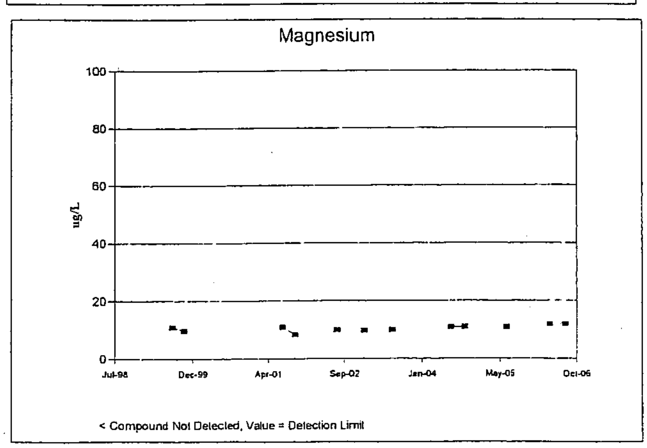





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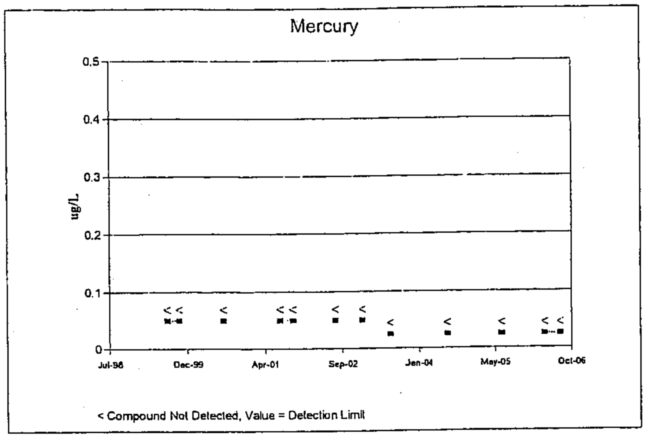
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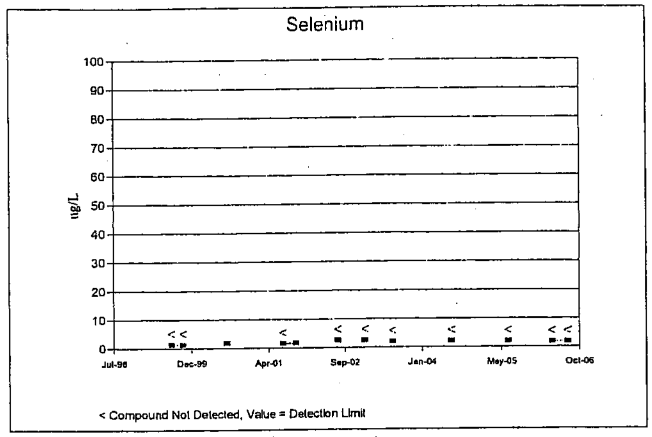
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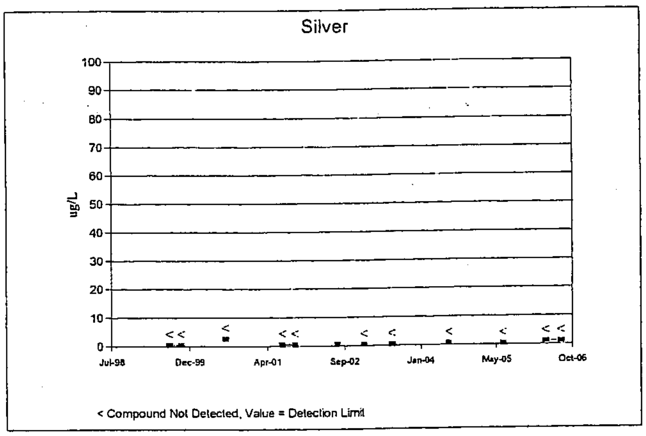
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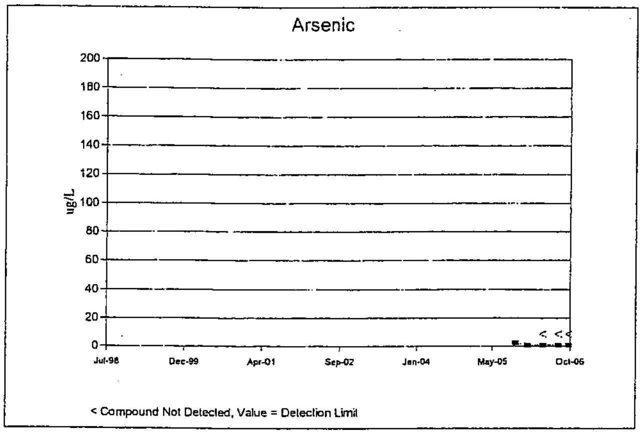
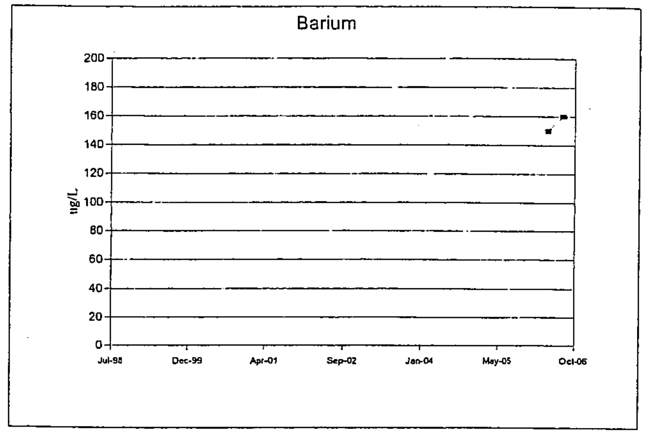
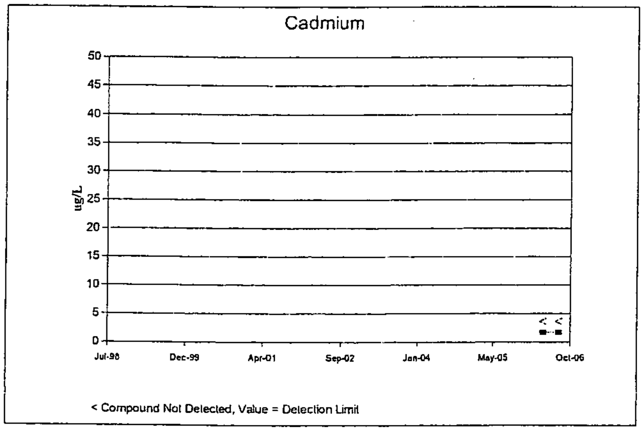
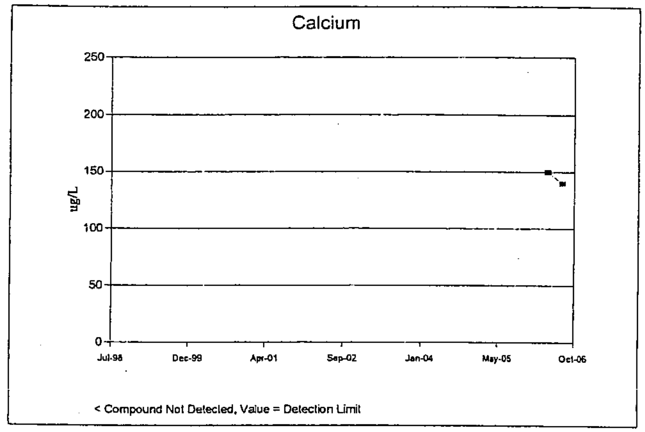
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

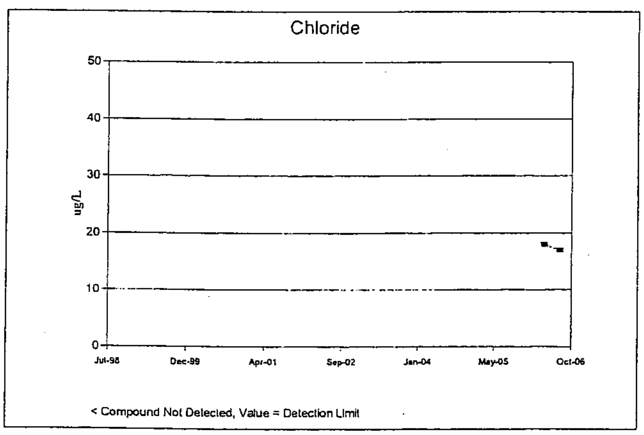
MW-1013

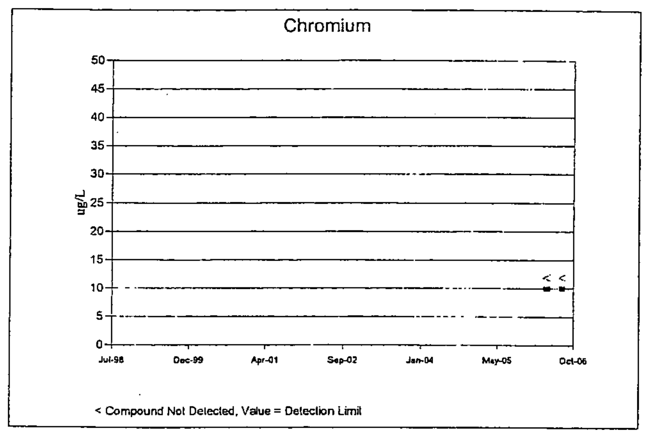


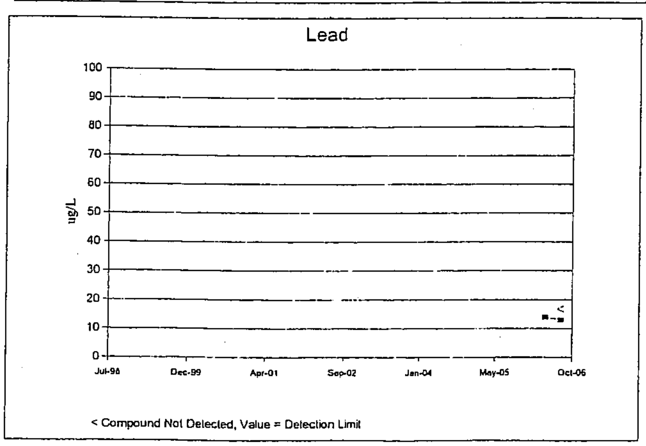



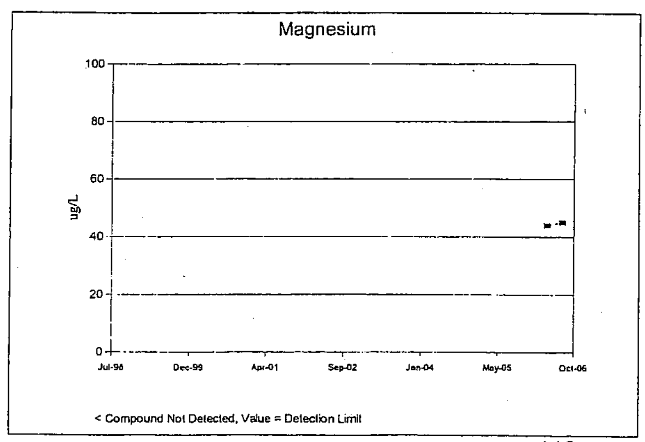





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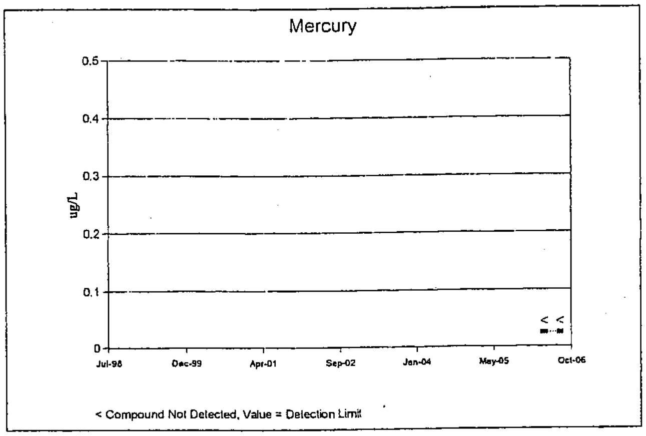
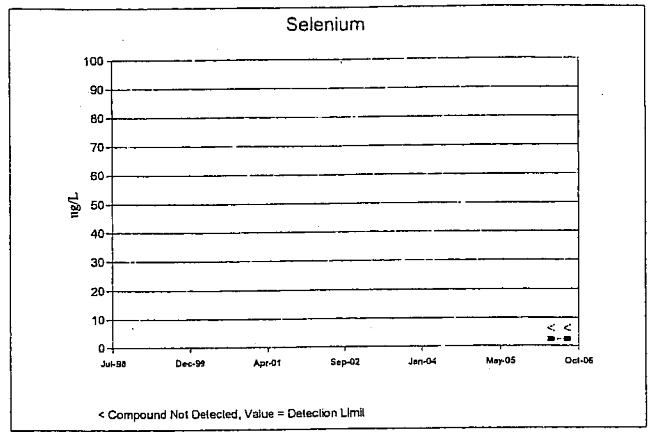
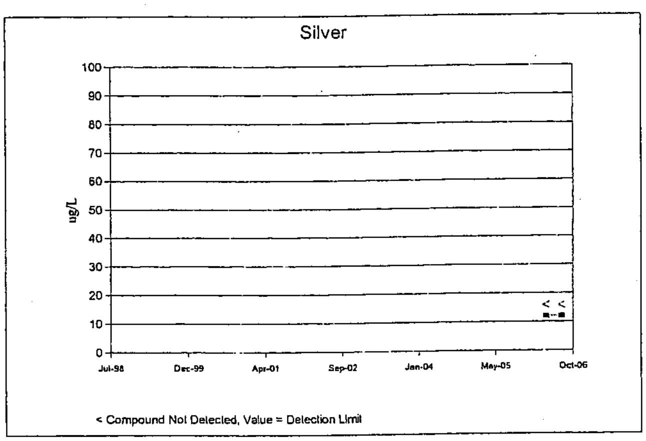
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

MW-1013



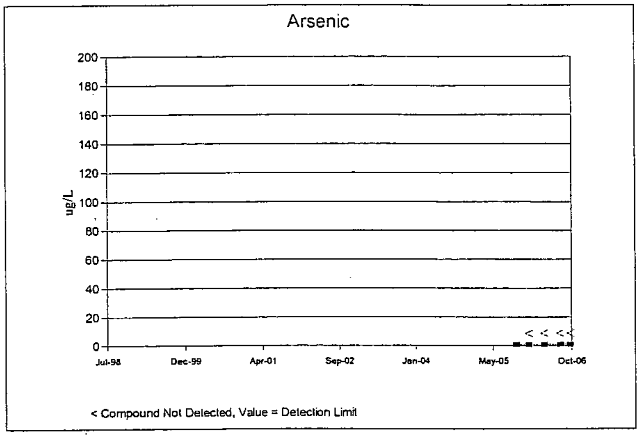



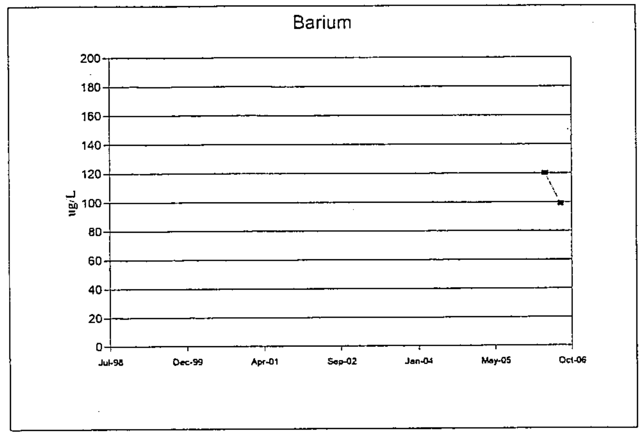



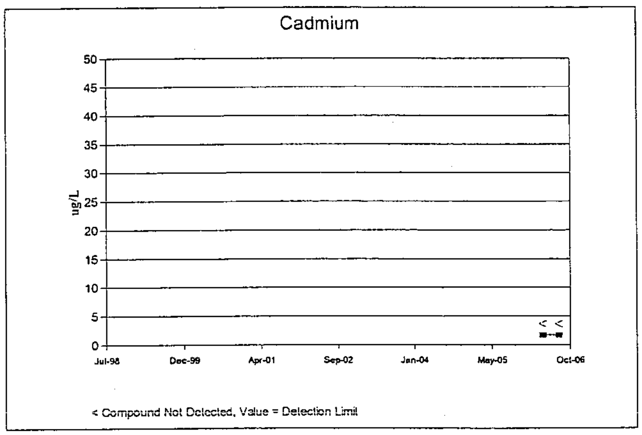
Flambeau Mining Company

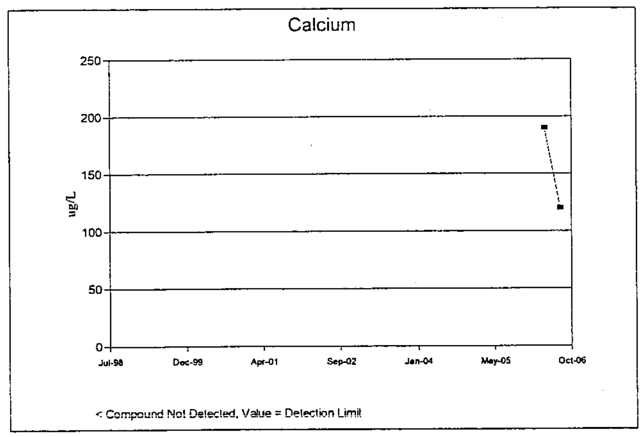
Groundwater Quality Results (Annual Monitoring)

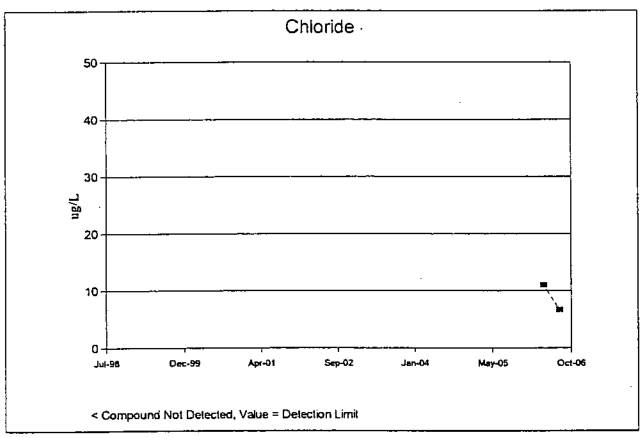
MW-1013A

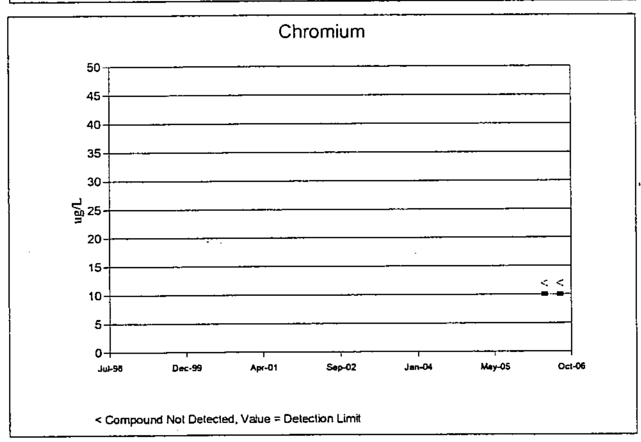


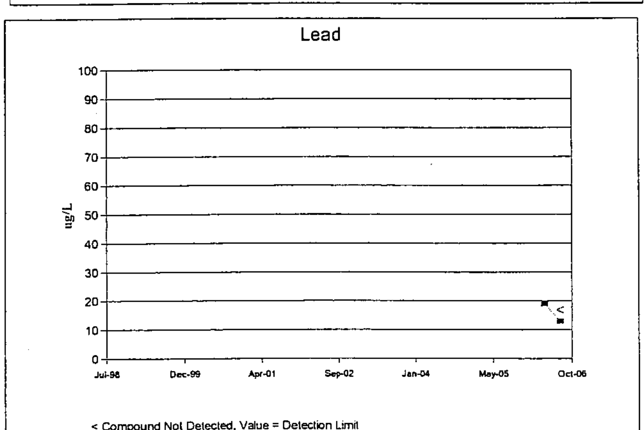



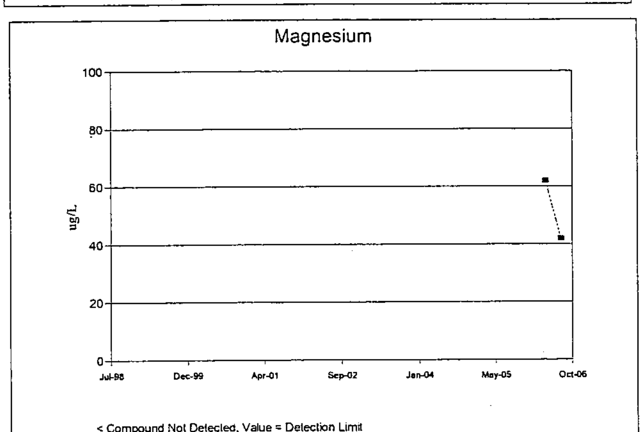



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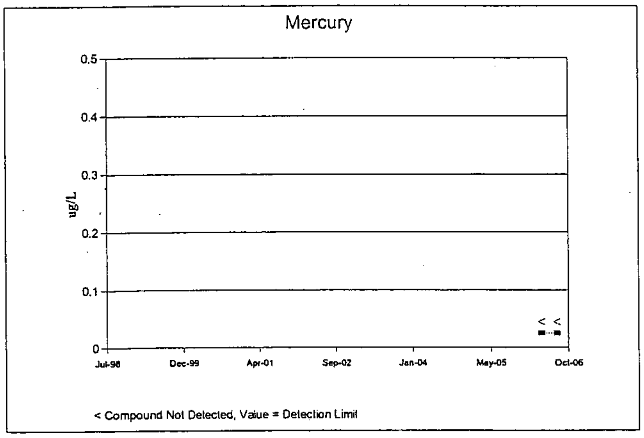


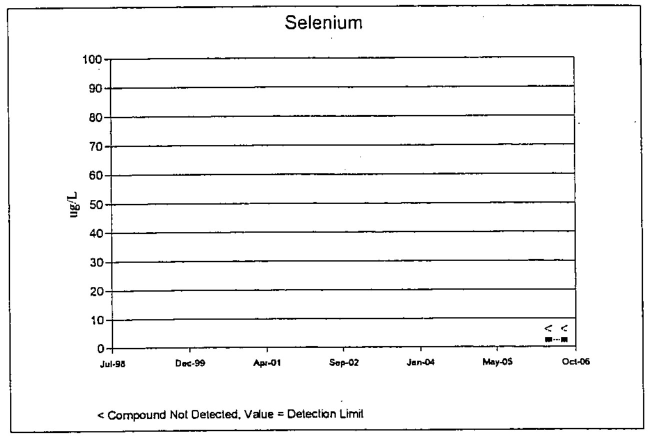


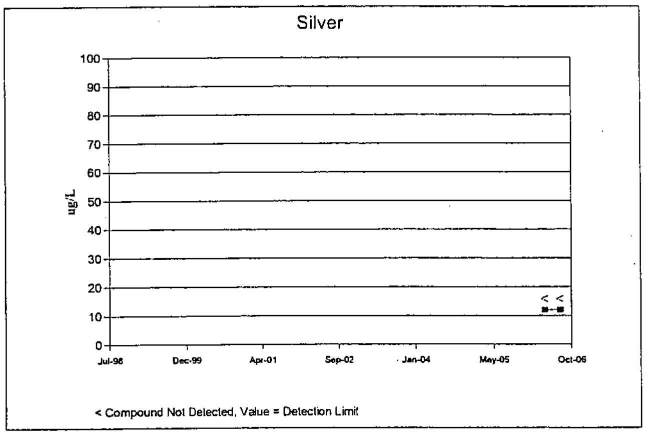




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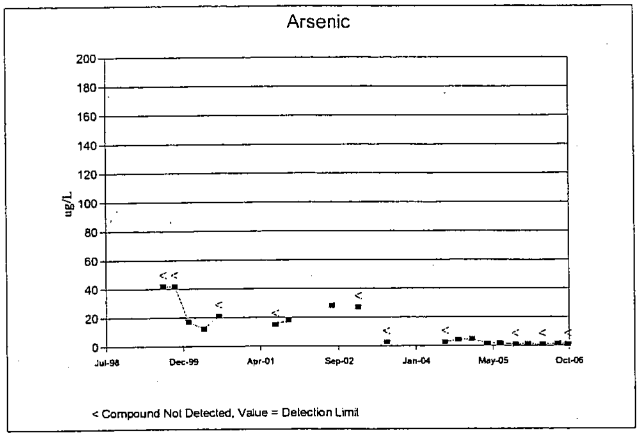
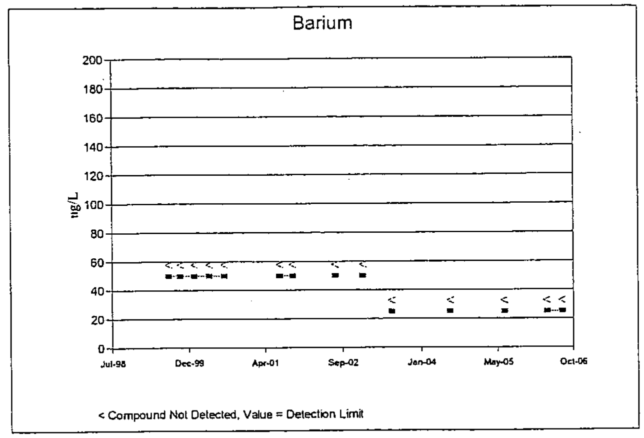
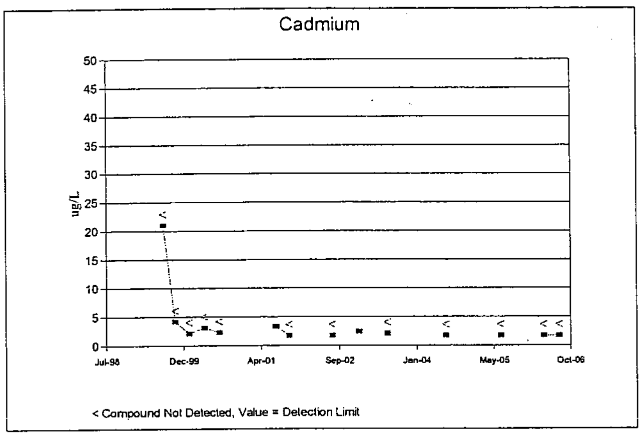
Flambeau Mining Company

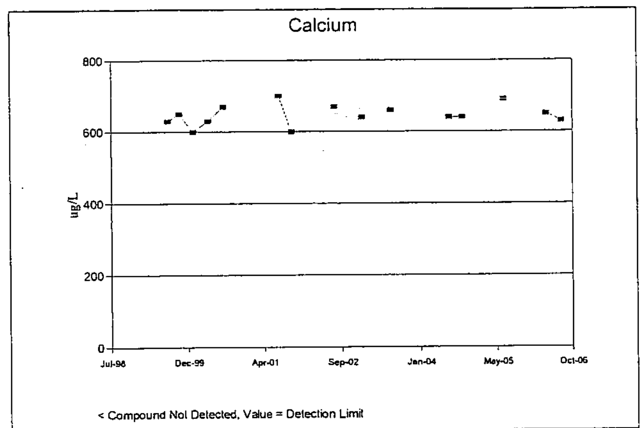
Groundwater Quality Results (Annual Monitoring)

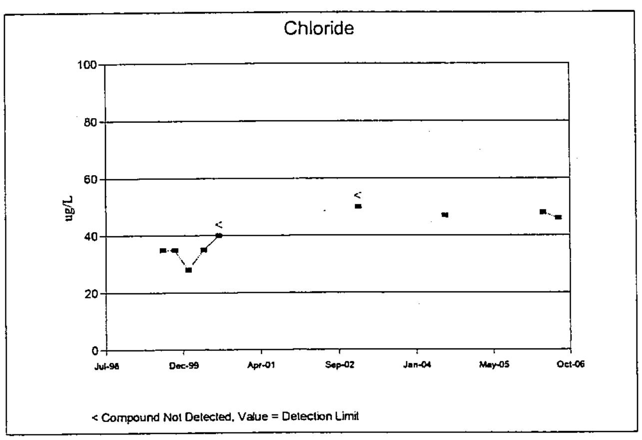
MW-1013B

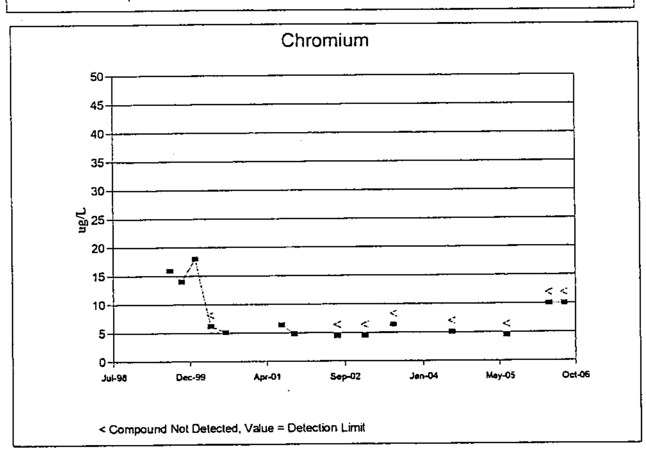


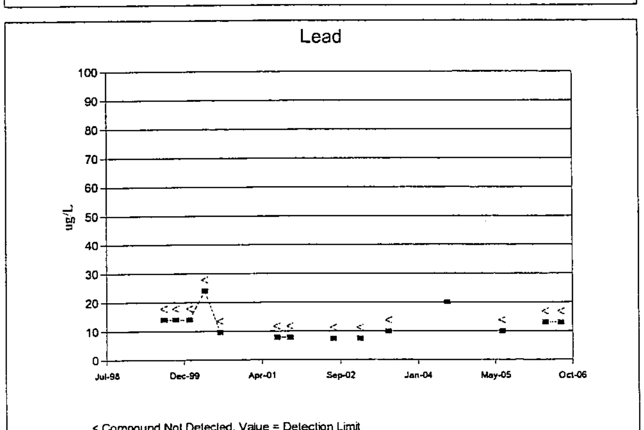



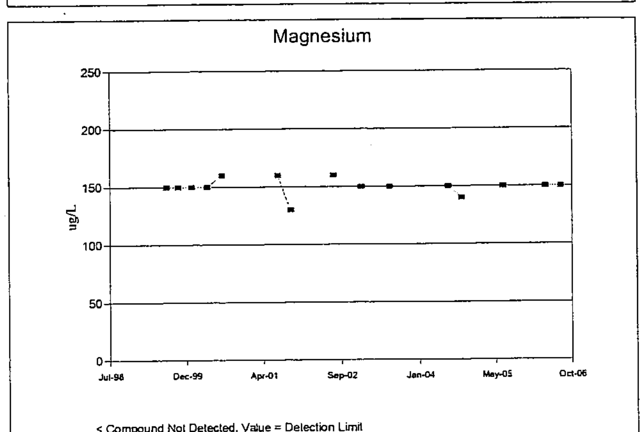



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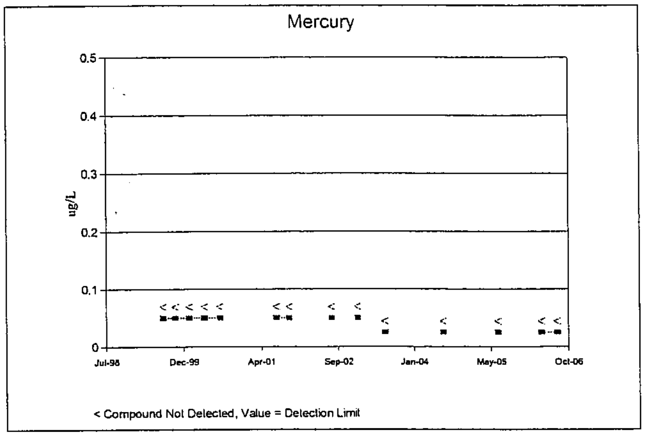


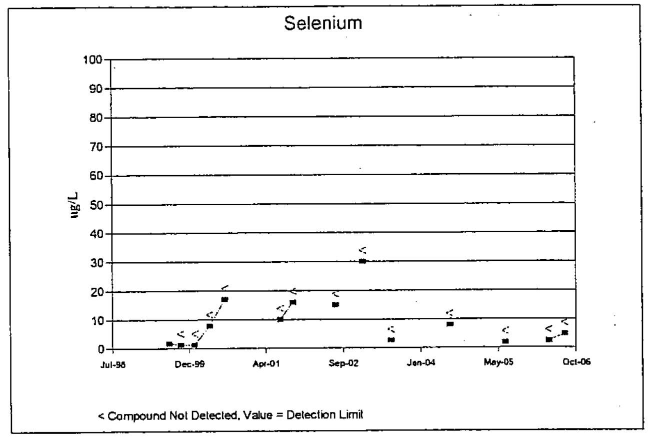


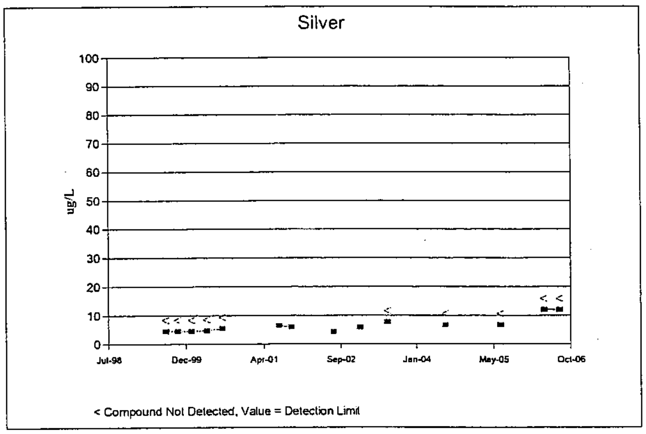




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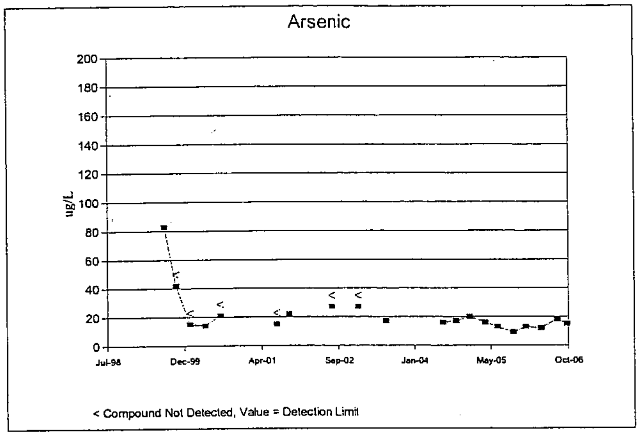
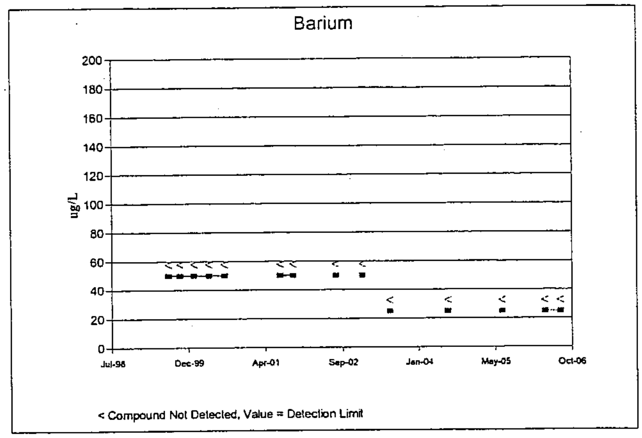
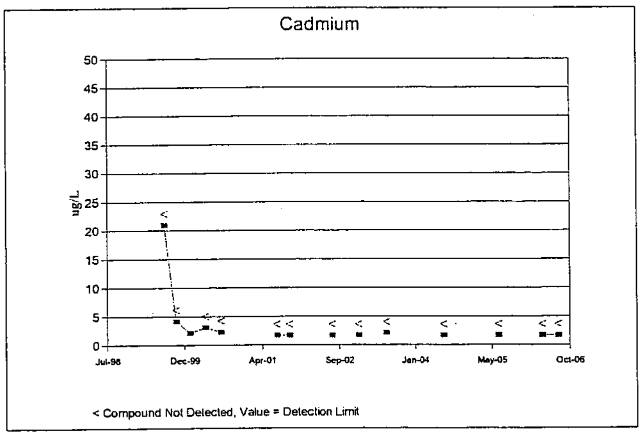
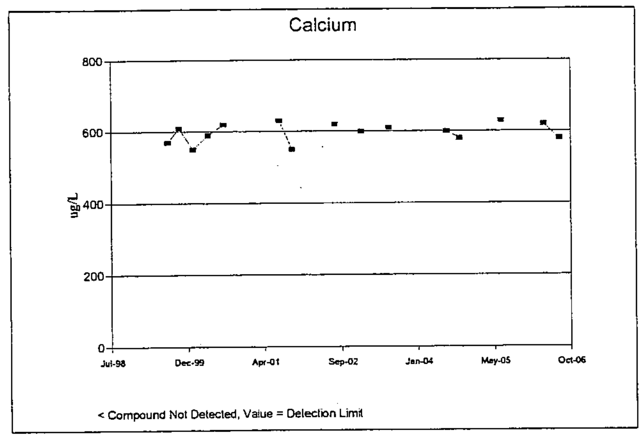
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

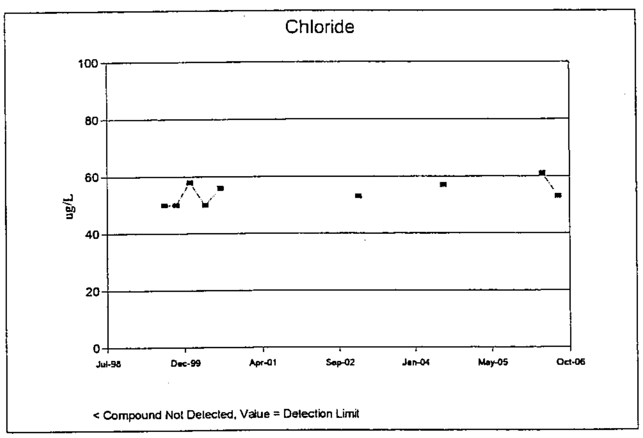
MW-1013C

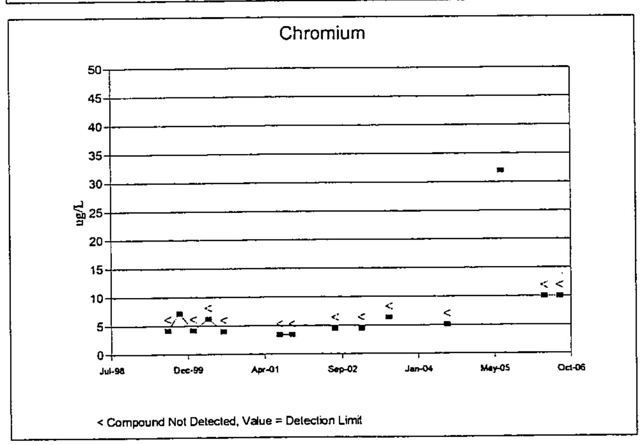


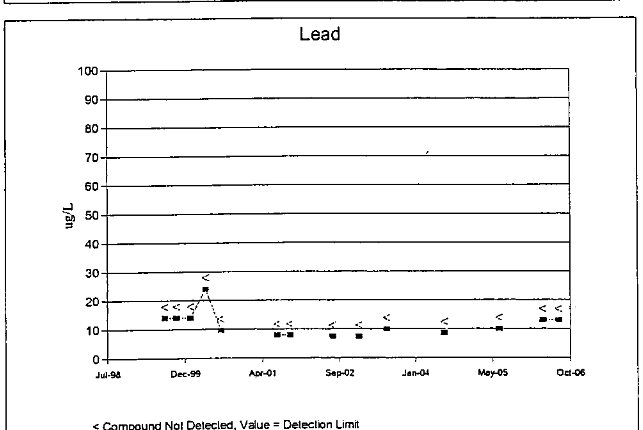



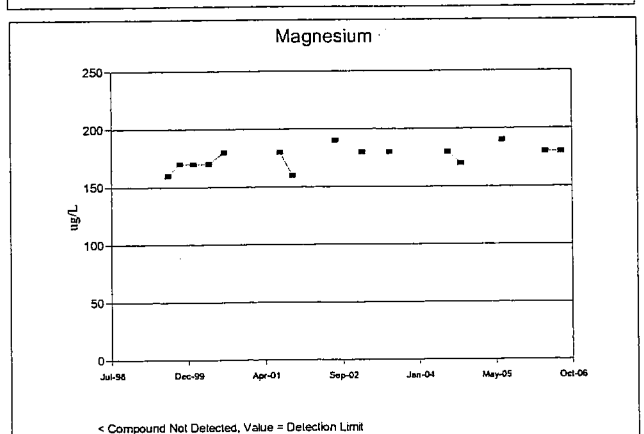



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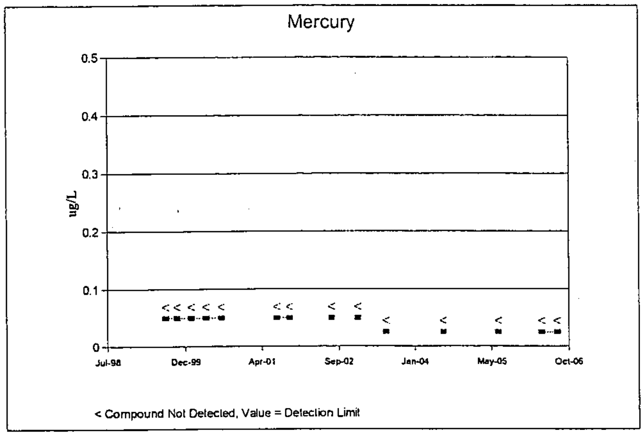


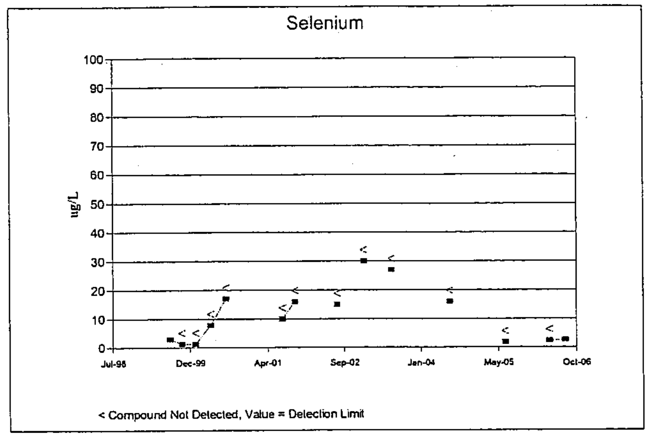


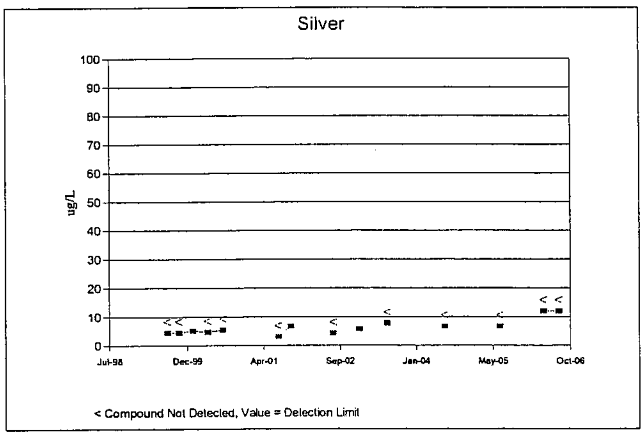




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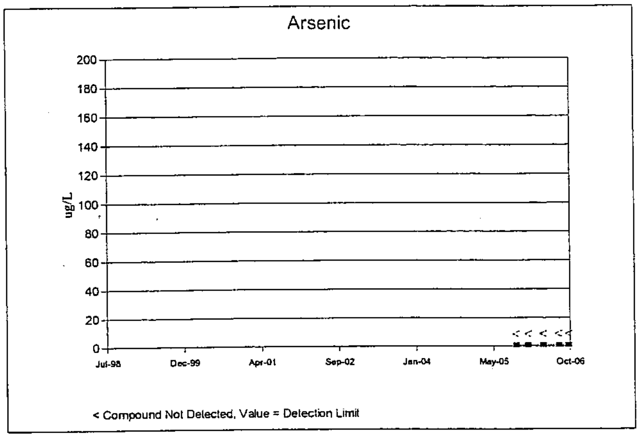
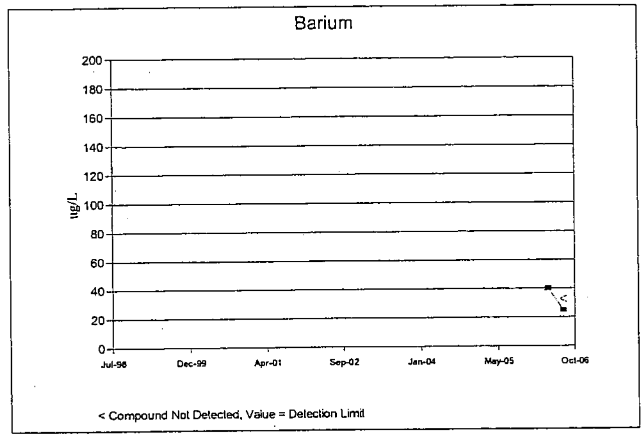
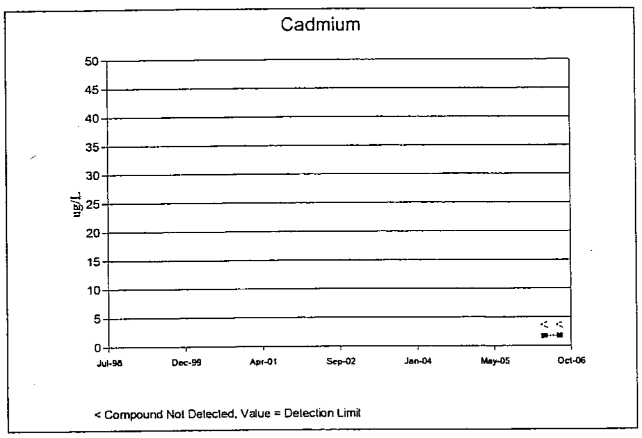
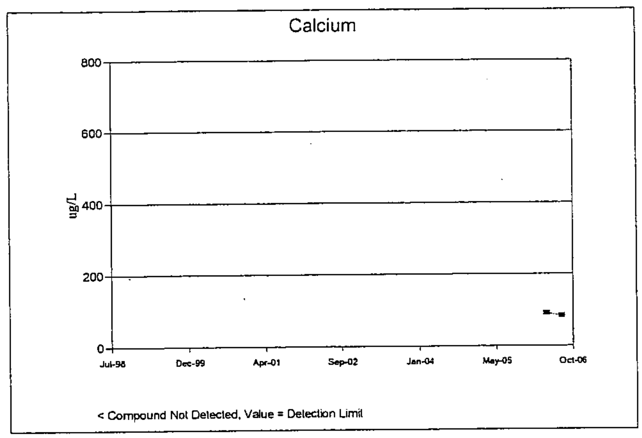
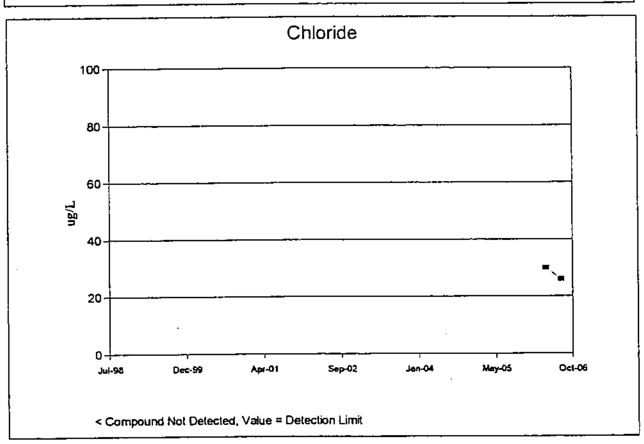
MW-1014

