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NTS 2009

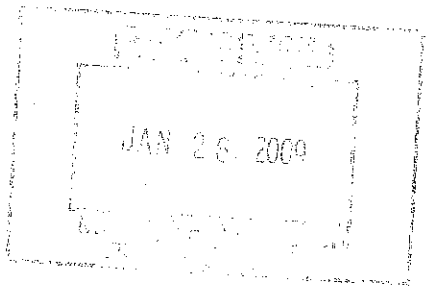
2008 ANNUAL REPORT
HOYT LAKES TAILINGS BASIN

Cliffs Erie LLC
NPDES/SDS Permit No. MN0054089

January 2009

Prepared For:

Cliffs Erie LLC
P.O. Box 900
Hoyt Lakes, Minnesota



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1. INTRODUCTION

1.1. Purpose

The "2008 Hoyt Lakes Tailings Basin Annual Report" (Annual Report), is intended to meet the reporting requirements stipulated in Chapter 5 of Cliffs Erie LLC's (CE's) Hoyt Lakes Tailings Basin Area NPDES/SDS Permit # MN0054089 (Permit). The Permit specifies that an Annual Report shall be submitted for the Hoyt Lakes Tailings Basin (Tailings Basin) by February 5th of each year following issuance of the Permit. The Permit also stipulates that a Dike Seepage Survey Report which summarizes the results of the Tailings Basin Dike Seepage Survey (conducted during October of each year) be included in the Annual Report. The Dike Seepage Survey Report is presented as Section 2 of this Annual Report. A map of the Tailings Basin is included as Figure 1. NPDES Permit monitoring stations are shown on Figure 2.

1.2. Tailings Basin Status

On December 29, 2000, LTV Corporation filed for Chapter 11 bankruptcy protection and on January 3, 2001, announced the immediate shut down of LTV Steel Mining Company (LTVSMC). The last tailings were pumped to the Tailings Basin on January 5, 2001. CE purchased the Hoyt Lakes Tailings Basin in October 2001. PolyMet Mining, Inc. purchased the Hoyt Lakes Tailings Basin during November 2005. CE currently remains the permittee with regard to the NPDES/SDS Permit (Permit) pending Minnesota Pollution Control Agency acting on an associated Permit modification request also made during November 2005.

The Tailings Basin has remained inactive since January 5, 2001, except for continuing reclamation work and operation of CE's Land Treatment Facility SW-625. A map of Land Treatment Facility SW-625 is provided as Figure 3. Dewatering of the Tailings Basin by pumping was not conducted during 2008 and seepage pumps along the north side of the Tailings Basin were not operated. Reclamation activities have been conducted on the Tailings Basin including repair of erosion and seeding of areas inside Tailings Basin Cells. Reclamation work is summarized in a separate annual report submitted to the Minnesota Department of Natural Resources (MDNR). Piezometers and inclinometer monitoring results are summarized in a separate report provided to MDNR. Similarly, MDNR and/or MDNR's engineer performs an annual dam safety inspection on the Tailings Basin and prepares an Annual Dam Safety Inspection Report for the Tailings Basin.

As indicated above, the Emergency Basin was also inactive during 2008. The only water received by the Emergency Basin during 2008 was seepage from Cell 2W and stormwater. Pumping from the Emergency Basin to the Tailings Basin was discontinued during 2001 and a "T-culvert discharge structure" was installed on the Emergency Basin. The T-culvert discharge structure is designed to prevent any potential petroleum products floating on the surface of the Emergency Basin from being released, while controlling the elevation of water in the Emergency Basin. Installation of the T-culvert discharge

structure is not in compliance with the Permit, but was necessary to minimize the risk to the public due to potential dam stability issues.

Land Treatment Facility SW-625 (SW-625) is permitted for treatment by composting of petroleum contaminated soils generated during cleanup (i.e., soil excavation) of contaminated soils from Knox Train Fueling Station and Area 2 Shops Train Fueling Station. SW-625 is located within Cell 2W of the Hoyt Lakes Tailings Basin (Figure 3) and consists of a 90 acre treatment area and a temporary staging area. The organic carbon content of the native soils within the 90 acre treatment area was augmented by spreading an average of approximately 5 inches of peat on the area. Petroleum contaminated soils were screened and thin spread approximately 4 inches thick on the area. Screened rock greater than 4-inches in diameter was windrowed along the outer edge of the 90 acres.

1.3. Tailings Basin Area Map

Section 5.5.3 of the Permit requires that the Annual Report include a current map of the Tailings Basin area, including the Emergency Basin, which details the dikes, berms, dams, roads and cells, as well as the current topographic and water level elevations. A map of the Tailings Basin area is included as Figure 1. Figure 1 is based on aerial surveys performed May 18, 2001. Details of dikes, berms, dams, roads and cells, as well as topographic elevations are essentially current since the Tailings Basin area has been inactive since January 5, 2001.

The position of the shoreline within Tailings Basin Cell 1E and Cell 2E shown on Figure 1 is based on May 18, 2001 information. Tailings Basin Cell 2W is essentially dry. The position of the shoreline in Tailings Basin Cell 1E and Cell 2E could not be updated without significant cost for an additional aerial survey since a land based survey is not possible due to potentially dangerous ground conditions (wet and/or saturated tailings near the waters edge) within the Tailings Basin near the waters edge.