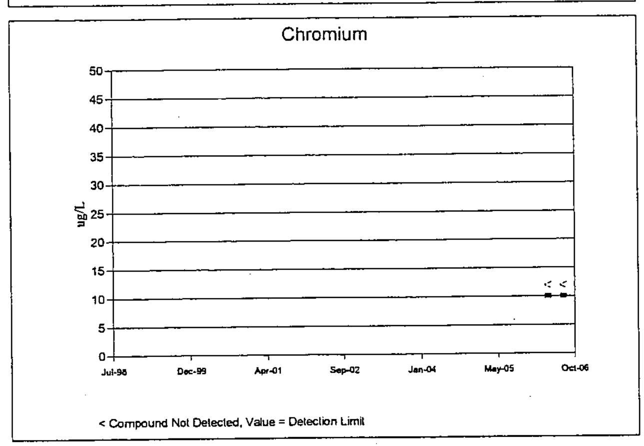


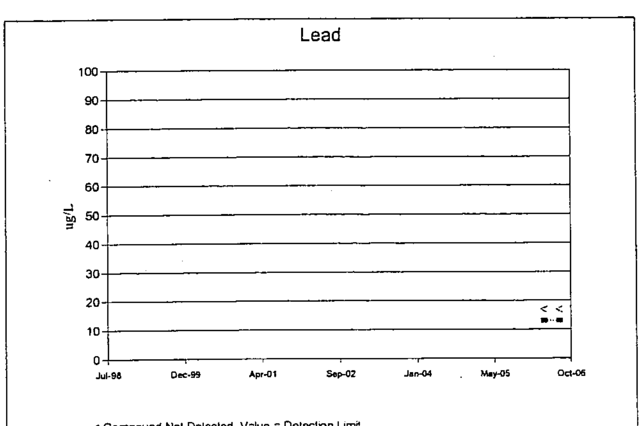



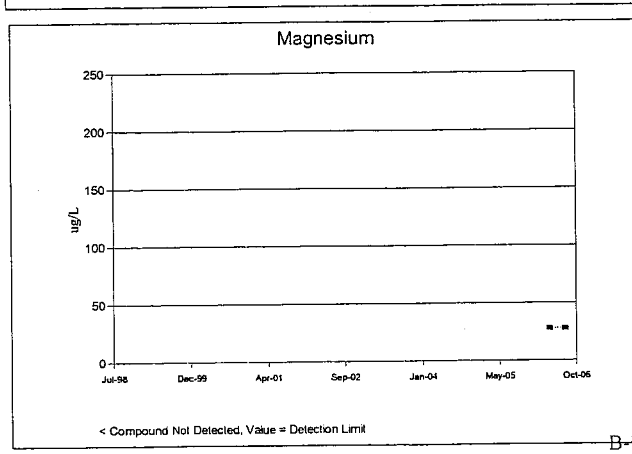



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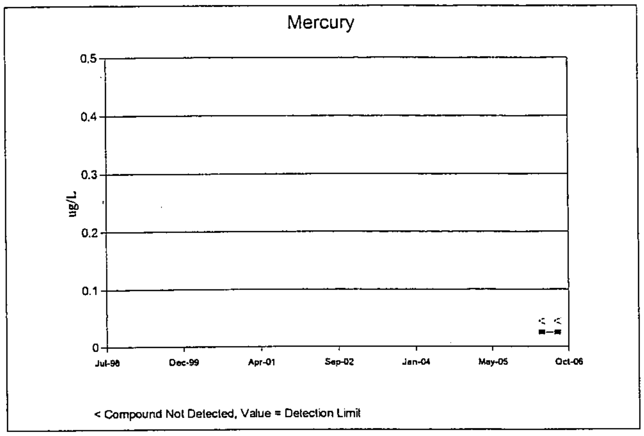
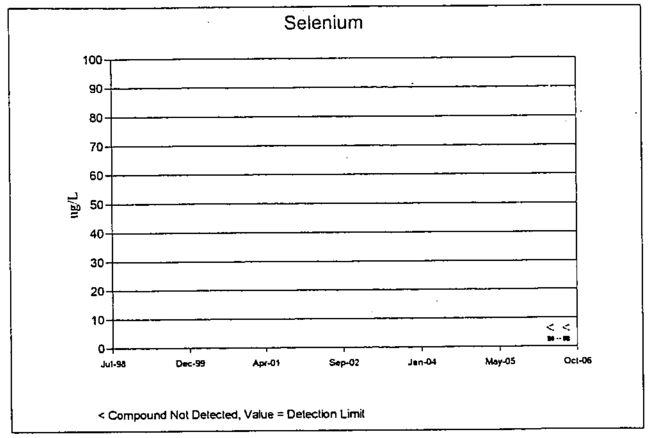
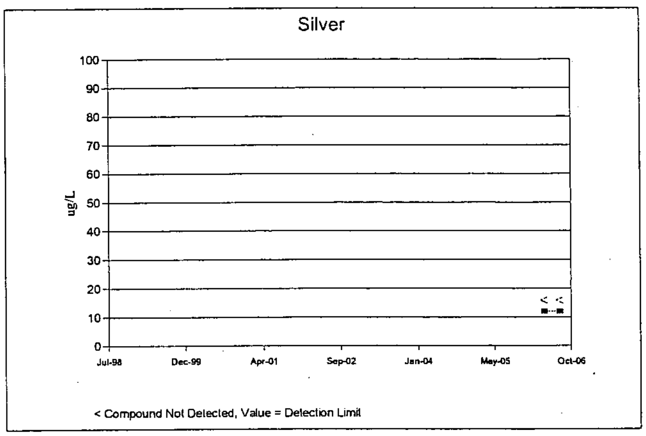
MW-1014



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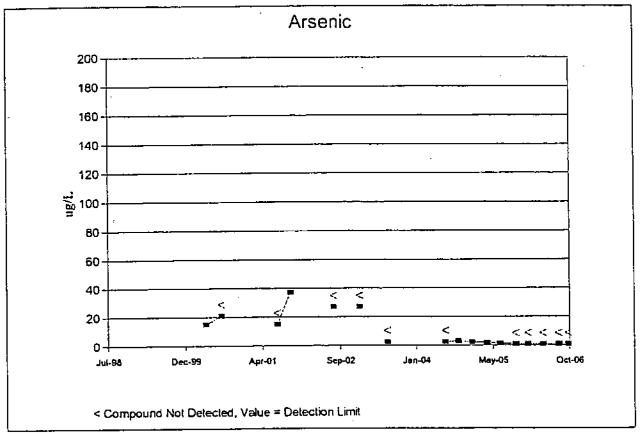
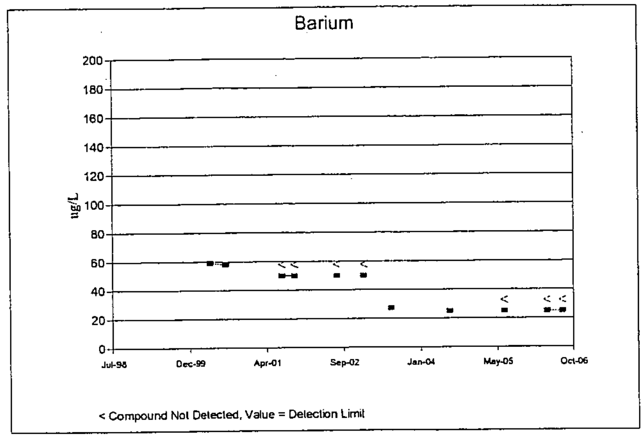
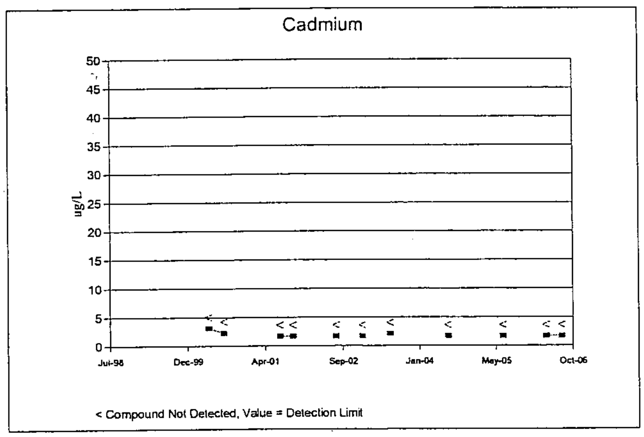
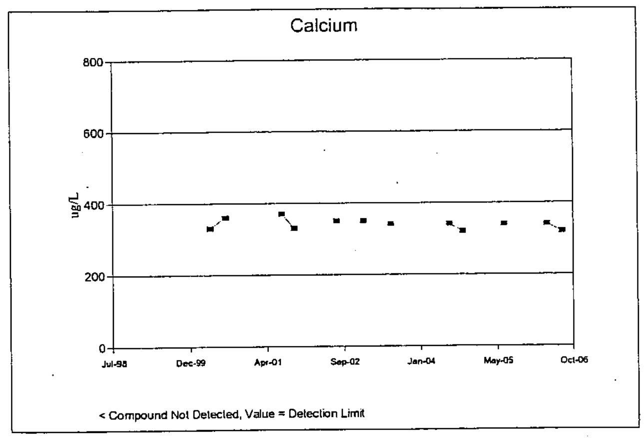
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

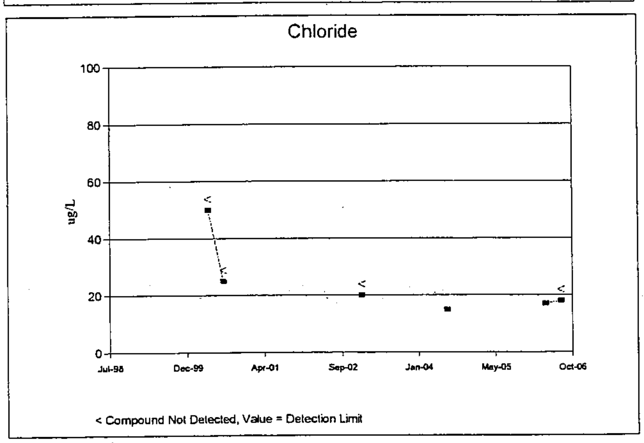
MW-1014A

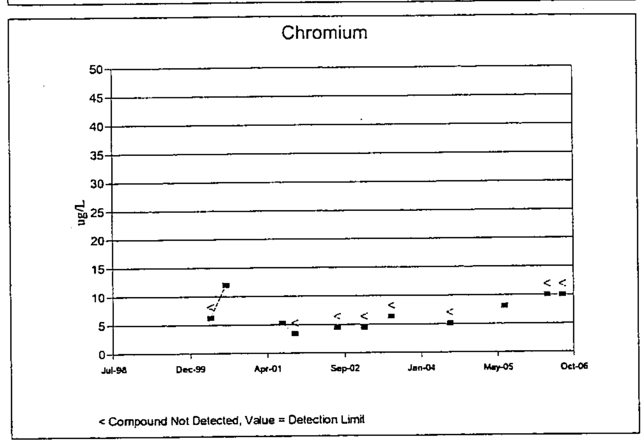


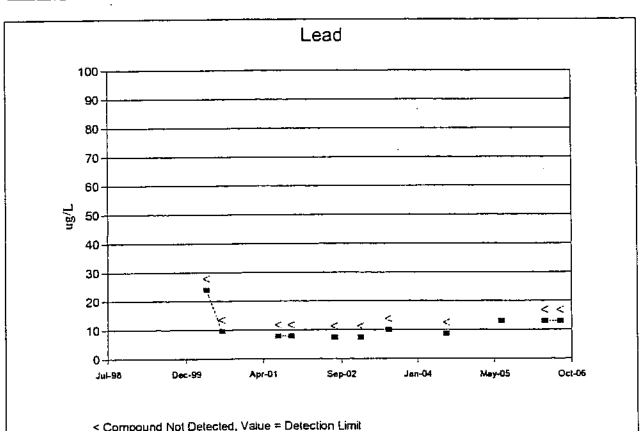



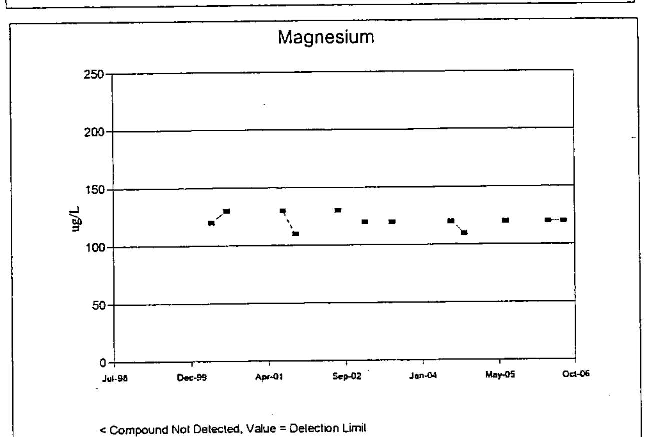



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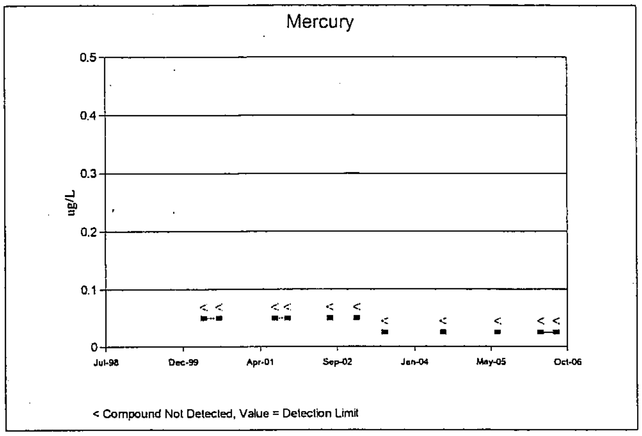
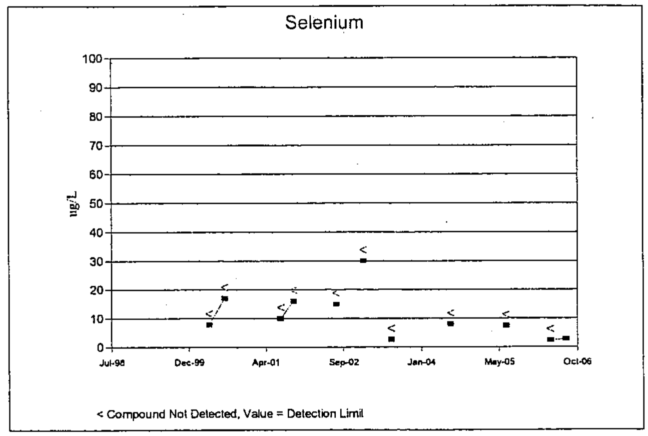
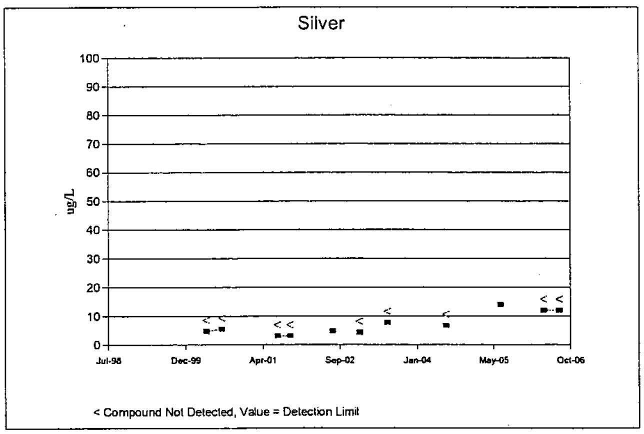
## MW-1014A



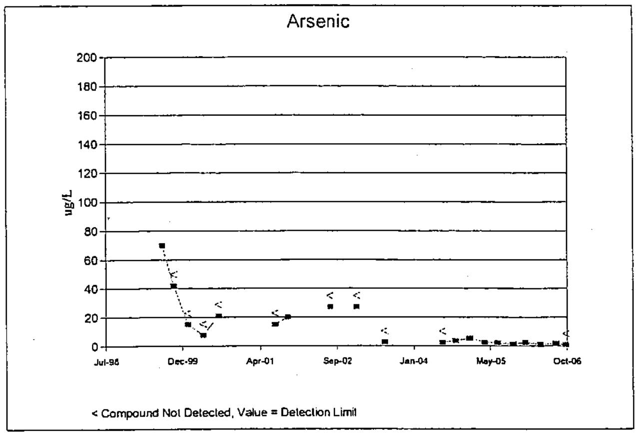



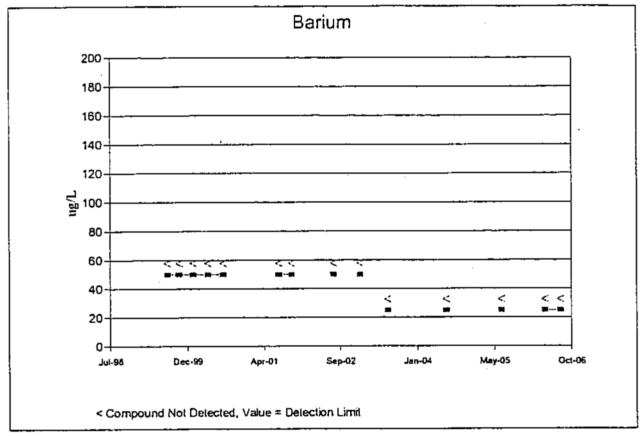


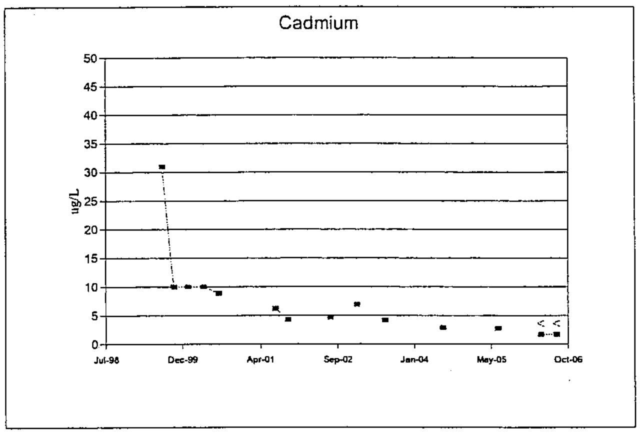

Created By: SGL Checked By: DAT

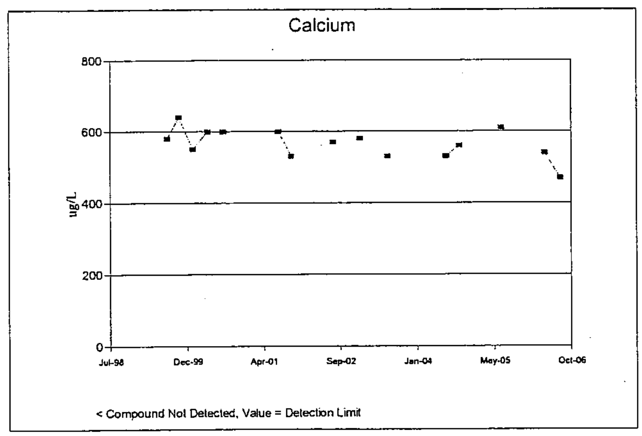
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

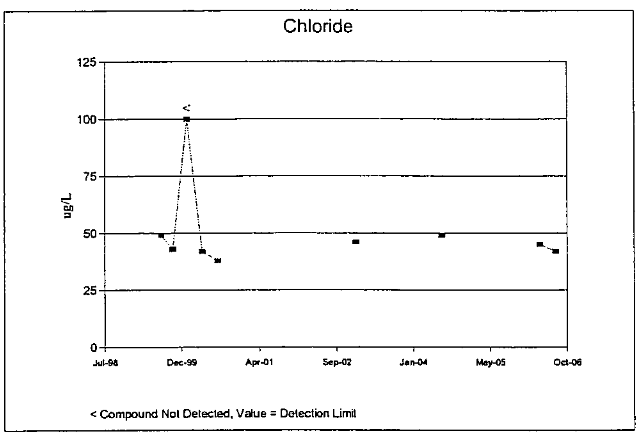
MW-1014B

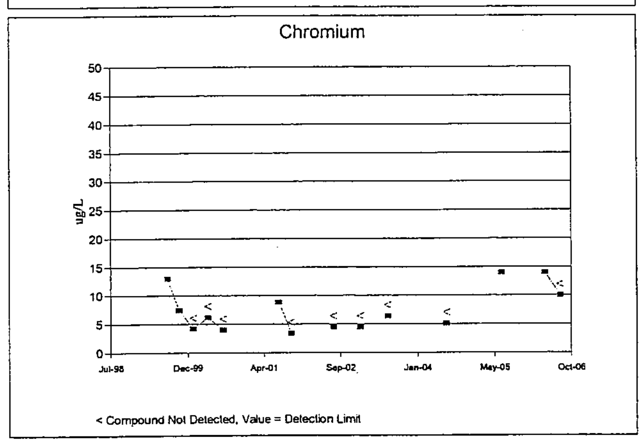


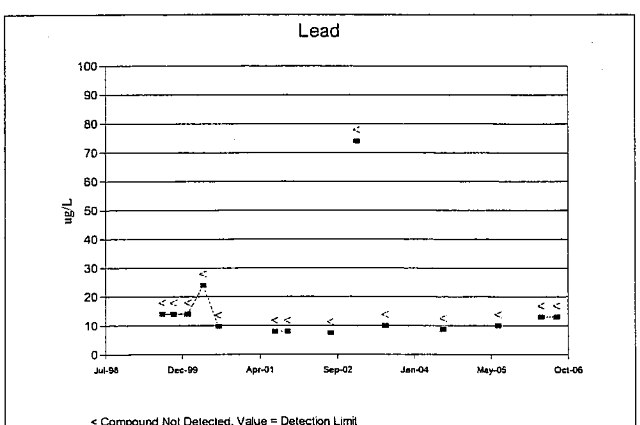



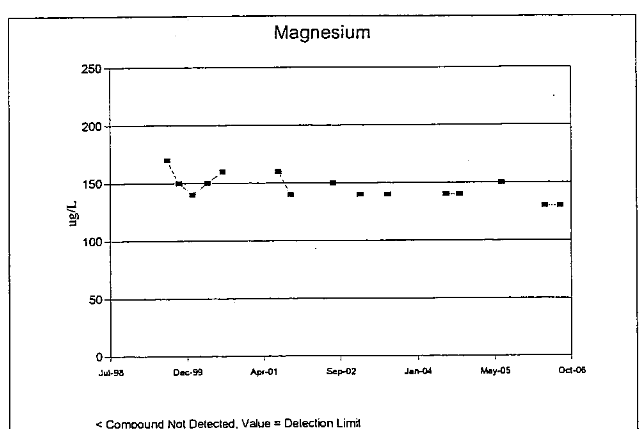



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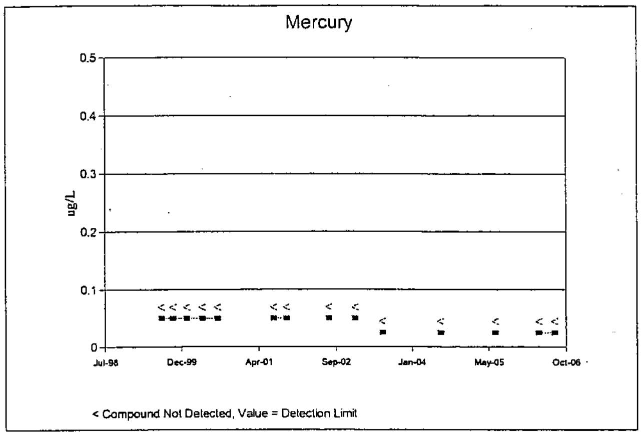
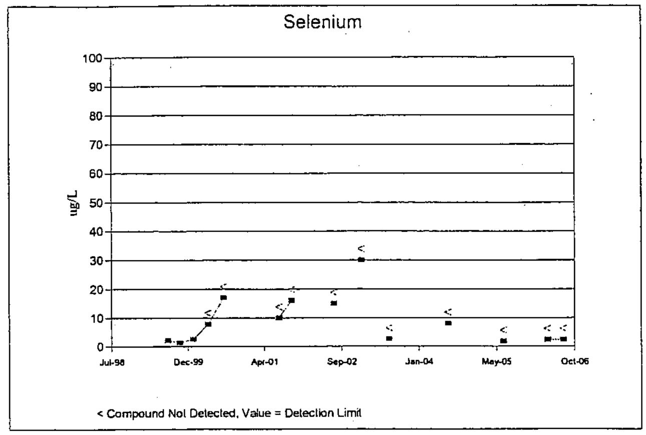
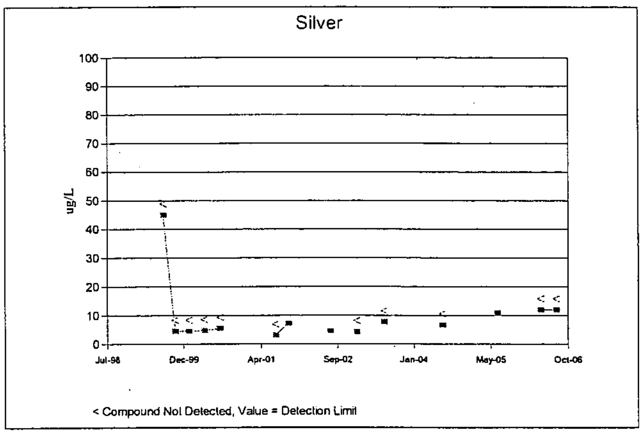
MW-1014B





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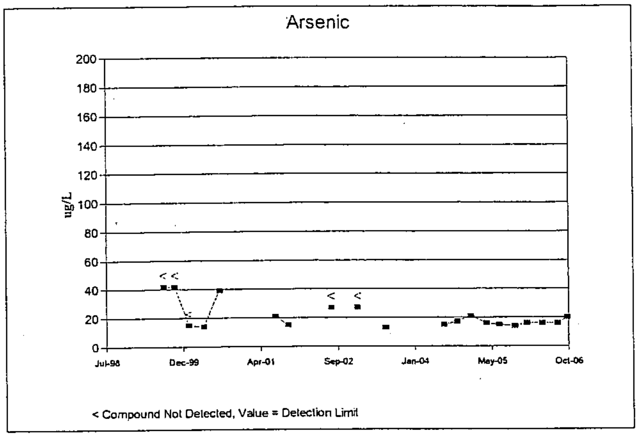
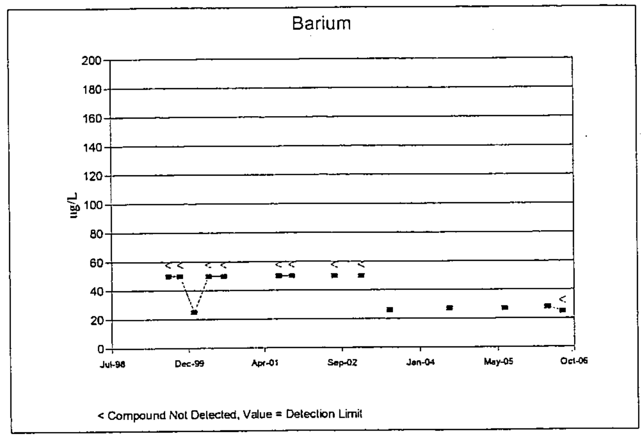
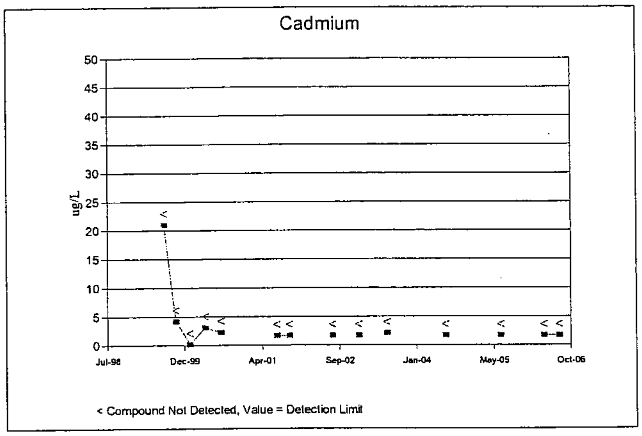
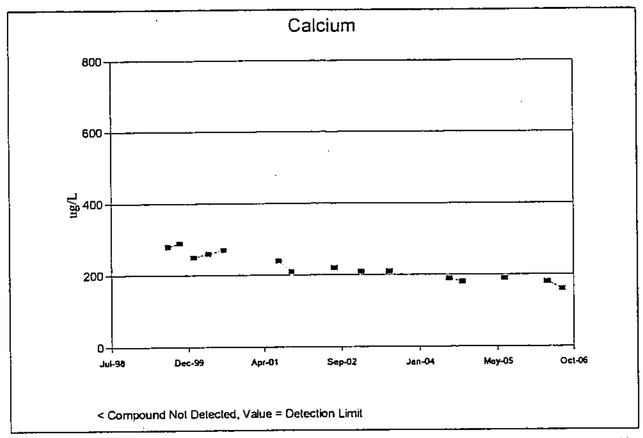
# Flambeau Mining Company
## Groundwater Quality Results (Annual Monitoring)

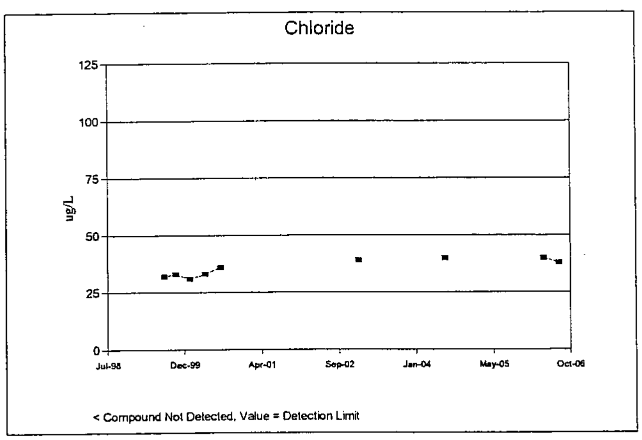
### MW-1014C

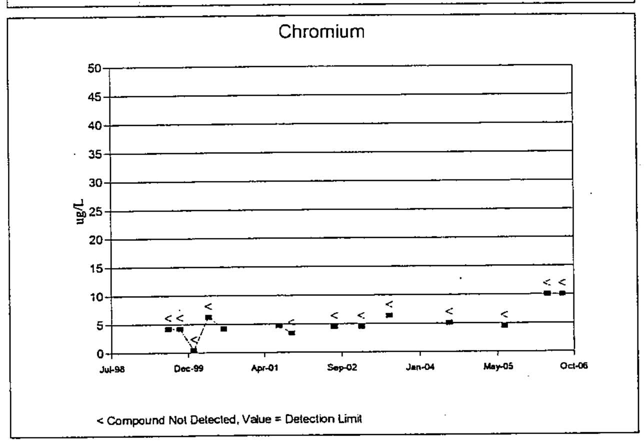


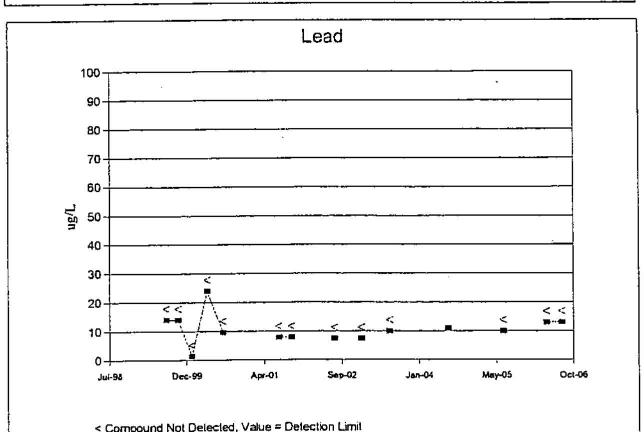



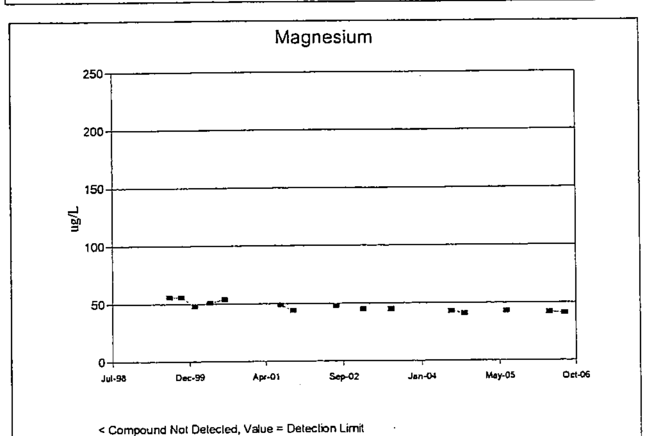



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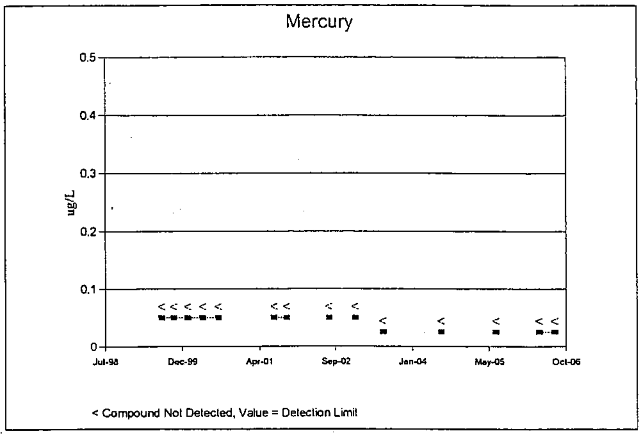
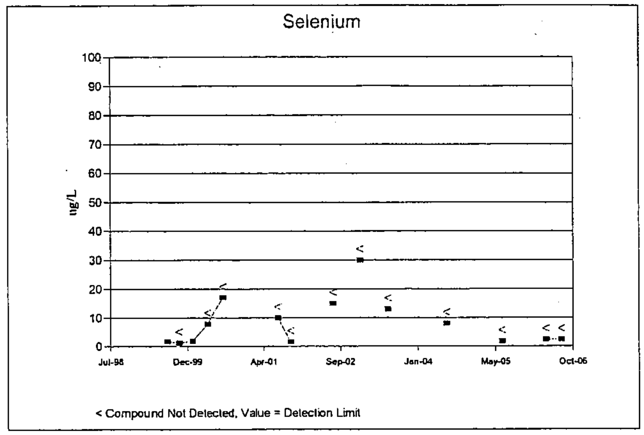
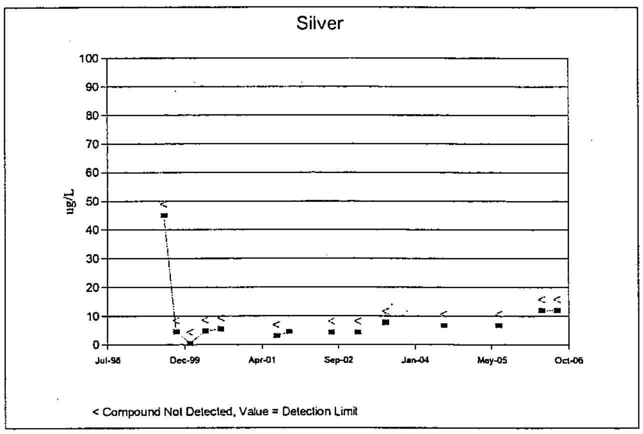
MW-1014C



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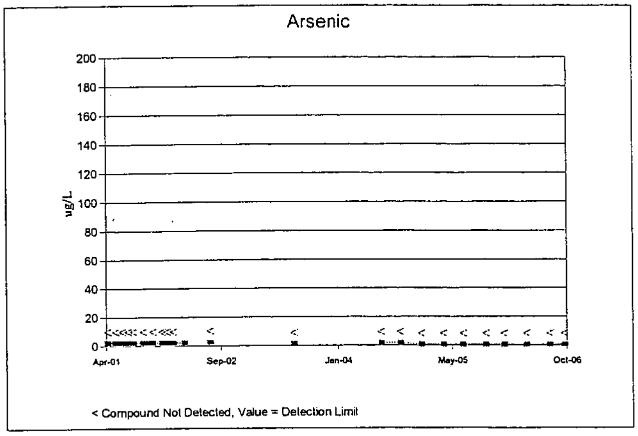
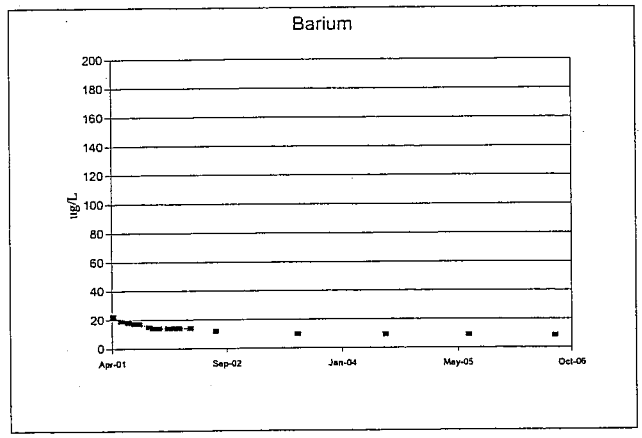
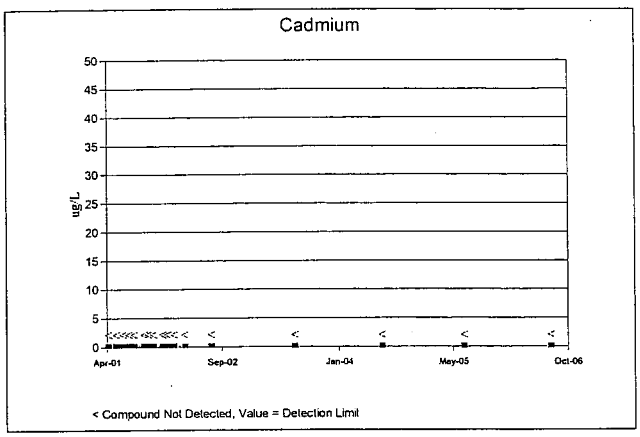
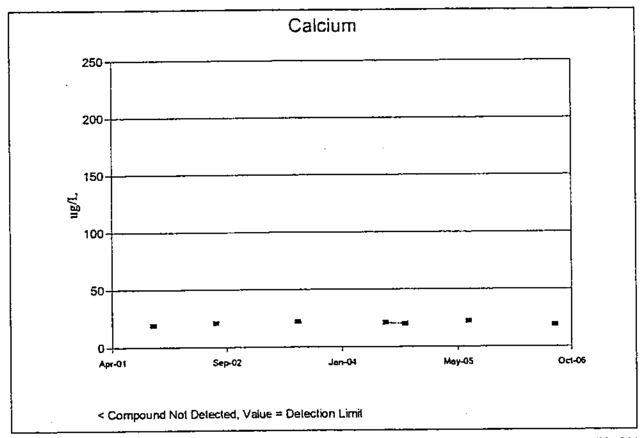
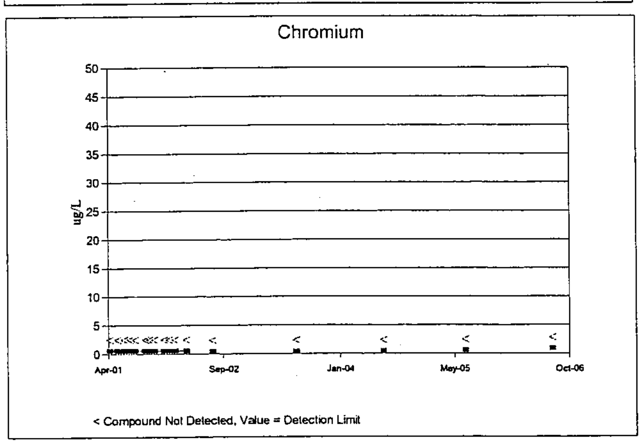
## MW-1015A

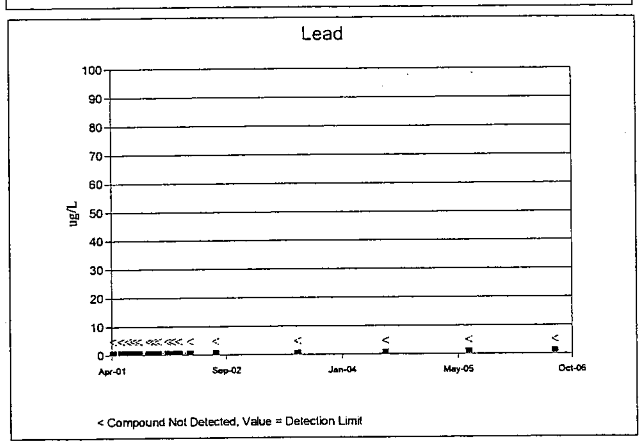


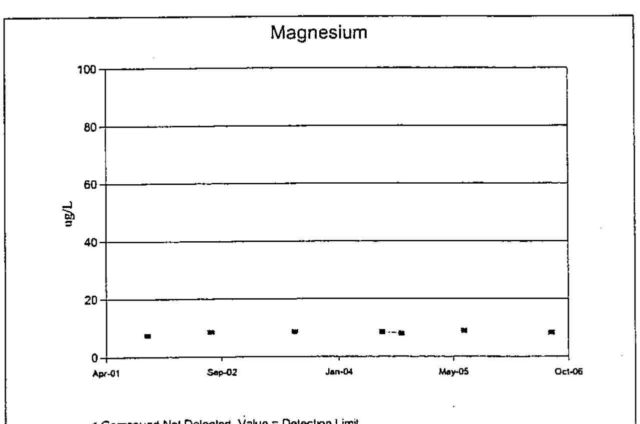



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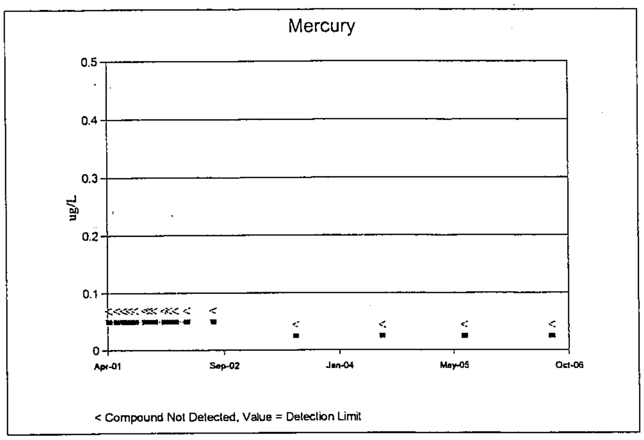
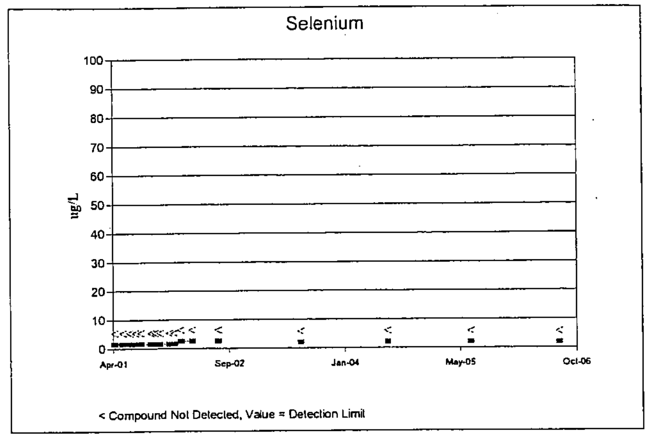
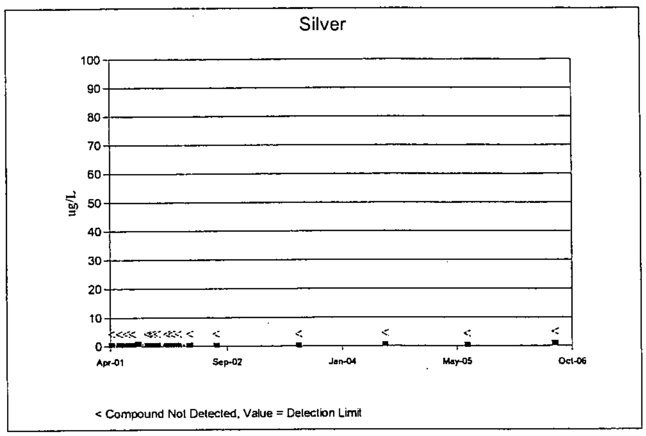
MW-1015A



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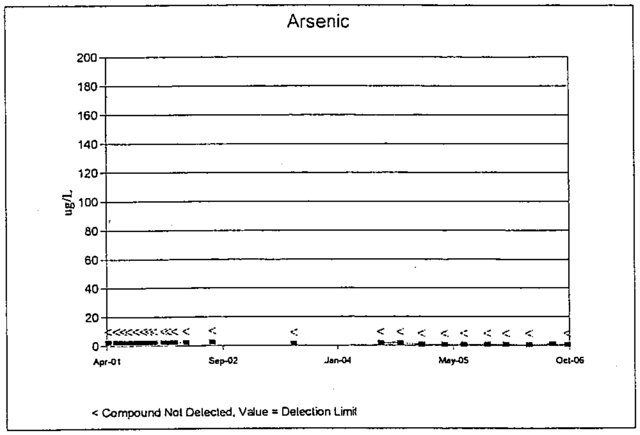
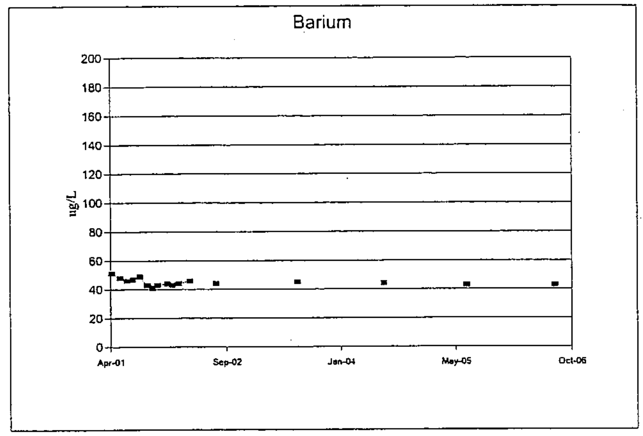
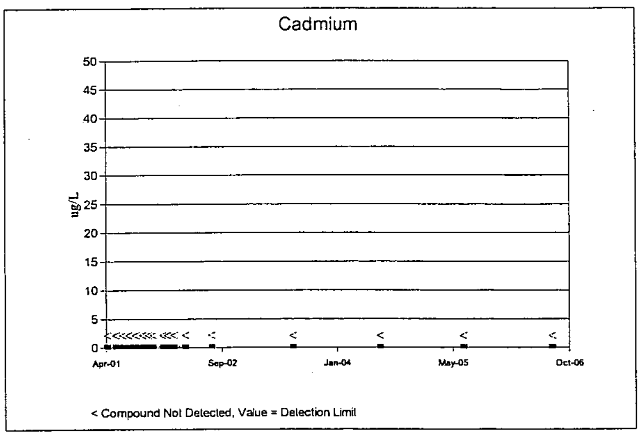
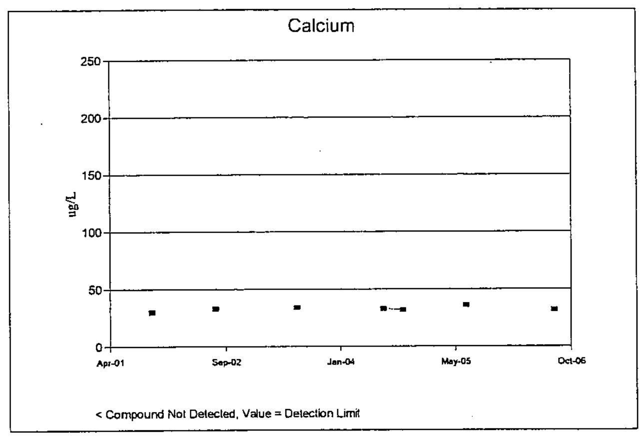
Flambeau Mining Company
Groundwater Quality Results (Annual Monitoring)

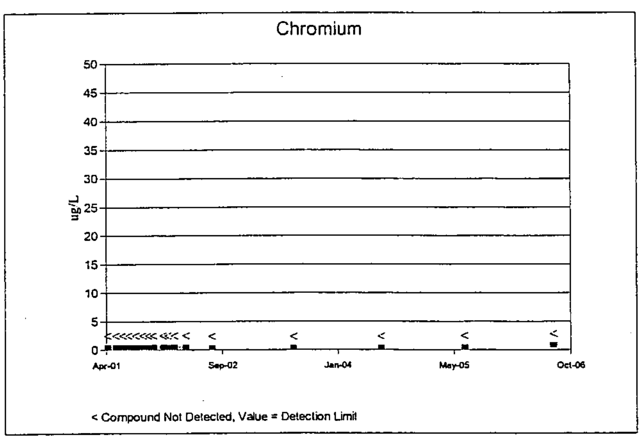
MW-1015B

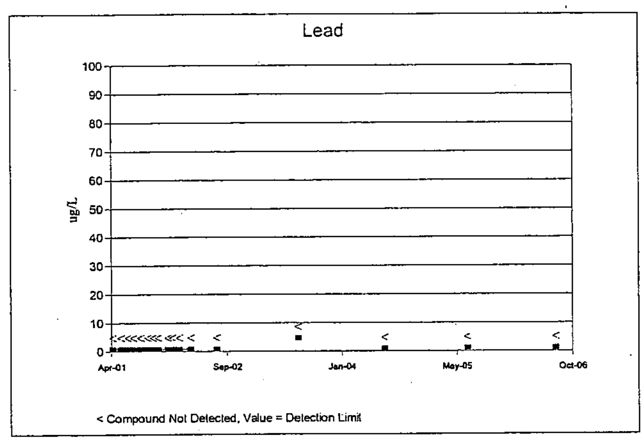


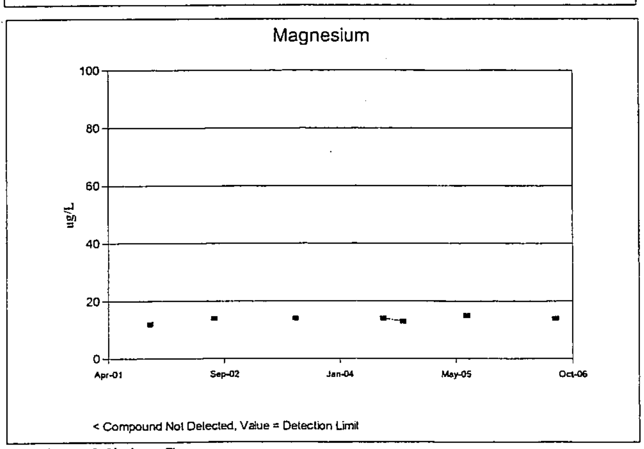



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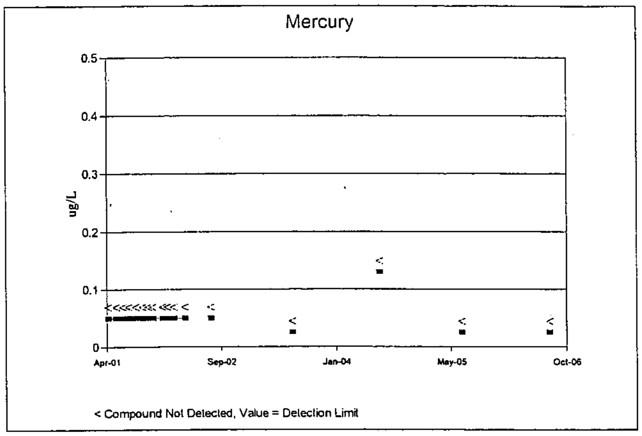
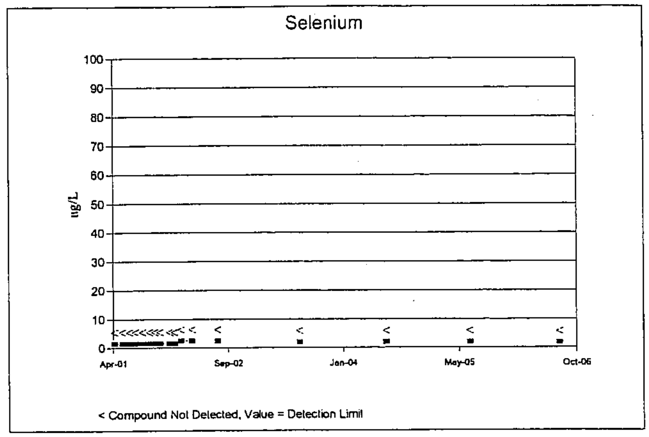
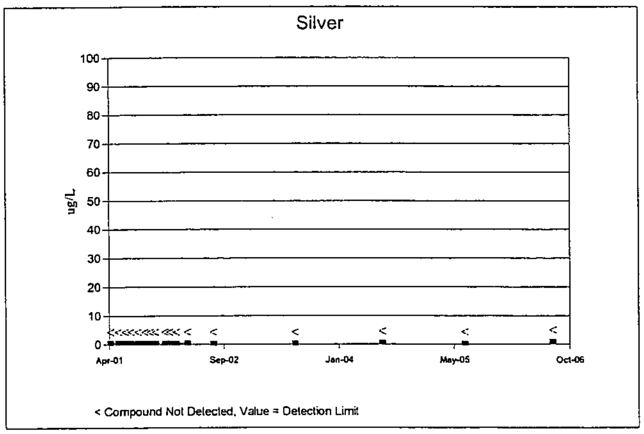
## MW-1015B



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# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/99 | | | | | | | | | | | | | | |
| | MW-1000PR | < 42 | < 50 | 28 | 220 | 10 | < 4.2 | < 14 | 61 | < 0.05 | < 1.3 | < 4.5 | 2.6 | 10 |
| | MW-1000PR (Dup) | < 42 | < 50 | < 21 | 220 | 10 | < 4.2 | < 14 | 62 | < 0.05 | 1.6 | < 4.5 | 2.8 | 10 |
| | MW-1002 | < 4.2 | 6.6 | 2.6 | 15 | 2 | 1 | < 1.4 | 4.9 | < 0.05 | < 1.3 | < 0.45 | < 1.1 | 2.8 |
| | MW-1002G | 5 | 24 | 3.4 | 25 | 9.7 | < 0.42 | < 1.4 | 9.5 | < 0.05 | < 1.3 | < 0.45 | < 1.1 | 4.7 |
| | MW-1004P | < 4.2 | 40 | < 2.1 | 34 | < 1.7 | 0.58 | < 1.4 | 14 | < 0.05 | < 1.3 | < 0.45 | 3.6 | 6 |
| | MW-1004S | < 4.2 | < 5 | < 2.1 | 15 | 4.4 | < 0.42 | < 1.4 | 5.6 | < 0.05 | < 1.3 | < 0.45 | < 1.1 | 3.6 |
| | MW-1005 | 5 | 92 | < 2.1 | 44 | 240 | 1.5 | < 1.4 | 22 | < 0.05 | < 1.3 | < 0.45 | < 1.1 | 13 |
| | MW-1005P | < 4.2 | 64 | < 2.1 | 52 | 3.5 | < 0.42 | < 1.4 | 21 | < 0.05 | < 1.3 | < 0.45 | 8.1 | 9 |
| | MW-1005S | < 4.2 | 39 | < 2.1 | 38 | < 1.7 | 0.57 | < 1.4 | 13 | < 0.05 | < 1.3 | < 0.45 | 2.1 | 5.6 |
| | MW-1010P | 16 | 38 | < 2.1 | 39 | 2.9 | < 0.42 | < 1.4 | 11 | < 0.05 | < 1.3 | < 0.45 | 1.8 | 5.1 |
| | MW-1013B | < 42 | < 50 | < 21 | 630 | 35 | 16 | < 14 | 150 | < 0.05 | 1.7 | < 4.5 | 8.2 | 35 |
| | MW-1013C | 83 | < 50 | < 21 | 570 | 50 | < 4.2 | < 14 | 160 | < 0.05 | 3 | < 4.5 | 23 | 35 |
| | MW-1014B | 70 | < 50 | 31 | 580 | 49 | 13 | < 14 | 170 | < 0.05 | 2.2 | < 45 | 25 | 93 |
| | MW-1014C | < 42 | < 50 | < 21 | 280 | 32 | < 4.2 | < 14 | 56 | < 0.05 | 1.8 | < 45 | 4.8 | 11 |
| 10/99 | | | | | | | | | | | | | | |
| | MW-1000PR | < 8.4 | 43 | < 2.1 | 210 | 11 | 2.6 | < 2.9 | 56 | < 0.05 | < 1.3 | < 0.9 | 2.9 | 7.9 |
| | MW-1004P | < 4.2 | 41 | 0.22 | 33 | < 1.7 | 0.53 | < 1.4 | 13 | < 0.05 | < 1.3 | < 0.45 | 5.9 | 5.8 |
| | MW-1004S | < 4.2 | < 5 | 0.38 | 15 | 4.4 | 0.88 | < 1.4 | 4.9 | < 0.05 | < 1.3 | < 0.45 | 1.1 | 7.7 |
| | MW-1010P | 6.8 | 40 | 0.29 | 38 | 3.1 | < 0.42 | < 1.4 | 9.8 | < 0.05 | < 1.3 | < 0.45 | 2.7 | 4.7 |
| | MW-1010P (Dup) | 13 | 41 | < 0.21 | 40 | 2.6 | < 0.42 | < 1.4 | 10 | < 0.05 | < 1.3 | < 0.45 | 2.6 | 3.7 |
| | MW-1013B | < 42 | < 50 | < 4.2 | 650 | 35 | 14 | < 14 | 150 | < 0.05 | < 1.3 | < 4.5 | 5.9 | 26 |
| | MW-1013C | < 42 | < 50 | < 4.2 | 610 | 50 | 7.2 | < 14 | 170 | < 0.05 | < 1.3 | < 4.5 | 26 | 29 |
| | MW-1014B | < 42 | < 50 | 10 | 640 | 43 | 7.4 | < 14 | 150 | < 0.05 | 1.4 | < 4.5 | 17 | 24 |
| | MW-1014C | < 42 | < 50 | < 4.2 | 290 | 33 | < 4.2 | < 14 | 56 | < 0.05 | < 1.3 | < 4.5 | 4 | 9.6 |
| 01/00 | | | | | | | | | | | | | | |

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/00 | | | | | | | | | | | | | | |
| | MW-1013B | 17 | < 50 | < 2.1 | 600 | 28 | 18 | < 14 | 150 | < 0.05 | < 1.3 | < 4.5 | 6.4 | 33 |
| | MW-1013C | < 15 | < 50 | 2.1 | 550 | 58 | < 4.2 | < 14 | 170 | < 0.05 | < 1.3 | 5.2 | 23 | 39 |
| | MW-1014B | < 15 | < 50 | 10 | 550 | < 100 | < 4.2 | < 14 | 140 | < 0.05 | 2.6 | < 4.5 | 18 | 27 |
| | MW-1014C | < 15 | 25 | < 0.21 | 250 | 31 | < 0.42 | < 1.4 | 48 | < 0.05 | 1.9 | < 0.45 | 6.3 | 12 |
| | MW-1014C (Dup) | < 15 | 25 | < 0.21 | 230 | 30 | 2 | 2 | 46 | < 0.05 | 1.6 | < 0.45 | 6.3 | 11 |
| 04/00 | | | | | | | | | | | | | | |
| | MW-1013B | 12 | < 50 | < 3.1 | 630 | 35 | < 6.2 | < 24 | 150 | < 0.05 | < 7.8 | < 4.7 | 8.5 | 27 |
| | MW-1013C | 14 | < 50 | < 3.1 | 590 | 50 | < 6.2 | < 24 | 170 | < 0.05 | < 7.8 | < 4.7 | 25 | 34 |
| | MW-1014A | 15 | 59 | < 3.1 | 330 | < 50 | < 6.2 | < 24 | 120 | < 0.05 | < 7.8 | < 4.7 | 12 | 34 |
| | MW-1014B | < 7.5 | < 50 | 10 | 600 | 42 | < 6.2 | < 24 | 150 | < 0.05 | < 7.8 | < 4.7 | 23 | 26 |
| | MW-1014C | 14 | < 50 | < 3.1 | 260 | 33 | < 6.2 | < 24 | 51 | < 0.05 | < 7.8 | < 4.7 | 7.6 | 9.4 |
| 07/00 | | | | | | | | | | | | | | |
| | MW-1000PR | < 8.6 | 38 | < 1 | | | < 3.7 | < 7.2 | | < 0.05 | < 1.6 | < 2.7 | | |
| | MW-1002 | < 1.7 | 7.3 | < 0.21 | | | 0.77 | < 1.4 | | < 0.05 | < 1.6 | < 0.55 | | |
| | MW-1002G | < 1.7 | 27 | < 0.21 | | | < 0.74 | < 1.4 | | < 0.05 | 1.9 | < 0.55 | | |
| | MW-1004P | < 1.7 | 43 | < 0.21 | | | < 0.74 | < 1.4 | | < 0.05 | < 1.6 | < 0.55 | | |
| | MW-1004S | < 1.7 | < 5 | < 0.21 | | | 1 | < 1.4 | | < 0.05 | 1.7 | < 0.55 | | |
| | MW-1005 | < 1.7 | 94 | < 0.21 | | | 1.1 | < 1.4 | | < 0.05 | < 1.6 | < 0.55 | | |
| | MW-1005P | < 1.7 | 70 | 0.28 | | | < 0.74 | < 1.4 | | < 0.05 | < 1.6 | < 0.55 | | |
| | MW-1005S | 2.9 | 46 | < 0.21 | | | < 0.74 | < 1.4 | | < 0.05 | 1.6 | < 0.55 | | |
| | MW-1010P | 12 | 39 | < 1 | | | < 3.7 | < 7.2 | | < 0.05 | 1.8 | < 2.7 | | |
| | MW-1010P (Dup) | 11 | 39 | 0.69 | | | < 0.74 | < 1.4 | | < 0.05 | < 1.6 | < 0.55 | | |
| | MW-1013B | < 21 | < 50 | < 2.3 | 670 | < 40 | 5.1 | < 9.6 | 160 | < 0.05 | < 17 | < 5.5 | 7.2 | 34 |
| | MW-1013C | < 21 | < 50 | < 2.3 | 620 | 56 | < 4 | < 9.6 | 180 | < 0.05 | < 17 | < 5.5 | 24 | 45 |
| | MW-1014A | < 21 | 58 | < 2.3 | 360 | < 25 | 12 | < 9.6 | 130 | < 0.05 | < 17 | < 5.5 | 12 | 35 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/00 | | | | | | | | | | | | | | |
| | MW-1014B | < 21 | < 50 | 8.9 | 600 | 38 | < 4 | < 9.6 | 160 | < 0.05 | < 17 | < 5.5 | 22 | 42 |
| | MW-1014C | 39 | < 50 | < 2.3 | 270 | 36 | 4.2 | < 9.6 | 54 | < 0.05 | < 17 | < 5.5 | 7.4 | 12 |
| 04/01 | | | | | | | | | | | | | | |
| | MW-1015A | < 2.3 | 22 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1015B | < 2.3 | 51 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| 05/01 | | | | | | | | | | | | | | |
| | MW-1015A | < 2.3 | 19 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1015B | < 2.3 | 48 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| 06/01 | | | | | | | | | | | | | | |
| | MW-1015A | < 2.3 | 18 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1015B | < 2.3 | 46 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| 07/01 | | | | | | | | | | | | | | |
| | MW-1000PR | < 11 | 36 | < 1.1 | 190 | | < 2.9 | < 4.6 | 47 | < 0.05 | < 1.6 | < 2.8 | | |
| | MW-1002 | < 2.3 | 7.7 | < 0.23 | | | 1.4 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1002G | < 2.3 | 27 | < 0.23 | | | 0.81 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1004P | < 2.3 | 41 | < 0.23 | 35 | | < 0.57 | < 0.92 | 14 | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1004S | < 2.3 | < 5 | < 0.23 | 16 | | 1.4 | < 0.92 | 5.1 | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1005 | < 2.3 | 82 | < 0.23 | | | 1.9 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1005P | < 2.3 | 69 | 0.4 | 56 | | 0.58 | < 0.92 | 22 | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1005P (Dup) | < 2.3 | 68 | < 0.23 | 56 | | < 0.57 | < 0.92 | 22 | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1005S | < 2.3 | 45 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1010P | 6.1 | 42 | 0.28 | 42 | | < 0.57 | < 0.92 | 11 | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1013B | < 15 | < 50 | 3.3 | 700 | | 6.4 | < 7.9 | 160 | < 0.05 | < 10 | 6.5 | | |
| | MW-1013C | < 15 | < 50 | < 1.7 | 630 | | < 3.4 | < 7.9 | 180 | < 0.05 | < 10 | < 3.1 | | |
| | MW-1014A | < 15 | < 50 | < 1.7 | 370 | | 5.3 | < 7.9 | 130 | < 0.05 | < 10 | < 3.1 | | |

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/01 | | | | | | | | | | | | | | |
| | MW-1014B | < 15 | < 50 | 6.2 | 600 | | 8.9 | < 7.9 | 160 | < 0.05 | < 10 | < 3.1 | | |
| | MW-1014C | 21 | < 50 | < 1.7 | 240 | | 4.7 | < 7.9 | 49 | < 0.05 | < 10 | < 3.1 | | |
| | MW-1015A | < 2.3 | 17 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1015B | < 2.3 | 47 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| 08/01 | | | | | | | | | | | | | | |
| | MW-1015A | < 2.3 | 17 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | 0.99 | | |
| | MW-1015B | < 2.3 | 49 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| 09/01 | | | | | | | | | | | | | | |
| | MW-1015A | < 2.3 | 15 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1015B | < 2.3 | 43 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| 10/01 | | | | | | | | | | | | | | |
| | MW-1000PR | < 11 | 32 | < 1.1 | 160 | | < 2.9 | < 4.6 | 40 | < 0.05 | < 1.6 | < 2.8 | | |
| | MW-1004P | < 2.3 | 39 | < 0.23 | 31 | | < 0.57 | < 0.92 | 12 | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1004S | < 2.3 | < 5 | < 0.23 | 13 | | 0.83 | < 0.92 | 4.4 | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1004S (Dup) | < 2.3 | < 5 | < 0.23 | 13 | | 0.68 | < 0.92 | 4.3 | < 0.05 | 2.2 | < 0.56 | | |
| | MW-1010P | 13 | 33 | < 0.23 | 35 | | < 0.57 | < 0.92 | 8.4 | < 0.05 | 1.7 | < 0.56 | | |
| | MW-1013B | 18 | < 50 | < 1.7 | 600 | | 4.8 | < 7.9 | 130 | < 0.05 | < 16 | 6 | | |
| | MW-1013C | 22 | < 50 | < 1.7 | 550 | | < 3.4 | < 7.9 | 160 | < 0.05 | < 16 | 6.8 | | |
| | MW-1014A | 37 | < 50 | < 1.7 | 330 | | < 3.4 | < 7.9 | 110 | < 0.05 | < 16 | < 3.1 | | |
| | MW-1014B | 20 | < 50 | 4.3 | 530 | | < 3.4 | < 7.9 | 140 | < 0.05 | < 16 | 7.2 | | |
| | MW-1014C | 15 | < 50 | < 1.7 | 210 | | < 3.4 | < 7.9 | 44 | < 0.05 | < 1.6 | 4.6 | | |
| | MW-1015A | 2.3 | 14 | < 0.23 | 19 | | < 0.57 | < 0.92 | 7.4 | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1015B | < 2.3 | 41 | < 0.23 | 30 | | < 0.57 | < 0.92 | 12 | < 0.05 | < 1.6 | < 0.56 | | |
| 11/01 | | | | | | | | | | | | | | |
| | MW-1015A | < 2.3 | 14 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11/01 | | | | | | | | | | | | | | |
| | MW-1015B | < 2.3 | 43 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| 12/01 | | | | | | | | | | | | | | |
| | MW-1015A | < 2.3 | 14 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1015B | < 2.3 | 44 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| 01/02 | | | | | | | | | | | | | | |
| | MW-1015A | < 2.3 | 14 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| | MW-1015B | < 2.3 | 43 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 1.6 | < 0.56 | | |
| 02/02 | | | | | | | | | | | | | | |
| | MW-1015A | < 2.3 | 14 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 2.5 | < 0.56 | | |
| | MW-1015B | < 2.3 | 44 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 2.5 | < 0.56 | | |
| 03/02 | | | | | | | | | | | | | | |
| | MW-1015A | 2.3 | 14 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 2.5 | < 0.56 | | |
| | MW-1015B | < 2.3 | 46 | < 0.23 | | | < 0.57 | < 0.92 | | < 0.05 | < 2.5 | < 0.56 | | |
| 07/02 | | | | | | | | | | | | | | |
| | MW-1000PR | 10 | 40 | < 1.1 | 170 | | < 2.2 | < 9.2 | 44 | < 0.05 | < 2.5 | 3.1 | | |
| | MW-1002 | < 2.6 | 7.8 | < 0.23 | 17 | | 0.79 | < 0.92 | 5.6 | < 0.05 | < 2.5 | < 0.47 | | |
| | MW-1002G | < 2.6 | 27 | < 0.23 | 27 | | < 0.44 | < 0.92 | 10 | < 0.05 | < 2.5 | < 0.47 | | |
| | MW-1004P | < 2.6 | 40 | < 0.23 | 33 | | < 0.44 | < 0.92 | 13 | < 0.05 | < 2.5 | < 0.47 | | |
| | MW-1004S | < 2.6 | < 5 | < 0.23 | 16 | | 0.59 | < 0.92 | 5.4 | < 0.05 | < 2.5 | < 0.47 | | |
| | MW-1005 | 3.2 | 88 | < 0.23 | 41 | | 0.87 | < 0.92 | 20 | < 0.05 | < 2.5 | < 0.47 | | |
| | MW-1005P | < 2.6 | 70 | < 0.23 | 51 | | < 0.44 | < 0.92 | 21 | < 0.05 | < 2.5 | < 0.47 | | |
| | MW-1005S | 3.3 | 44 | < 0.23 | 40 | | < 0.44 | < 0.92 | 14 | < 0.05 | < 2.5 | < 0.47 | | |
| | MW-1010P | 16 | 38 | < 0.23 | 39 | | < 0.44 | < 0.92 | 9.9 | < 0.05 | < 2.5 | 0.55 | | |
| | MW-1013B | 28 | < 50 | < 1.7 | 670 | | < 4.5 | < 7.4 | 160 | < 0.05 | < 15 | 4.3 | | |
| | MW-1013C | < 27 | < 50 | < 1.7 | 620 | | < 4.5 | < 7.4 | 190 | < 0.05 | < 15 | < 4.3 | | |

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/02 | | | | | | | | | | | | | | |
| | MW-1014A | < 27 | < 50 | < 1.7 | 350 | | < 4.5 | < 7.4 | 130 | < 0.05 | < 15 | 4.8 | | |
| | MW-1014A (Dup) | < 27 | < 50 | < 1.7 | 370 | | < 4.5 | < 7.4 | 130 | < 0.05 | < 15 | 4.3 | | |
| | MW-1014B | < 27 | < 50 | 4.7 | 570 | | < 4.5 | < 7.4 | 150 | < 0.05 | < 15 | 4.6 | | |
| | MW-1014C | < 27 | < 50 | < 1.7 | 220 | | < 4.5 | < 7.4 | 48 | < 0.05 | < 15 | < 4.3 | | |
| | MW-1015A | < 2.6 | 12 | < 0.23 | 21 | | < 0.44 | < 0.92 | 8.6 | < 0.05 | < 2.5 | < 0.47 | | |
| | MW-1015B | < 2.6 | 44 | < 0.23 | 33 | | < 0.44 | < 0.92 | 14 | < 0.05 | < 2.5 | < 0.47 | | |
| 01/03 | | | | | | | | | | | | | | |
| | MW-1000PR | 11 | 42 | < 1.1 | 170 | 16 | < 2.2 | < 9.2 | 41 | < 0.05 | < 13 | < 2.4 | | |
| | MW-1010P | 19 | 36 | < 0.23 | 39 | < 5 | < 0.44 | < 0.92 | 9.8 | < 0.05 | < 2.5 | < 0.47 | | |
| | MW-1013B | < 27 | < 50 | 2.4 | 640 | < 50 | < 4.5 | < 7.4 | 150 | < 0.05 | < 30 | 5.8 | | |
| | MW-1013C | < 27 | < 50 | < 1.7 | 600 | 53 | < 4.5 | < 7.4 | 180 | < 0.05 | < 30 | 5.7 | | |
| | MW-1014A | < 27 | < 50 | < 1.7 | 350 | < 20 | < 4.5 | < 7.4 | 120 | < 0.05 | < 30 | < 4.3 | | |
| | MW-1014B | < 27 | < 50 | 6.9 | 580 | 46 | < 4.5 | < 74 | 140 | < 0.05 | < 30 | < 4.3 | | |
| | MW-1014C | < 27 | < 50 | < 1.7 | 210 | 39 | < 4.5 | < 7.4 | 45 | < 0.05 | < 30 | < 4.3 | | |
| | MW-1014C (Dup) | < 27 | < 50 | < 1.7 | 200 | 42 | < 4.5 | < 7.4 | 45 | < 0.05 | < 30 | < 4.3 | | |
| 07/03 | | | | | | | | | | | | | | |
| | MW-1000PR | 12 | 42 | < 0.85 | 170 | | < 2.2 | < 4.7 | 40 | < 0.025 | < 2 | < 2 | | |
| | MW-1002 | < 1.2 | 7.6 | < 0.17 | 17 | | 0.96 | < 0.94 | 5.5 | < 0.025 | < 2 | < 0.4 | | |
| | MW-1002G | < 1.2 | 27 | < 0.17 | 27 | | 0.6 | < 0.94 | 10 | < 0.025 | 2.1 | < 0.4 | | |
| | MW-1004P | < 1.2 | 43 | < 0.17 | 35 | | < 0.43 | < 0.94 | 14 | < 0.025 | < 2 | < 0.4 | | |
| | MW-1004S | < 1.2 | 4.3 | < 0.17 | 18 | | 0.88 | < 0.94 | 5.9 | < 0.025 | < 2 | < 0.4 | | |
| | MW-1005 | < 1.2 | 150 | < 0.85 | 80 | | < 0.43 | < 0.94 | 37 | < 0.025 | < 2 | < 2 | | |
| | MW-1005P | < 1.2 | 67 | < 0.17 | 55 | | < 0.43 | < 0.94 | 22 | < 0.025 | < 2 | < 0.4 | | |
| | MW-1005S | 2.1 | 42 | < 0.17 | 41 | | < 0.43 | < 0.94 | 14 | < 0.025 | < 2 | < 0.4 | | |
| | MW-1010P | 11 | 39 | < 0.17 | 42 | | 0.5 | < 0.94 | 10 | < 0.025 | < 2 | < 0.4 | | |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/03 | | | | | | | | | | | | | | |
| | MW-1013B | < 2.6 | < 25 | < 2.1 | 660 | | < 6.4 | < 10 | 150 | < 0.025 | < 2.7 | < 7.7 | | |
| | MW-1013B (Dup) | 4.3 | < 25 | < 2.1 | 660 | | < 6.4 | < 10 | 150 | < 0.025 | < 2.7 | < 7.7 | | |
| | MW-1013C | 17 | < 25 | < 2.1 | 610 | | < 6.4 | < 10 | 180 | < 0.025 | < 27 | < 7.7 | | |
| | MW-1014A | < 2.6 | 27 | < 2.1 | 340 | | < 6.4 | < 10 | 120 | < 0.025 | < 2.7 | < 7.7 | | |
| | MW-1014B | < 2.6 | < 25 | 4.2 | 530 | | < 6.4 | < 10 | 140 | < 0.025 | < 2.7 | < 7.7 | | |
| | MW-1014C | 13 | 26 | < 2.1 | 210 | | < 6.4 | < 10 | 45 | < 0.025 | < 13 | < 7.7 | | |
| | MW-1015A | < 1.2 | 9.8 | < 0.17 | 22 | | < 0.43 | < 0.94 | 8.6 | < 0.025 | < 2 | < 0.4 | | |
| | MW-1015B | < 1.2 | 45 | < 0.17 | 34 | | < 0.43 | < 4.7 | 14 | < 0.025 | < 2 | < 0.4 | | |
| 04/04 | | | | | | | | | | | | | | |
| | MW-1000PR DNR Split | 13.5 | 43 | 0.3 | 151 | 17.3 | < 1 | < 1 | 39.7 | < 0.03 | < 1 | < 0.1 | | |
| | MW-1010P DNR Split | 14.5 | 33 | 0.06 | 40.9 | 3.2 | < 1 | < 1 | 10.4 | < 0.03 | < 1 | < 0.1 | | |
| | MW-1013C DNR Split | 9.9 | 15 | 0.1 | 576 | 52.4 | 5.4 | < 1 | 180 | < 0.03 | < 1 | 0.3 | | |
| | MW-1014A DNR Split | < 1 | 20 | 1.05 | 331 | 10.9 | 1.5 | < 1 | 119 | < 0.03 | < 1 | < 0.1 | | |
| | MW-1014B DNR Split | < 1 | 15 | 4.39 | 538 | 39 | 4.3 | < 1 | 139 | < 0.03 | < 1 | < 0.1 | | |
| | MW-1014C DNR Split | 8.4 | 26 | < 0.05 | 185 | 38.2 | < 1 | < 1 | 47.3 | < 0.03 | < 1 | < 0.1 | | |
| 07/04 | | | | | | | | | | | | | | |
| | MW-1000PR | < 1.8 | 41 | < 0.8 | 150 | 18 | < 2.3 | < 5.2 | 37 | < 0.025 | < 2.1 | < 3.4 | 3.9 | 9.3 |
| | MW-1002 | < 1.8 | 7.1 | < 0.16 | 16 | 3.2 | 1.1 | < 1 | 5 | < 0.025 | < 2.1 | < 0.67 | 0.81 | 3.2 |
| | MW-1002G | < 1.8 | 27 | < 0.16 | 27 | 11 | < 0.45 | < 1 | 9.9 | < 0.025 | < 2.1 | < 0.67 | 1.1 | 5.4 |
| | MW-1004P | < 1.8 | 45 | < 0.16 | 35 | < 2.5 | < 0.45 | < 1 | 14 | < 0.025 | < 2.1 | < 0.67 | 5.8 | 7.2 |
| | MW-1004S | < 1.8 | 4.8 | < 0.16 | 18 | 6.5 | 1.2 | < 1 | 6.1 | < 0.025 | < 2.1 | < 0.67 | 0.96 | 4.9 |
| | MW-1005 | < 1.8 | 130 | < 0.16 | 63 | 210 | < 0.45 | < 1 | 30 | < 0.025 | < 2.1 | < 0.67 | 0.78 | 17 |
| | MW-1005P | < 1.8 | 69 | < 0.16 | 54 | 4.2 | < 0.45 | < 1 | 21 | < 0.025 | < 2.1 | < 0.67 | 8.7 | 7.4 |
| | MW-1005S | < 1.8 | 44 | < 0.16 | 40 | 2.6 | < 0.45 | < 1 | 14 | < 0.025 | < 2.1 | < 0.67 | 3.1 | 7 |
| | MW-1010P | 2.3 | 46 | < 0.16 | 44 | 4.3 | < 0.45 | < 1 | 11 | < 0.025 | < 2.1 | < 0.67 | 2.6 | 5.3 |

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/04 | | | | | | | | | | | | | | |
| | MW-1013B | < 2.6 | < 25 | < 1.7 | 640 | 47 | < 5.1 | 20 | 150 | < 0.025 | < 8 | < 6.7 | 6.8 | 31 |
| | MW-1013C | 16 | < 25 | < 1.7 | 600 | 57 | < 5.1 | < 8.7 | 180 | < 0.025 | < 16 | < 6.7 | 26 | 42 |
| | MW-1013C (Dup) | 9.7 | < 25 | < 1.7 | 590 | 61 | < 5.1 | 14 | 180 | < 0.025 | < 8 | < 6.7 | 25 | 41 |
| | MW-1014A | < 2.6 | 25 | < 1.7 | 340 | 15 | < 5.1 | < 8.7 | 120 | < 0.025 | < 8 | < 6.7 | 11 | 52 |
| | MW-1014B | < 2.6 | < 25 | 2.9 | 530 | 49 | < 5.1 | < 8.7 | 140 | < 0.025 | < 8 | < 6.7 | 20 | 32 |
| | MW-1014C | 15 | 27 | < 1.7 | 190 | 40 | < 5.1 | 11 | 43 | < 0.025 | < 8 | < 6.7 | 6.2 | 12 |
| | MW-1015A | < 1.8 | 9.2 | < 0.16 | 21 | 5.8 | < 0.45 | < 1 | 8.5 | < 0.025 | < 2.1 | < 0.67 | 0.94 | 3.4 |
| | MW-1015B | < 1.8 | 44 | < 0.16 | 33 | 51 | < 0.45 | < 1 | 14 | < 0.13 | < 2.1 | < 0.67 | 5.9 | 39 |
| 10/04 | | | | | | | | | | | | | | |
| | MW-1000PR | 3.2 | | | 140 | | | | 35 | | | | | |
| | MW-1002 | < 1.8 | | | 15 | | | | 4.6 | | | | | |
| | MW-1002G | < 1.8 | | | 24 | | | | 9 | | | | | |
| | MW-1004P | < 1.8 | | | 33 | | | | 13 | | | | | |
| | MW-1004S | < 1.8 | | | 17 | | | | 5.6 | | | | | |
| | MW-1005 | 4.3 | | | 60 | | | | 29 | | | | | |
| | MW-1005P | 2.6 | | | 51 | | | | 20 | | | | | |
| | MW-1005S | 3.9 | | | 38 | | | | 13 | | | | | |
| | MW-1010P | 3.3 | | | 42 | | | | 11 | | | | | |
| | MW-1013B | 4.2 | | | 640 | | | | 140 | | | | | |
| | MW-1013C | 17 | | | 580 | | | | 170 | | | | | |
| | MW-1014A | 2.9 | | | 320 | | | | 110 | | | | | |
| | MW-1014B | 3.6 | | | 560 | | | | 140 | | | | | |
| | MW-1014C | 17 | | | 180 | | | | 41 | | | | | |
| | MW-1015A | < 1.8 | | | 20 | | | | 8 | | | | | |
| | MW-1015B | < 1.8 | | | 32 | | | | 13 | | | | | |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/04 | | | | | | | | | | | | | | |
| | MW-1015B (Dup) | < 1.8 | | | 32 | | | | 13 | | | | | |
| 01/05 | | | | | | | | | | | | | | |
| | MW-1000PR | 1.3 | | | | | | | | | | | | |
| | MW-1002 | < 0.73 | | | | | | | | | | | | |
| | MW-1002G | < 0.73 | | | | | | | | | | | | |
| | MW-1004P | < 0.73 | | | | | | | | | | | | |
| | MW-1004S | < 0.73 | | | | | | | | | | | | |
| | MW-1004S (Dup) | < 0.73 | | | | | | | | | | | | |
| | MW-1005 | 2.3 | | | | | | | | | | | | |
| | MW-1005P | < 0.73 | | | | | | | | | | | | |
| | MW-1005S | 2.4 | | | | | | | | | | | | |
| | MW-1010P | 18 | | | | | | | | | | | | |
| | MW-1013B | 4.8 | | | | | | | | | | | | |
| | MW-1013C | 20 | | | | | | | | | | | | |
| | MW-1014A | 2.3 | | | | | | | | | | | | |
| | MW-1014B | 5.3 | | | | | | | | | | | | |
| | MW-1014C | 21 | | | | | | | | | | | | |
| | MW-1015A | < 0.73 | | | | | | | | | | | | |
| | MW-1015B | < 0.73 | | | | | | | | | | | | |
| 04/05 | | | | | | | | | | | | | | |
| | MW-1000PR | 2.7 | | | | | | | | | | | | |
| | MW-1002 | < 0.66 | | | | | | | | | | | | |
| | MW-1002G | < 0.66 | | | | | | | | | | | | |
| | MW-1004P | < 0.66 | | | | | | | | | | | | |
| | MW-1004S | < 0.66 | | | | | | | | | | | | |

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/05 | | | | | | | | | | | | | | |
| | MW-1005 | 2.3 | | | | | | | | | | | | |
| | MW-1005 (Dup) | 2.2 | | | | | | | | | | | | |
| | MW-1005P | < 0.66 | | | | | | | | | | | | |
| | MW-1005S | 2.8 | | | | | | | | | | | | |
| | MW-1010P | 9.9 | | | | | | | | | | | | |
| | MW-1013B | 1.7 | | | | | | | | | | | | |
| | MW-1013C | 16 | | | | | | | | | | | | |
| | MW-1014A | 1.9 | | | | | | | | | | | | |
| | MW-1014B | 2.6 | | | | | | | | | | | | |
| | MW-1014C | 16 | | | | | | | | | | | | |
| | MW-1015A | < 0.66 | | | | | | | | | | | | |
| | MW-1015B | < 0.66 | | | | | | | | | | | | |
| 07/05 | | | | | | | | | | | | | | |
| | MW-1000PR | 4 | 44 | < 0.17 | 160 | | 1.2 | < 1.2 | 40 | < 0.025 | < 2 | 1.4 | | |
| | MW-1002 | < 0.66 | 6.2 | < 0.17 | 14 | | 1.2 | < 1.2 | 4.6 | < 0.025 | < 2 | < 0.47 | | |
| | MW-1002G | < 0.66 | 26 | < 0.17 | 27 | | < 0.55 | < 1.2 | 10 | < 0.025 | < 2 | < 0.47 | | |
| | MW-1004P | < 0.66 | 42 | < 0.17 | 36 | | < 0.55 | < 1.2 | 15 | < 0.025 | < 2 | < 0.47 | | |
| | MW-1004S | < 0.66 | 4.9 | < 0.17 | 20 | | < 0.55 | < 1.2 | 6.9 | < 0.025 | < 2 | < 0.47 | | |
| | MW-1004S (Dup) | < 0.66 | 4.8 | < 0.17 | 20 | | 1.3 | < 1.2 | 6.9 | < 0.025 | < 2 | 0.95 | | |
| | MW-1005 | 1.5 | 77 | 0.44 | 40 | | 1.5 | < 1.2 | 20 | < 0.025 | < 2 | 1.2 | | |
| | MW-1005P | < 0.66 | 69 | < 0.17 | 57 | | < 0.55 | < 1.2 | 23 | < 0.025 | < 2 | < 0.47 | | |
| | MW-1005S | 3 | 44 | < 0.17 | 42 | | < 0.55 | < 1.2 | 15 | < 0.025 | < 2 | < 0.47 | | |
| | MW-1010P | 22 | 42 | < 0.17 | 46 | | < 0.55 | < 1.2 | 11 | < 0.025 | < 2 | < 0.47 | | |
| | MW-1013B | 1.9 | < 25 | < 1.7 | 690 | | < 4.5 | < 10 | 150 | < 0.025 | < 1.9 | < 6.7 | | |
| | MW-1013C | 13 | < 25 | < 1.7 | 630 | | 32 | < 10 | 190 | < 0.025 | < 1.9 | < 6.7 | | |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/05 | | | | | | | | | | | | | | |
| | MW-1014A | 1.2 | < 25 | < 1.7 | 340 | | 8.1 | 13 | 120 | < 0.025 | < 7.4 | 14 | | |
| | MW-1014B | 2.3 | < 25 | 2.8 | 610 | | 14 | < 10 | 150 | < 0.025 | < 1.9 | 11 | | |
| | MW-1014C | 15 | 27 | < 1.7 | 190 | | < 4.5 | < 10 | 43 | < 0.025 | < 1.9 | < 6.7 | | |
| | MW-1015A | < 0.66 | 8.9 | < 0.17 | 22 | | < 0.55 | < 1.2 | 9 | < 0.025 | < 2 | < 0.47 | | |
| | MW-1015B | < 0.66 | 43 | < 0.17 | 36 | | < 0.55 | < 1.2 | 15 | < 0.025 | < 2 | < 0.47 | | |
| 10/05 | | | | | | | | | | | | | | |
| | MW-1000PR | 2.9 | | | | | | | | | | | | |
| | MW-1002 | < 0.66 | | | | | | | | | | | | |
| | MW-1002G | < 0.66 | | | | | | | | | | | | |
| | MW-1004P | < 0.66 | | | | | | | | | | | | |
| | MW-1004S | < 0.66 | | | | | | | | | | | | |
| | MW-1005 | 2 | | | | | | | | | | | | |
| | MW-1005P | < 0.66 | | | | | | | | | | | | |
| | MW-1005S | 1.9 | | | | | | | | | | | | |
| | MW-1010P | 3.9 | | | | | | | | | | | | |
| | MW-1013 | 2.5 | | | | | | | | | | | | |
| | MW-1013A | 0.86 | | | | | | | | | | | | |
| | MW-1013B | < 0.85 | | | | | | | | | | | | |
| | MW-1013C | 9.2 | | | | | | | | | | | | |
| | MW-1013C (Dup) | 9.4 | | | | | | | | | | | | |
| | MW-1014 | < 0.85 | | | | | | | | | | | | |
| | MW-1014A | < 0.85 | | | | | | | | | | | | |
| | MW-1014B | 1.2 | | | | | | | | | | | | |
| | MW-1014C | 14 | | | | | | | | | | | | |
| | MW-1015A | < 0.66 | | | | | | | | | | | | |

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/05 | | | | | | | | | | | | | | |
| | MW-1015B | < 0.66 | | | | | | | | | | | | |
| 01/06 | | | | | | | | | | | | | | |
| | MW-1000PR | 3 | | | | | | | | | | | | |
| | MW-1002 | < 0.66 | | | | | | | | | | | | |
| | MW-1002G | < 0.66 | | | | | | | | | | | | |
| | MW-1004P | < 0.66 | | | | | | | | | | | | |
| | MW-1004S | < 0.66 | | | | | | | | | | | | |
| | MW-1005 | 1.7 | | | | | | | | | | | | |
| | MW-1005P | < 0.66 | | | | | | | | | | | | |
| | MW-1005S | 2.4 | | | | | | | | | | | | |
| | MW-1010P | 4.3 | | | | | | | | | | | | |
| | MW-1013 | 0.98 | | | | | | | | | | | | |
| | MW-1013A | < 0.85 | | | | | | | | | | | | |
| | MW-1013B | 1.1 | | | | | | | | | | | | |
| | MW-1013C | 13 | | | | | | | | | | | | |
| | MW-1014 | < 0.85 | | | | | | | | | | | | |
| | MW-1014A | < 0.85 | | | | | | | | | | | | |
| | MW-1014B | 2.4 | | | | | | | | | | | | |
| | MW-1014C | 16 | | | | | | | | | | | | |
| | MW-1014C (Dup) | 18 | | | | | | | | | | | | |
| | MW-1015A | < 0.66 | | | | | | | | | | | | |
| | MW-1015B | < 0.66 | | | | | | | | | | | | |
| 04/06 | | | | | | | | | | | | | | |
| | MW-1000PR | 1.8 | 40 | < 0.17 | 150 | 18 | < 0.88 | 2.9 | 37 | < 0.025 | < 1.8 | < 1.1 | | |
| | MW-1002 | < 0.57 | | | | | | | | | | | | |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/06 | | | | | | | | | | | | | | |
| | MW-1002G | < 0.57 | | | | | | | | | | | | |
| | MW-1004P | < 0.57 | | | | | | | | | | | | |
| | MW-1004S | < 0.57 | | | | | | | | | | | | |
| | MW-1005 | 2.2 | | | | | | | | | | | | |
| | MW-1005P | < 0.57 | | | | | | | | | | | | |
| | MW-1005S | 2.8 | | | | | | | | | | | | |
| | MW-1005S (Dup) | 2.3 | | | | | | | | | | | | |
| | MW-1010P | 4.2 | 48 | < 0.17 | 46 | 4.1 | < 0.88 | < 1.8 | 12 | < 0.025 | < 1.8 | < 1.1 | | |
| | MW-1013 | < 1 | 150 | < 1.7 | 150 | 18 | < 10 | 14 | 44 | < 0.025 | < 2.4 | < 12 | | |
| | MW-1013A | < 1 | 120 | < 1.7 | 190 | 11 | < 10 | 19 | 62 | < 0.025 | < 2.4 | < 12 | | |
| | MW-1013B | < 1 | < 25 | < 1.7 | 650 | 48 | < 10 | < 13 | 150 | < 0.025 | < 2.4 | < 12 | | |
| | MW-1013C | 12 | < 25 | < 1.7 | 620 | 61 | < 10 | < 13 | 180 | < 0.025 | < 2.4 | < 12 | | |
| | MW-1014 | < 1 | 40 | < 1.7 | 91 | 30 | < 10 | < 13 | 28 | < 0.025 | < 2.4 | < 12 | | |
| | MW-1014A | < 1 | < 25 | < 1.7 | 340 | 17 | < 10 | < 13 | 120 | < 0.025 | < 2.4 | < 12 | | |
| | MW-1014B | 1.1 | < 25 | < 1.7 | 540 | 45 | 14 | < 13 | 130 | < 0.025 | < 2.4 | < 12 | | |
| | MW-1014C | 16 | 28 | < 1.7 | 180 | 40 | < 10 | < 13 | 42 | < 0.025 | < 2.4 | < 12 | | |
| | MW-1015A | < 0.57 | | | | | | | | | | | | |
| | MW-1015B | < 0.57 | | | | | | | | | | | | |
| 07/06 | | | | | | | | | | | | | | |
| | MW-1000PR | 1.7 | 42 | < 0.17 | 130 | 18 | < 0.88 | < 1.3 | 36 | < 0.025 | < 1.8 | < 1.1 | 3.9 | 7.7 |
| | MW-1002 | < 0.57 | 6.3 | < 0.17 | 13 | 3.5 | < 0.88 | < 1.3 | 4.7 | < 0.025 | < 1.8 | < 1.1 | 0.59 | 3.1 |
| | MW-1002G | < 0.57 | 26 | < 0.17 | 24 | 10 | < 0.88 | < 1.3 | 9.6 | < 0.025 | < 1.8 | < 1.1 | 0.84 | 5.4 |
| | MW-1004P | < 0.57 | 40 | < 0.17 | 32 | < 2.5 | < 0.88 | < 1.3 | 14 | < 0.025 | < 1.8 | < 1.1 | 5.9 | 7.1 |
| | MW-1004S | < 0.57 | 5.3 | < 0.17 | 19 | 5.6 | < 0.88 | < 1.3 | 6.8 | < 0.025 | < 1.8 | < 1.1 | 0.87 | 5.1 |
| | MW-1005 | 1.7 | 110 | < 0.17 | 48 | 200 | < 0.88 | < 1.3 | 24 | < 0.025 | < 1.8 | < 1.1 | 0.71 | 21 |

Created By: SGL Checked By: DAT

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/06 | | | | | | | | | | | | | | | |
| | MW-1005P | | < 0.57 | 67 | < 0.17 | 48 | 4 | < 0.88 | < 1.3 | 21 | < 0.025 | < 1.8 | < 1.1 | 9.2 | 7.2 |
| | MW-1005S | | 2.8 | 44 | < 0.17 | 37 | < 2.5 | < 0.88 | < 1.3 | 14 | < 0.025 | < 1.8 | < 1.1 | 3.1 | 7.2 |
| | MW-1010P | | 4.4 | 46 | < 0.17 | 40 | 4.2 | < 0.88 | < 1.3 | 12 | < 0.025 | < 1.8 | < 1.1 | 2.6 | 5.3 |
| | MW-1013 | | < 1 | 160 | < 1.7 | 140 | 17 | < 10 | < 13 | 45 | < 0.025 | < 2.4 | < 12 | 3.1 | 19 |
| | MW-1013 | (Dup) | < 1 | 150 | < 1.7 | 140 | 17 | < 10 | < 13 | 43 | < 0.025 | 3.4 | < 12 | 3.1 | 18 |
| | MW-1013A | | < 1 | 99 | < 1.7 | 120 | 6.7 | < 10 | < 13 | 42 | < 0.025 | < 2.4 | < 12 | 7.1 | 35 |
| | MW-1013B | | 1.4 | < 25 | < 1.7 | 630 | 46 | < 10 | < 13 | 150 | < 0.025 | < 4.8 | < 12 | 6.3 | 31 |
| | MW-1013C | | 18 | < 25 | < 1.7 | 580 | 53 | < 10 | < 13 | 180 | < 0.025 | 2.7 | < 12 | 24 | 43 |
| | MW-1014 | | < 1 | < 25 | < 1.7 | 84 | 26 | < 10 | < 13 | 28 | < 0.025 | < 2.4 | < 12 | 3.7 | 20 |
| | MW-1014A | | < 1 | < 25 | < 1.7 | 320 | < 18 | < 10 | < 13 | 120 | < 0.025 | 2.8 | < 12 | 9.6 | 58 |
| | MW-1014B | | 1.8 | < 25 | < 1.7 | 470 | 42 | < 10 | < 13 | 130 | < 0.025 | < 2.4 | < 12 | 18 | 29 |
| | MW-1014C | | 16 | < 25 | < 1.7 | 160 | 38 | < 10 | < 13 | 41 | < 0.025 | < 2.4 | < 12 | 5.4 | 12 |
| | MW-1015A | | < 0.57 | 8.5 | < 0.17 | 19 | 5.7 | < 0.88 | < 1.3 | 8.3 | < 0.025 | < 1.8 | < 1.1 | 0.83 | 3.5 |
| | MW-1015B | | 0.97 | 43 | < 0.17 | 32 | 77 | < 0.88 | < 1.3 | 14 | < 0.025 | < 1.8 | < 1.1 | 6.5 | 46 |
| 10/06 | | | | | | | | | | | | | | | |
| | MW-1000PR | | 2.8 | | | | | | | | | | | | |
| | MW-1002 | | < 0.57 | | | | | | | | | | | | |
| | MW-1002G | | < 0.57 | | | | | | | | | | | | |
| | MW-1004P | | < 0.57 | | | | | | | | | | | | |
| | MW-1004P | (Dup) | < 0.57 | | | | | | | | | | | | |
| | MW-1004S | | < 0.57 | | | | | | | | | | | | |
| | MW-1005 | | 2.3 | | | | | | | | | | | | |
| | MW-1005P | | < 0.57 | | | | | | | | | | | | |
| | MW-1005S | | 2.3 | | | | | | | | | | | | |
| | MW-1010P | | 5.7 | | | | | | | | | | | | |

# Historical Groundwater Results (Annual Parameters)

| Date | SamplePointName | As (ug/l) | Ba (ug/l) | Cd (ug/l) | Ca (mg/l) | Cl (mg/l) | Cr (ug/l) | Pb (ug/l) | Mg (mg/l) | Hg (ug/l) | Se (ug/l) | Ag (ug/l) | K (ug/l) | Na (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/06 | | | | | | | | | | | | | | |
| | MW-1013 | < 1 | | | | | | | | | | | | |
| | MW-1013A | < 1 | | | | | | | | | | | | |
| | MW-1013B | < 1 | | | | | | | | | | | | |
| | MW-1013C | 15 | | | | | | | | | | | | |
| | MW-1014 | < 1 | | | | | | | | | | | | |
| | MW-1014A | < 1 | | | | | | | | | | | | |
| | MW-1014B | < 1 | | | | | | | | | | | | |
| | MW-1014C | 20 | | | | | | | | | | | | |
| | MW-1015A | < 0.57 | | | | | | | | | | | | |
| | MW-1015B | < 0.57 | | | | | | | | | | | | |

# Attachment 3

## Statistical Results

## Trend Graphs

## Historical Data

## (Surface Water)

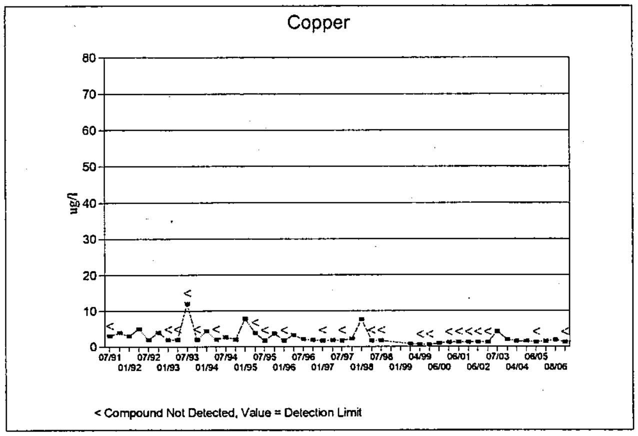
# Trend Analysis Results - Surface Water
## Oct. 1997 - Oct. 2006

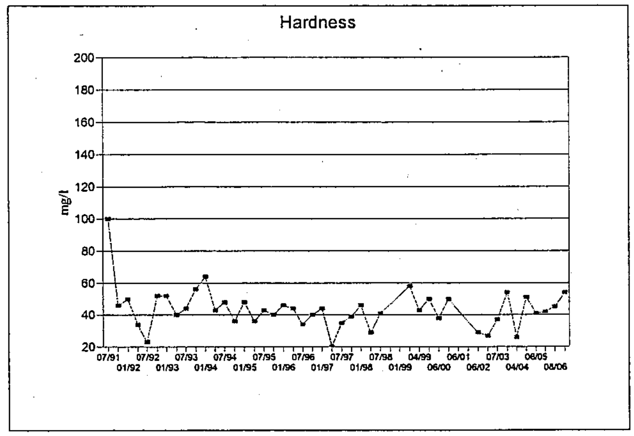
| | Conductivity (Field) (umhos) | pH(Field) (su) | Copper | Hardness | Iron | Manganese | Sulfate | Zinc |
|---|---|---|---|---|---|---|---|---|
| SW-1 | | | | | | | | |
| Sample Size | 21 | 21 | 21 | 19 | 15 | 15 | 15 | 21 |
| Mann-Kendall S | -52 | -4 | 8 | 15 | 6 | 11 | 4 | 47 |
| p-Level | 0.124 | 0.928 | 0.834 | 0.628 | 0.808 | 0.626 | 0.884 | 0.167 |
| Trend | | | | | | | | |
| SW-2 | | | | | | | | |
| Sample Size | 21 | 21 | 22 | 20 | 16 | 16 | 16 | 22 |
| Mann-Kendall S | -73 | -8 | 7 | 16 | -7 | 2 | 20 | 60 |
| p-Level | 0.028 | 0.834 | 0.868 | 0.63 | 0.79 | 0.964 | 0.398 | 0.096 |
| Trend | | | | | | | | |

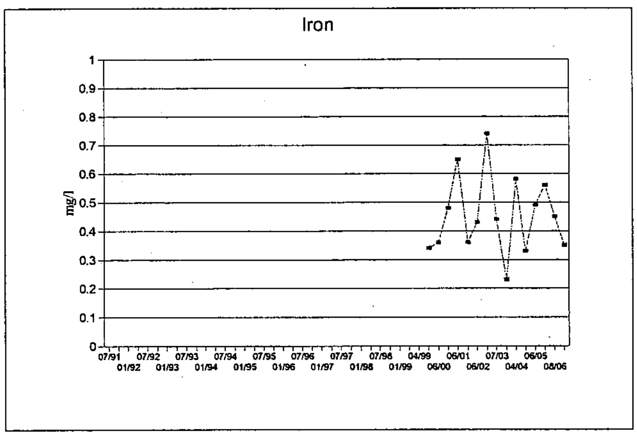
Notes: Overall increasing trend denoted by "+".
Overall decreasing trend denoted by "-"
Trend tests performed at a Type I (two-tailed) error rate of 0.01.

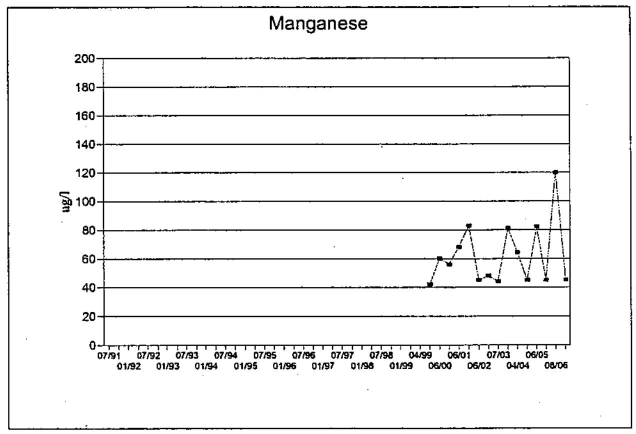
Flambeau Mining Company
Surface Water Quality Results

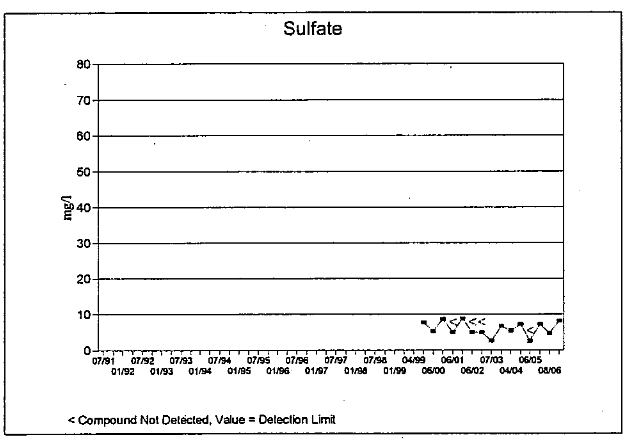
SW-1 (Upstream)

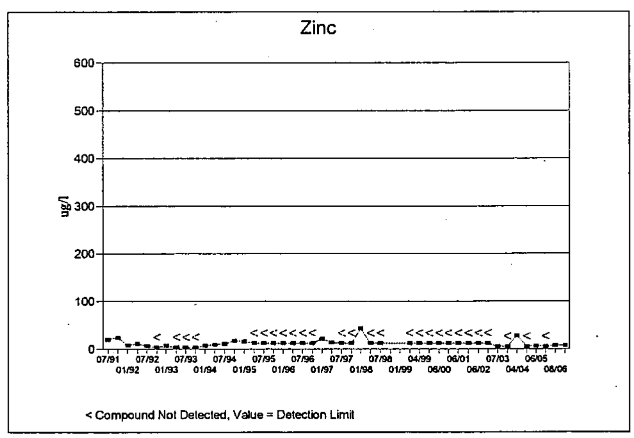


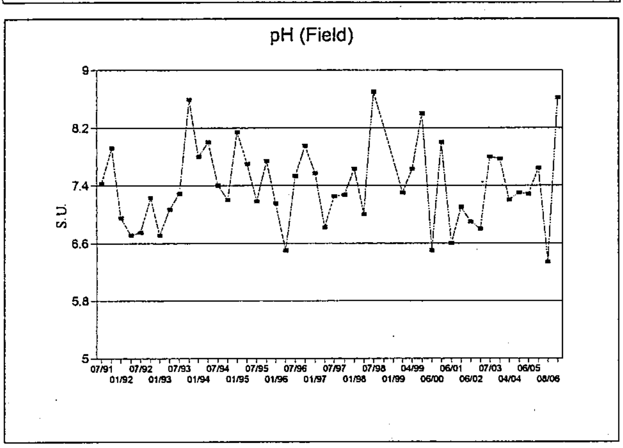



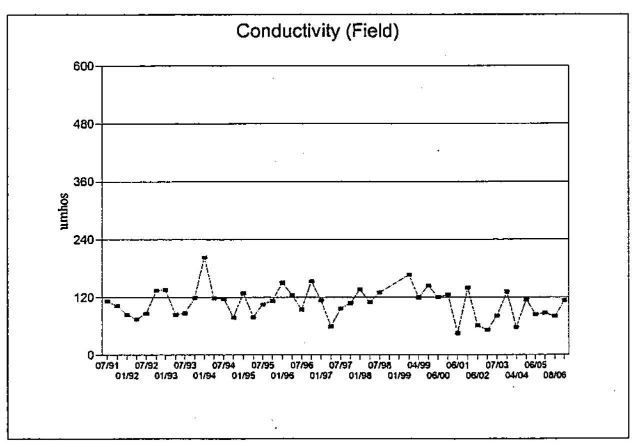





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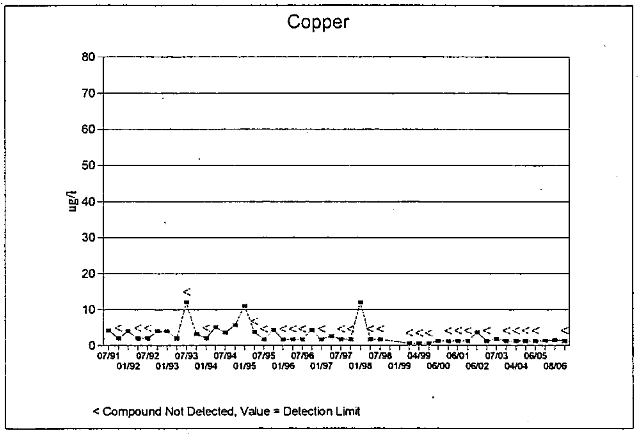
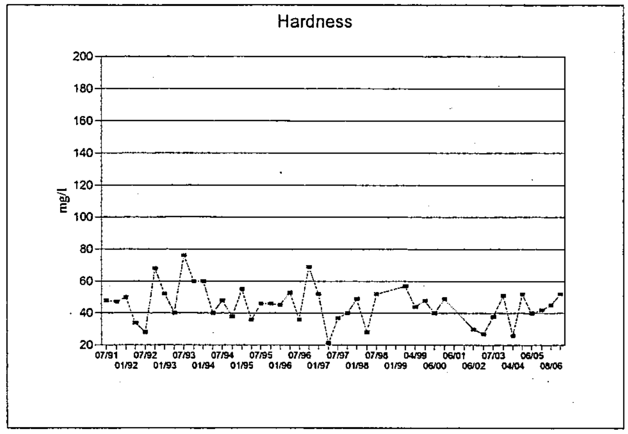
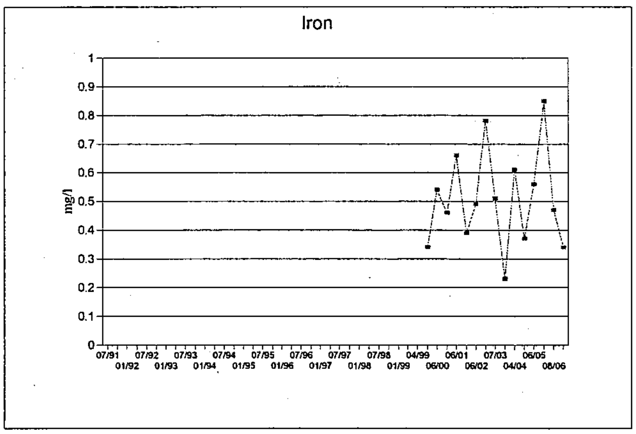
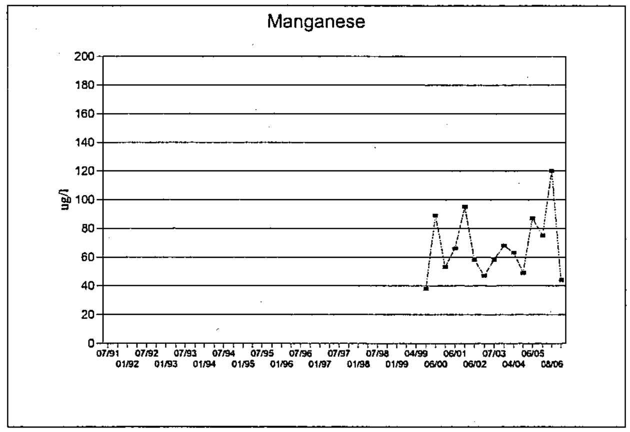
Flambeau Mining Company
Surface Water Quality Results

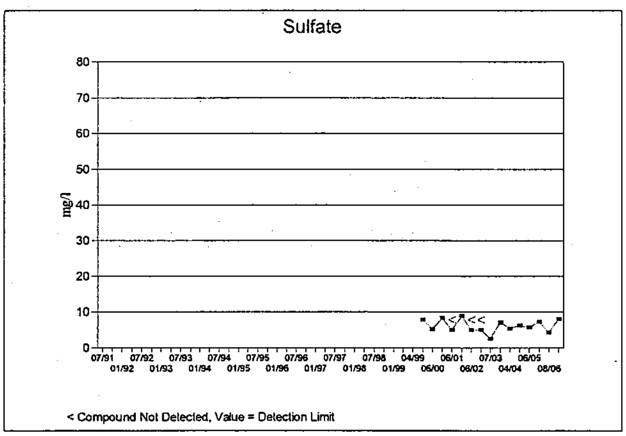
SW-2 (Downstream)

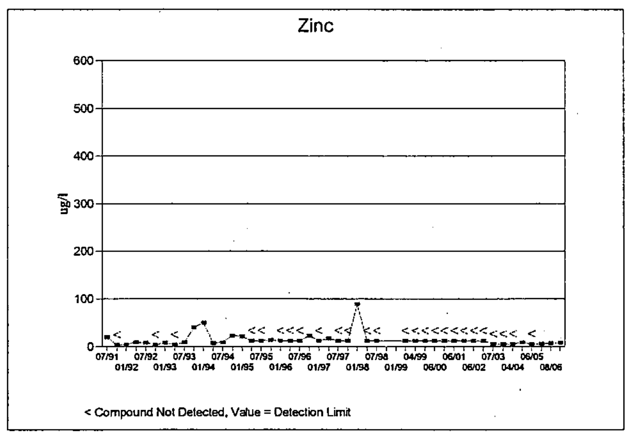


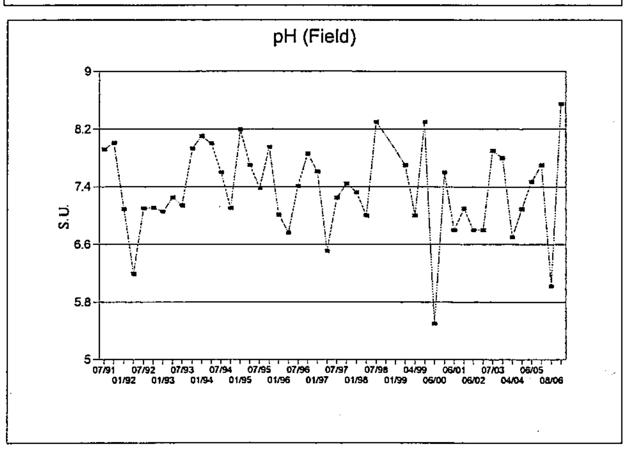



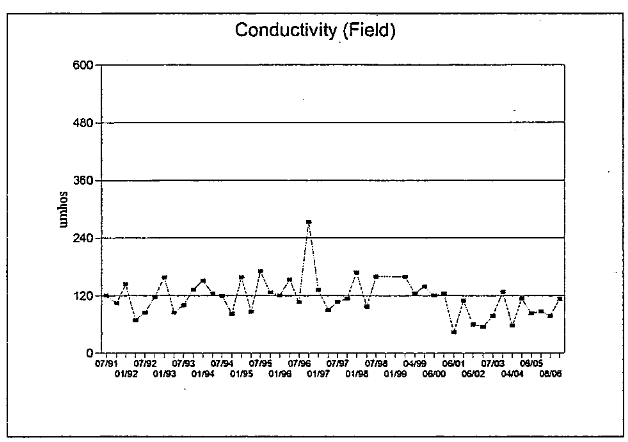





Created By: SGL Checked By: DAT

# Historical Surface Water Results

| Date | Sample Point Name | Field pH | Field Cond | Copper (ug/l) | Hardness (mg/l) | Iron (mg/l) | Manganese (ug/l) | Sulfate (mg/l) | Zinc (ug/l) |
|---|---|---|---|---|---|---|---|---|---|
| 07/91 | | | | | | | | | |
| | SW-1 | 7.43 | 112 | < 3 | 100 | | | | 20 |
| | SW-2 | 7.92 | 120 | 4.2 | 48 | | | | 20 |
| 10/91 | | | | | | | | | |
| | SW-1 | 7.92 | 102 | 4 | 46 | | | | 24 |
| | SW-2 | 8.01 | 104 | < 2 | 47 | | | | < 3 |
| 01/92 | | | | | | | | | |
| | SW-1 | 6.95 | 84 | 3 | 50 | | | | 8 |
| | SW-2 | 7.09 | 144 | 4 | 50 | | | | 4 |
| 04/92 | | | | | | | | | |
| | SW-1 | 6.71 | 74 | 5 | 34 | | | | 11 |
| | SW-2 | 6.19 | 69 | < 2 | 34 | | | | 9 |
| 07/92 | | | | | | | | | |
| | SW-1 | 6.75 | 86 | 2 | 23 | | | | 6 |
| | SW-2 | 7.1 | 85 | < 2 | 28 | | | | 8 |
| 10/92 | | | | | | | | | |
| | SW-1 | 7.23 | 134 | 4 | 52 | | | | < 3 |
| | SW-2 | 7.11 | 117 | 4 | 68 | | | | < 3 |
| 01/93 | | | | | | | | | |
| | SW-1 | 6.71 | 136 | < 2 | 52 | | | | 7 |
| | SW-2 | 7.05 | 158 | 4 | 52 | | | | 8 |
| 04/93 | | | | | | | | | |
| | SW-1 | 7.07 | 84 | < 2 | 40 | | | | < 3 |
| | SW-2 | 7.25 | 85 | 2 | 40 | | | | < 3 |
| 07/93 | | | | | | | | | |
| | SW-1 | 7.29 | 87 | < 12 | 44 | | | | < 3 |
| | SW-2 | 7.14 | 100 | < 12 | 76 | | | | 9 |
| 11/93 | | | | | | | | | |
| | SW-1 | 8.59 | 118.9 | < 2 | 56 | | | | < 3 |
| | SW-2 | 7.93 | 132.6 | 3.2 | 60 | | | | 40 |
| 01/94 | | | | | | | | | |
| | SW-1 | 7.8 | 203 | 4.4 | 64 | | | | 7 |
| | SW-2 | 8.1 | 151 | < 2 | 60 | | | | 50 |
| 04/94 | | | | | | | | | |
| | SW-1 | 8 | 118 | < 2 | 43 | | | | 9 |
| | SW-2 | 8 | 124 | 5.1 | 40 | | | | 7 |

# Historical Surface Water Results

| Date | Sample Point Name | Field pH | Field Cond | Copper (ug/l) | Hardness (mg/l) | Iron (mg/l) | Manganese (ug/l) | Sulfate (mg/l) | Zinc (ug/l) |
|---|---|---|---|---|---|---|---|---|---|
| 07/94 | | | | | | | | | |
| | SW-1 | 7.4 | 117 | 2.7 | 48 | | | | 11 |
| | SW-2 | 7.6 | 119 | 3.6 | 48 | | | | 9 |
| 10/94 | | | | | | | | | |
| | SW-1 | 7.2 | 78 | 2 | 36 | | | | 17 |
| | SW-2 | 7.1 | 82 | 5.7 | 38 | | | | 23 |
| 01/95 | | | | | | | | | |
| | SW-1 | 8.14 | 128.5 | 7.8 | 48 | | | | 16 |
| | SW-2 | 8.19 | 158.3 | 11 | 55 | | | | 21 |
| 04/95 | | | | | | | | | |
| | SW-1 | 7.7 | 78.1 | < 3.8 | 36 | | | | < 12 |
| | SW-2 | 7.7 | 86.2 | < 3.8 | 36 | | | | < 12 |
| 07/95 | | | | | | | | | |
| | SW-1 | 7.18 | 105.5 | < 1.7 | 43 | | | | < 12 |
| | SW-2 | 7.38 | 170 | < 1.7 | 46 | | | | < 12 |
| 10/95 | | | | | | | | | |
| | SW-1 | 7.74 | 112.5 | 3.7 | 40 | | | | < 12 |
| | SW-2 | 7.95 | 126.3 | 4.3 | 46 | | | | 13 |
| 01/96 | | | | | | | | | |
| | SW-1 | 7.15 | 150.5 | < 1.7 | 46 | | | | < 12 |
| | SW-2 | 7.01 | 120.2 | < 1.7 | 45 | | | | < 12 |
| 04/96 | | | | | | | | | |
| | SW-1 | 6.5 | 124 | 3.3 | 44 | | | | < 12 |
| | SW-2 | 6.76 | 153.1 | < 1.7 | 53 | | | | < 12 |
| 07/96 | | | | | | | | | |
| | SW-1 | 7.53 | 94.5 | 2.1 | 34 | | | | < 12 |
| | SW-2 | 7.41 | 106.8 | < 1.7 | 36 | | | | < 12 |
| 10/96 | | | | | | | | | |
| | SW-1 | 7.95 | 153.5 | 1.9 | 40 | | | | < 12 |
| | SW-2 | 7.86 | 274 | 4.3 | 69 | | | | 23 |
| 01/97 | | | | | | | | | |
| | SW-1 | 7.57 | 113.3 | < 1.7 | 44 | | | | 21 |
| | SW-2 | 7.61 | 132 | < 1.7 | 52 | | | | < 12 |
| 04/97 | | | | | | | | | |
| | SW-1 | 6.82 | 58.9 | 1.8 | 20 | | | | 13 |
| | SW-2 | 6.51 | 89.6 | 2.6 | 21 | | | | 17 |

# Historical Surface Water Results

| Date | Sample Point Name | Field pH | Field Cond | Copper (ug/l) | Hardness (mg/l) | Iron (mg/l) | Manganese (ug/l) | Sulfate (mg/l) | Zinc (ug/l) |
|---|---|---|---|---|---|---|---|---|---|
| 07/97 | | | | | | | | | |
| | SW-1 | 7.25 | 96.1 | < 1.7 | 35 | | | | < 12 |
| | SW-2 | 7.25 | 106.8 | < 1.7 | 37 | | | | < 12 |
| 10/97 | | | | | | | | | |
| | SW-1 | 7.27 | 107.6 | 2.2 | 39 | | | | < 12 |
| | SW-2 | 7.44 | 113.8 | < 1.7 | 40 | | | | < 12 |
| 01/98 | | | | | | | | | |
| | SW-1 | 7.63 | 136.3 | 7.6 | 46 | | | | 43 |
| | SW-2 | 7.32 | 167.9 | 12 | 49 | | | | 89 |
| 04/98 | | | | | | | | | |
| | SW-1 | 7 | 110 | < 1.7 | 29 | | | | < 12 |
| | SW-2 | 7 | 97 | < 1.7 | 28 | | | | < 12 |
| 07/98 | | | | | | | | | |
| | SW-1 | 8.7 | 130 | < 1.7 | 41 | | | | < 12 |
| | SW-2 | 8.3 | 160 | < 1.7 | 52 | | | | < 12 |
| 03/99 | | | | | | | | | |
| | SW-1 | 7.3 | 166.7 | 0.74 | 58 | | | | < 12 |
| | SW-2 | 7.7 | 159.6 | < 0.6 | 57 | | | | < 12 |
| 04/99 | | | | | | | | | |
| | SW-1 | 7.63 | 119.3 | < 0.6 | 43 | | | | < 12 |
| | SW-2 | 7 | 124.7 | < 0.6 | 44 | | | | < 12 |
| 11/99 | | | | | | | | | |
| | SW-1 | 8.4 | 144 | < 0.6 | 50 | 0.34 | 42 | 7.7 | < 12 |
| | SW-2 | 8.3 | 139 | < 0.6 | 48 | 0.34 | 38 | 7.9 | < 12 |
| 06/00 | | | | | | | | | |
| | SW-1 | 6.5 | 120 | 0.94 | 38 | 0.36 | 60 | 5.2 | < 12 |
| | SW-2 | 5.5 | 120 | 1.3 | 40 | 0.54 | 89 | 5.2 | < 12 |
| 11/00 | | | | | | | | | |
| | SW-1 | 8 | 126 | < 1.2 | 50 | 0.48 | 56 | 8.6 | < 12 |
| | SW-2 | 7.6 | 125 | < 1.2 | 49 | 0.46 | 53 | 8.4 | < 12 |
| 06/01 | | | | | | | | | |
| | SW-1 | 6.6 | 45 | < 1.3 | | 0.65 | 68 | < 5 | < 12 |
| | SW-2 | 6.8 | 44 | < 1.3 | | 0.66 | 66 | < 5 | < 12 |
| 10/01 | | | | | | | | | |
| | SW-1 | 7.1 | 140 | < 1.3 | | 0.36 | 83 | 8.8 | < 12 |
| | SW-2 | 7.1 | 110 | < 1.3 | | 0.39 | 95 | 8.9 | < 12 |

# Historical Surface Water Results

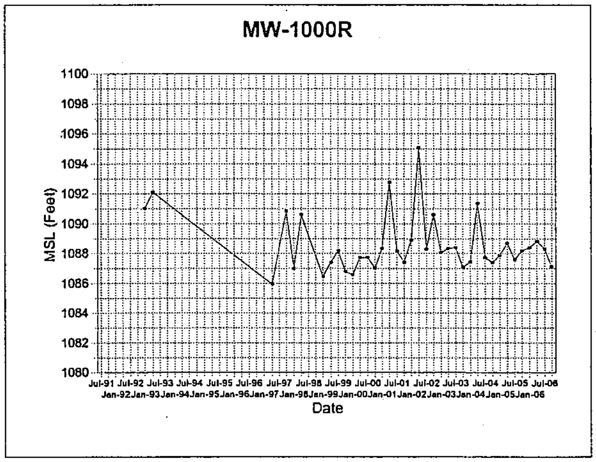
| Date | Sample Point Name | Field pH | Field Cond | Copper (ug/l) | Hardness (mg/l) | Iron (mg/l) | Manganese (ug/l) | Sulfate (mg/l) | Zinc (ug/l) |
|---|---|---|---|---|---|---|---|---|---|
| 06/02 | | | | | | | | | |
| | SW-1 | 6.9 | 61 | < 1.3 | 29 | 0.43 | 45 | < 5 | < 12 |
| | SW-2 | 6.8 | 60 | 3.7 | 30 | 0.49 | 58 | < 5 | < 12 |
| 10/02 | | | | | | | | | |
| | SW-1 | 6.8 | 52 | < 1.3 | 27 | 0.74 | 48 | < 5 | < 12 |
| | SW-2 | 6.8 | 55 | < 1.3 | 27 | 0.78 | 47 | < 5 | < 12 |
| 07/03 | | | | | | | | | |
| | SW-1 | 7.8 | 81 | 4.2 | 37 | 0.44 | 44 | 2.6 | 5.1 |
| | SW-2 | 7.9 | 78 | 1.8 | 38 | 0.51 | 58 | 2.6 | < 5 |
| 10/03 | | | | | | | | | |
| | SW-1 | 7.77 | 131 | 2 | 54 | 0.23 | 81 | 6.7 | < 5 |
| | SW-2 | 7.8 | 128 | < 1.3 | 51 | 0.23 | 68 | 7.1 | < 5 |
| 04/04 | | | | | | | | | |
| | SW-1 | 7.2 | 57 | 1.5 | 26 | 0.58 | 64 | 5.4 | 28 |
| | SW-2 | 6.7 | 57 | < 1.3 | 26 | 0.61 | 63 | 5.4 | < 5 |
| 11/04 | | | | | | | | | |
| | SW-1 | 7.3 | 115 | 1.6 | 51 | 0.33 | 45 | 7.2 | < 5 |
| | SW-2 | 7.09 | 114 | < 1.3 | 52 | 0.37 | 49 | 6.3 | 8.8 |
| 06/05 | | | | | | | | | |
| | SW-1 | 7.28 | 84 | < 1.3 | 41 | 0.49 | 82 | < 2.5 | 6 |
| | SW-2 | 7.47 | 83 | < 1.3 | 40 | 0.56 | 87 | 5.7 | < 5 |
| 11/05 | | | | | | | | | |
| | SW-1 | 7.64 | 87 | 1.5 | 42 | 0.56 | 45 | 7.2 | < 5 |
| | SW-2 | 7.7 | 87 | 1.4 | 42 | 0.85 | 75 | 7.3 | 5.9 |
| 08/06 | | | | | | | | | |
| | SW-1 | 6.34 | 80 | 1.9 | 45 | 0.45 | 120 | 4.7 | 7.3 |
| | SW-2 | 6.02 | 78 | 1.5 | 45 | 0.47 | 120 | 4.3 | 6.9 |
| 11/06 | | | | | | | | | |
| | SW-1 | 8.62 | 113 | < 1.3 | 54 | 0.35 | 45 | 8.1 | 7.1 |
| | SW-2 | 8.55 | 113 | < 1.3 | 52 | 0.34 | 44 | 8.1 | 7.8 |
| | SW-2 (Dup) | | | < 1.3 | 52 | 0.34 | 44 | 8.1 | 7.8 |

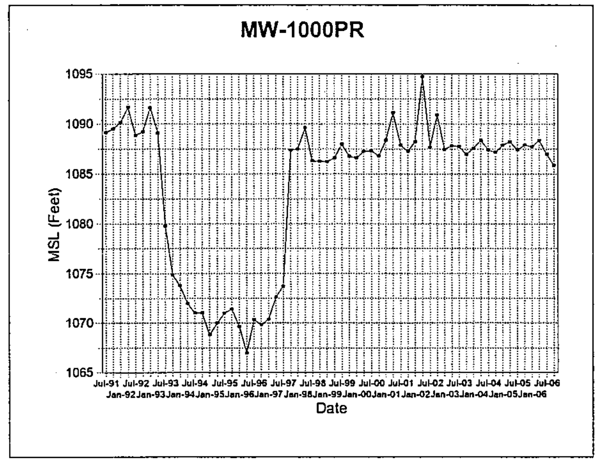
# Attachment 4

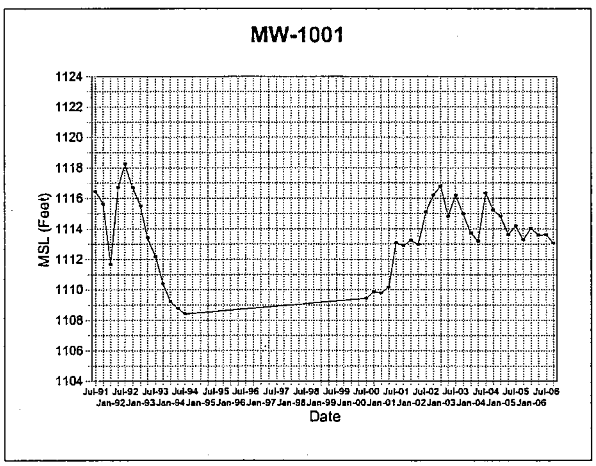
# Hydrographs

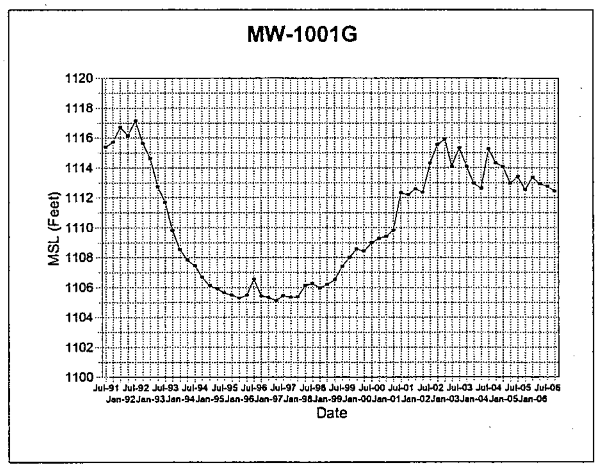
## Flambeau Mining Company

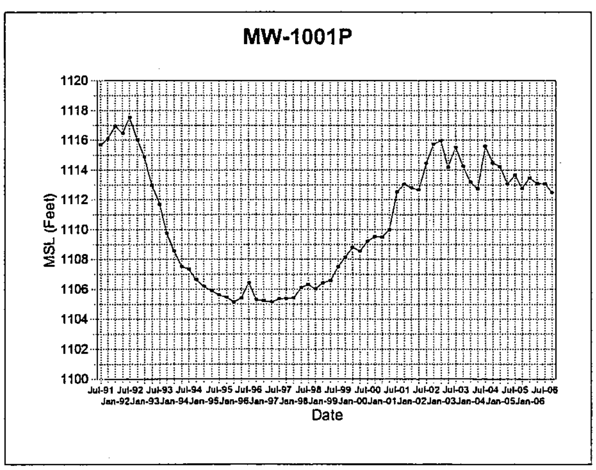
## Groundwater Elevation Results

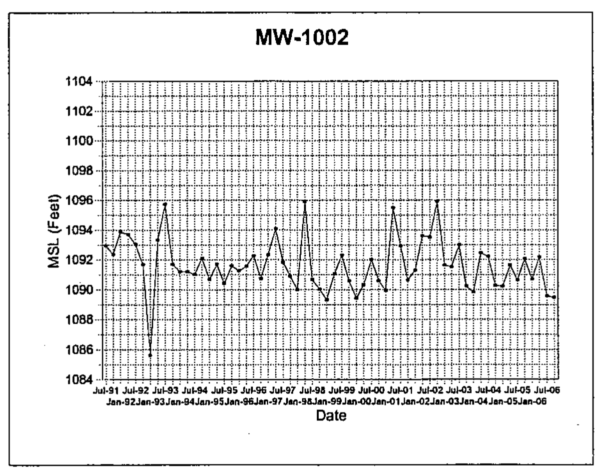


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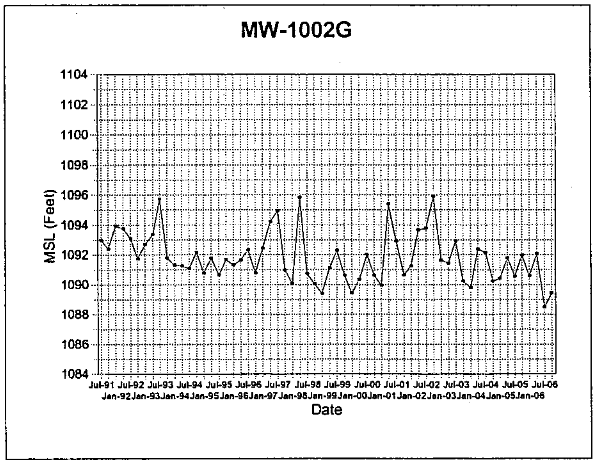
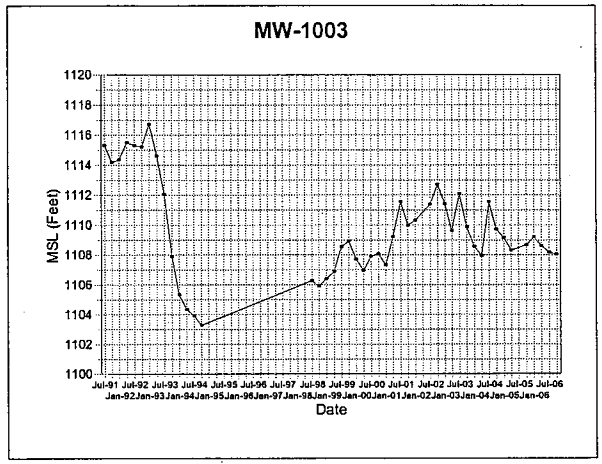
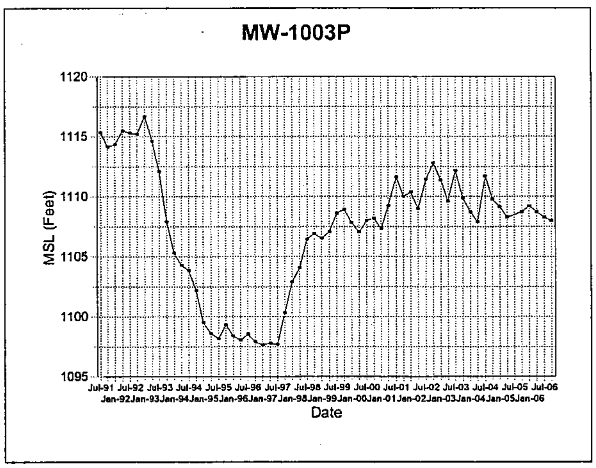
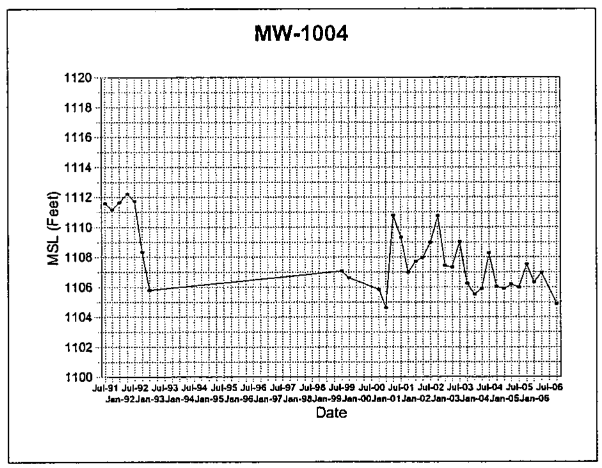
# Flambeau Mining Company

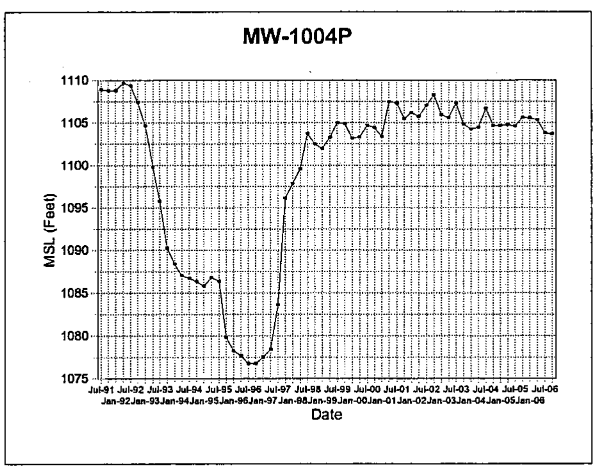
## Groundwater Elevation Results

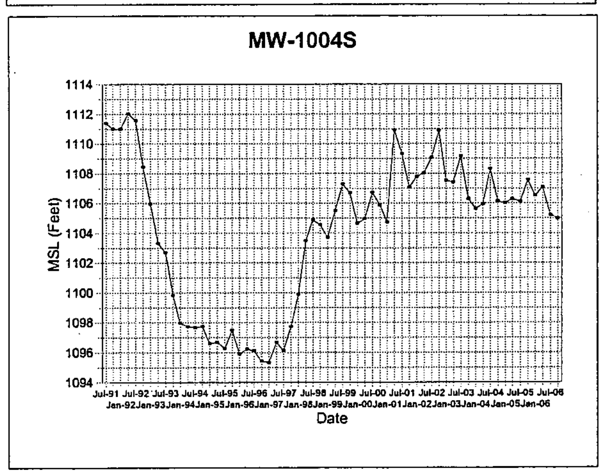


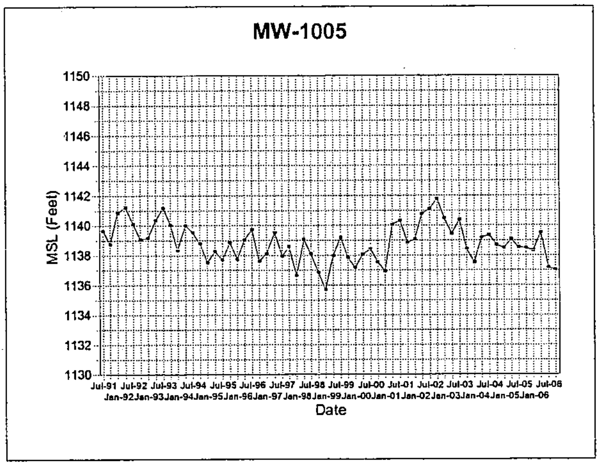



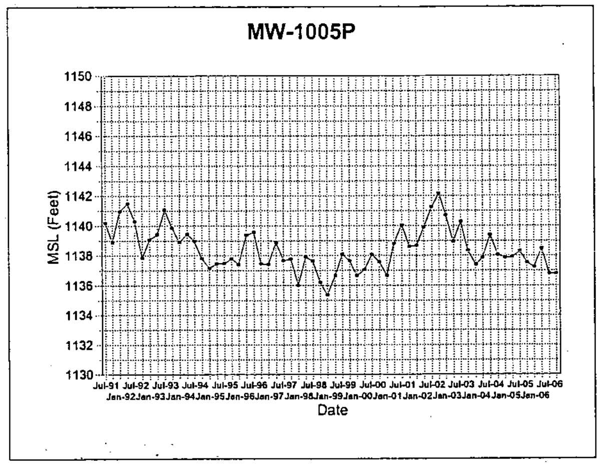



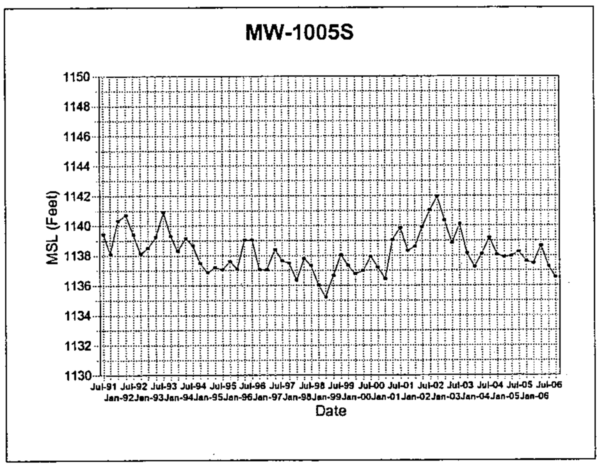



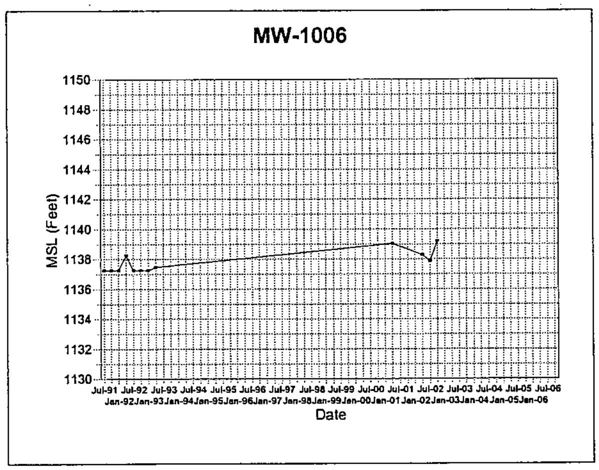
## Flambeau Mining Company

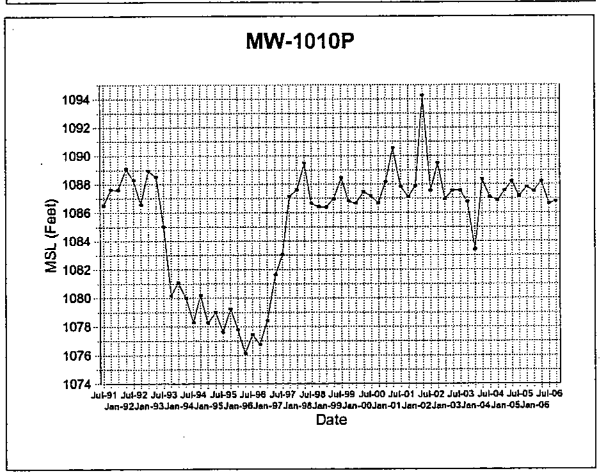
## Groundwater Elevation Results

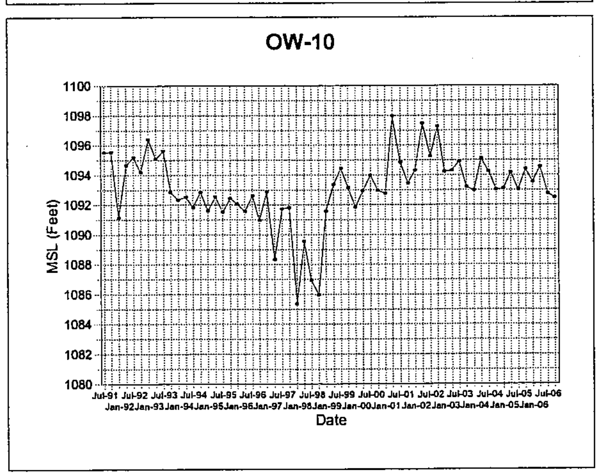




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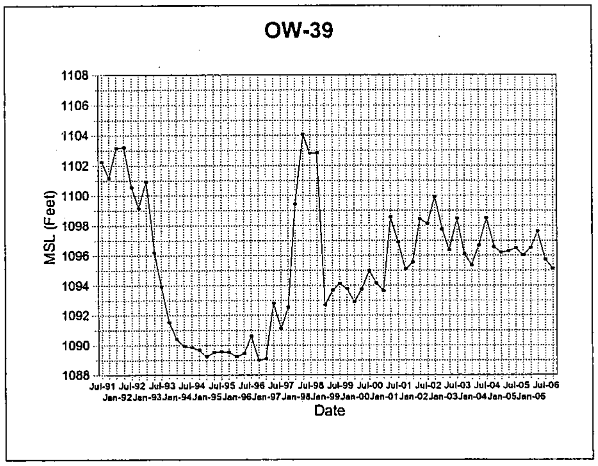
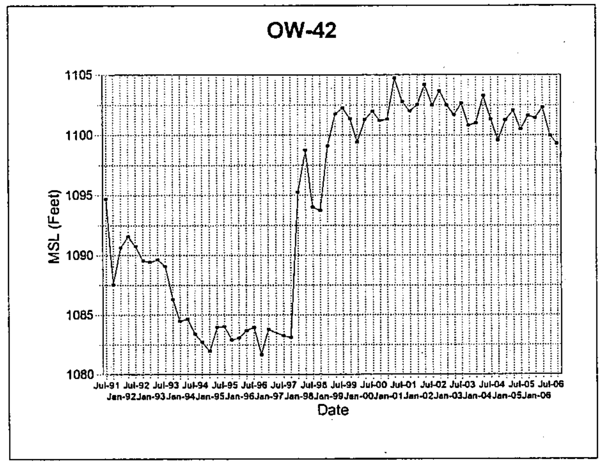
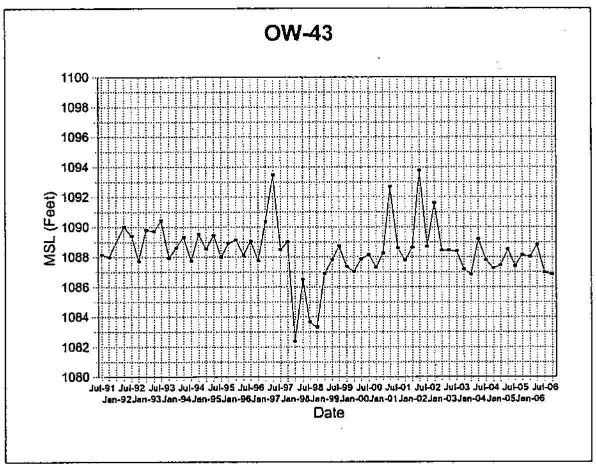
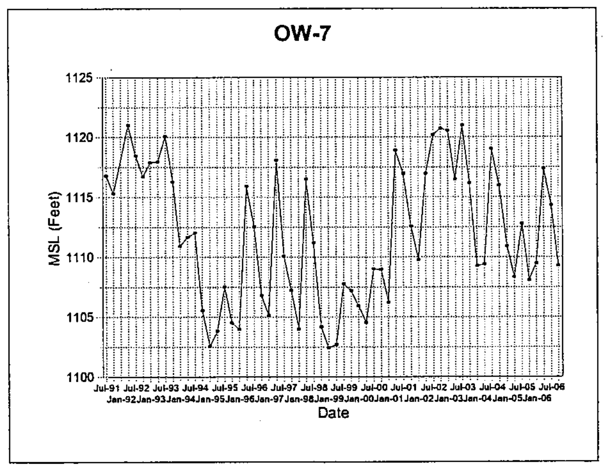
Flambeau Mining Company

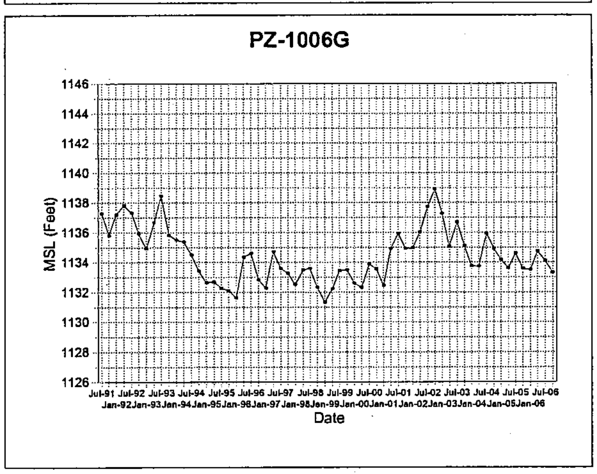
Groundwater Elevation Results

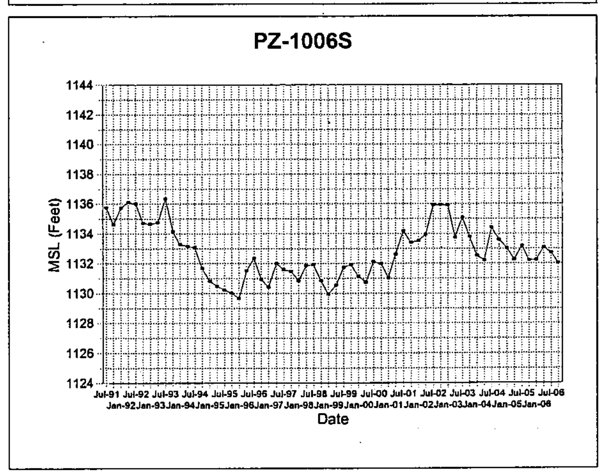


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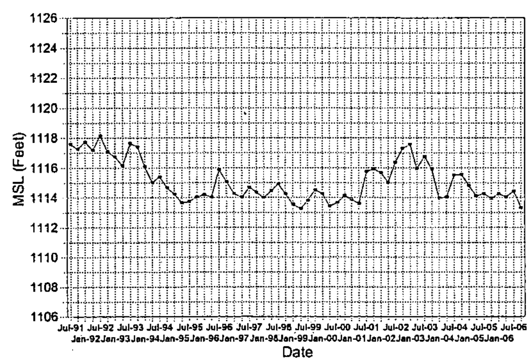
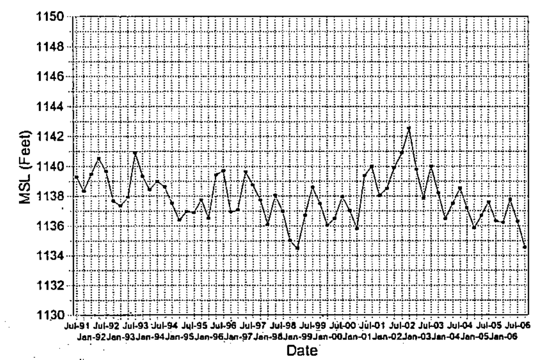
# Flambeau Mining Company

## Groundwater Elevation Results

**PZ-1007S**




**PZ-1008**

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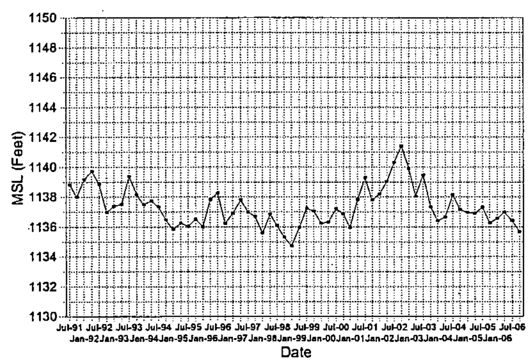


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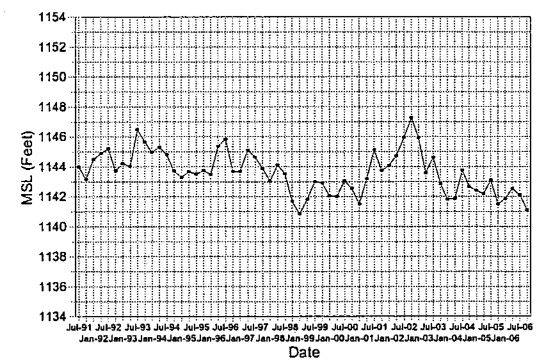


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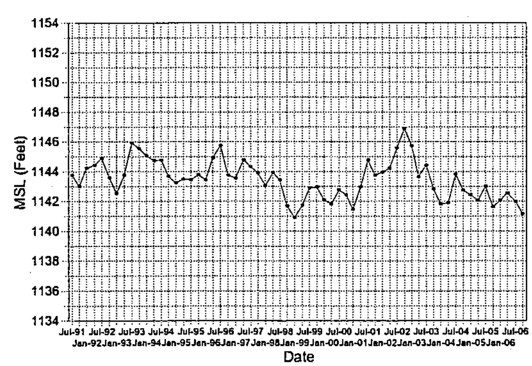


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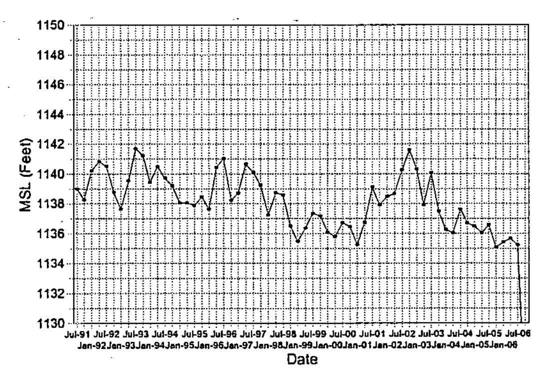
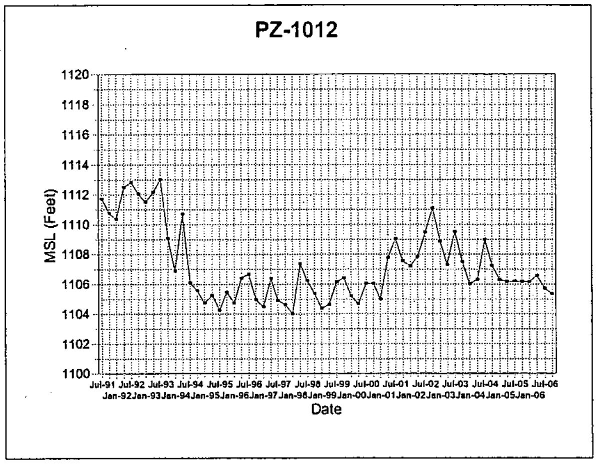


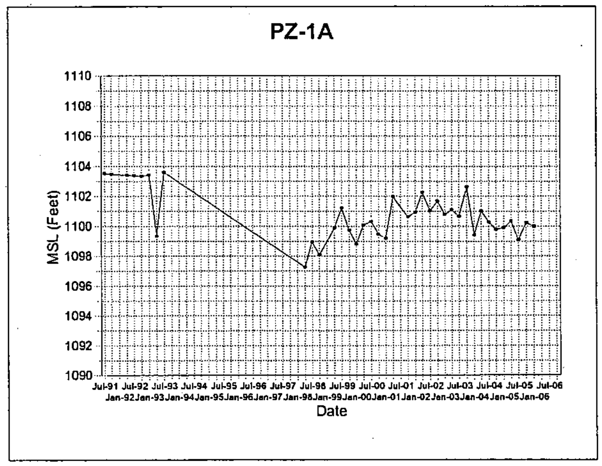


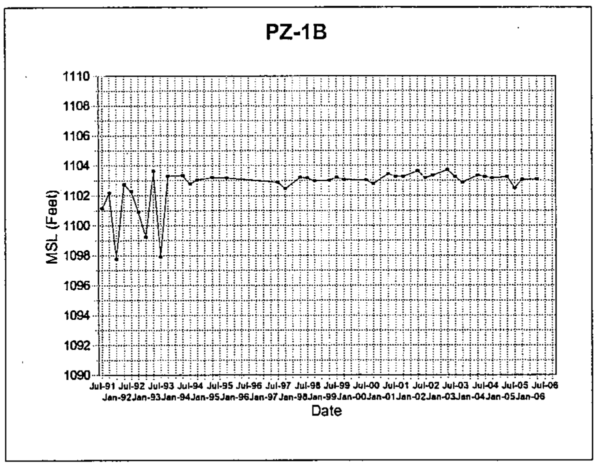

Created By: SGL Checked By: DAT

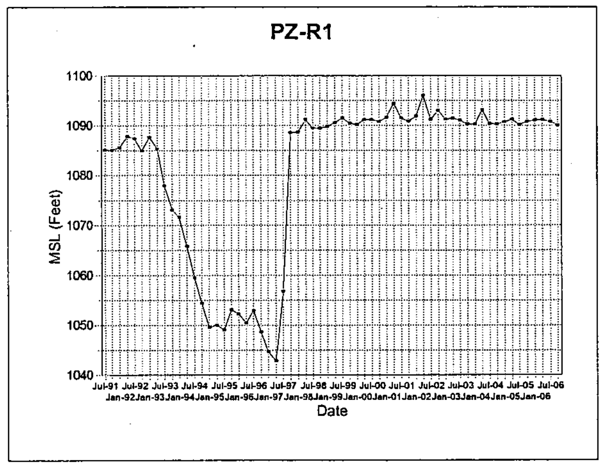
Flambeau Mining Company

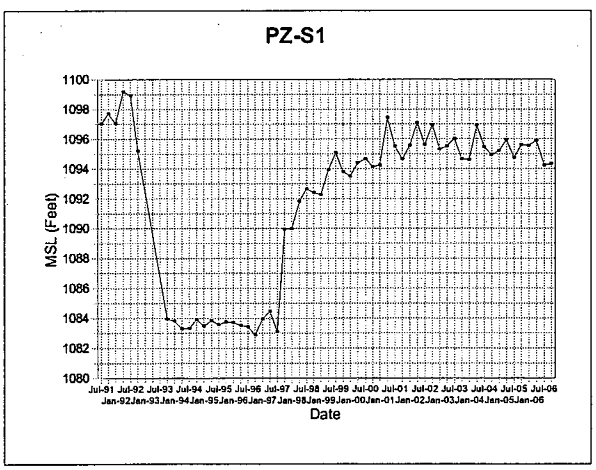
Groundwater Elevation Results

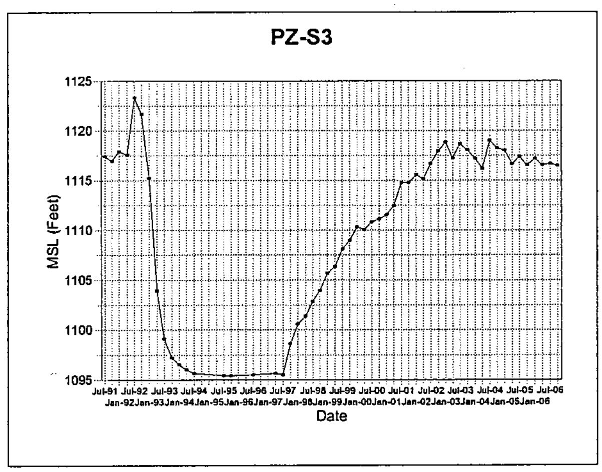


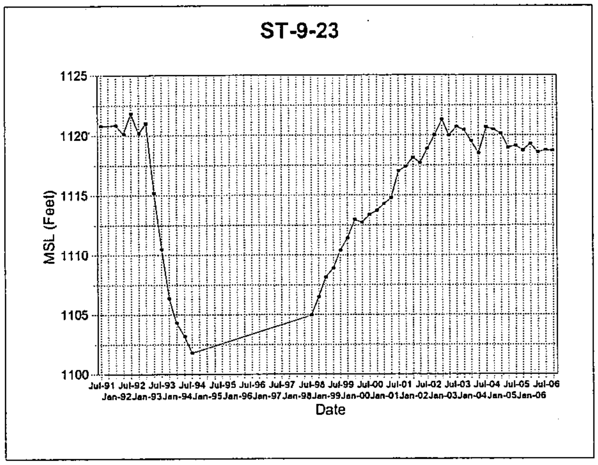



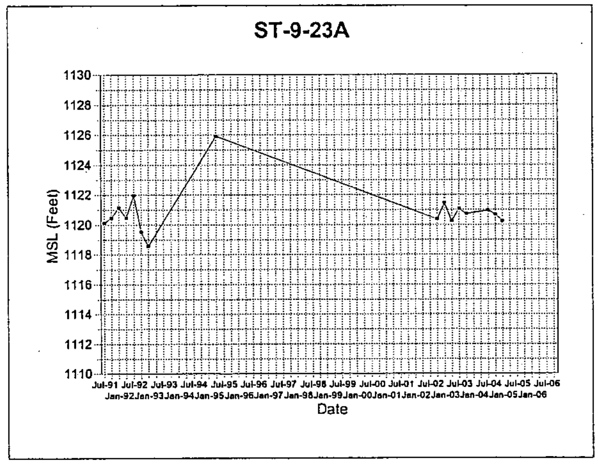



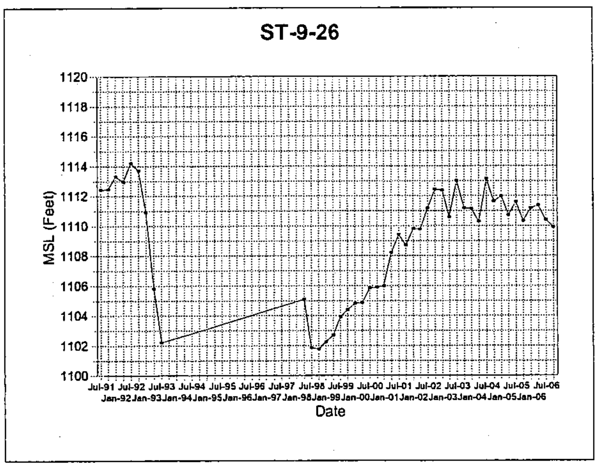



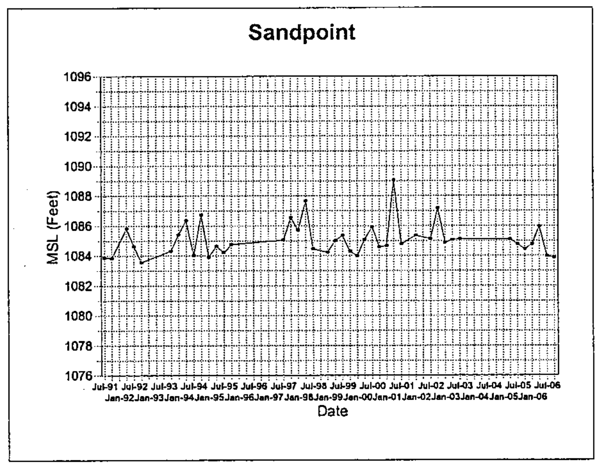
## Flambeau Mining Company

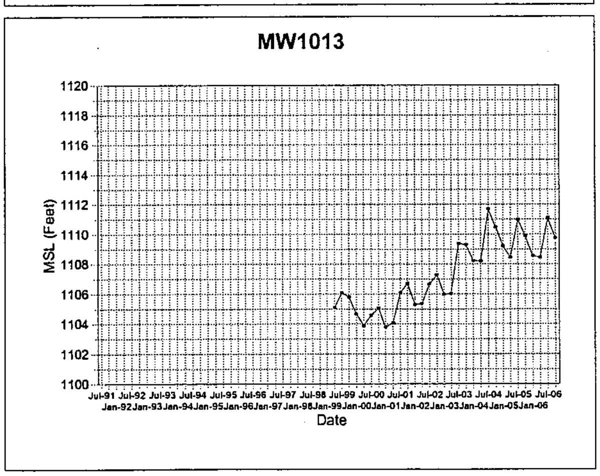
## Groundwater Elevation Results

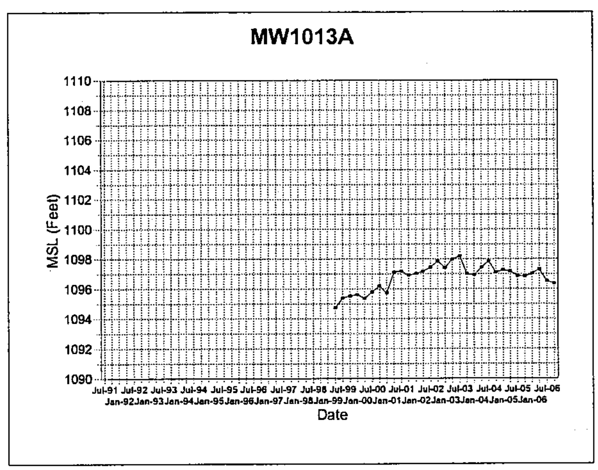


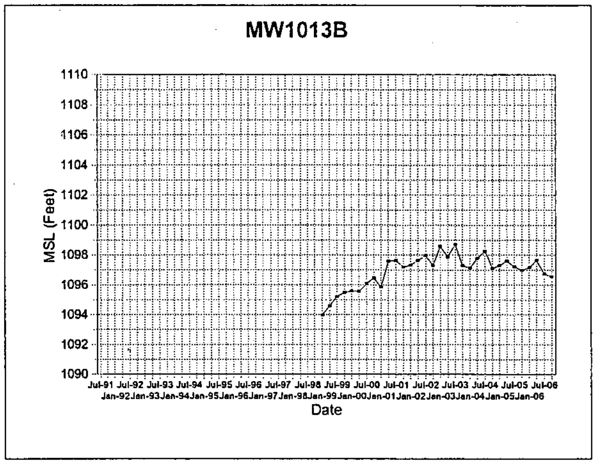



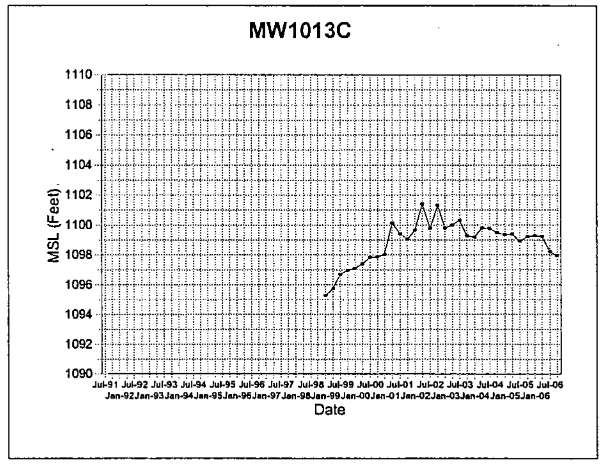


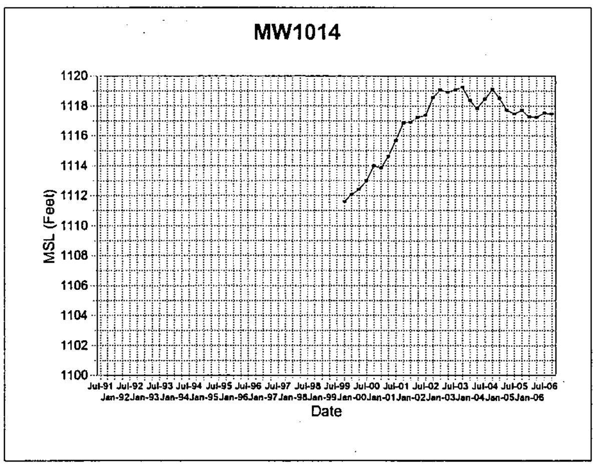
Created By: SGL Checked By: DAT

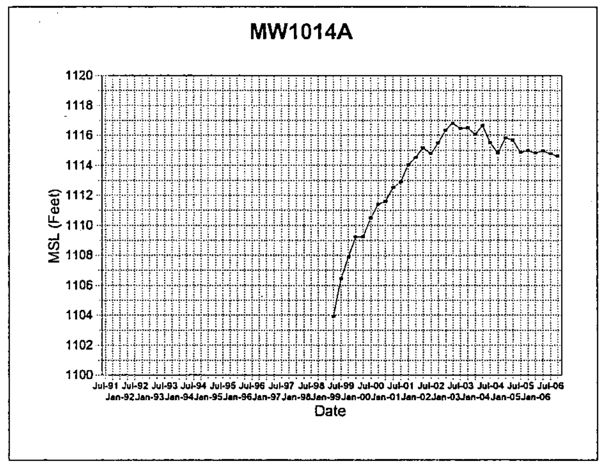
Flambeau Mining Company

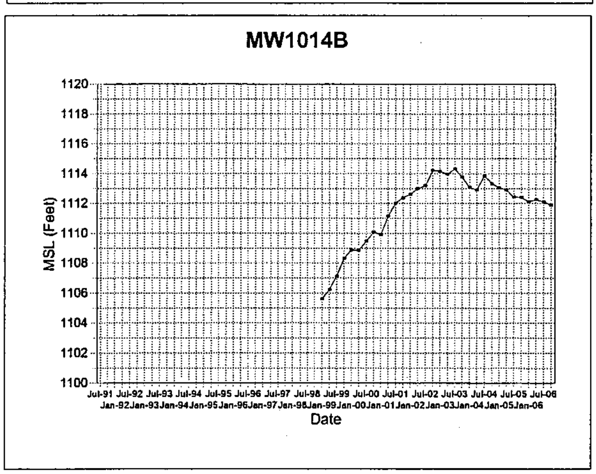
Groundwater Elevation Results

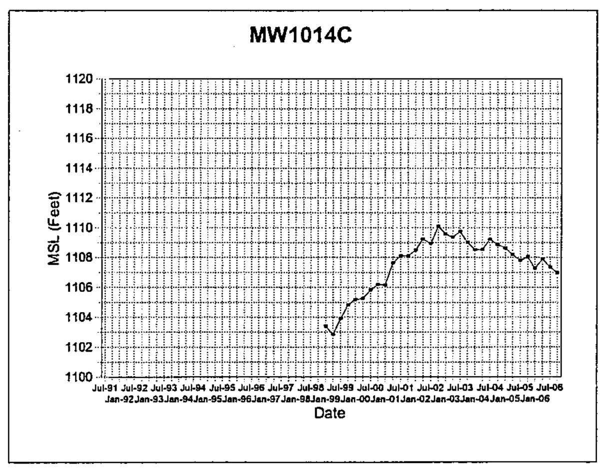


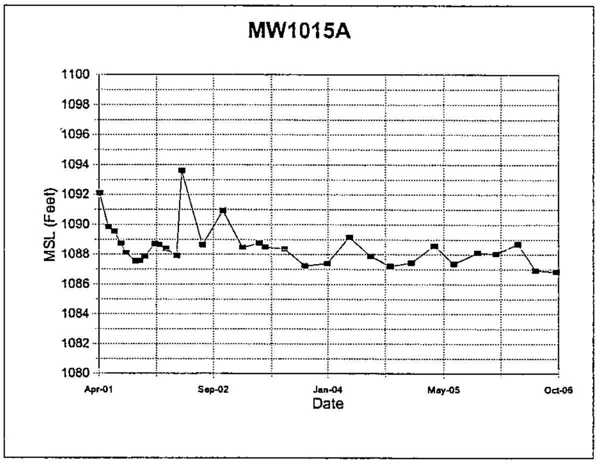



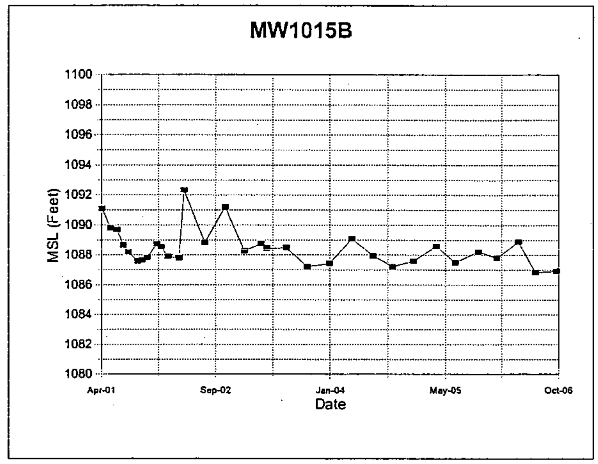


Created By: SGL Checked By: DAT

Flambeau Mining Company

Groundwater Elevation Results





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# Appendix C

## Crayfish Memorandum

**Blue Iris Environmental, Inc.**
**Memorandum**

November 20, 2006

TO: Jana Murphy, Flambeau Mining Company

FR: Bill West, Blue Iris Environmental, Inc.

RE: Report on Activities Conducted in 2006 Associated with Collection and Analysis of Crayfish from the Flambeau River, Ladysmith, Wisconsin

## Introduction

On September 11 and 12, Bill West of Blue Iris Environmental, Inc. completed crayfish collection activities at three sites on the Flambeau River downstream of Ladysmith, Wisconsin. This activity was conducted at the request of Flambeau Mining Company (Flambeau). Crayfish were collected similarly to collection activities which were conducted during the active phase of the Flambeau Mining Operation. As in previous collection efforts, the purpose of the crayfish collection was to conduct metals analysis of crayfish at selected sites upstream and downstream of the now reclaimed Flambeau Mine Site. Between 25 and 30 crayfish were collected at each of the following sites, which are also shown on Figure 1.

- The Flambeau River at the Blackberry Lane access (upstream site)
- The Flambeau River at Meadowbrook Creek (downstream site)
- The Flambeau River at the site of the former Port Arthur Dam (downstream site)

## Methodology

All samples were collected using an 8 by 18 inch rectangular net with 800 to 900 micron mesh size. Crayfish were collected by using a kick seine method.

Specimens were composited for each site in a Ziploc bag and placed on ice. Specimens were transported to Northern Lake Service, Crandon, Wisconsin for metals analysis.

*N5811 Twelve Corners Road, Black Creek, Wisconsin 54106 : ph-920-730-5684 : fax-920-738-7774 :email-blueiris@milwpc.com*

Crayfish were collected during the following time windows:

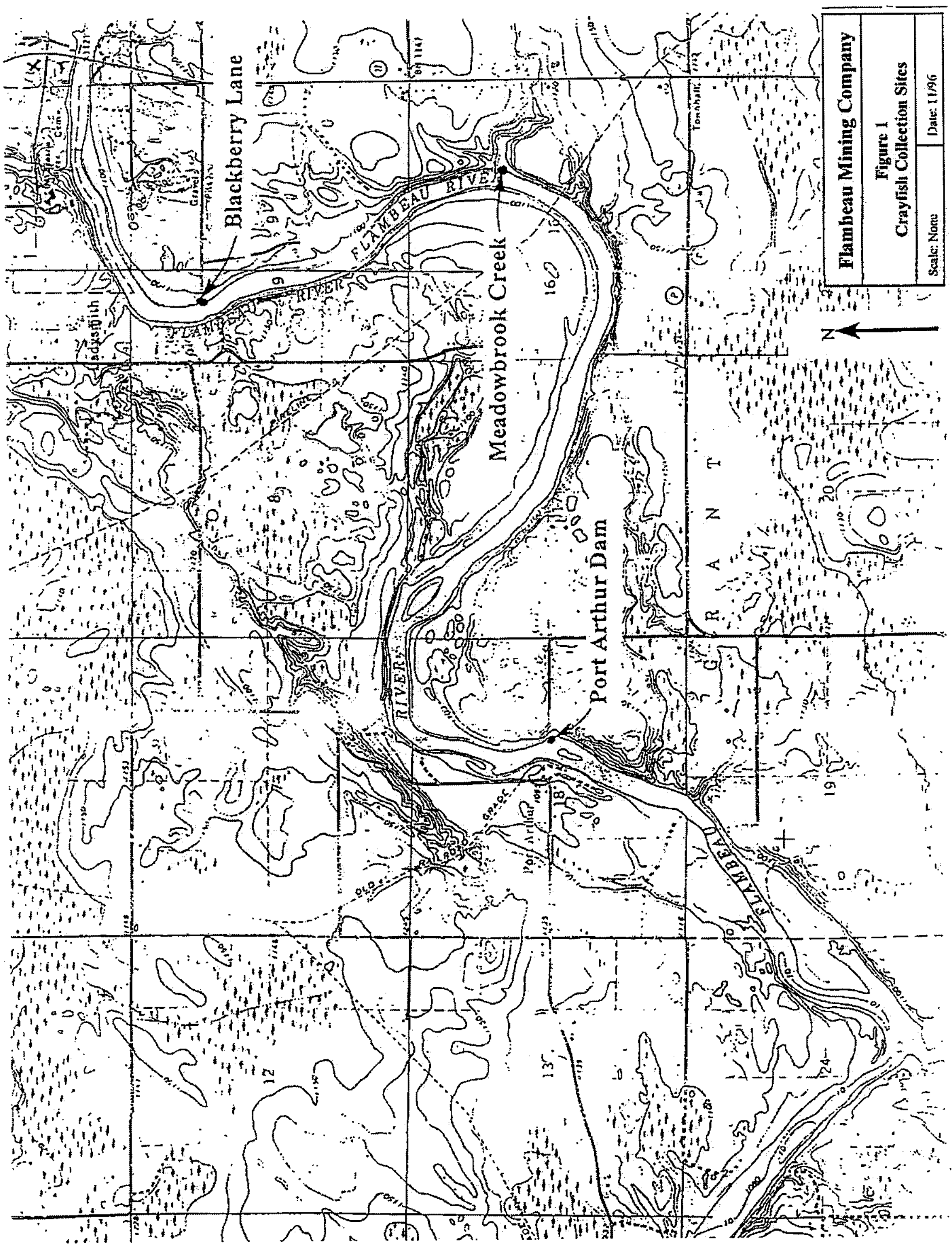
| Site Location | Time of Collection | Number of Crayfish |
|---|---|---|
| Blackberry Lane | Sept 11 (3:00 p.m.) | 30 |
| Port Arthur Dam | Sept 12 (9:15 a.m.) | 30 |
| Meadowbrook Creek | Sept 12 (11:00 a.m.) | 30 |

**Results and Discussion**

Water levels in the Flambeau River during which the crayfish were collected were considered slightly low. Water level in the river on the day of collection was several inches below bank stage at Blackberry Lane and Meadowbrook Creek to about bank stage at Port Arthur Dam. Water stage will fluctuate one to two feet during the day when water is discharged for power generation at the Ladysmith Dam. Water temperature during the collection was 17.3$^0$C at Blackberry lane, 16.3$^0$C at Meadowbrook Creek and 17.1$^0$C at Port Arthur Dam.

The results of the analysis of the crayfish appear in Table 1. Raw laboratory results are provided in Appendix1. The results represent a composite from all crayfish collected per site. Whole bodies were used for analysis. A review of the data indicated that no relative difference in parameter concentrations from upstream locations to downstream locations is evident. Data for the three sites are similar when compared to each other and , are also comparable to results which were obtained both during the active mine operations and the years during and immediately following the mine site reclamation. It is noted that in 2001 concentrations of metal for cadmium, chromium, and aluminum for all locations had elevated but in 2004 and 2006 all metal concentrations for each of these sites were observed to be within the range of concentrations from previous work efforts.

Based on all data collected, including that which was collected in 2006, there are no impacts to crayfish relative to metal uptake whether we are looking at upstream/downstream effects or effects due to time (active mining phase, mine site reclamation, or post-reclamation).




N5811 Twelve Corners Road, Black Creek, Wisconsin 54106 : ph-920-730-5684 : fax-920-738-7774 :email-blueiris@milwpc.com

Table 1
Metals analysis of Crayfish
Flambeau River, Ladysmith, Wisconsin
Results in mg/kg
1991- 2001, 2004, 2006

| Sample ID | Cadmium | Chromium | Copper | Nickel | Lead | Zinc | Aluminum | Mercury | Arsenic | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blackberry Lane** | | | | | | | | | | | |
| 1991 | 0.1 | 1.0 | 17 | 0.4 | 1.2 | 23 | 36 | 0.1 | 0.24 | 0.14 | 0.2 |
| 1992 | <0.1 | 0.4 | 16 | <0.2 | 0.1 | 43 | 46 | 0.1 | 0.30 | 0.13 | <0.1 |
| 1993 | 0.03 | <0.09 | 15 | 0.2 | <0.05 | 16 | 28 | <0.2 | <0.09 | <0.19 | 0.06 |
| 1994 | 0.02 | 0.92 | 9.9 | <0.22 | <0.05 | 12 | 17 | <0.02 | <0.75 | <1.93 | <0.09 |
| 1995 | <0.04 | 0.96 | 21 | <0.19 | <0.23 | 21 | 48 | <0.05 | <0.41 | <0.44 | <0.05 |
| 1996 | <0.06 | <0.16 | 20 | 0.40 | <0.97 | 16 | 24 | <0.02 | 0.33 | <0.13 | <0.25 |
| 1997 | <0.07 | 0.67 | 18 | <0.41> | <1.2 | 20 | 17 | <0.025> | <0.82 | <0.95 | <0.44 |
| 1998 | <0.038> | <0.17> | 15 | <0.47> | <0.71 | 14 | 15 | <0.067 | <0.45> | <0.28 | <0.035 |
| 1999 | <0.049 | <0.24> | 12 | <0.17> | <0.80 | 10 | 36 | <0.027 | <0.28 | <0.32 | <0.040 |
| 2000 | <0.063 | <0.18 | 8.8 | <0.20 | <1.6 | 9.4 | 11 | <0.10 | <0.42 | <0.34 | <0.093 |
| 2001 | 0.32 | <0.53> | 14 | 0.86 | <2.1 | 18 | 46 | <0.033 | <0.29 | <0.21 | <0.17 |
| 2004 | <0.10 | <0.31> | 15 | <0.49> | <1.7 | 19 | 21 | <0.032 | <0.45 | <0.28 | <0.12 |
| 2006 | <0.072 | <0.36> | 15 | <0.36> | <1.3 | 21 | 33 | <0.038> | <0.51 | <0.49 | <0.096 |

Table 1 (cont)

| Sample ID | Cadmium | Chromium | Copper | Nickel | Lead | Zinc | Aluminum | Mercury | Arsenic | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Meadowbrook Creek** | | | | | | | | | | | |
| 1991 | 0.1 | 1.6 | 20 | 0.5 | 1.3 | 27 | 36 | 0.1 | 0.29 | 0.15 | 0.2 |
| 1992 | <0.1 | 0.5 | 19 | <0.2 | 0.2 | 39 | 82 | 0.11 | 0.4 | 0.12 | <0.1 |
| 1993 | 0.04 | <0.09 | 15 | 0.2 | <0.04 | 15 | 18 | <0.20 | <0.08 | <0.35 | 0.08 |
| 1994 | 0.02 | 0.74 | 22 | <0.29 | <0.09 | 17 | 31 | <0.03 | <0.66 | <1.64 | <0.08 |
| 1995 | <0.05 | 0.71 | 27 | <0.23 | <0.33 | 19 | 69 | <0.06 | <0.60 | <0.64 | <0.07 |
| 1996 | <0.08 | <0.22 | 28 | 0.74 | <1.3 | 16 | 30 | <0.02 | <0.26 | <0.14 | <0.35 |
| 1997 | <0.066 | <0.49> | 24 | <0.55> | <1.1 | 17 | 42 | <0.029 | <0.78 | <0.91 | <0.41 |
| 1998 | <0.037 | <0.19> | 24 | <0.34> | <0.72 | 14 | 32 | <0.067 | <0.50 | <0.28 | <0.036 |
| 1999 | <0.047 | <0.11 | 13 | <0.20> | <0.76 | 8.6 | 14 | <0.027 | <0.23 | <0.26 | <0.038 |
| 2000 | <0.056 | <0.36> | 21 | <0.36> | <1.4 | 14 | 18 | <0.10 | <0.49> | <0.34 | <0.082 |
| 2001 | 0.40 | 1.1 | 26 | 0.85 | <2.0 | 17 | 67 | <0.034 | <0.30 | <0.22 | <0.17 |
| 2004 | <0.12 | <0.37> | 25 | <0.76> | <1.9 | 19 | 36 | <0.032 | <0.49 | <0.31 | <0.14 |
| 2006 | <0.085 | <0.22> | 26 | <0.40> | <1.6 | 25 | 39 | <0.065> | 0.66 | <0.4 | <0.11 |

Table 1 (cont)

| Sample ID | Cadmium | Chromium | Copper | Nickel | Lead | Zinc | Aluminum | Mercury | Arsenic | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Port Arthur Dam** | | | | | | | | | | | |
| 1991 | 0.1 | 1.6 | 20 | 0.5 | 1.2 | 21 | 27 | 0.3 | 0.28 | 0.15 | 0.2 |
| 1992 | <0.1 | 0.4 | 14 | 1.5 | 0.2 | 33 | 430 | 0.1 | 0.34 | 0.14 | <0.1 |
| 1993 | 0.03 | <0.09 | 12 | <0.15 | <0.04 | 11 | 22 | <0.2 | <0.1 | <0.36 | 0.09 |
| 1994 | 0.04 | 0.92 | 18 | <1.4 | <0.10 | 15 | 28 | <0.02 | <0.76 | <1.88 | <0.09 |
| 1995 | <0.04 | 4.5 | 24 | 0.05 | <0.25 | 16 | 130 | <0.06 | <0.45 | <0.48 | <0.05 |
| 1996 | <0.07 | 0.17 | 28 | 0.44 | <1.1 | 16 | 68 | <0.02 | <0.28 | <0.42 | <0.28 |
| 1997 | <0.049 | <0.26> | 22 | <0.53> | <0.81 | 16 | 11 | 0.065 | <0.74 | <0.86 | <0.30 |
| 1998 | <0.037 | <0.027> | 24 | <0.20> | <0.72 | 15 | 29 | <0.067 | <0.46> | <0.29 | <0.036 |
| 1999 | <0.048 | <0.12 | 14 | <0.15 | <0.78 | 8.9 | 17 | <0.027 | <0.27 | <0.31 | <0.039 |
| 2000 | <0.062 | <0.25> | 16 | <0.29> | <1.6 | 12 | 25 | <0.10 | <0.37 | <0.30 | <0.091 |
| 2001 | 0.39 | 0.86 | 23 | 0.97 | <2.1 | 17 | 48 | <0.033 | <0.31 | <0.23 | <0.17 |
| 2004 | <0.10 | <0.26> | 23 | <0.52> | <1.6 | 16 | 25 | <0.057> | <0.57 | <0.36 | <0.12 |
| 2006 | <0.089 | <0.40> | 28 | <0.42> | <1.6 | 20 | 48 | <0.065> | 0.78 | <0.39 | <0.12 |

Data for Blackberry Lane is represented by Sample ID# 418000, Meadowbrook Creek by Sample ID#418001, and Port Arthur Dam by ID#418002
Data appearing in brackets (<>) fall between the level of detection (LOD) and level of quantitation (LOQ).

Prepared by WMW
Checked by BJW

# Appendix 1

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Project: Flambeau Mining Company

**FMC-BBL-CR NLS ID: 418000**
Ref. Line 9 COC 84326 FMC-BBL-CR Matrix: FI
Collected: 09/11/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Aluminum, tot. recoverable as Al by ICP | 33 | mg/Kg WWB | 1 | 0.60 | 2.2 | 10/05/06 | SW846 6010 | 721026460 |
| Arsenic, tot. recoverable as As by furnace AAS | [0.51] | mg/Kg WWB | 20 | 0.20 | 0.76 | 10/06/06 | SW846 7060 | 721026460 |
| Cadmium, tot. recoverable as Cd by ICP | ND | mg/Kg WWB | 1 | 0.072 | 0.26 | 10/04/06 | SW846 6010 | 721026460 |
| Chromium, tot. recoverable as Cr by ICP | [0.36] | mg/Kg WWB | 1 | 0.15 | 0.55 | 10/04/06 | SW846 6010 | 721026460 |
| Copper, tot. recoverable as Cu by ICP | 15 | mg/Kg WWB | 1 | 0.050 | 0.18 | 10/04/06 | SW846 6010 | 721026460 |
| Lead, tot. recoverable as Pb by ICP | ND | mg/Kg WWB | 1 | 1.3 | 4.9 | 10/05/06 | SW846 6010 | 721026460 |
| Mercury (Tissue) by CVAA | [0.038] | mg/Kg WWB | 1 | 0.035 | 0.11 | 10/03/06 | SW846 7470 | 721026460 |
| Nickel, tot. recoverable as Ni by ICP | [0.36] | mg/Kg WWB | 1 | 0.22 | 0.81 | 10/04/06 | SW846 6010 | 721026460 |
| Selenium, tot. recoverable as Se by furnace | ND | mg/Kg WWB | 20 | 0.49 | 1.7 | 10/06/06 | SW846 7740 | 721026460 |
| Silver, tot. recoverable as Ag by ICP | ND | mg/Kg WWB | 1 | 0.096* | 0.31* | 10/04/06 | SW846 6010 | 721026460 |
| Zinc, tot. recoverable as Zn by ICP | 21 | mg/Kg WWB | 1 | 0.047 | 0.18 | 10/04/06 | SW846 6010 | 721026460 |
| Metals digestion - tot. recov. (solid) GF | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Metals digestion - tot. recov (solid) ICP | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Misc. Sample Prep | yes | | | | | 09/25/06 | NA | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 11/09/06 Code: S 
NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**FMC-MBC-CR NLS ID: 418001**
Ref. Line 10 COC 84326 FMC-MBC-CR Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Aluminum, tot. recoverable as Al by ICP | 39 | mg/Kg WWB | 1 | 0.70 | 2.6 | 10/05/06 | SW846 6010 | 721026460 |
| Arsenic, tot. recoverable as As by furnace AAS | 0.66 | mg/Kg WWB | 20 | 0.17 | 0.62 | 10/06/06 | SW846 7060 | 721026460 |
| Cadmium, tot. recoverable as Cd by ICP | ND | mg/Kg WWB | 1 | 0.085 | 0.31 | 10/04/06 | SW846 6010 | 721026460 |
| Chromium, tot. recoverable as Cr by ICP | [0.22] | mg/Kg WWB | 1 | 0.18 | 0.65 | 10/04/06 | SW846 6010 | 721026460 |
| Copper, tot. recoverable as Cu by ICP | 26 | mg/Kg WWB | 1 | 0.059 | 0.22 | 10/04/06 | SW846 6010 | 721026460 |
| Lead, tot. recoverable as Pb by ICP | ND | mg/Kg WWB | 1 | 1.6 | 5.8 | 10/05/06 | SW846 6010 | 721026460 |
| Mercury (Tissue) by CVAA | [0.065] | mg/Kg WWB | 1 | 0.035 | 0.11 | 10/03/06 | SW846 7470 | 721026460 |
| Nickel, tot. recoverable as Ni by ICP | [0.40] | mg/Kg WWB | 1 | 0.26 | 0.95 | 10/04/06 | SW846 6010 | 721026460 |
| Selenium, tot. recoverable as Se by furnace | ND | mg/Kg WWB | 20 | 0.40 | 1.4 | 10/06/06 | SW846 7740 | 721026460 |
| Silver, tot. recoverable as Ag by ICP | ND | mg/Kg WWB | 1 | 0.11* | 0.36* | 10/04/06 | SW846 6010 | 721026460 |
| Zinc, tot. recoverable as Zn by ICP | 25 | mg/Kg WWB | 1 | 0.055 | 0.21 | 10/04/06 | SW846 6010 | 721026460 |
| Metals digestion - tot. recov. (solid) GF | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Metals digestion - tot. recov (solid) ICP | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Misc. Sample Prep | yes | | | | | 09/25/06 | NA | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection
DWB = Dry Weight Basis
Shaded results indicate >MCL.
LOQ = Limit of Quantitation
NA = Not Applicable
ND = Not Detected (< LOD)
%DWB = (mg/kg DWB) / 10000
1000 ug/L = 1 mg/L

Reviewed by: ______

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Project: Flambeau Mining Company

**FMC-PAD-CR NLS ID: 418002**
Ref. Line 11 COC 84326 FMC-PAD-CR Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Aluminum, tot. recoverable as Al by ICP | 48 | mg/Kg WWB | 1 | 0.74 | 2.7 | 10/05/06 | SW846 6010 | 721026460 |
| Arsenic, tot. recoverable as As by furnace AAS | 0.78 | mg/Kg WWB | 20 | 0.16 | 0.59 | 10/06/06 | SW846 7060 | 721026460 |
| Cadmium, tot. recoverable as Cd by ICP | ND | mg/Kg WWB | 1 | 0.089 | 0.33 | 10/04/06 | SW846 6010 | 721026460 |
| Chromium, tot. recoverable as Cr by ICP | [0.40] | mg/Kg WWB | 1 | 0.19 | 0.68 | 10/04/06 | SW846 6010 | 721026460 |
| Copper, tot. recoverable as Cu by ICP | 28 | mg/Kg WWB | 1 | 0.062 | 0.23 | 10/04/06 | SW846 6010 | 721026460 |
| Lead, tot. recoverable as Pb by ICP | ND | mg/Kg WWB | 1 | 1.6 | 6.1 | 10/05/06 | SW846 6010 | 721026460 |
| Mercury (Tissue) by CVAA | [0.065] | mg/Kg WWB | 1 | 0.035 | 0.11 | 10/03/06 | SW846 7470 | 721026460 |
| Nickel, tot. recoverable as Ni by ICP | [0.42] | mg/Kg WWB | 1 | 0.27 | 1.0 | 10/04/06 | SW846 6010 | 721026460 |
| Selenium, tot. recoverable as Se by furnace | ND | mg/Kg WWB | 20 | 0.39 | 1.4 | 10/06/06 | SW846 7740 | 721026460 |
| Silver, tot. recoverable as Ag by ICP | ND | mg/Kg WWB | 1 | 0.12* | 0.38* | 10/04/06 | SW846 6010 | 721026460 |
| Zinc, tot. recoverable as Zn by ICP | 20 | mg/Kg WWB | 1 | 0.058 | 0.22 | 10/04/06 | SW846 6010 | 721026460 |
| Metals digestion - tot. recov. (solid) GF | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Metals digestion - tot. recov (solid) ICP | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Misc. Sample Prep | yes | | | | | 09/25/06 | NA | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection  LOQ = Limit of Quantitation  ND = Not Detected (< LOD)  1000 ug/L = 1 mg/L
DWB = Dry Weight Basis  NA = Not Applicable  %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by.
R. T. Krueger
President

# Appendix D

## Macroinvertebrate Memorandum

**Blue Iris Environmental, Inc.**
**Memorandum**

November 8, 2006

TO: Jana Murphy, Flambeau Mining Company

FR: Bill West, Blue Iris Environmental, Inc.

RE: Summary of Activities, 2006, Macroinvertebrate Collection
Flambeau River, Ladysmith, Wisconsin

## Introduction

On September 11 and 12, 2006, Bill West of Blue Iris Environmental, Inc. completed macroinvertebrate collection activities as requested by Flambeau Mining Company. These activities were completed in similar locations and fashion as had previously been completed by the Flambeau Mining Company during the active phase of the Mining Project. The Project location is on the Flambeau River south of Ladysmith, Wisconsin. Three sampling locations, one upstream of the former mine discharge location and two downstream of the discharge location, were sampled. Sampling locations include the end of Blackberry Lane (upstream location), the Flambeau River at the confluence with Meadowbrook Creek and at the site of the former Port Arthur Dam – the latter two sites being downstream sites. Sample site locations are identified in Figure 1. This report describes the collection activities and records observations noted on the day of collection along with enumeration of macroinvertebrate specimens collected.

## Site Conditions

Water levels in the Flambeau River during which the macroinvertebrates were collected were considered low. Water level in the river on the days of collection was about six inches to a foot below bank stage at Blackberry Lane and Meadowbrook Creek to near back stage at Port Arthur Dam. Water levels can fluctuate as much as two feet or more due to diurnal dam fluctuations for power generation upstream. Because of the lower water level, collections from the sites, especially Blackberry Lane were assumed to contain fewer organisms which inhabit near shore overhanging vegetation.

## Methods

Macroinvertebrate samples were collected using a net with an 8 by 18-inch opening and an 800 to 900 micron mesh size. In-stream sampling methods consisted of kick seining. At each of the three sites, in-stream sampling was conducted for approximately two man-hours. This time window included sorting of collected specimens from debris. Specimens were preserved in 10% formalin.

Once collected and preserved, samples were sent to Ken Tennessen, Wautoma, Wisconsin for identification and enumeration.

## Site-Specific Observations and Conditions

### *Blackberry Lane*

Blackberry Lane macroinvertebrate collections were completed on September 11, 2006. Water temperature was 17.3°C with an air temperature of 13.4°C. Skies were overcast with a light drizzle. Bank vegetation at the Blackberry Lane access is made up of grass/sedge with a significant amount of overhang at the water edge. Normally, this is an excellent habitat from which to collect macroinvertebrates particularly certain beetles, water scorpions, water striders, and damselflies. This habitat was not sampled in 2006 due to the low water levels. Most sampling at this site was in the main stream from shore to approximately 50 feet out in one to three feet of water.

The substrate of Blackberry lane is characterized as well washed rock and cobble with gravel filling the interstices.

### *Meadowbrook Creek*

Collections on the Flambeau River immediately above the Meadowbrook Creek confluence were taken on September 12, 2006. Water temperature was 18.1°C with an air temperature of 14.4°C. Skies were partly cloudy. Water levels were approximately six inches below back stage with exposed shoreline visible throughout the area.

Near shore substrate consists of fine gravel and washed cobble. Several large boulders are present throughout the area while the main substrate offshore consists of rock in the three to five inch size category.

### *Port Arthur Dam*

Collections on the Flambeau River at the former Port Arthur Dam location were conducted on September 12, 2006. Water temperature was 17.1°C with an air temperature of 14.4°C. Skies were partly cloudy. Water levels were approximately bank stage.

Substrate in this location consists of larger rock, six inches or larger is common. At least one large tree, greater than 18 inches in diameter, has existed submerged in this area over the entire length of the Flambeau Mining Project and continues to provide substrate and habitat for macroinvertebrates.

## Results and Discussion

All collected specimens were sent to Dr. Ken Tennessen for identification and enumeration. If any specimens would have been suspected of being a threatened and endangered species (T&E) or a species of special concern, these genera would have been keyed to species. No T&E species or special concern species were found. All specimens found are provided on Table 1. In all three sites, efforts were expended to collect over a two hour window or a minimum of 100 specimens. If at the end of each target window (time window or total count) there were still specimens within a kick seine, the particular kick seine was added to the total. Therefore, all sites exceeded the 100 specimen minimum and, at Blackberry Lane there were a significant amount of specimens observed in the final kick seine. Therefore, Blackberry Lane appears to have significantly more specimens per unit effort than the other sites but this may be due more to the makeup of the last sample collected. Also it must be remembered that Blackberry Lane substrate makes it easier to employ kick seine methods due to the smaller sized cobble.

In general, specimens collected represent most of the major groups of macroinvertebrates expected to be observed. There are a fair number of representatives of Ephemeroptera (mayflies) which is indicative of good water quality. Other major groups that were well represented included the Tricoptera (caddisfly) and Diptera (flies). All three groups were well represented in all sampling efforts since the beginning of the Flambeau Mining Project in 1991.

Table 2 provides the macroinvertebrate information from 1991 for the years during which data was collected. In some years, not all specimens were keyed to species so it should be noted that for those years, data will be listed under a common genera. For instance, for the Mayfly genus Caenis, in some years there are listed several species while in some instances all species are listed as Caenis sp.

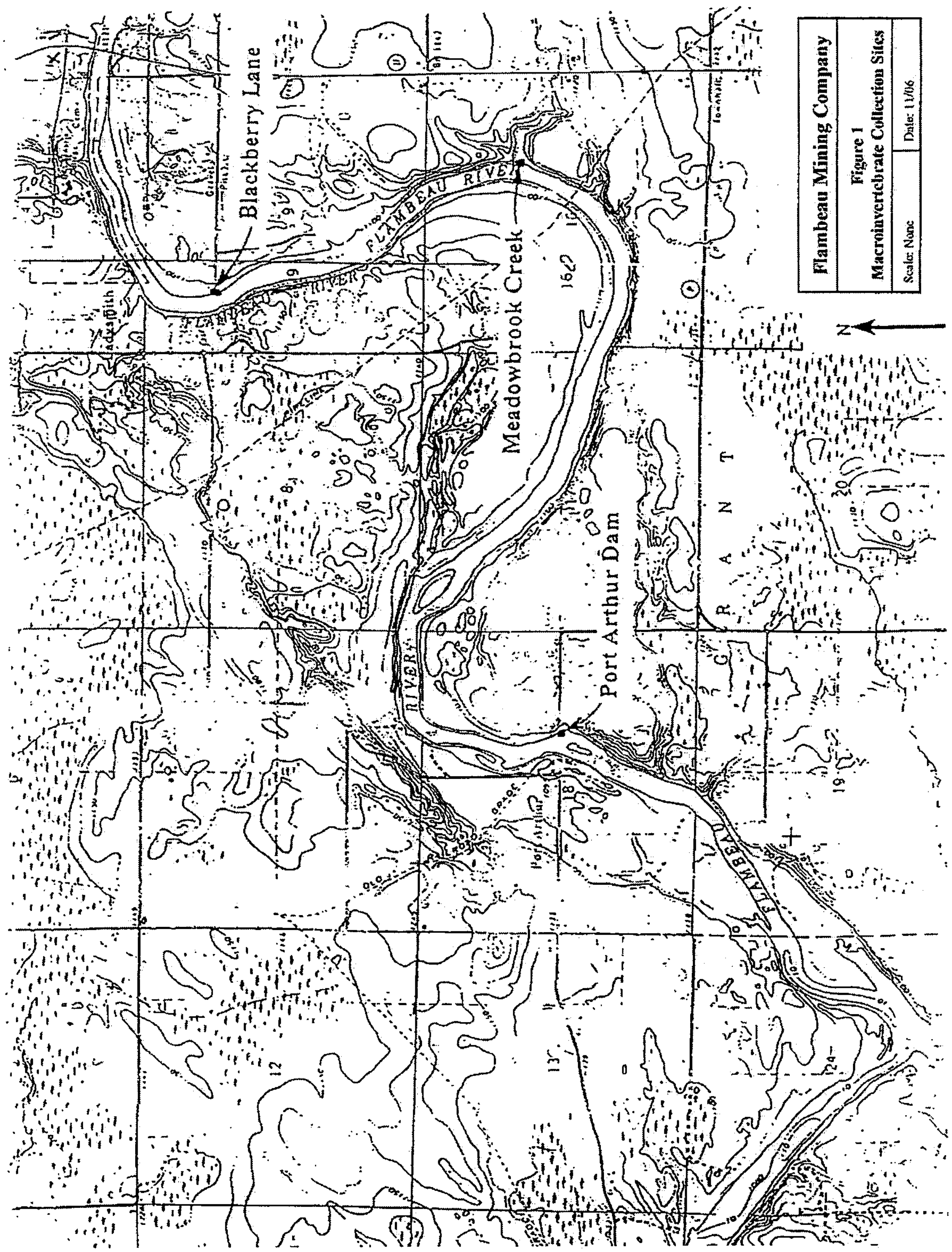

Flambeau Mining Company
Figure 1
Macroinvertebrate Collection Sites
Scale: None
Date: 11/06
Blackberry Lane
Meadowbrook Creek
Port Arthur Dam
FLAMBEAU RIVER
N

**Table 1**
**Macroinvertibrates Collected From Three Locations Near the Flambeau Mine Site**
**September 2006**

| Taxa | Blackberry Lane | Meadowbrook Creek | Port Arthur Dam |
|---|---|---|---|
| **Oligocheata** | 8 | 4 | 7 |
| **Decopoda** | | | |
| Orconectes sp. | 3 | 3 | 2 |
| **Amphipoda** | | | |
| Gammerus sp. | | | 2 |
| **Gastropoda** | | | |
| Ancylidae | 3 | 1 | |
| **Pelecypoda** | | | |
| **Ephemeroptera** | | | |
| Acanthopotamus sp. | | 1 | |
| Baetis sp | 33 | 7 | |
| Caenis sp | 1 | 4 | |
| Choroterpes sp. | | 4 | 3 |
| Hexagenia sp. | | 35 | 10 |
| Isonychia sp. | 3 | 1 | |
| Leucrocuta sp. | 5 | 3 | |
| Procloeon sp. | 29 | 6 | 36 |
| Stenocron sp. | | | 1 |
| Stenonema sp. | 2 | 30 | 44 |
| **Odonata** | | | |
| Argia moesta | | 2 | 10 |
| Ophiogomphus sp | 3 | 1 | |
| **Plecoptera** | | | |
| Acorneuria sp. | 1 | | 1 |
| Agnetina sp. | 43 | 3 | |
| Perlinella sp. | 1 | | |
| **Megaloptera** | | | |
| Corydalus cornutus | 7 | | |
| **Tricoptera** | | | |
| Cheumatopsyche sp | .120 | 32 | 2 |
| Chimarra sp. | 7 | 1 | |
| Hydropsyche sp. | 7 | | 1 |
| Macrostemum sp. | 3 | | |
| **Coleoptera** | | | |
| Ectopria sp. | | 1 | |
| Optioservus sp. | 34 | | |

| Table 1 (cont.) | | | |
|---|---|---|---|
| **Coleoptera (cont.)** | Blackberry Lane | Meadowbrook Creek | Port Arthur Dam |
| Stenelmis sp. | 27 | 11 | 1 |
| **Diptera** | | | |
| Atherix sp. | 1 | | |
| Ceratopogonidae | 1 | | |
| Chirononmidae | 29 | 8 | 11 |
| Tipulidae | 44 | | |
| | | | |
| **Total** | 415 | 158 | 131 |

## Table 2

### Macroinvertebrates Collected From Flambeau River, Ladysmith, WI
### Site: Blackberry Lane, 1991 - 1998, 2004, 2006

| Taxa | Blackberry Lane | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| **Platyhelminthes** | | | | | | | | | | |
| **Dugesia sp.** | 2 | 2 | - | - | - | - | - | 1 | - | |
| **Oligochaete** | | | | | | | | | | 8 |
| Aulodrilus sp. | - | - | - | - | - | - | - | - | - | - |
| Branchiobdellida sp. | - | - | - | - | - | - | - | 3 | 1 | - |
| Chetogaster limnae | - | - | - | - | - | - | - | - | - | - |
| Dero sp. | - | - | - | - | - | - | - | - | - | - |
| Limnodrilus hoffmeisteri | - | - | - | - | - | - | - | - | - | - |
| Enchytraeidae | - | - | - | - | - | - | - | - | - | - |
| Lumbriculidae | - | - | - | - | - | - | - | - | - | - |
| Lumbriculus variegatus | - | - | - | - | - | - | - | - | - | - |
| Tubificidae | 1 | 1 | - | - | - | - | 1 | 1 | 3 | - |
| Naididae | - | - | 3 | - | 1 | - | 21 | 14 | 5 | - |
| **Decapoda** | | | | | | | | | | |
| Orconectes sp. | - | - | - | 5 | 6 | - | - | - | - | 3 |
| Orconectes rusticus | - | - | - | - | - | 4 | 4 | 4 | 2 | - |
| Orconectes virlis | - | - | 4 | - | - | - | - | - | - | - |
| **Isopoda** | | | | | | | | | | |
| Caecidotea sp. | 39 | - | - | - | - | - | - | - | - | - |
| **Amphipoda** | | | | | | | | | | |
| Hyalella azteca | - | - | - | - | - | - | - | - | - | - |
| Gammarus sp. | - | - | - | - | - | - | - | - | - | - |
| Gammerus pseudolimnaeus | 5 | - | - | - | - | - | - | - | - | - |
| Crangonyx sp. | - | - | - | - | - | - | - | - | - | - |
| **Hydracarina** | - | - | 2 | - | - | - | - | - | - | - |

Table 2 (cont.)

| | Blackberry Lane | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Taxa** | **1991** | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** | **2004** | **2006** |
| **Gastropoda** | | | | | | | | | | |
| Ancylidae | - | - | - | - | - | - | - | - | - | 3 |
| Ferrissia sp. | 6 | 8 | - | - | - | 5 | 6 | 6 | 12 | - |
| Campeloma sp. | - | - | - | - | - | - | - | - | - | - |
| Physella sp. | - | - | - | - | - | - | 1 | - | - | - |
| Helisoma sp. | - | - | - | - | - | - | - | - | - | - |
| Amnicola sp. | - | - | - | - | - | - | - | - | - | - |
| **Pelecypoda** | | | | | | | | | | |
| Sphaeriidae immature | 3 | 4 | 5 | - | - | - | - | - | - | - |
| Sphaerium striatinum | - | - | - | - | - | - | - | - | - | - |
| Elliptio dilatata | - | - | - | - | - | - | 1 | - | - | - |
| Pisidium sp. | - | - | - | - | - | - | - | - | 6 | - |
| **Ephemeroptera** | | | | | | | | | | |
| Isonychia (Isonychia) sp. | - | 3 | 19 | 16 | 10 | 38 | 4 | 1 | 9 | 3 |
| Anthopotamus verticis | 7 | 18 | 73 | 13 | 123 | 51 | 82 | 74 | - | - |
| Stenonema exiguum | - | - | - | - | - | - | - | - | - | - |
| Stenacron sp. | - | - | - | - | - | - | - | - | - | - |
| Stenonema femoratum | - | - | - | - | - | - | - | - | - | - |
| Stenonema mediopunctatum | - | 7 | 29 | - | 11 | 14 | 6 | 12 | 23 | - |
| Stenonema terminatum | - | - | - | - | - | 1 | - | 1 | 3 | - |
| Stenonoma vicarium | 1 | - | 9 | - | 4 | 10 | 2 | 7 | 5 | - |
| Stenonema sp. | - | - | - | 1 | - | - | - | - | - | 2 |
| Lecrocuta sp. | - | - | - | - | - | 1 | - | 8 | 33 | 5 |
| Baetis flavistriga | - | - | - | - | - | 4 | 8 | 1 | 46 | - |
| Baetis pygmaeus | - | - | - | - | - | - | - | - | - | - |
| Baetis intercalaris | - | - | - | - | 13 | - | 3 | - | 9 | - |
| Baetis sp. | - | 2 | 153 | - | - | - | - | - | - | 33 |

Table 2 (cont.)

| Taxa Ephemeroptera (cont.) | Blackberry Lane 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|
| Baetisca sp. | - | - | - | - | - | - | - | - | - | - |
| Ephemerella sp. | 1 | 2 | - | - | - | - | - | - | - | - |
| Stenocron sp. | - | - | - | - | - | - | - | - | - | - |
| Acerpenna pygmaea | - | - | - | - | - | - | 1 | 1 | 2 | - |
| Acentrella sp. | - | - | - | - | - | - | - | - | 2 | - |
| Acentrella ampla | - | - | - | - | - | 1 | - | - | - | - |
| Centroptilum sp. | - | - | - | - | - | - | - | - | - | - |
| Procloeon sp. | - | - | - | - | - | - | 1 | - | - | 29 |
| Ephemera simulans | - | 1 | - | - | - | - | - | - | 1 | - |
| Caenis sp. | - | - | - | - | - | - | - | 3 | 2 | 1 |
| Callibaetis sp. | - | - | - | - | - | - | - | - | - | - |
| Choroterpes sp. | - | - | - | - | - | - | - | - | - | - |
| Leptophlebia sp. | - | - | - | - | - | - | - | - | 2 | - |
| Heptagenia hebe | - | - | 4 | - | - | - | - | - | - | - |
| Paraleptophlebia sp. | - | - | 1 | - | - | - | - | - | - | - |
| Ephoron eukon | - | - | - | - | - | - | - | - | 36 | - |
| Pseudocloeon propinquus | - | - | - | - | - | - | - | - | - | - |
| Procloeon sp. | - | - | - | - | - | - | - | - | 5 | - |
| **Odonata** | | | | | | | | | | |
| Ophiogomphus sp. | - | - | - | - | - | - | 4 | 5 | 2 | 3 |
| Ophiogomphus rupinsulensis | 3 | 4 | 8 | 12 | 5 | 4 | 2 | - | - | - |
| Argia sp. | - | - | - | - | - | - | - | - | - | - |
| Calopteryx sp. | 1 | - | - | - | - | - | - | - | - | - |
| Aeshna sp. | - | - | - | - | - | - | - | - | - | - |
| Somatochlora sp. | - | - | - | - | - | - | - | - | - | - |
| Hylogomphus sp. | - | - | - | 1 | - | - | - | - | - | - |
| **Plecoptera** | | | | | | | | | | |
| Agnetina capitata | 46 | 48 | 58 | 35 | 32 | 73 | 26 | 2 | - | 43 |

Table 2 (cont.)

| Taxa<br>Plecoptera (cont.) | Blackberry Lane<br>1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|
| Acroneuria abnormis | - | - | 2 | 1 | 3 | - | 1 | 2 | - | 1 |
| Perlinella drymo | - | - | - | - | - | - | - | 2 | - | 1 |
| Perlinella sp. | - | - | - | - | - | - | - | - | - | - |
| Pteronarcys sp. | 1 | - | - | 1 | - | - | - | - | - | - |
| Neoperla clymene | - | - | - | - | - | - | - | - | 20 | - |
| **Megaloptera** | | | | | | | | | | |
| Nigronia sp. | - | 1 | - | - | - | - | - | - | - | - |
| Nigronia serricornis | - | - | - | 2 | - | - | 1 | - | 1 | - |
| Corydalus cornutus | - | - | 4 | - | - | 1 | - | - | 3 | 7 |
| Sialis sp. | - | - | - | - | - | - | - | - | - | - |
| **Hemiptera** | | | | | | | | | | |
| Belostoma sp. | - | - | - | - | 1 | 2 | - | - | - | - |
| Belostoma flumineum | - | 1 | 1 | - | - | - | - | - | - | - |
| Notonecta sp. | - | - | - | - | - | - | - | - | - | - |
| Aquarius sp. | - | - | - | - | - | 1 | - | - | - | - |
| Sigara sp. | - | - | - | - | - | - | - | - | - | - |
| Corixidae | - | 1 | - | - | - | - | - | - | - | - |
| Hesperocorixa sp. | - | - | - | - | - | - | - | - | - | - |
| Gerris sp. | - | 5 | 7 | - | - | - | - | - | - | - |
| Metrobates sp. | - | 1 | - | - | 1 | - | 9 | - | - | - |
| Ranatra sp. | - | 1 | - | - | 1 | - | - | - | - | - |
| Trepobates sp. | - | - | - | - | - | - | 1 | - | - | - |
| Rhagovelia sp. | - | - | 5 | - | 1 | - | 1 | - | - | - |
| **Coleoptera** | | | | | | | | | | |
| Stenelmis sp. | 3 | 4 | 10 | 7 | 25 | 5 | 7 | 4 | 3 | 27 |
| Dineutus sp. | 5 | - | - | 1 | - | - | - | - | - | - |
| Laccophilus sp. | - | - | - | - | - | - | - | - | - | - |
| Ectopria nervosa | - | - | - | 1 | - | - | - | - | - | - |

Table 2 (cont.)

| Taxa Coleoptera (cont.) | Blackberry Lane 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|
| Optioservus sp. | 14 | 9 | 5 | - | - | - | - | 2 | - | 34 |
| Optioservus fastiditus | - | - | - | - | - | - | - | - | - | - |
| Optioservus trivittatus | - | - | - | - | - | - | - | - | - | - |
| Tropisternus sp. | 1 | - | - | - | - | - | - | - | - | - |
| Gyrinus sp. | - | 1 | 33 | - | - | - | - | - | - | - |
| Haliplus sp. | - | - | - | - | - | - | - | - | - | - |
| Hydaticus sp. | - | 1 | - | - | - | - | - | - | - | - |
| Peltodytnes sp. | - | - | - | - | - | - | - | - | - | - |
| Dubiraphia sp. | - | - | - | - | - | - | - | - | - | - |
| **Tricoptera** | | | | | | | | | | |
| Chimarra obscura | 2 | 5 | 6 | - | 8 | 8 | 5 | 19 | 3 | 7 |
| Cheumatopsyche sp. | 4 | 6 | 22 | 6 | 46 | 43 | 20 | 81 | 2 | 120 |
| Ceratopsyche morosa | - | - | - | - | 39 | 68 | 27 | 16 | 25 | - |
| Macrostemum zebratum | 1 | - | 3 | 1 | 13 | 2 | 4 | 8 | 1 | - |
| Psychomyia flavida | - | 12 | 11 | - | - | 3 | - | - | - | - |
| Setodes sp. | 3 | - | 1 | 1 | - | 1 | - | - | - | - |
| Polycentropus sp. | - | 1 | - | - | 1 | - | - | - | - | - |
| Polycentropus senu lato | - | - | - | - | 1 | - | - | - | - | - |
| Orthotrichia sp. | - | - | - | - | - | - | - | - | - | - |
| Lype diversa | - | - | - | - | - | - | - | - | - | - |
| Helicopsyche borealis | 1 | 1 | - | - | - | - | - | - | - | - |
| Hydatophylax sp. | - | - | - | - | - | - | - | - | - | - |
| Hydropsyche phalerata | 5 | 2 | 3 | 2 | - | - | - | - | - | - |
| Hydropsyche sp. | 7 | - | 1 | 37 | - | - | - | - | - | 7 |
| Hydroptila sp. | 1 | - | - | - | - | - | - | - | - | - |
| Lepidostoma sp. | 1 | 3 | 1 | - | - | - | - | - | - | - |
| Micrasema rusticum | 1 | 1 | - | - | - | - | - | - | - | - |
| Microsternum sp. | - | - | - | - | - | - | - | - | - | 3 |
| Nyctiophylax sp. | - | - | - | - | - | - | - | - | - | - |

Table 2 (cont.)

| Taxa<br>Tricoptera (cont.) | Blackberry Lane<br>1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|
| Oecetis sp. | - | - | - | - | - | - | - | - | - | - |
| Pycnopsyche sp. | 3 | - | - | - | - | - | - | - | 1 | - |
| Symphitopsyche bifida series | 86 | 325 | 167 | - | - | - | - | - | - | - |
| Ceraclea sp. | - | 1 | - | - | - | - | - | - | - | - |
| Glossosoma sp. | - | - | - | - | - | - | - | - | 1 | - |
| Neuroclipsis sp. | - | 1 | - | - | - | - | - | - | - | - |
| **Diptera** | | | | | | | | | | - |
| Atherix sp. | - | - | 3 | 1 | 2 | 1 | 1 | - | - | 1 |
| Atherix variegata | - | - | - | - | - | - | - | - | 1 | - |
| Tabanus sp. | - | - | - | 2 | - | - | - | - | 1 | - |
| Hemerodromia sp. | - | - | - | - | - | 2 | - | - | 1 | - |
| Hexatoma sp. | - | - | - | 1 | - | - | 1 | 5 | - | - |
| Simulium sp. | - | - | - | - | - | - | - | - | - | - |
| Chironomidae (P) | - | - | - | - | - | - | - | - | - | 29 |
| Tipula sp. | - | - | - | - | - | - | - | - | - | - |
| Nilothauma sp. | - | - | - | - | - | - | 1 | 2 | - | - |
| Cricotopus bicinctus grp. | - | - | 4 | - | - | 3 | - | 5 | 1 | - |
| Thienemannimyia sp. grp. | - | - | 2 | 1 | - | - | - | 1 | - | - |
| Micropsectra sp. | - | - | - | - | - | - | - | - | - | - |
| Epoicocladius sp. | - | - | - | - | - | - | - | - | - | - |
| Cricotopus tremulus grp. | - | - | - | - | - | - | - | - | - | - |
| Tanytarsus guerlus grp. | - | - | - | - | - | - | - | - | - | - |
| Psectrocladuis sp. | - | - | - | - | - | - | - | - | - | - |
| Phaenopsectra sp. | - | - | - | - | - | - | - | - | - | - |
| Djalmabatista sp. | - | - | - | - | - | - | 1 | 1 | 1 | - |
| Demicryptochironomus sp. | - | 1 | - | - | - | - | - | - | - | - |
| Potthastia longimana grp. | - | - | - | - | - | - | - | - | - | - |
| Microtendipes pedellus grp. | - | - | - | - | - | - | - | 4 | 5 | - |

Table 2 (cont.)

| Taxa Diptera (cont.) | Blackberry Lane 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|
| Phaenopsectra sp. | - | - | - | - | - | - | - | - | - | - |
| Djalmabatista sp. | - | - | - | - | - | - | 1 | 1 | 1 | - |
| Demicryptochironomus sp. | - | 1 | - | - | - | - | - | - | - | - |
| Potthastia longimana grp. | - | - | - | - | - | - | - | - | - | - |
| Microtendipes pedellus grp. | - | - | - | - | - | - | - | 4 | 5 | - |
| Stictochirononmus sp. | - | 2 | - | 4 | - | - | - | 8 | 7 | - |
| Dicrotendipes neomodestus | - | - | - | - | - | - | 1 | - | - | - |
| Cladotanytarsus vandervulpi grp. | - | - | - | - | - | - | - | - | - | - |
| Ablabesmyia janta | - | - | - | - | - | - | - | - | - | - |
| Ablabesmyia variegata | - | - | - | - | - | - | - | - | - | - |
| Cladotanytarsus sp. | - | - | - | - | - | - | - | - | - | - |
| Dicrotendipes sp. | - | - | - | - | - | - | - | - | - | - |
| Eukiefferiella sp. | - | - | 1 | - | - | - | - | - | - | - |
| Hydrobaenus spl. | - | - | - | - | - | - | - | - | - | - |
| Labrundrinia sp. | - | - | - | - | - | - | - | - | - | - |
| Microtendipes sp. | - | - | - | - | - | - | - | - | - | - |
| Paratendipes sp. | - | - | - | - | - | - | - | - | - | - |
| Phaenopsecta sp. | - | - | - | - | - | - | - | - | - | - |
| Polypedilum scalaneum type | 1 | - | - | - | - | - | - | - | - | - |
| Psectrocladius sp. | - | - | - | - | - | - | - | - | - | - |
| Cryptochironomus sp. | - | - | 2 | 1 | - | - | - | - | 1 | - |
| Lenziella sp. | - | - | - | - | - | - | - | - | - | - |
| Nanocladius sp. | - | - | 2 | - | - | - | - | - | - | - |
| Orthocladiinae | - | - | 2 | - | - | - | - | - | - | - |
| Orthocladius sp. | - | 1 | 2 | - | - | - | - | - | - | - |
| Stempellinella sp. | - | - | - | - | - | - | - | 2 | - | - |
| Synorthocladius sp. | - | - | - | - | - | - | - | - | - | - |

Table 2 (cont.)

| Taxa Diptera (cont.) | Blackberry Lane 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tanytarsus coffmani | - | - | - | - | - | - | - | - | - | - |
| Tanytarsus sp. | - | - | - | - | - | - | - | - | 17 | - |
| Rheotanytarsus sp. | - | - | - | - | - | - | - | - | - | - |
| Tvetenia sp. gr. | - | 2 | - | - | - | - | - | - | - | - |
| Paratanytarsus sp. | - | - | - | - | - | - | - | - | - | - |
| Pseudochironomus sp. | - | - | - | - | - | - | - | - | - | - |
| Empididae | - | 1 | - | - | - | - | - | - | - | - |
| Tipulidae | - | - | 2 | - | - | - | - | - | - | 44 |
| Ceratopogonidae | - | - | - | - | - | - | - | 1 | - | 1 |
| Chironomus sp. | - | - | - | - | - | - | - | 3 | 1 | - |
| Parakiefferiella sp. | - | - | - | - | - | - | - | 1 | - | - |
| Polypedilum sp. | - | - | - | - | - | - | - | - | 8 | - |
| Tribelos jucundum | - | - | - | - | - | - | - | 2 | 4 | - |
| **Total Taxa** | 31 | 39 | 39 | 25 | 22 | 26 | 32 | 38 | 43 | 24 |

Table 2 (cont.)

**Macroinvertebrates Collected From Flambeau River, Ladysmith, WI**
**Site: Meadowbrook Creek, 1991 - 1998, 2004, 2006**

| Taxa | Meadowbrook Creek | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| **Platyhelminthes** | | | | | | | | | | |
| Dugesia sp. | 1 | - | 1 | - | - | - | - | - | - | - |
| **Hirudinea** | | | | | | | | | | |
| Placobdella ornata | - | - | - | - | - | - | - | - | - | - |
| Helobdella stagnalis | - | - | 1 | - | - | - | - | - | - | - |
| **Oligochaete** | | | | | | | | | | |
| Oligochaetae | - | - | - | - | - | - | - | - | - | 4 |
| Aulodrilus sp. | - | - | - | - | 1 | - | - | - | - | - |
| Branchiobdellida sp. | - | 2 | - | - | - | - | - | 6 | - | - |
| Chaetogaster limnae | - | - | - | - | - | - | - | - | - | - |
| Dero sp. | - | 1 | - | - | - | - | - | - | - | - |
| Limnodrilus hoffmeisteri | - | - | 1 | - | - | - | - | - | - | - |
| Bothrioneureum vejdovskyanum | - | - | - | - | - | - | - | - | - | - |
| Enchytraeidae | - | - | - | - | - | - | - | - | - | - |
| Lumbriculidae | - | - | 1 | - | - | - | - | - | - | - |
| Lumbriculus variegatus | - | 1 | 1 | - | 1 | - | - | - | - | - |
| Tubificidae | 3 | 1 | 2 | - | 2 | 3 | 4 | 14 | 3 | - |
| Naididae | 1 | - | - | - | - | 1 | 23 | 3 | 6 | - |
| **Decapoda** | | | | | | | | | | |
| Orconectes sp. | - | - | - | 4 | 7 | 1 | - | - | - | 3 |
| Orconectes rusticus | - | - | - | - | - | 5 | 4 | 5 | 4 | - |
| Orconectes virlis | - | 1 | 13 | - | - | - | - | - | - | - |
| **Isopoda** | | | | | | | | | | |
| Caecidotea sp. | 1 | 1 | 3 | 1 | 1 | 3 | - | - | - | - |
| **Amphipoda** | | | | | | | | | | |
| Hyalella azteca | - | 1 | 1 | 1 | - | 1 | - | - | - | - |

Table 2 (cont.)

| Taxa (Amphipoda cont.) | Meadowbrook Creek | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| <u>Gammarus</u> sp. | - | - | - | - | - | 1 | 17 | - | - | - |
| <u>Gammarus pseudolimnaeus</u> | - | 1 | 3 | - | - | - | - | - | - | - |
| <u>Crangonyx</u> sp. | - | - | - | - | - | - | - | - | - | - |
| **Hydracarina** | - | - | - | - | - | - | - | - | - | - |
| **Gastropoda** | | | | | | | | | | |
| Ancylidae | - | - | - | - | - | - | - | - | - | 1 |
| <u>Ferrissia</u> sp. | 3 | 2 | 35 | - | - | 13 | 27 | 6 | 2 | - |
| <u>Campeloma</u> sp. | 1 | - | - | - | - | - | - | - | - | - |
| <u>Physella</u> sp. | 1 | 4 | 2 | - | - | - | - | - | - | - |
| <u>Helisoma</u> sp. | - | 1 | - | - | - | - | - | - | - | - |
| <u>Amnicola</u> sp. | - | - | 1 | - | - | - | - | - | - | - |
| **Pelecypoda** | | | | | | | | | | |
| Sphaeriidae immature | 3 | 2 | 18 | - | - | - | - | - | - | - |
| <u>Elloptio dilatata</u> | - | - | - | - | - | - | - | 1 | - | - |
| <u>Psisdium</u> sp. | - | - | - | - | - | - | 2 | 2 | 6 | - |
| <u>Sphaerium striatinum</u> | 6 | 2 | 9 | - | - | - | - | - | - | - |
| **Ephemeroptera** | | | | | | | | | | - |
| <u>Isonychia (Isonychia)</u> sp. | 1 | - | 4 | 17 | 10 | 18 | - | - | - | 3 |
| <u>Anthopotamus verticis</u> | 24 | 21 | 69 | 98 | 99 | 116 | 292 | 115 | 1 | 1 |
| <u>Stenonema exiguum</u> | - | 1 | - | - | - | 5 | - | - | - | - |
| <u>Stenonema femoratum</u> | - | - | 1 | - | - | 7 | 9 | 7 | 7 | - |
| <u>Stenonema mediopunctatum</u> | 3 | - | 16 | 10 | 18 | 54 | 14 | 4 | 10 | 30 |
| <u>Stenonema terminatum</u> | - | - | - | - | 2 | - | 6 | 5 | 5 | - |
| <u>Stenonoma vicarium</u> | 5 | 6 | 93 | 9 | 41 | 117 | 98 | 42 | 4 | - |
| <u>Stenonema</u> sp. | - | - | 4 | 1 | - | - | - | - | - | - |
| <u>Lecrocuta</u> sp. | - | - | - | - | 3 | 21 | 3 | 2 | 23 | 3 |
| <u>Baetis flavistriga</u> | - | - | - | - | - | - | - | - | - | - |
| <u>Baetis pygmaeus</u> | - | - | - | - | - | - | - | - | - | - |

Table 2 (cont.)

| Taxa<br>Ephemeroptera (cont.) | Meadowbrook Creek | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| Baetis intercalaris | - | - | - | - | 2 | - | - | - | - | - |
| Baetis sp. | - | 1 | 11 | - | - | - | - | - | - | 7 |
| Baetisca sp. | - | - | - | - | - | - | - | - | - | - |
| Ephemerella sp. | - | - | - | 1 | - | - | - | - | - | - |
| Stenocron sp. | - | - | - | - | - | - | - | - | - | - |
| Acerpenna pygmaea | - | - | - | - | - | 7 | - | 1 | - | - |
| Centroptilum sp. | - | - | - | - | - | - | 1 | 4 | - | - |
| Acentrella ampla | - | - | - | - | - | - | - | - | - | - |
| Procloeon sp. | - | - | - | - | 1 | 1 | 1 | - | 21 | 6 |
| Ephemera simulans | 5 | 23 | 181 | 15 | 6 | 53 | 23 | 51 | 64 | - |
| Caenis sp. | - | - | 2 | 1 | - | 5 | 1 | 3 | 16 | 4 |
| Callibaetis sp. | - | - | 16 | - | - | - | - | - | - | - |
| Choroterpes sp. | - | - | - | - | - | 3 | 2 | 1 | - | 4 |
| Leptophlebia sp. | 4 | 11 | 2 | - | - | 16 | 14 | 7 | 8 | - |
| Hexagenie sp. | - | - | - | - | - | - | - | - | - | 35 |
| Heptagenia hebe | - | - | 1 | - | - | - | - | - | - | - |
| Ephoron leukon | - | - | - | - | - | - | - | - | 55 | - |
| Pseudocloeon propinquus | - | - | - | - | - | - | - | - | 5 | - |
| Paraleptophlebia sp. | - | - | 8 | - | - | - | - | - | - | - |
| **Odonata** | | | | | | | | | | |
| Ophiogomphus sp. | - | - | - | - | - | - | - | 1 | - | 1 |
| Ophiogomphus rupinsulensis | - | - | 15 | 3 | 3 | 1 | - | - | - | - |
| Argia sp. | - | - | - | - | 1 | - | - | - | 5 | 2 |
| Calopteryx sp. | - | - | - | - | - | - | - | - | - | - |
| Aeshna sp. | - | - | - | - | - | - | - | - | - | - |
| Somatochlora sp. | - | - | - | - | - | - | - | - | - | - |
| Hylogomphus sp. | - | - | 1 | 1 | - | - | - | - | - | - |

Table 2 (cont.)

| Taxa | Meadowbrook Creek | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| **Plecoptera** | | | | | | | | | | |
| Agnetina capitata | 37 | 2 | 38 | 126 | 4 | - | - | - | - | 3 |
| Neoperla clymene | 3 | - | 1 | 2 | 3 | 8 | 8 | 4 | 2 | - |
| Acroneuria abnormis | 1 | - | 13 | 1 | 2 | 4 | 2 | 1 | - | - |
| Perlinella drymo | - | - | - | - | - | 1 | 3 | - | - | - |
| Perlinella sp. | - | - | - | - | - | - | - | - | - | - |
| Pteronarcys sp. | - | - | - | - | - | - | - | - | - | - |
| **Megaloptera** | | | | | | | | | | |
| Nigronia sp. | - | 12 | 14 | - | - | - | - | - | - | - |
| Nigronia serricornis | - | - | - | 1 | 5 | 4 | 7 | 3 | 1 | - |
| Corydalus cornutus | - | - | - | - | - | - | - | - | - | - |
| Sialis sp. | - | 4 | - | 1 | - | - | - | - | - | - |
| **Hemiptera** | | | | | | | | | | |
| Belostoma sp. | - | - | - | - | 2 | 5 | - | - | - | - |
| Belostoma flumineum | 3 | - | 2 | - | - | - | 1 | 1 | - | - |
| Notonecta sp. | - | - | - | - | - | - | - | - | - | - |
| Aquarius sp. | - | - | - | - | - | - | - | - | - | - |
| Sigara sp. | - | - | - | - | - | 2 | - | - | - | - |
| Corixidae | 57 | 3 | - | - | - | - | - | - | - | - |
| Hesperocorixa sp. | - | - | - | - | - | - | - | - | - | - |
| Gerris sp. | - | - | - | - | - | - | - | - | - | - |
| Metrobates sp. | - | - | - | - | - | - | - | - | - | - |
| Ranatra sp. | - | - | - | - | - | - | - | - | - | - |
| Rhagovelia sp. | - | - | - | - | - | - | - | - | - | - |
| **Coleoptera** | | | | | | | | | | |
| Ectopria nervosa | 4 | 1 | 2 | 2 | 1 | 2 | 2 | - | - | 1 |
| Stenelmis sp. | 2 | 5 | 41 | 1 | 12 | 11 | 27 | 10 | 5 | 11 |
| Dineutus sp. | - | - | - | - | - | - | - | - | - | - |
| Laccophilus sp. | - | - | - | - | - | - | - | - | - | - |

Table 2 (cont.)

| Taxa<br>Coleoptera (cont.) | Meadowbrook Creek | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| Liodessus sp. | 2 | - | - | - | - | - | - | - | - | - |
| Optioservus sp. | - | - | 1 | - | - | - | 1 | 1 | - | - |
| Optioservus fastiditus | - | - | - | - | - | - | 1 | - | - | - |
| Optioservus trivittatus | - | - | - | - | - | - | 1 | - | - | - |
| Tropisternus sp. | - | - | - | - | - | - | - | - | - | - |
| Gyrinus sp. | - | - | - | - | - | - | - | - | - | - |
| Haliplus sp. | - | - | - | - | - | - | - | - | - | - |
| Hydaticus sp. | - | - | - | - | - | - | - | - | - | - |
| Peltodytpes sp. | - | - | - | - | - | - | - | - | - | - |
| Dubiraphia sp. | - | - | - | - | - | - | - | - | - | - |
| **Tricoptera** | | | | | | | | | | |
| Chimarra obscura | - | - | 1 | - | - | 2 | 1 | - | - | 1 |
| Cheumatopsyche sp. | 12 | 4 | 17 | 19 | 50 | 29 | 27 | 12 | - | 32 |
| Ceratopsyche morosa | - | - | - | - | 3 | - | - | - | 2 | - |
| Macrostemum zebratum | - | - | - | - | - | 2 | - | - | - | - |
| Psychomyia flavida | 1 | 1 | 2 | - | - | - | - | - | - | - |
| Setodes sp. | - | - | - | - | - | - | - | - | - | - |
| Polycentropus sp. | - | 9 | 19 | - | - | 5 | 4 | 3 | - | - |
| Polycentropus senu lato | - | - | - | - | 1 | - | - | - | - | - |
| Orthotrichia sp. | - | - | - | - | - | 1 | 1 | - | - | - |
| Lype diversa | - | - | - | - | - | - | - | - | - | - |
| Helicopsyche borealis | - | 3 | 3 | - | - | - | - | - | - | - |
| Hydatophylax sp. | 1 | - | - | - | - | - | - | - | - | - |
| Hydropsyche phalerata | - | - | - | 3 | - | - | - | - | - | - |
| Hydropsyche sp. | - | - | - | 27 | - | - | - | - | - | - |
| Hydroptila sp. | - | 3 | - | - | - | - | - | - | - | - |
| Lepidostoma sp. | - | - | - | - | - | - | - | - | - | - |
| Micrasema rusticum | - | - | - | - | - | - | - | - | - | - |
| Nyctiophylax sp. | - | - | 1 | - | - | - | - | - | - | - |

Table 2 (cont.)

| Taxa<br>Tricoptera (cont.) | Meadowbrook Creek | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| Oecetis sp. | 2 | - | 1 | - | - | - | - | - | - | - |
| Pycnopsyche sp. | 1 | - | 1 | - | - | - | - | - | 5 | - |
| Symphitopsyche bifida series | - | 2 | 1 | - | - | - | - | - | - | - |
| Ceraclea sp. | - | - | - | - | - | - | - | - | - | - |
| Neureclipsis sp. | - | - | - | - | - | - | - | - | - | - |
| **Diptera** | | | | | | | | | | |
| Atherix sp. | - | - | - | 1 | 1 | - | - | - | - | - |
| Tabanus sp. | - | - | 1 | - | 1 | - | - | - | - | - |
| Hemerodromia sp. | - | - | - | - | - | - | - | - | - | - |
| Chrysops sp. | - | - | - | - | - | - | 1 | - | - | - |
| Hexatoma sp. | - | - | - | - | 1 | 4 | 6 | 10 | 2 | - |
| Simulium sp. | - | - | - | - | - | 3 | - | - | - | - |
| Chironomidae (P) | - | 2 | 10 | 1 | - | - | - | - | - | 8 |
| Tipula sp. | - | - | - | - | - | - | 1 | - | - | - |
| Nilothauma sp. | - | - | - | - | - | - | - | - | - | - |
| Cricotopus bicinctus grp. | - | - | 2 | - | - | - | 1 | - | 2 | - |
| Thienemannimyia sp. grp. | - | 1 | 2 | - | 1 | 2 | - | 1 | - | - |
| Micropsecta sp. | - | - | - | - | - | - | 1 | - | - | - |
| Epoicocladius sp. | - | 3 | 6 | - | - | 1 | 2 | - | - | - |
| Cricotopus sp. | - | - | - | - | 2 | - | - | - | - | - |
| Cricotopus tremulus grp. | 1 | 1 | - | - | - | 1 | 2 | - | - | - |
| Demicryptochironomus sp. | - | 1 | - | - | - | 1 | - | - | - | - |
| Tanytarsus guerlus grp. | - | - | - | - | - | - | 3 | - | - | - |
| Psectrocladius sp. | - | - | - | - | - | - | 1 | - | - | - |
| Phaenopsectra sp. | - | - | - | - | - | - | 3 | - | - | - |
| Djalmabatista sp. | - | - | - | - | - | - | 2 | 1 | - | - |

| Taxa Diptera (cont.) | Meadowbrook Creek | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| Potthastia longimana grp. | - | - | - | - | - | 1 | 1 | - | - | - |
| Microtendipes pedellus grp. | - | 1 | 3 | - | - | 5 | 30 | 7 | 11 | - |
| Stictochironomus sp. | 2 | 5 | 13 | - | 9 | 15 | 8 | 12 | 6 | - |
| Ablabesmyia mallochi | - | - | - | - | - | - | - | - | 1 | - |
| Ablabesmyia sp. | - | - | 1 | - | - | - | - | - | - | - |
| Cladotanytarsus sp. | 1 | 1 | 2 | - | - | - | - | - | - | - |
| Dicrotendipes sp. | 1 | - | - | - | - | - | - | - | - | - |
| Eukiefferiella pseudomontona | - | - | - | - | - | - | - | - | - | - |
| Hydrobaenus spl. | - | - | - | - | - | - | - | - | - | - |
| Labrundrinia sp. | - | - | - | - | - | - | - | - | - | - |
| Microtendipes sp. | - | 2 | - | 7 | - | - | - | - | - | - |
| Paratendipes sp. | 1 | 2 | - | - | - | - | - | - | - | - |
| Phaenopsecta sp. | 1 | 3 | 2 | - | - | - | - | - | - | - |
| Polypedilum scalaneum type | - | 1 | - | - | - | - | - | - | - | - |
| Cladotanytarsus vanderwulpi grp. | - | - | - | - | - | - | 5 | - | 1 | - |
| Cryptochironomus sp. | - | 1 | 3 | - | - | - | 1 | - | 1 | - |
| Lenziella sp. | - | 2 | - | - | - | - | - | - | - | - |
| Nanocladius sp. | - | 3 | 1 | - | - | - | - | - | - | - |
| Orthocladiinae | - | 1 | - | - | - | - | - | - | - | - |
| Orthocladius sp. | - | 1 | 1 | - | - | - | - | - | - | - |
| Stempellinella sp. | - | 1 | - | - | - | - | 1 | 1 | - | - |
| Synorthocladius sp. | - | 1 | - | - | - | - | - | - | - | - |
| Tanytarsus coffmani | - | 1 | - | - | - | - | - | - | - | - |
| Tanytarsus sp. | - | 3 | - | - | - | - | - | - | 9 | - |
| Rheotanytarsus sp. | - | - | - | - | 1 | - | - | - | - | - |
| Tvetenia discloripes gr. | - | - | - | - | - | - | - | - | - | - |
| Paratanytarsus sp. | - | - | 3 | - | - | - | - | - | - | - |

| Taxa<br>Diptera (cont.) | Meadowbrook Creek | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| Procladius sp. | - | - | 1 | - | - | - | - | - | - | - |
| Pseudochironomus sp. | - | - | 1 | - | - | - | - | - | - | - |
| Empididae | - | 1 | 2 | - | - | - | - | - | - | - |
| Tipulidae | - | - | 1 | - | - | - | - | - | - | |
| Ceratopogonidae | - | - | - | - | - | - | - | - | - | - |
| Ablabesmyis janta | - | - | - | - | - | - | - | - | - | - |
| Chironomus sp. | - | - | - | - | - | - | - | 1 | - | - |
| Parakiefferiella sp. | - | - | - | - | - | - | - | - | - | - |
| Tribelos jucundum | - | - | - | - | - | - | - | 3 | 2 | - |
| Polypedilum sp. | - | - | - | - | - | - | - | 1 | 1 | - |
| **Total Taxa** | 37 | 53 | 65 | 26 | 33 | 43 | 48 | 37 | 33 | 20 |

**Table 2**

**Macroinvertebrates Collected From Flambeau River, Ladysmith, WI**
**Site: Port Arthur Dam, 1991 - 1998, 2004, 2006**

| Taxa | Port Arthur Dam | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| **Platyhelminthes** | | | | | | | | | | |
| Dugesia sp. | - | 1 | - | - | - | - | - | - | - | - |
| **Hirudinea** | | | | | | | | | | |
| **Placobdella sp.** | - | - | 1 | - | - | - | - | - | - | - |
| **Helobdella sp.** | - | - | - | - | - | - | - | - | - | - |
| **Oligochaete** | | | | | | | | | | |
| Oligocheata | - | - | - | - | - | - | - | - | - | 7 |
| Aulodrilus sp. | - | 2 | 8 | - | - | - | - | - | - | - |
| Branchiobdellida sp. | - | - | - | - | - | - | - | 3 | 1 | - |
| Chaetogaster limnae | - | 1 | - | - | - | - | - | - | - | - |
| Dero sp. | - | - | - | - | - | - | - | - | - | - |
| Limnodrilus hoffmeisteri | - | - | - | - | 1 | - | - | - | - | - |
| Enchytraeidae | - | - | - | - | - | - | - | - | - | - |
| Lumbriculidae | - | - | 1 | - | - | - | - | - | - | - |
| Lumbriculus variegatus | - | - | - | - | - | - | - | - | - | - |
| Tubificidae | - | - | 1 | - | - | 2 | 1 | 6 | - | - |
| Naididae | 1 | 2 | 1 | - | - | 2 | 3 | 5 | - | - |
| **Decapoda** | | | | | | | | | | |
| Orconectes sp. | - | - | - | 4 | 8 | 1 | - | - | - | 2 |
| Orconectes rusticus | - | - | - | - | - | 5 | 5 | 3 | 3 | - |
| Orconectes virlis | - | - | 1 | - | - | - | - | - | - | - |
| **Isopoda** | | | | | | | | | | |
| Caecidotea sp. | 1 | 3 | 4 | 1 | - | - | - | - | - | - |

Table 2 (cont.)

| Taxa | Port Arthur Dam | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| **Amphipoda** | | | | | | | | | | |
| Hyalella azteca | - | 38 | - | 4 | - | - | - | - | - | - |
| Gammarus sp. | - | - | - | - | - | - | 1 | 8 | 14 | 2 |
| Gammarus pseudolimnaeus | - | - | - | - | - | - | - | - | - | - |
| Crangonyx sp. | 1 | - | - | - | - | - | - | - | - | - |
| **Hydracarina** | - | - | - | - | - | - | - | - | - | - |
| **Gastropoda** | | | | | | | | | | |
| Ferrissia sp. | 1 | 1 | 32 | - | - | 1 | 1 | - | - | - |
| Campeloma sp. | 1 | - | - | - | - | - | - | - | - | - |
| Physella sp. | - | 21 | - | - | - | - | - | - | - | - |
| Helisoma sp. | - | - | - | - | - | - | - | - | - | - |
| Amnicola sp. | - | - | - | - | - | - | - | - | - | - |
| **Pelecypoda** | | | | | | | | | | |
| Sphaeriidae immature | - | - | 26 | - | - | - | - | - | - | - |
| Sphaerium striatinum | 12 | 2 | - | - | - | - | - | - | - | - |
| Pisidium sp. | - | - | - | - | - | - | 4 | - | - | - |
| **Ephemeroptera** | | | | | | | | | | |
| Isonychia (Isonychia) sp. | - | - | 4 | 28 | 4 | 21 | 1 | - | - | - |
| Anthopotamus verticis | 24 | 21 | 69 | 53 | 72 | 149 | 119 | 147 | 2 | - |
| Stenonema exiguum | 1 | - | - | - | - | 9 | - | 1 | - | - |
| Stenonema femoratum | - | - | - | - | - | 1 | 6 | 2 | 7 | - |
| Stenonema mediopunctatum | - | - | 14 | 19 | 17 | 34 | 16 | 2 | - | - |
| Stenonema terminatum | - | - | - | - | 3 | - | 8 | 2 | 1 | - |
| Stenonoma vicarium | 16 | 16 | 190 | 20 | 37 | 103 | 117 | 44 | 3 | - |
| Stenonema sp. | - | - | - | 21 | - | - | - | - | - | 44 |
| Lecrocuta sp. | - | - | - | - | 1 | 13 | 14 | 2 | 3 | - |
| Baetis pygmaeus | 1 | - | - | - | - | - | - | - | - | - |
| Baetis intercalaris | - | - | - | - | 1 | - | - | - | - | - |
| Baetis flavistriga | - | - | - | - | - | 1 | - | - | 1 | - |

Table 2 (cont.)

| Taxa<br>Ephemeroptera (cont.) | Port Arthur Dam | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| Baetis sp. | - | 1 | 153 | - | - | - | - | - | - | - |
| Baetisca sp. | - | 1 | - | - | - | - | - | - | - | - |
| Ephemerella sp. | 1 | 1 | - | 1 | - | - | - | - | - | - |
| Stenocron sp. | 4 | 3 | 12 | 5 | - | - | 1 | - | - | 1 |
| Acerpenna pygmaea | - | - | - | - | - | - | - | - | 2 | - |
| Procloeon sp. | - | - | - | - | - | 12 | 4 | - | 44 | 36 |
| Ephemera simulans | 13 | 6 | 120 | 41 | 26 | 64 | 42 | 40 | 41 | - |
| Caenis sp. | - | - | 2 | - | - | 1 | - | - | 2 | - |
| Callibaetis sp. | - | - | 36 | - | - | - | - | - | - | - |
| Choroterpes sp. | - | - | - | - | - | - | 1 | 1 | - | 3 |
| Leptophlebia sp. | - | 26 | - | - | - | 1 | 3 | 6 | 11 | - |
| Hexagenia sp. | - | - | - | - | - | - | - | - | - | 10 |
| Heptagenia hebe | - | - | 12 | - | - | - | - | - | - | - |
| Paraleptophlebia sp. | - | - | 2 | - | - | - | - | - | - | - |
| Centroptilum sp. | - | - | - | - | - | - | - | 1 | 1 | - |
| **Odonata** | | | | | | | | | | |
| Ophiogomphus sp. | - | - | - | - | - | - | 1 | - | - | - |
| Ophiogomphus rupinsulensis | - | - | 4 | 3 | 1 | 2 | 1 | 1 | - | - |
| Ophiogomphus howei | - | - | - | 1 | - | - | - | - | - | - |
| Argia sp. | - | - | - | - | - | - | 1 | - | - | 10 |
| Argia moesta | 4 | 2 | 4 | - | - | - | - | - | - | - |
| Calopteryx sp. | - | 5 | 2 | 5 | 1 | - | - | - | - | - |
| Aeshna sp. | - | 1 | - | - | - | - | - | - | - | - |
| Somatochlora sp. | - | 1 | - | - | - | - | - | - | - | - |
| Hylogomphus sp. | - | - | - | 4 | 1 | - | - | - | - | - |

Table 2 (cont.)

| Taxa<br>Plecoptera (cont.) | Port Arthur Dam | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| **Plecoptera** | | | | | | | | | | |
| Agnetina capitata | 12 | 2 | 30 | 64 | 10 | 7 | - | - | - | - |
| Neoperla clymene | 3 | - | 8 | 9 | 23 | 17 | 7 | 8 | - | - |
| Acroneuria abnormis | 9 | 1 | 28 | 12 | 5 | 12 | 4 | - | 2 | 1 |
| Perlinella drymo | - | 1 | - | - | - | - | 2 | - | - | - |
| Perlinella sp. | - | - | - | - | - | - | - | - | - | - |
| Pteronarcys sp. | - | - | 2 | - | - | - | - | - | - | - |
| **Megaloptera** | | | | | | | | | | |
| Nigronia sp. | 3 | - | 17 | - | - | - | - | - | - | - |
| Nigronia serricornis | - | - | - | 7 | 10 | 8 | 12 | 5 | 1 | - |
| Corydalus cornutus | - | - | 1 | - | - | - | - | - | - | - |
| Sialis sp. | - | 4 | 2 | 1 | - | - | - | - | 1 | - |
| **Hemiptera** | | | | | | | | | | |
| Belostoma sp. | - | - | - | - | - | - | - | - | - | - |
| Belostoma flumineum | 5 | 4 | - | - | - | - | - | 2 | - | - |
| Notonecta sp. | 11 | 5 | - | - | - | - | - | - | - | - |
| Aquarius sp. | - | - | - | - | - | - | - | - | - | - |
| Sigara sp. | - | - | - | - | - | - | - | - | 14 | - |
| Corixidae | 5 | 44 | 118 | - | - | 1 | - | - | - | - |
| Hesperocorixa sp. | - | - | - | 2 | 6 | - | - | - | 1 | - |
| Gerris sp. | - | - | - | - | - | - | - | - | - | - |
| Metrobates sp. | - | - | - | - | - | - | - | - | 1 | - |
| Ranatra fusca | - | 2 | - | - | - | - | - | - | - | - |
| Ranatra sp. | - | - | - | - | - | - | - | 2 | 1 | - |
| Rheumatobates sp. | - | - | - | - | - | - | - | - | 1 | - |
| **Coleoptera** | | | | | | | | | | |
| Ectopria nervosa | 1 | 2 | 2 | 2 | 1 | - | - | - | - | - |
| Stenelmis sp. | 1 | 1 | 52 | 1 | 4 | 8 | 1 | - | 5 | 1 |

Table 2 (cont.)

| Taxa<br>Coleoptera (cont.) | Port Arthur Dam | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| Dineutus sp. | - | - | - | 1 | - | - | - | - | - | |
| Laccopholus sp. | 2 | - | - | - | - | - | - | - | - | - |
| Stenelmis sp. | - | - | - | - | - | - | - | - | 5 | - |
| Optioservus sp. | - | - | 16 | - | - | - | - | - | - | - |
| Tropisternis sp. | 1 | - | - | - | - | - | - | - | - | - |
| Gyrinus sp. | - | 22 | 10 | 1 | - | - | - | - | - | - |
| Haliplus sp. | - | 1 | - | - | - | - | - | - | - | - |
| Hydaticus sp. | - | - | - | - | - | - | - | - | - | - |
| Peltodytes edentulus | - | - | - | - | - | - | - | - | 1 | - |
| Peltodytes sp. | - | 1 | - | - | - | - | - | - | - | - |
| Dubiraphia sp. | - | - | - | 2 | - | - | - | - | - | - |
| **Tricoptera** | | | | | | | | | | |
| Chimarra obscura | - | - | - | 1 | - | 2 | - | - | - | - |
| Cheumatopsyche sp. | 7 | 1 | 14 | 21 | 14 | 45 | 7 | 2 | - | 2 |
| Ceratopsyche morosa | - | - | - | - | 2 | 4 | 3 | - | - | - |
| Macrostemum zebratum | 1 | - | - | 4 | - | - | - | - | - | - |
| Psychomyia flavida | 5 | 1 | 16 | - | - | 1 | - | - | - | - |
| Setodes sp. | - | - | - | - | - | - | - | - | - | - |
| Polycentropus sp. | - | 2 | 8 | - | - | - | 3 | - | - | - |
| Polycentropus senu lato | - | - | - | 2 | - | - | - | - | - | - |
| Orthotrichia sp. | - | - | - | - | - | - | - | - | - | - |
| Lype diversa | - | - | - | - | - | 1 | - | - | - | - |
| Helicopsyche borealis | - | - | 2 | - | - | - | - | - | - | - |
| Hydatophylax sp. | - | - | - | - | - | - | - | - | - | - |
| Hydropsyche phalerata | - | - | - | 3 | - | - | - | 1 | - | - |
| Hydropsyche sp. | - | - | - | 25 | - | - | - | - | - | 1 |

Table 2 (cont.)

| Taxa Tricoptera (cont.) | Port Arthur Dam 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|
| Hydroptila sp. | - | - | - | - | - | - | - | - | - | - |
| Lepidostoma sp. | - | - | 6 | - | - | - | - | - | - | - |
| Micrasema rusticum | - | - | - | - | - | - | - | - | - | - |
| Nyctiophylax sp. | - | - | - | - | - | - | - | - | - | - |
| Oecetis sp. | - | - | 2 | - | - | - | - | - | - | - |
| Pycnopsyche sp. | 2 | 1 | - | - | - | - | - | - | - | - |
| Symphitopsyche bifida series | 8 | 1 | 14 | - | - | - | - | - | - | - |
| Ceraclea sp. | - | - | - | - | - | - | - | - | - | - |
| Neureclipsis sp. | - | 1 | - | - | - | - | - | - | - | - |
| **Diptera** | | | | | | | | | | |
| Atherix sp. | - | - | - | 1 | - | - | - | - | - | - |
| Tabanus sp. | - | - | 6 | - | - | - | - | - | - | - |
| Hemerodromia sp. | - | - | - | - | - | - | - | - | | - |
| Hexatoma sp. | - | - | - | - | - | - | 2 | - | 1 | - |
| Simulium sp. | - | - | - | - | - | - | - | - | - | - |
| Chironomidae (P) | - | - | - | - | - | 1 | - | - | - | 11 |
| Cricotopus bicinctus grp. | - | - | - | - | - | - | - | - | - | - |
| Thienemannimyia sp. grp. | 1 | 2 | 1 | - | - | - | - | - | - | - |
| Epoicocladius sp. | 1 | - | - | 8 | - | 1 | - | - | - | - |
| Cricotopus sp. | - | - | - | - | 1 | - | - | - | - | - |
| Cricotopus tremulus grp. | 1 | - | - | - | - | 1 | - | - | - | - |
| Demicryptochironomus sp. | - | - | - | - | - | - | - | 1 | - | - |
| Psectrocladius sp. | - | - | - | - | - | - | 3 | - | - | - |
| Djalmabatista sp. | - | - | - | - | - | - | 1 | - | - | - |
| Potthastia longimana grp. | - | - | - | - | - | - | - | - | - | - |
| Microtendipes pedellus grp. | - | 2 | - | - | - | - | 3 | 5 | 7 | - |
| Stictochironomus sp. | 1 | - | 11 | - | 1 | 16 | 4 | 2 | 4 | - |

| Taxa<br>Diptera (cont.) | Port Arthur Dam | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 2004 | 2006 |
| Ablabesmyia janta | - | - | - | - | - | 1 | - | 1 | - | - |
| Cladotanytarsus sp. | - | - | 2 | - | - | - | - | - | - | - |
| Dicrotendipes sp. | - | - | - | - | - | - | - | - | - | - |
| Eukiefferiella pseudomontona | 1 | - | - | - | - | - | - | - | - | - |
| Hydrobaenus sp. | 3 | - | - | - | - | - | - | - | - | - |
| Labrundrinia sp. | 1 | - | - | - | - | - | - | - | - | - |
| Microtendipes sp. | 2 | - | - | - | - | - | - | - | - | - |
| Paratendipes sp. | - | - | - | - | - | - | - | - | - | - |
| Phaenopsecta sp. | - | - | - | - | - | - | - | - | - | - |
| Polypendilum scalaneum type | 2 | - | - | - | - | - | - | - | - | - |
| Psectrocladius sp. | 2 | - | - | - | - | - | - | - | - | - |
| Cryptochironomus sp. | - | 1 | 2 | - | - | - | - | - | 1 | - |
| Lenziella sp. | - | - | - | - | - | - | - | - | - | - |
| Nanocladius sp. | - | - | - | 2 | - | - | - | - | - | - |
| Orthocladiinae | - | - | - | - | - | - | - | - | - | - |
| Orthocladius sp. | - | 1 | - | - | - | - | - | - | - | - |
| Stempellinella sp. | - | 1 | - | - | - | - | - | - | - | - |
| Synorthocladius sp. | - | 1 | - | - | - | - | - | - | - | - |
| Tanytarsus coffmani | - | - | - | - | - | - | - | - | - | - |
| Tanytarsus sp. | - | - | 2 | - | - | - | - | - | - | - |
| Rheotanytarsus sp. | - | - | - | - | - | - | - | - | - | - |
| Tvetenia discloripes gr. | - | - | - | - | 1 | - | - | - | - | - |
| Procladius sp. | - | - | 1 | - | - | - | - | - | - | - |
| Pseudochironomus sp. | - | - | - | - | - | - | - | - | - | - |
| Empididae | - | - | 2 | - | - | - | - | - | - | - |
| Tipulidae | - | 2 | 2 | - | - | - | - | - | - | - |
| **Total Taxa** | 42 | 28 | 50 | 34 | 25 | 33 | 34 | 27 | 30 | 14 |

# Appendix E

# Fish Memorandum

**Blue Iris Environmental, Inc.**
**Memorandum**

November 5, 2006

TO: Jana Murphy, Flambeau Mining Company

FR: Bill West, Blue Iris Environmental, Inc.

RE: Report on Activities Associated with 2006 Fish Sampling
Flambeau River, Ladysmith, Wisconsin

## Introduction

On September 12 and 13, 2006, representatives of EA Associates, Deerfield, Illinois and Blue Iris Environmental, Inc., electroshocked two impoundments on the Flambeau River located above and below the former Flambeau Mining Site. These impoundments included the flowage above the Ladysmith Dam, Ladysmith, Wisconsin (upstream sample location) and above the Thornapple Dam (downstream location). The purpose of this activity was to conduct metals analysis of fish (walleye) tissue at specified sites above and below the mining outfall. In addition to tissue analysis, captured fish were aged, sexed, lengths recorded, and stomach contents evaluated. Relative abundance of all fish encountered was also recorded for each flowage.

## Methods

Acceptable sampling methods for fish collection include hook and line, electrofishing, and fyke netting. Consistent with previous years during active mining, electrofishing was used for the collection of walleye and, walleye in the following size ranges were targeted for collection:

- 10 to 12 inches - one fish
- 12 to 15 inches - two fish
- 15 to 18 inches - three fish
- 18 to 22 inches - two fish
- > 22 inches - one fish

Electrofishing was conducted on the Thornapple Flowage on September 12, 2006 and on the Ladysmith Flowage on September 13, 2006. Approximately 25-30% of the workable shoreline of the Thornapple Flowage was sampled (3.8 hours of energized time). Weather conditions at the initiation of the collection period included a partly cloudy sky with a temperature in the lower 40s ($^{o}$F). Initial water conditions included a temperature of 17.9 $^{o}$C, dissolved oxygen of 8.2 mg/L, and conductivity of 118 umhos/cm (all measurements taken near the boat ramp prior to sampling).

Approximately 30-35% of the workable shoreline of the Ladysmith Flowage was sampled (4.5 hours of energized time). Weather conditions included clear skies, fairly calm, and air temperature in the low 40s ($^{o}F$). Initial water conditions included a temperature of 9.9 $^{o}C$, dissolved oxygen of 10.2 mg/L, and conductivity of 102 umhos/cm (all measurements taken at the boat ramp prior to sampling).

During each of the collection efforts, observed fish species were recorded. As in previous years, fish in the largest walleye size class were not obtained from the Ladysmith Flowage. Therefore, in the Ladysmith Flowage, fish collected in the next lower size class were substituted for the largest size. In 2006 all fish of the intended size were obtained from the Thornapple Flowage.

Walleye which met the criteria for length were set aside in tubs of ice water for further processing. Walleye were measured for length, filleted, and certain organs were extracted for analysis. Scales of each walleye were extracted for aging and on the largest walleye as were dorsal spines.

Paired walleye fillets were bagged separately for analysis. The livers from each of the nine walleye from a single flowage were composited into a single sample for analysis. Individual walleye stomachs were extracted and preserved in formalin, the contents of which were analyzed on an individual basis. Walleye fillets and livers once processed were placed on ice for transport to Northern Lake Service, Crandon, Wisconsin, for analysis. Walleye stomachs were retained by Blue Iris Environmental, Inc. for analysis.

**Results and Discussion**

The physical data of the walleye collected for analysis is provided in Table 1. Total species of fish observed and their relative abundance are provided in Table 2. An analysis of the stomach contents of the walleye is provided in Table 3. Analytical results of fish tissue and liver are provided in Tables 4 and 5 respectively. A copy of the analytical results relative to this report is provided in Appendix 1.

Data which is provided in Tables 1 through 5 is consistent with the data which was obtained in previous years.

A review of the historical information (data from 1991 to 2005) suggests that relative values for copper in walleye liver from the Thornapple Flowage and from the Ladysmith Flowage are consistent. Moreover, it is observed that year-to-year increases and decreases in concentrations of copper in the liver of walleye are comparable from the upstream flowage to the downstream flowage. Since 1996 copper levels in both upstream and downstream samples have remained stable if not decreasing.

Mercury levels in fish tissue have decreased since 1991 in both upstream and downstream samples. It is noted that beginning in about 1997 there is an increase in the number of values reported that fell between the level of quantitation (LOQ) and level of detection (LOD) and that the frequency of such data becomes more common through 2005. This occurrence is due to the use of more sophisticated mercury testing and greater emphasis on the use of low level mercury techniques in the lab. Values for 2006 reflect the lower level testing.

Based on review of the data, it is concluded that the operation of the mine, including the time window when reclamation and habitat restoration activities are being conducted, has had no impact on the concentrations of metals which are observed in the liver or tissue of walleye.

## Table 1

### Physical Data of Walleye
### Flambeau River, Ladysmith, Wisconsin
### September 2006

| ID No. | Length (mm) | Weight (g) | Sex | Age |
|---|---|---|---|---|
| | | **Thornapple Flowage** | | |
| WE-TA-01 | 302 | 240 | F | 2 |
| WE-TA-02 | 333 | 305 | F | 3 |
| WE-TA-03 | 380 | 450 | F | 3 |
| WE-TA-04 | 380 | 460 | M | 3 |
| WE-TA-05 | 412 | 635 | F | 4 |
| WE-TA-06 | 415 | 580 | F | 4 |
| WE-TA-07 | 433 | 870 | F | 4 |
| WE-TA-08 | 551 | 1670 | F | 7 |
| WE-TA-09 | 568 | 1740 | F | 7 |
| | | **Ladysmith Flowage** | | |
| WE-LS-01 | 277 | 140 | U* | 2 |
| WE-LS-02 | 343 | 360 | M | 3 |
| WE-LS-03 | 352 | 390 | F | 3 |
| WE-LS-04 | 382 | 475 | F | 3 |
| WE-LS-05 | 415 | 620 | M | 4 |
| WE-LS-06 | 431 | 700 | M | 5 |
| WE-LS-07 | 433 | 680 | F | 5 |
| WE-LS-08 | 457 | 845 | F | 5 |
| WE-LS-09 | 510 | 1410 | F | 6 |

*U=unsexed, M=male, F=female

Prepared by: WMW
Checked by: BJW

## Table 2

**Fish Species Observed**
**Flambeau River, Ladysmith, Wisconsin**
**September 2006**

| Species | Relative Abundance | |
|---|---|---|
| | Thornapple Flowage | Ladysmith Flowage |
| Northern pike | A | P |
| Muskellunge | C | C |
| Golden shiner | A | C |
| White sucker | P | C |
| Silver redhorse | A | C |
| Golden redhorse | P | -- |
| Shorthead redhorse | -- | P |
| Burbot | C | -- |
| Rock bass | A | C |
| Pumpkinseed sunfish | C | P |
| Smallmouth bass | A | A |
| Black crappie | C | -- |
| Yellow perch | C | A |
| Logperch | -- | C |
| Walleye | C | A |
| Yellow bullhead | P | P |

A = abundant
C = common
P = present
--- = not observed in that particular flowage

## Table 3

**Stomach Analysis of Walleye**
**Flambeau River, Ladysmith, Wisconsin**
**September 2006**

| Sample ID | Percent Full | Type of Content | General Comment |
|---|---|---|---|
| | | Thornapple Flowage | |
| WE-TA-01 | 50 | 1 minnow; 2.54 cm | Mostly digested |
| WE-TA-02 | Empty | None | None |
| WE-TA-03 | Empty | None | None |
| WE-TA-04 | Empty | None | None |
| WE-TA-05 | 100 | 1 minnow; 7.62 cm | Partially digested |
| WE-TA-06 | 100 | 1 minnow (bullhead); 7.8 cm | Partially digested |
| WE-TA-07 | 5 | Digested minnow | Not discernable |
| WE-TA-08 | 100 | 2 minnow (bullhead); 6.4 and 10 cm | Partially digested |
| WE-TA-09 | 80 | 1 minnow (bullhead); 6.4 cm | Partially digested |
| | | Ladysmith Flowage | |
| WE-LS-01 | Empty | None | None |
| WE-LS-02 | Empty | None | None |
| WE-LS-03 | Empty | None | None |
| WE-LS-04 | 5 | Digested minnow | Partially digested |
| WE-LS-05 | Empty | None | None |
| WE-LS-06 | Empty | None | None |
| WE-LS-07 | 100 | Perch 10 cm | Partially digested |
| WE-LS-08 | Empty | None | None |
| WE-LS-09 | 80% | 1 minnow (digested); 5.8 cm | Mostly digested |

**Table 4**
**Fish Tissue Analysis**
**Flambeau River, Ladysmith, Wisconsin**
**Mercury 1991 - 2006 (mg/kg)**

| Fish ID No. | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thornapple Flowage** | | | | | | | | | | | | |
| WE-TA-01 | 0.09 | 0.78 | 0.40 | 0.10 | 0.08 | 0.12 | 0.16 | <0.24> | <0.054 | <0.14> | <0.083> | <0.068> |
| WE-TA-02 | 1.00 | 0.55 | 0.40 | 0.18 | 0.10 | 0.09 | 0.13 | <0.13> | <0.074> | <0.18> | <0.083> | <0.095> |
| WE-TA-03 | 0.60 | 0.59 | 0.20 | 0.19 | 0.09 | 0.19 | 0.15 | <0.24> | 0.22 | <0.19> | <0.083> | <0.075> |
| WE-TA-04 | 0.80 | 0.52 | 0.48 | 0.21 | 0.13 | 0.13 | 0.66 | <0.24> | <0.12> | <0.10 | <0.15> | 0.13 |
| WE-TA-05 | 0.40 | 0.68 | 0.39 | 0.37 | 0.12 | 0.16 | <0.072> | <0.20> | <0.11> | <0.16> | <0.14> | <0.091> |
| WE-TA-06 | 0.70 | 0.76 | 0.33 | 0.88 | 0.12 | 0.19 | 0.14 | 0.29 | 0.37 | <0.19> | <0.15> | 0.11 |
| WE-TA-07 | 0.60 | 0.44 | 1.10 | 0.59 | 0.14 | 0.35 | 0.14 | <0.19> | <0.11> | <0.19> | <0.22> | 0.11 |
| WE-TA-08 | 0.80 | 0.47 | 0.63 | 0.29 | 0.13 | 0.23 | 0.14 | <0.20> | <0.040> | <0.12> | <0.22> | 0.20 |
| WE-TA-09 | 0.60 | 0.38 | 0.91 | 0.32 | 0.13 | 0.19 | 0.52 | <0.22> | <0.14> | 0.51 | <0.21> | 0.33 |
| Average Concentration | 0.71 | 0.57 | 0.54 | 0.35 | 0.12 | 0.17 | 0.20 | 0.22 | 0.14 | 0.20 | <0.22 | <0.17 |

Data appearing in brackets (< >) were observed in concentrations between the level of detection (LOD) and the level of quantitation (LOQ)
Data for Thornapple fish samples have lab ID#s 418013 through 418021.

Prepared by: WMW
Checked by: BJW

**Table 4 (cont.)**
**Fish Tissue Analysis**
**Flambeau River, Ladysmith, Wisconsin**
**Mercury 1991 - 2006 (mg/kg)**

| Fish ID No. | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ladysmith Flowage** | | | | | | | | | | | | |
| WE-LS-01 | 0.90 | 0.99 | 0.68 | 0.35 | 0.19 | 0.17 | <0.079> | <0.20> | <0.046> | 0.94 | <0.10> | * |
| WE-LS-02 | 0.80 | 0.94 | 0.67 | 0.45 | 0.12 | 0.23 | 0.25 | 0.27 | 0.13 | <0.27> | 0.34 | 0.27 |
| WE-LS-03 | 0.80 | 0.79 | 0.55 | 0.31 | 0.18 | 0.44 | 0.34 | <0.19> | <0.066> | <0.16> | <0.19> | 0.18 |
| WE-LS-04 | 0.70 | 0.85 | 0.44 | 0.25 | 0.16 | 0.27 | 0.16 | 0.27 | 0.20 | <0.10> | 0.39 | 0.19 |
| WE-LS-05 | 0.90 | 0.81 | 0.81 | 0.53 | 0.15 | 0.30 | 0.12 | 0.29 | 0.15 | <0.18> | <0.21> | 0.31 |
| WE-LS-06 | 0.60 | 0.91 | 0.66 | 0.35 | 0.15 | 0.50 | 0.34 | 0.34 | 0.18 | <0.27> | 0.29 | 0.37 |
| WE-LS-07 | 0.80 | 0.82 | 0.71 | 0.25 | 0.29 | 0.40 | 0.32 | 0.33 | 0.19 | <0.25> | <0.22> | 0.26 |
| WE-LS-08 | 0.60 | 0.96 | 0.76 | 0.18 | 0.25 | 0.38 | 0.22 | 0.31 | <0.14> | <0.27> | 0.29 | 0.26 |
| WE-LS-09 | 0.60 | 0.55 | 0.77 | 0.31 | 0.29 | 0.38 | 0.26 | 0.50 | <0.10> | <0.27> | 0.41 | 0.26 |
| Average Concentration | 0.67 | 0.84 | 0.67 | 0.33 | 0.20 | 0.34 | 0.20 | 0.30 | 0.13 | 0.30 | 0.27 | 0.26 |

Data appearing in brackets (< >) were observed in concentrations between the level of detection (LOD) and the level of quantitation (LOQ)
*Sample lost in lab during prep
Data for Ladysmith fish samples have lab ID#s 418003 through 418011

Prepared by: WMW
Checked by: BJW

# Table 5

## Metals Analysis of Walleye Liver
## Flambeau River, Ladysmith, Wisconsin
## 1991 - 2006 (mg/kg)

| Sample ID | Cd | Cr | Cu | Ni | Pb | Zn | Al | Hg | As | Se | Ag | Fe | Mn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Thornapple Flowage** | | | | | | | | | | | | | |
| WE-TA-1-9 1991 | 0.1 | 0.2 | 1.5 | 0.4 | 1.3 | 17 | 1.1 | 0.3 | 0.02 | 0.51 | 0.2 | 73 | 1.5 |
| WE-TA-1-9 1992 | <0.1 | <0.1 | 1.6 | <0.2 | <0.1 | 33 | 15 | 0.2 | <0.04 | 0.6 | <0.1 | 96 | 1.6 |
| WE-TA-1-9 1993 | 0.10 | <0.10 | 4.3 | <0.2 | <0.05 | 21 | 1.6 | 0.45 | <0.09 | 0.70 | 0.03 | 110 | 1.6 |
| WE-TA-1-9 1994 | <0.27 | <0.63 | 1.2 | <0.72 | <3.9 | 16 | 7.9 | 0.12 | <1.3 | <1.3 | <0.45 | 140 | 1.4 |
| WE-TA-1-9 1995 | <0.9 | <1.2 | 3.6 | 0.34 | <1.1 | 14 | 1.8 | 0.07 | <0.60 | <0.65 | <0.30 | 99 | 1.6 |
| WE-TA-1-9 1996 | 0.10 | 0.31 | 45(40*) | 0.64 | <1.1 | 29 | 2.3 | <0.01 | <0.26 | 0.97 | <0.29 | 72 | 1.1 |
| WE-TA-1-9 1997 | <0.21> | <0.45> | 45(43*) | <0.77 | <1.3 | 30 | 1.9 | 0.13 | <0.86 | <1.2> | <0.48> | 110 | 1.3 |
| WE-TA-1-9 1998 | <0.15> | <0.20> | 33 | <0.27> | <0.80 | 21 | 1.3 | <0.15> | <0.27 | <0.40> | <0.040 | 75 | 1.1 |
| WE-TA-1-9 1999 | 0.20 | <0.11 | 46 | 0.69 | <0.74 | 28 | 5.0 | <0.047> | <0.30 | <0.62> | <0.13> | 110 | 1.4 |
| WE-TA-1-9 2000 | 0.21 | <0.14 | 48 | <0.54> | <1.3 | 30 | <0.90> | 0.36 | <0.37 | <0.34> | <0.11> | 130 | 2.0 |
| WE-TA-1-9 2005 | <0.30> | <0.20 | 51 | <0.47 | <2.2 | 31 | <2.8 | <0.10> | <0.49 | <0.57 | <0.19 | 160 | 2.1 |
| WE-TA-1-9 2006 | <0.16 | <0.33 | 31 | <0.48 | <2.9 | 31 | <1.3 | 0.12 | <0.28 | <0.68 | <0.21 | 140 | 1.7 |

Data for Thornapple fish liver sample has a lab ID# 418022

Table 5 (cont.)

## Metals Analysis of Walleye Liver
## Flambeau River, Ladysmith, Wisconsin
## 1991 - 2006 (mg/kg)

| Sample ID | Cd | Cr | Cu | Ni | Pb | Zn | Al | Hg | As | Se | Ag | Fe | Mn |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ladysmith Flowage** | | | | | | | | | | | | | |
| WE-LS-1-9 1991 | 0.1 | 0.3 | 6.0 | 0.5 | 1.2 | 18 | 2.9 | 0.3 | 0.02 | 0.48 | 0.2 | 67 | 1.4 |
| WE-LS-1-9 1992 | 0.2 | 0.2 | 9.6 | <0.2 | <0.1 | 37 | 14 | 0.4 | <0.05 | 0.6 | <0.1 | 59 | 2.0 |
| WE-LS-1-9 1993 | 0.19 | <0.08 | 17 | 0.17 | <0.04 | 22 | 1.6 | 0.28 | <0.09 | 0.64 | 0.07 | 63 | 1.3 |
| WE-LS-1-9 1994 | 0.32 | <0.58 | 3.1 | <0.67 | <3.7 | 19 | 4.0 | 0.19 | <1.4 | <1.4 | <0.42 | 76 | 1.6 |
| WE-LS-1-9 1995 | <0.10 | <0.13 | 13 | 0.47 | <1.2 | 18 | 1.5 | 0.26 | <0.54 | 1.2 | <0.33 | 56 | 1.3 |
| WE-LS-1-9 1996 | 0.18 | 0.30 | 26(45*) | 0.96 | <1.3 | 22 | 2.2 | 0.22 | <0.27 | 0.76 | <0.34 | 68 | 1.3 |
| WE-LS-1-9 1997 | 0.48 | <0.46> | 33(33*) | <0.33> | <1.1 | 27 | 5.2 | 0.22 | <0.90 | <1.0 | <0.41 | 90 | 1.8 |
| WE-LS-1-9 1998 | 0.37 | <0.14> | 29 | <0.42> | <0.92> | 18 | 2.4 | <0.24> | <0.23 | <0.38> | <0.034 | 54 | 1.8 |
| WE-LS-1-9 1999 | 0.23 | <0.23> | 25 | <0.43> | <0.75 | 23 | 4.5 | 0.11 | <0.31 | <0.75> | <0.037 | 79 | 2.1 |
| WE-LS-1-9 2000 | 0.20 | <0.14 | 32 | <0.61> | <1.3 | 25 | <0.59> | <0.23> | <0.37 | <0.30 | <0.10> | 92 | 1.7 |
| WE-LS-1-9 2005 | 0.55 | <0.22 | 28 | <0.52 | <2.4 | 27 | <3.1 | <0.14> | <0.53 | <0.62 | <0.22 | 96 | 2.2 |
| WE-LS-1-9 2006 | <0.14 | <0.30 | 9.6 | <0.43 | <2.6 | 19 | <1.2 | 0.22 | <0.3 | <0.71 | <0.19 | 65 | 1.5 |

Data for Ladysmith fish liver sample has a lab ID# 418012
Data in appearing brackets (< >) were observed in concentrations between the level of detection (LOD) and level of quantitation (LOQ)

Prepared by: WMW
Checked by: BJW

*Values in parentheses were derived from re-digestion and re-run of laboratory analytical process and which are believed to be representative of the copper concentrations present in the walleye liver.

# Appendix 1

## Analytical Data - Fish Tissue Analysis
## 2006

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 11/09/06 Code: S 
NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

WE-LS-01 NLS ID: 418003
Ref. Line 1 COC 84325 WE-LS-01 Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | not analyzed due to laboratory error | | | | | 10/17/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: Troy Walker

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-LS-01 NLS ID: 418003**
Ref. Line 1 COC 84325 WE-LS-01 Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | not analyzed due to laboratory error | | | | | 10/17/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-LS-02 NLS ID: 418004**
Ref. Line 2 COC 84325 WE-LS-02 Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.27 | mg/Kg WWB | 1 | 0.030 | 0.096 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection
DWB = Dry Weight Basis
Shaded results indicate >MCL.

LOQ = Limit of Quantitation
NA = Not Applicable

ND = Not Detected (< LOD)
%DWB = (mg/kg DWB) / 10000

1000 ug/L = 1 mg/L

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 11/09/06 Code: S



NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-LS-03 NLS ID: 418005**
Ref. Line 3 COC 84325 WE-LS-03 Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.18 | mg/Kg WWB | 1 | 0.032 | 0.10 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: Gary Huber

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-LS-04 NLS ID: 418006**
Ref. Line 4 COC 84325 WE-LS-04 Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.19 | mg/Kg WWB | 1 | 0.021 | 0.065 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection
DWB = Dry Weight Basis
Shaded results indicate >MCL.
LOQ = Limit of Quantitation
NA = Not Applicable
ND = Not Delected (< LOD)
%DWB = (mg/kg DWB) / 10000
1000 ug/L = 1 mg/L

Reviewed by: 

Authorized by:
R. T. Krueger
President

# ANALYTICAL REPORT

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Fax: 920 738 7774 Phone: 920 730 5684

Project: Flambeau Mining Company

**WE-LS-05 NLS ID: 418007**
Ref. Line 5 COC 84325 WE-LS-05 Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.31 | mg/Kg WWB | 1 | 0.030 | 0.096 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: ______________

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-LS-06 NLS ID: 418008**
Ref. Line 6 COC 84325 WE-LS-06 Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.37 | mg/Kg WWB | 1 | 0.030 | 0.096 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-LS-07 NLS ID: 418009**
Ref. Line 7 COC 84325 WE-LS-07 Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.26 | mg/Kg WWB | 1 | 0.035 | 0.11 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by:

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 11/09/06 Code: S 

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Project: Flambeau Mining Company

**WE-LS-08 NLS ID: 418010**
Ref. Line 8 COC 84325 WE-LS-08 Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.26 | mg/Kg WWB | 1 | 0.035 | 0.11 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection
DWB = Dry Weight Basis
Shaded results indicate >MCL.
LOQ = Limit of Quantitation
NA = Not Applicable
ND = Not Detected (< LOD)
%DWB = (mg/kg DWB) / 10000
1000 ug/L = 1 mg/L

Reviewed by: ____________

Authorized by:
R. T. Krueger
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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-LS-09 NLS ID: 418011**
Ref. Line 9 COC 84325 WE-LS-09 Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.26 | mg/Kg WWB | 1 | 0.032 | 0.10 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by.

Authorized by:
R. T. Krueger
President

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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-LS-(1-9) NLS ID: 418012**
Ref. Line 10 COC 84325 WE-LS-(1-9) Matrix: FI
Collected: 09/13/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Aluminum, tot. recoverable as Al by ICP | ND | mg/Kg WWB | 1 | 1.2 | 4.3 | 10/05/06 | SW846 6010 | 721026460 |
| Arsenic, tot. recoverable as As by furnace AAS | ND | mg/Kg WWB | 20 | 0.30 | 1.1 | 10/06/06 | SW846 7060 | 721026460 |
| Cadmium, tot. recoverable as Cd by ICP | ND | mg/Kg WWB | 1 | 0.14 | 0.51 | 10/04/06 | SW846 6010 | 721026460 |
| Chromium, tot. recoverable as Cr by ICP | ND | mg/Kg WWB | 1 | 0.30 | 1.1 | 10/04/06 | SW846 6010 | 721026460 |
| Copper, tot. recoverable as Cu by ICP | 9.6 | mg/Kg WWB | 1 | 0.097 | 0.36 | 10/04/06 | SW846 6010 | 721026460 |
| Iron, tot. recoverable as Fe by ICP | 65 | mg/Kg WWB | 1 | 0.24 | 0.91 | 10/06/06 | SW846 6010 | 721026460 |
| Lead, tot. recoverable as Pb by ICP | ND | mg/Kg WWB | 1 | 2.6 | 9.5 | 10/05/06 | SW846 6010 | 721026460 |
| Manganese, tot. recoverable as Mn by ICP | 1.5 | mg/Kg WWB | 1 | 0.037 | 0.14 | 10/06/06 | SW846 6010 | 721026460 |
| Mercury (Tissue) by CVAA | 0.22 | mg/Kg WWB | 1 | 0.018 | 0.058 | 09/27/06 | SW846 7470 | 721026460 |
| Nickel, tot recoverable as Ni by ICP | ND | mg/Kg WWB | 1 | 0.43 | 1.6 | 10/04/06 | SW846 6010 | 721026460 |
| Selenium, tot. recoverable as Se by furnace | ND | mg/Kg WWB | 20 | 0.71 | 2.5 | 10/06/06 | SW846 7740 | 721026460 |
| Silver tot. recoverable as Ag by ICP | ND | mg/Kg WWB | 1 | 0.19* | 0.60* | 10/04/06 | SW846 6010 | 721026460 |
| Zinc, tot. recoverable as Zn by ICP | 19 | mg/Kg WWB | 1 | 0.091 | 0.34 | 10/04/06 | SW846 6010 | 721026460 |
| Metals digestion - tot. recov. (solid) GF | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Metals digestion - tot. recov (solid) ICP | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Misc. Sample Prep | yes | | | | | 09/25/06 | NA | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

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400 North Lake Avenue - Crandon, WI 54520
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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 11/09/06 Code: S 
NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-TA-01 NLS ID: 418013**
Ref. Line 1 COC 84324 WE-TA-01 Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | [0.068] | mg/Kg WWB | 1 | 0.032 | 0.10 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-TA-02 NLS ID: 418014**
Ref. Line 2 COC 84324 WE-TA-02 Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | [0.095] | mg/Kg WWB | 1 | 0.033 | 0.10 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection
DWB = Dry Weight Basis
Shaded results indicate >MCL.
LOQ = Limit of Quantitation
NA = Not Applicable
ND = Not Detected (< LOD)
%DWB = (mg/kg DWB) / 10000
1000 ug/L = 1 mg/L

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-TA-03 NLS ID: 418015**
Ref. Line 3 COC 84324 WE-TA-03 Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | [0.075] | mg/Kg WWB | 1 | 0.035 | 0.11 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection
DWB = Dry Weight Basis
Shaded results indicate >MCL.

LOQ = Limit of Quantitation
NA = Not Applicable

ND = Not Detected (< LOD)
%DWB = (mg/kg DWB) / 10000

1000 ug/L = 1 mg/L

Reviewed by:

Authorized by:
R. T. Krueger
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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-TA-04 NLS ID: 418016**
Ref. Line 4 COC 84324 WE-TA-04 Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.13 | mg/Kg WWB | 1 | 0.027 | 0.085 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection  LOQ = Limit of Quantitation  ND = Not Detected (< LOD)  1000 ug/L = 1 mg/L
DWB = Dry Weight Basis  NA = Not Applicable  %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by:

Authorized by:
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President

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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-TA-05 NLS ID: 418017**
Ref. Line 5 COC 84324 WE-TA-05 Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | [0.091] | mg/Kg WWB | 1 | 0.032 | 0.10 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection   LOQ = Limit of Quantitation   ND = Not Detected (< LOD)   1000 ug/L = 1 mg/L
DWB = Dry Weight Basis   NA = Not Applicable   %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

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400 North Lake Avenue - Crandon, WI 54520
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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-TA-06 NLS ID: 418018**
Ref. Line 6 COC 84324 WE-TA-06 Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.11 | mg/Kg WWB | 1 | 0.030 | 0.096 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection  LOQ = Limit of Quantitation  ND = Not Detected (< LOD)  1000 ug/L = 1 mg/L
DWB = Dry Weight Basis  NA = Not Applicable  %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: ______________

Authorized by:
R. T. Krueger
President

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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-TA-07 NLS ID: 418019**
Ref. Line 7 COC 84324 WE-TA-07 Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.11 | mg/Kg WWB | 1 | 0.030 | 0.096 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-TA-08 NLS ID: 418020**
Ref. Line 8 COC 84324 WE-TA-08 Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.20 | mg/Kg WWB | 1 | 0.033 | 0.10 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection
LOQ = Limit of Quantitation
ND = Not Detected (< LOD)
1000 ug/L = 1 mg/L
DWB = Dry Weight Basis
NA = Not Applicable
%DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
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# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Printed: 11/09/06 Code: S 

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**WE-TA-09 NLS ID: 418021**
Ref. Line 9 COC 84324 WE-TA-09 Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Mercury (Tissue) by CVAA | 0.33 | mg/Kg WWB | 1 | 0.029 | 0.092 | 09/27/06 | SW846 7470 | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

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Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 11/09/06 Code: S 

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Project: Flambeau Mining Company

**WE-TA-09 (1-9) NLS ID: 418022**
Ref. Line 10 COC 84324 WE-TA-09 (1-9) Matrix: FI
Collected: 09/12/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Aluminum, tot. recoverable as Al by ICP | ND | mg/Kg WWB | 1 | 1.3 | 4.8 | 10/05/06 | SW846 6010 | 721026460 |
| Arsenic, tot. recoverable as As by furnace AAS | ND | mg/Kg WWB | 20 | 0.28 | 1.0 | 10/06/06 | SW846 7060 | 721026460 |
| Cadmium, tot. recoverable as Cd by ICP | ND | mg/Kg WWB | 1 | 0.16 | 0.57 | 10/04/06 | SW846 6010 | 721026460 |
| Chromium, tot. recoverable as Cr by ICP | ND | mg/Kg WWB | 1 | 0.33 | 1.2 | 10/04/06 | SW846 6010 | 721026460 |
| Copper, tot. recoverable as Cu by ICP | 31 | mg/Kg WWB | 1 | 0.11 | 0.40 | 10/04/06 | SW846 6010 | 721026460 |
| Iron, tot. recoverable as Fe by ICP | 140 | mg/Kg WWB | 1 | 0.27 | 1.0 | 10/06/06 | SW846 6010 | 721026460 |
| Lead. tot. recoverable as Pb by ICP | ND | mg/Kg WWB | 1 | 2.9 | 11 | 10/05/06 | SW846 6010 | 721026460 |
| Manganese, tot. recoverable as Mn by ICP | 1.7 | mg/Kg WWB | 1 | 0.041 | 0.15 | 10/06/06 | SW846 6010 | 721026460 |
| Mercury (Tissue) by CVAA | 0.12 | mg/Kg WWB | 1 | 0.023 | 0.071 | 09/27/06 | SW846 7470 | 721026460 |
| Nickel, tot. recoverable as Ni by ICP | ND | mg/Kg WWB | 1 | 0.48 | 1.7 | 10/04/06 | SW846 6010 | 721026460 |
| Selenium, tot. recoverable as Se by furnace | ND | mg/Kg WWB | 20 | 0.68 | 2.4 | 10/06/06 | SW846 7740 | 721026460 |
| Silver, tot. recoverable as Ag by ICP | ND | mg/Kg WWB | 1 | 0.21* | 0.67* | 10/04/06 | SW846 6010 | 721026460 |
| Zinc, tot. recoverable as Zn by ICP | 31 | mg/Kg WWB | 1 | 0.10 | 0.38 | 10/04/06 | SW846 6010 | 721026460 |
| Metals digestion - tot. recov. (solid) GF | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Metals digestion - tot. recov (solid) ICP | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Misc. Sample Prep | yes | | | | | 09/25/06 | NA | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

# Appendix F

# Flambeau River Sediment Memorandum

**Blue Iris Environmental, Inc.**
**Memorandum**

November 14, 2006

TO: Jana Murphy, Flambeau Mining Company

FR: Bill West, Blue Iris Environmental, Inc.

RE: Report on Activities Associated with 2006 Sediment Sampling, Flambeau River, Ladysmith, Wisconsin.

## Introduction

On June 29, 2006, Bill West of Blue Iris Environmental, Inc. installed two sets of sediment traps in the Flambeau River south of Ladysmith, Wisconsin. This activity was part of routine monitoring of the Flambeau River. Sediment traps were located both upstream and downstream of the former Flambeau Mine.

Four individual sampling containers were positioned in two locations in the Flambeau River. One location (Site S-1) was above the reclaimed Flambeau Mine Site and located at the Blackberry Lane access. The second location was downstream of the mining site near the Sister's Farm (Site S-3). The sampling locations for 2006 were the same locations sampled from 1993 through 1999 and 2000 and these are shown on Figure 1.

Sediment sample jars were retrieved on September 11, 2006 after an approximate two and one half month exposure window.

## Methodology

Sediment traps were installed upstream and downstream of the Flambeau Mine discharge location as illustrated in Figure 1. Sample containers consisted of one-quart jars which were acid washed prior to installation.

At each sampling location, a set of four sample jars were placed in the river, each surrounded by a concrete half block. The half blocks were secured by rebar. Rebar was driven into the substrate to the point of being flush with the top of the block to keep from collecting floating debris which might cover the opening.

Quart jars inserted into the submerged half block opening were positioned so that the top of the jar was either flush with the top of the block or slightly below the top of the block. This positioning was successful in avoiding accumulation of debris or accidental breakage. With every four jar set, the outer most jar (most distal from short) was positioned approximately ten feet and 45 degrees upstream of the second jar. The second, third, and fourth jars were similarly placed at 45 degrees and downstream of the previously placed jar. Prior to jar placement, a nitex screen with ¼ inch mesh was secured over the jar opening with plastic ties. The mesh was found necessary to eliminate colonization by crayfish.

Sample containers were retrieved on September 11, 2006. At each station, downstream sample jars were retrieved first to eliminate chance contamination due to the retrieval activity. Once retrieved, the nitex mesh was removed and the jar was sealed with parafilm followed by a lid and ring seal. Samples were iced and taken to Northern Lake Service in Crandon, Wisconsin for analysis. At the lab, samples from each site were composited into a single sample, analyzed for metals. A sieve analysis was also conducted on each sample.

**Observations**

Sample jars from both sites appeared to contain amounts of sediments which were typical of previous years. There appeared to be more variability from jar to jar in upstream samples than downstream samples. Table 1 presents information relative to the observed percent volume of sediment levels in each jar. These levels are also shown on Figure 2 and 3 representing samples from Sister's Farm and Blackberry Lane respectively. One upstream jar was full of larger gravel which is uncharacteristic of this site given the fact that screens covered the opening. Historically, the observed amount of gravel usually had something to do with placement by crayfish though this could not be proven or disproved.

Typically the downstream jars contained more organic matter due to higher amounts of soft sediment along the bank. The upstream samples are more associated with an inside bank and contained less soft sediment. Therefore, it would be anticipated that the downstream sample would have a higher amount of volatile solids than the upstream sample, and this is exactly what is observed relative to the data presented in Table 2.

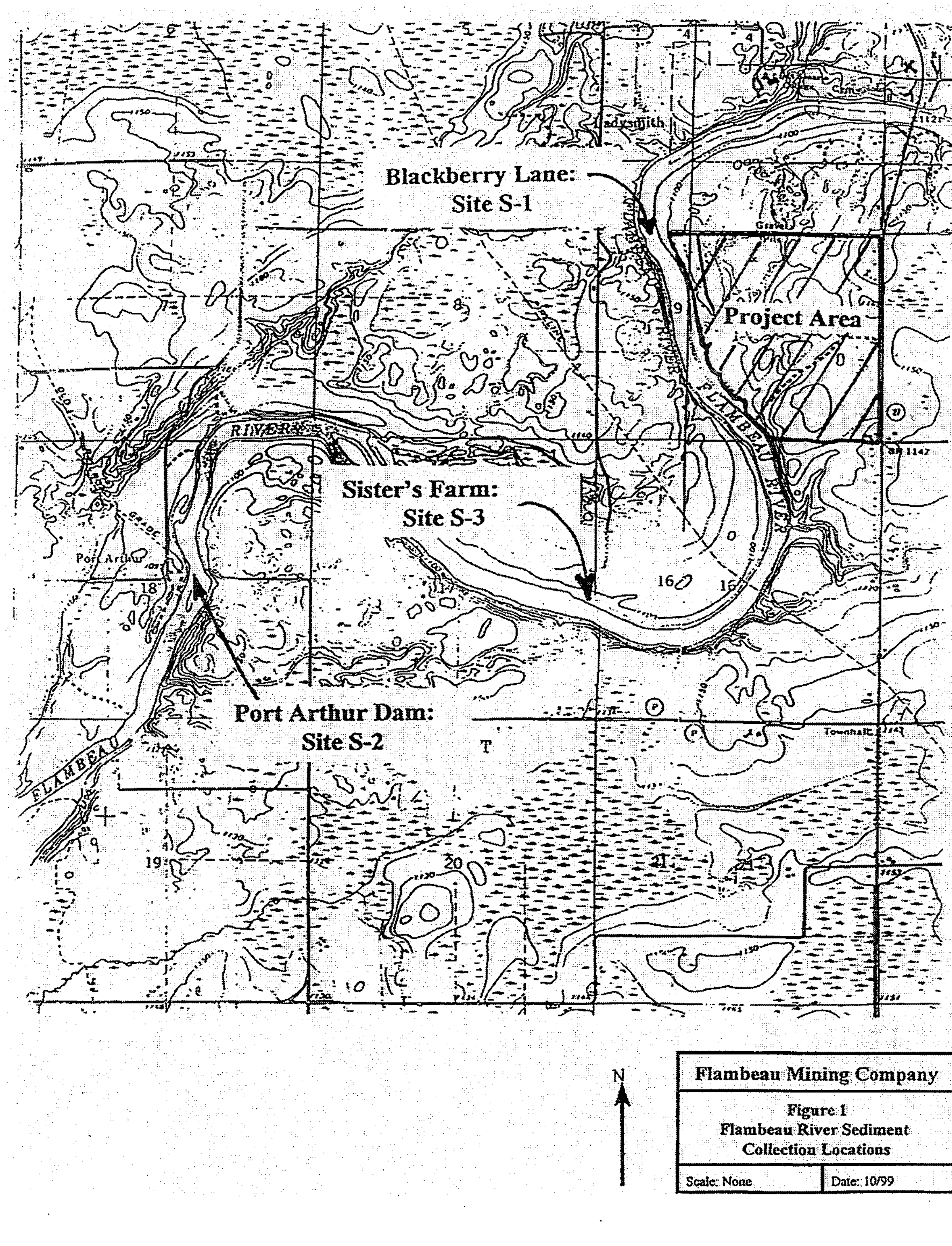
Table 1
Percent Sediment Levels Observed
Flambeau River Sediments Collected in 2006

| Blackberry Lane | | Sister's Farm | |
|---|---|---|---|
| Site ID | % Sediment | Site ID | % Sediment |
| A-1 | 20 | B-1 | 20 |
| A-2 | 10 | B-2 | 47 |
| A-3 | 35 | B-3 | 22 |
| A-4 | 100 | B-4 | 45 |

## Results and Discussion

Results of the laboratory analysis of the sediment samples from the two sampling sites are shown in Table 2. Individual sample analytical data and sieve analysis are provided in Appendix 1.

Data from the years of sediment analysis indicate that, in general, no increase or decrease in parameter concentration in sediments is occurring. Moreover, downstream samples continue to compare favorably with upstream sediment samples indicating no impacts due to mine activities during the closure time window.




| Flambeau Mining Company | |
|---|---|
| Figure 1<br>Flambeau River Sediment<br>Collection Locations | |
| Scale: None | Date: 10/99 |

**Table 2**
**Flambeau River Sediment Sampling Results**
**1991 - 2006**

| Parameter (mg/kg) | Sample Location/Number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Blackberry Lane (S-1) | | | | | | | | | |
| | S-1-91 (1991) | S-1-92 (1992) | S-1-93 (1993) | S-1-94 (1994) | S-1-95 (1995) | S-1-96 (1996) | S-1-97 (1997) | S-1-98 (1998) | S-1-99 (1999) | S-1-06 (2006) |
| Silver | <1.2 | <1.1 | 0.057 | <0.21 | <0.05 | <0.57 | <0.70 | <0.043 | <0.068 | <0.23 |
| Aluminum | 3800 | 3300 | 4000 | 3900 | 2900 | 1900 | 2100 | 1900 | 2700 | 2900 |
| Arsenic | 2.2 | 2.2 | 1.4 | <4.2 | <0.41 | 1.6 | <0.87 | 1.1 | <0.71> | 1.3 |
| Cadmium | <0.7 | <0.6 | <0.06 | <0.42 | <0.03 | 0.72 | 1.2 | 1.2 | 1.4 | <0.18 |
| Chromium | 11.0 | 10.0 | 11 | 10 | 4.4 | 4.1 | 5.6 | 5.3 | 7.7 | 7.7 |
| Copper | 7.3 | 6.0 | 7.0 | 5.8 | 6.4 | 5.8 | 5.3 | 4.9 | 7.0 | 5.3 |
| Iron | 18000 | 16000 | 15000 | 11000 | 4800 | 6800 | 6500 | 7900 | 12000 | 15000 |
| Mercury | 0.1 | <0.1 | <0.045 | <0.04 | <0.02 | <0.02 | <0.024> | <0.013 | <0.0070> | <0.026 |
| Manganese | 1900 | 1000 | 1300 | 1500 | 600 | 510 | 700 | 1100 | 1500 | 1200 |
| Nickel | 5.8 | 6.1 | 8.4 | 7.4 | 6.1 | 6.1 | 2.2 | 4.4 | 6.7 | 6.1 |
| Lead | 6.0 | 5.8 | 8.5 | 3.3 | 3.3 | <2.2 | <5.1> | 5.1 | 7.8 | <7.1> |
| Selenium | 0.4 | <0.4 | <0.32 | 4.2 | <0.44 | <0.28 | <1.0 | <0.37 | <0.34 | <0.74 |
| Zinc | 47.0 | 33.0 | 38 | 34 | 18 | 19 | 20 | 18 | 28 | 25 |
| Total Solids% | 73.0 | 78.6 | 79.2 | NA | 76.7 | 74.9 | 72.6 | 41.7 | 74.9 | 74.6 |
| Total Vol. Solids % | 1.8 | 1.6 | 0.77 | NA | <2 | <2 | <2 | 6.7 | <2 | <2 |
| Field Temp. C | 25.0 | 16.2 | 15.0 | NA | 25.0 | 27.0 | 18.9 | 22.8 | 26.1 | 17.3 |

NA = Data Not Available
Data from Site S-1 is referenced by Sample ID#417998, Site S-3 is represented by Sample ID#417999
Data appearing in brackets (< >) was reported as observed between the level of detection (LOD) and level of quantitation (LOQ)

Prepared by: WMW
Checked by: BJW

| Table 2 (cont) | Sample Location/Number | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Port Arthur Dam (S-2) Sister's Farm( S-3) | | | | | | | | | | |
| Parameter (mg/kg) | S-2-91 (1991) | S-2-92 (1992) | S-2-93 (1993) | S-3-93 (1993) | S-3-94 (1994) | S-3-95 (1995) | S-3-96 (1996) | S-3-97 (1997) | S-3-98 (1998) | S-3-99 (1999) | S-3-06 (2006) |
| Silver | <1.1 | <2.6 | 0.086 | 0.58 | <0.08 | 0.04 | <0.56 | <0.40 | <0.044 | <0.058 | <0.19 |
| Aluminum | 4000 | 12000 | 1500.0 | 4400 | 4000 | 3600 | 2500 | 2400 | 2000 | 3000 | 3800 |
| Arsenic | 1.5 | 4.1 | <0.55 | 0.71 | <1.6 | 1.5 | <0.45 | <0.71 | <0.94> | <0.90> | <0.17 |
| Cadmium | 0.6 | <1.4 | <0.055 | 0.11 | 0.13 | 0.085 | 0.64 | 0.70 | 1.0 | 1.1 | <0.26> |
| Chromium | 13.0 | 24.0 | 23.8 | 9.6 | 10 | 6.6 | 6.3 | 6.1 | 5.6 | 8.0 | 9.4 |
| Copper | 7.2 | 24.0 | 2.1 | 6.7 | 7.1 | 7.0 | 8.2 | 6.7 | 6.1 | 7.7 | 7.1 |
| Iron | 16000 | 25000 | 3100 | 8200 | 7700 | 7300 | 6700 | 7900 | 6300 | 9300 | 12000 |
| Mercury | 0.1 | <0.3 | <0.057 | <0.07 | <0.03 | <0.06 | <0.02 | <0.059> | <0.042> | 0.029 | 0.045 |
| Manganese | 1600 | 570 | 610 | 830 | 860 | 780 | 840 | 910 | 910 | 830 | 1100 |
| Nickel | 7.3 | 12.0 | 1.7 | 6.5 | 6.2 | 5.0 | 5.7 | 3.0 | 3.1 | 5.7 | 5.8 |
| Lead | 6.9 | 20.0 | 2.6 | 8.3 | 7.8 | 7.5 | 9.0 | 6.4 | 5.9 | 11 | <9.8> |
| Selenium | 0.4 | <0.9 | <0.28 | <0.26 | <1.6 | <0.27 | 1.4 | <0.95> | <0.37 | <0.54 | <0.41 |
| Zinc | 45.0 | 79.0 | 9.6 | 33 | 46 | 26 | 28 | 24 | 21 | 34 | 37 |
| Total Solids% | 76.8 | 35.0 | 32 | 56 | NA | 44.8 | 49.8 | 30.6 | 24.5 | 45.9 | 36 |
| Total Vol. Solids % | 2.5 | 12.0 | 5.8 | 6.24 | NA | 6.9 | 5.5 | 11 | 15 | 6.0 | 9.7 |
| Field Temp. C | 25.0 | 15.8 | 15.5 | 15.5 | NA | 25.0 | 27.0 | 19.4 | 22.8 | 26.1 | 17.3 |


Figure 2 – Sediment Levels in jars at Sister's Farm

Figure 3 – Sediment Levels in jars at Blackberry Lane

Appendix 1
Laboratory Data Sheets
Sediment Analysis From Flambeau River 2006

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 11/09/06 Code: S


NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

Project: Flambeau Mining Company

**FMC-SED-A1-A4 NLS ID: 417998**
Ref. Line 1 COC 84326 FMC-SED-A1-A4 Matrix: MS
Collected: 09/11/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Aluminum, tot. recoverable as Al by ICP | 2900 | mg/Kg WWB | 1 | 1.5 | 5.4 | 09/26/06 | SW846 6010 | 721026460 |
| Arsenic, tot. recoverable as As by furnace AAS | 1.3 | mg/Kg WWB | 20 | 0.31 | 1.1 | 10/06/06 | SW846 7060 | 721026460 |
| Cadmium, tot. recoverable as Cd by ICP | ND | mg/Kg WWB | 1 | 0.18 | 0.65 | 09/25/06 | SW846 6010 | 721026460 |
| Chromium, tot. recoverable as Cr by ICP | 7.7 | mg/Kg WWB | 1 | 0.38 | 1.4 | 09/25/06 | SW846 6010 | 721026460 |
| Copper, tot. recoverable as Cu by ICP | 5.3 | mg/Kg WWB | 1 | 0.12 | 0.45 | 09/25/06 | SW846 6010 | 721026460 |
| Iron, tot. recoverable as Fe by ICP | 15000 | mg/Kg WWB | 10 | 3.1 | 12 | 10/02/06 | SW846 6010 | 721026460 |
| Lead, tot. recoverable as Pb by ICP | [7.1] | mg/Kg WWB | 1 | 3.2 | 12 | 09/26/06 | SW846 6010 | 721026460 |
| Manganese, tot. recoverable as Mn by ICP | 1200 | mg/Kg WWB | 10 | 0.47 | 1.7 | 09/27/06 | SW846 6010 | 721026460 |
| Mercury, total as Hg on solids | ND | mg/Kg WWB | 1 | 0.026 | 0.082 | 09/29/06 | SW846 7470A | 721026460 |
| Nickel, tot. recoverable as Ni by ICP | 6.1 | mg/Kg WWB | 1 | 0.54 | 2.0 | 09/25/06 | SW846 6010 | 721026460 |
| Selenium, tot. recoverable as Se by furnace | ND | mg/Kg WWB | 20 | 0.74 | 2.6 | 10/06/06 | SW846 7740 | 721026460 |
| Silver, tot. recoverable as Ag by ICP | ND | mg/Kg WWB | 1 | 0.23* | 0.76* | 10/04/06 | SW846 6010 | 721026460 |
| Solids, total on solids | 74.6 | % | 1 | 0.10* | | 09/18/06 | ASTM D2216 | 721026460 |
| Solids, tot. volatile | ND | % DWB | 1 | 2.0* | | 09/18/06 | EPA 160.4 | 721026460 |
| Zinc, tot. recoverable as Zn by ICP | 25 | mg/Kg WWB | 1 | 0.12 | 0.43 | 09/25/06 | SW846 6010 | 721026460 |
| Metals digestion - tot. recov. (solid) GF | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Metals digestion - tot. recov (solid) ICP | yes | | | | | 09/25/06 | SW846 3050M | 721026460 |
| Sieve test | see attached | | | | | 10/16/06 | ASTM D422 | NA |
| Misc. Sample Prep | yes | | | | | 09/18/06 | NA | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: [signature]

Authorized by:
R. T. Krueger
President

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

# ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034
Printed: 11/09/06 Code: S



Client: Blue Iris Environmental Inc
Attn: Bill West
N5811 Twelve Corners Road
Black Creek,WI 54106 7936

NLS Project: 101463
NLS Customer: 90830
Fax: 920 738 7774 Phone: 920 730 5684

Project: Flambeau Mining Company

**FMC-SED-B1-B4 NLS ID: 417999**
Ref. Line 5 COC 84326 FMC-SED-B1-B4 Matrix: MS
Collected: 09/11/06 00:00 Received: 09/14/06

| Parameter | Result | Units | Dilution | LOD | LOQ | Analyzed | Method | Lab |
|---|---|---|---|---|---|---|---|---|
| Aluminum, tot. recoverable as Al by ICP | 3800 | mg/Kg WWB | 1 | 1.2 | 4.5 | 09/26/06 | SW846 6010 | 721026460 |
| Arsenic, tot. recoverable as As by furnace AAS | 1.2 | mg/Kg WWB | 20 | 0.17 | 0.63 | 10/06/06 | SW846 7060 | 721026460 |
| Cadmium, tot. recoverable as Cd by ICP | [0.26] | mg/Kg WWB | 1 | 0.15 | 0.53 | 09/25/06 | SW846 6010 | 721026460 |
| Chromium, tot. recoverable as Cr by ICP | 9.4 | mg/Kg WWB | 1 | 0.31 | 1.1 | 09/25/06 | SW846 6010 | 721026460 |
| Copper, tot. recoverable as Cu by ICP | 7.1 | mg/Kg WWB | 1 | 0.10 | 0.37 | 09/25/06 | SW846 6010 | 721026460 |
| Iron, tot. recoverable as Fe by ICP | 12000 | mg/Kg WWB | 10 | 2.5 | 9.5 | 10/02/06 | SW846 6010 | 721026460 |
| Lead, tot. recoverable as Pb by ICP | [9.8] | mg/Kg WWB | 1 | 2.7 | 10 | 09/26/06 | SW846 6010 | 721026460 |
| Manganese, tot. recoverable as Mn by ICP | 1100 | mg/Kg WWB | 10 | 0.39 | 1.4 | 09/27/06 | SW846 6010 | 721026460 |
| Mercury, total as Hg on solids | 0.045 | mg/Kg WWB | 1 | 0.013 | 0.040 | 09/29/06 | SW846 7470A | 721026460 |
| Nickel, tot. recoverable as Ni by ICP | 5.8 | mg/Kg WWB | 1 | 0.45 | 1.6 | 09/25/06 | SW846 6010 | 721026460 |
| Selenium, tot. recoverable as Se by furnace | ND | mg/Kg WWB | 20 | 0.41 | 1.4 | 10/06/06 | SW846 7740 | 721026460 |
| Silver, tot. recoverable as Ag by ICP | ND | mg/Kg WWB | 1 | 0.19* | 0.62* | 10/04/06 | SW846 6010 | 721026460 |
| Solids, total on solids | 36.0 | % | 1 | 0.10* | | 09/18/06 | ASTM D2216 | 721026460 |
| Solids, tot. volatile | 9.7 | % DWB | 1 | 2.0* | | 09/18/06 | EPA 160.4 | 721026460 |
| Zinc, tot. recoverable as Zn by ICP | 37 | mg/Kg WWB | 1 | 0.095 | 0.36 | 09/25/06 | SW846 6010 | 721026460 |
| Metals digestion - tot. recov. (solid) GF | yes | | | | | 10/03/06 | SW846 3050M | 721026460 |
| Metals digestion - tot. recov (solid) ICP | yes | | | | | 09/25/06 | SW846 3050M | 721026460 |
| Sieve test | see attached | | | | | 10/16/06 | ASTM D422 | NA |
| Misc. Sample Prep | yes | | | | | 09/18/06 | NA | 721026460 |

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dlution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
Shaded results indicate >MCL.

Reviewed by: 

Authorized by:
R. T. Krueger
President

# GRADATION ANALYSIS

CLIENT: Northern Lakes Service | JOB NO.: 06-1-17270
PROJECT: Lab Testing

LAB ID: SH2398 | TEST DATE: 10/16/06
SPECIFICATION: | TESTED BY: BJL
SAMPLED BY: NLS | REVIEWED BY: PGP
SPECIMEN IDENTIFICATION: 417998 | SOURCE:

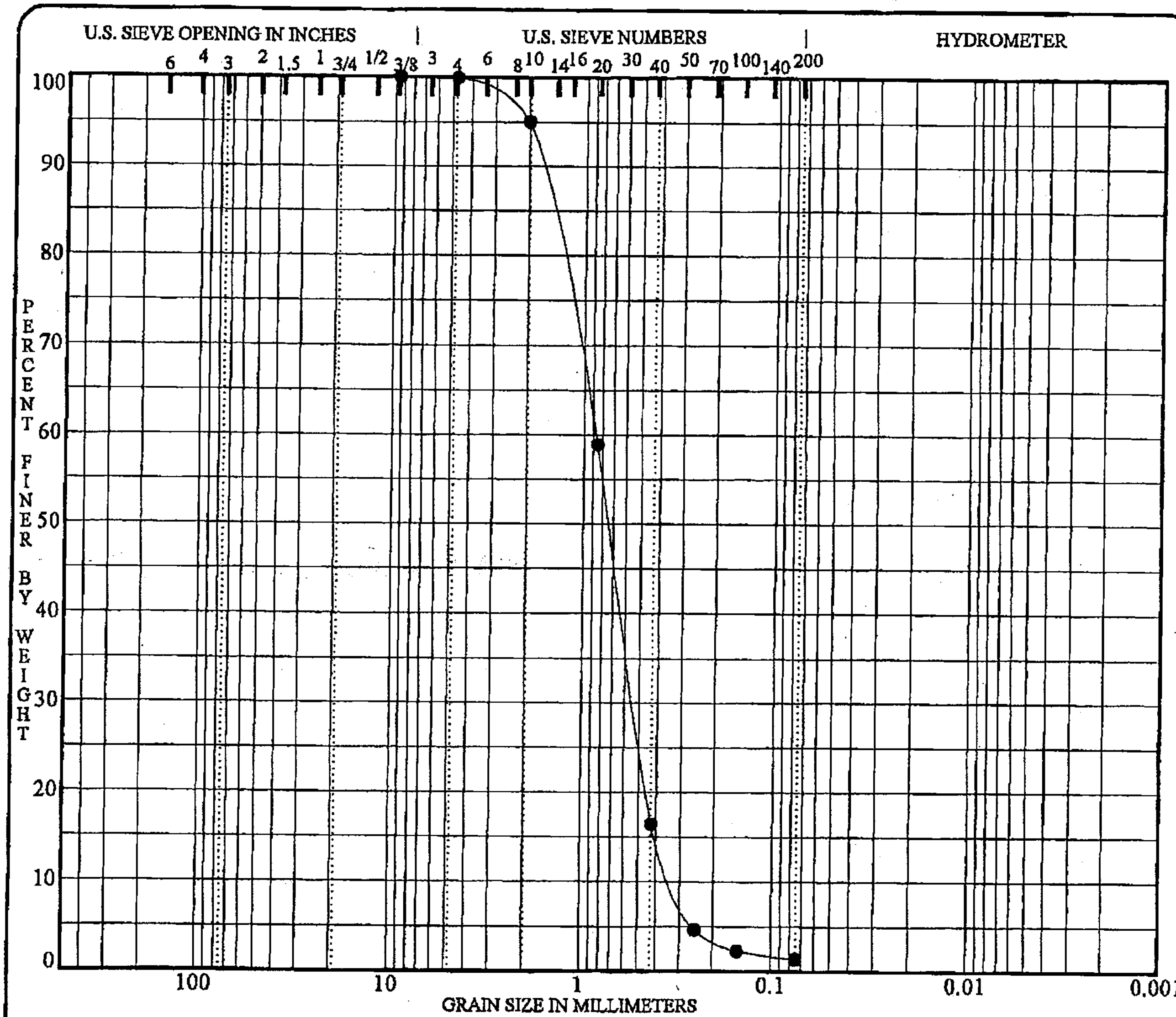
TOTAL WEIGHT OF SAMPLE (g): 225.20

**SIEVE TEST ANALYSIS (ASTM D422)**

| SIEVE SIZE | %FINER | REQUIRED SPECS | |
|---|---|---|---|
| | | MIN | MAX |
| #200 | 1.4 | | |
| #100 | 2.3 | | |
| #60 | 4.7 | | |
| #40 | 16.4 | | |
| #20 | 58.9 | | |
| #10 | 95.0 | | |
| #4 | 99.9 | | |
| 3/8" | 100.0 | | |

TABLE_SIEVE GRNT.GPJ MLLR_ENG.GDT 10/16/06 15:41

MILLER ENGINEERS SCIENTISTS




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| Specimen Identification | Classification | MC% | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|
| ● 417998 | **POORLY GRADED SAND(SP)** | | | | | 1.01 | 2.7 |
| LAB ID: **SH2398** | | | | | | | |

| Specimen Identification | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|
| ● 417998 | 9.50 | 0.87 | 0.530 | 0.3180 | 0.1 | 98.5 | 1.4 | |

CLIENT : **Northern Lakes Service**
PROJECT: **Lab Testing**

JOB NO.: **06-1-17270**
TEST DATE: **10/16/06**
SOURCE:
SAMPLED BY: **NLS**
TESTED BY: **BJL**
REVIEWED BY: **PGP**

**MILLER ENGINEERS SCIENTISTS**

**GRAIN SIZE ANALYSIS**
**ASTM D422**

GRAFSIEV GINT.GPJ MLLR ENG.GDT 10/16/06 15:41

# GRADATION ANALYSIS

CLIENT: Northern Lakes Service
JOB NO.: 06-1-17270
PROJECT: Lab Testing

LAB ID: SH2399
TEST DATE: 10/16/06
SPECIFICATION:
TESTED BY: BJL
SAMPLED BY: NLS
REVIEWED BY: PGP
SPECIMEN IDENTIFICATION: 417999
SOURCE:

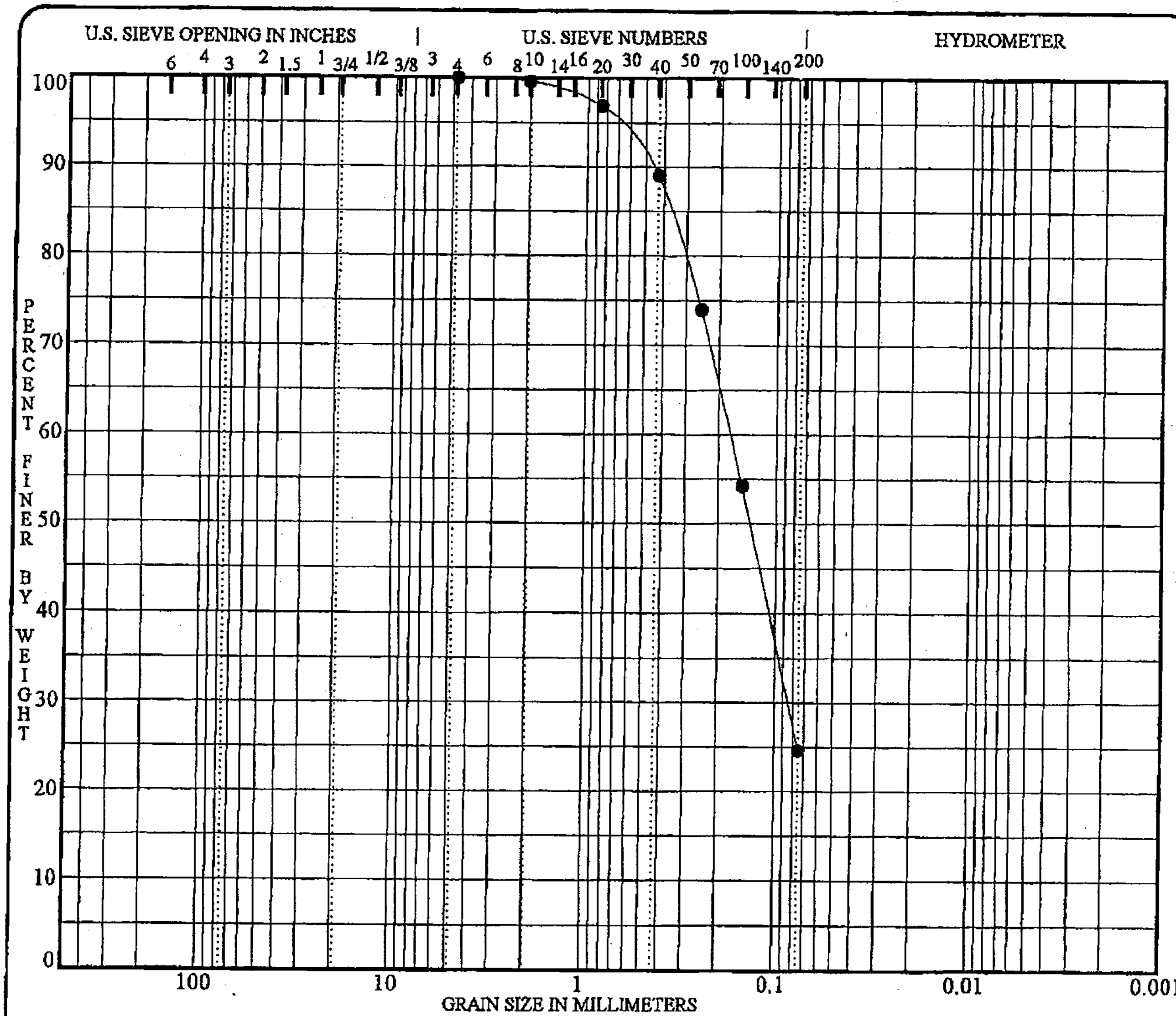
TOTAL WEIGHT OF SAMPLE (g): 70.30

**SIEVE TEST ANALYSIS (ASTM D422)**

| SIEVE SIZE | %FINER | REQUIRED SPECS | |
|---|---|---|---|
| | | MIN | MAX |
| #200 | 24.6 | | |
| #100 | 54.2 | | |
| #60 | 74.0 | | |
| #40 | 89.0 | | |
| #20 | 96.9 | | |
| #10 | 99.6 | | |
| #4 | 100.0 | | |

TABLE_SIEVE GINT.GPJ MLLR_ENG.GDT 10/16/06 15:47

MILLER
ENGINEERS
SCIENTISTS




| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| Specimen Identification | Classification | MC% | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|
| ● 417999 | | | | | | | |
| LAB ID: **SH2399** | | | | | | | |

| Specimen Identification | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|
| ● 417999 | 4.75 | 0.17 | 0.085 | | 0.0 | 75.4 | 24.6 | |

CLIENT: **Northern Lakes Service**
PROJECT: **Lab Testing**

JOB NO.: **06-1-17270**
TEST DATE: **10/16/06**
SOURCE:
SAMPLED BY: **NLS**
TESTED BY: **BJL**
REVIEWED BY: **PGP**

MILLER ENGINEERS SCIENTISTS

**GRAIN SIZE ANALYSIS**
**ASTM D422**

GRAFSIEV GINT.GPJ MILLR_ENG.GDT 10/16/06 15:46