2. DIKE SEEPAGE SURVEY REPORT

The Permit specifies that a Dike Seepage Survey Report be prepared that summarizes a detailed field survey of the seepage zones from the perimeter of dikes of the Tailings Basin, including the Emergency Basin, during October of each year. The results of the 2008 Dike Seepage Survey are summarized in Table 1 and on Figure 1.

The Dike Seepage Survey was conducted on October 28 & 29, 2008. During previous Dike Seepage Surveys, Universal Transverse Mercator (UTM) coordinates based on NAD 83 were recorded for each visible seep and/or seepage zone. During the 2005 Dike Seepage Survey, the previously identified locations of visible seeps and seepage zones were verified using a hand held global positioning system instrument. Table 1 contains UTM coordinates of the visible seeps and seepage zones, and the locations of seeps and

seepage zones are shown on Figure 1. Photographs were not obtained during the 2008 survey.

Seep and seepage zone flow rates were estimated or measured in gallons per minute (gpm). When possible, discharge rates were measured directly as a timed volume (e.g., where a given pipe outfall was elevated above the ground surface). Other seep or seepage zone flow rates were calculated using a flow meter to obtain an average flow velocity combined with either measured or estimated cross-sectional flow areas to calculate flow rates. Visual flow rate estimates were not utilized due to inaccuracy.

Field parameters (i.e., flow, specific conductance, pH, and temperature) were measured at all seeps and seepage zones, and the inflow to Cell 1E. There was an overall decrease in the number of seeps observed from the original 2001 seep survey. The seep discharge volumes (not including Seeps 32 & 33) have decreased overall from approximately 650 gpm during 2001 to less than 100 gpm in 2007, and at approximately 200 gpm during 2008.

3. GROUND WATER MONITORING

Eight (8) ground water (GW) monitoring stations (i.e., wells GW001 through GW008) are included in the Permit. GW002 is considered the background station for the Tailings Basin. The locations of the GW monitoring stations are shown on Figure 2. Three (3) of the wells (GW003, GW004 and GW005) are located within Tailings Basin Cell 2W. The wells installed in Cell 2W were intended to monitor hornfels rock that was placed in the Tailing Basin and covered with tailings during 1993. As stipulated in the Permit, monitoring of GW stations is performed three (3) times per year during May, July, and October. Ground water monitoring data (e.g., laboratory analysis results and field measurements) are included on monthly Discharge Monitoring Reports submitted to the Minnesota Pollution Control Agency (MPCA).

GW003 was dry during the April 2003 monitoring event. In response, and based on Chapter 1, Section 1.5 of the Permit, an alternative monitoring proposal was submitted to the Minnesota Pollution Control Agency (MPCA) by CE on May 20, 2004 (Appendix A). Monitoring of GW003 has continued per the alternative monitoring proposal, but has remained dry during 2008. Static water elevation data from wells are summarized in Table 2. Static water elevation trends are presented graphically as Figure 4. Static water elevations in GW004 and GW005 (located within Tailings Basin Cell 2W) have leveled out.

Ground water has been impacted by the Tailings Basin based on comparison of GW006 and GW007 monitoring results to those of GW002 (the background station for the Tailings Basin). Ground water monitoring data is summarized in Table 3 and analyte concentration trends are presented graphically as Figures 5A through 5H. Included on the graphs are the ground water instantaneous maximum limits and instantaneous maximum intervention limits established within the Permit for ground water (GW) monitoring stations. Instantaneous maximum intervention limits have been routinely

exceeded for boron (Figure 5A), fluoride (Figure 5C), manganese (Figure 5D) and molybdenum (Figure 5E) within wells GW006 and GW007. Instantaneous maximum intervention limits have been routinely exceeded for total dissolved solids (Figure 5F) and sulfate (Figure 5H) within GW006. In addition, instantaneous maximum limits have been routinely exceeded for manganese (Figure 5D) and molybdenum (Figure 5E) within wells GW006 and GW007. The locations of wells GW006 and GW007 are shown on Figure 2.

Although ground water limits have been exceeded within ground water, there does not appear to be an overall trend (i.e., either increasing or decreasing) in concentration of constituents monitored. A Compliance Schedule Report (December 19, 2002) was prepared that addresses analyte concentrations in ground water that exceed Permit limits. Conceptual mitigation alternatives are discussed in the December 19, 2002, Compliance Schedule Report (Appendix B). Continued groundwater monitoring per the Permit was recommended in the Compliance Schedule Report.

4. SURFACE DISCHARGE AND WASTE STREAM (SEEP) MONITORING

Seeps are ground water that discharges to the ground surface or to surface water. It is recognized within the Permit that seeps are a concern with regard to surface water. Specific seeps are included in the Permit as surface discharge (SD) monitoring stations and waste stream (WS) monitoring stations. SD monitoring station seeps discharge external to the Tailings Basin system while WS monitoring stations discharge internal (i.e., to the emergency basin) to the Tailings Basin. Both SD and WS seep information is presented in this document.

Five (5) SD monitoring stations are included in the Permit, including:

- SD001 - NW Seepage Collection Ditch;
- SD002 - NE Seepage Collection Ditch;
- SD004 - Tailings Basin Cell 2W Seep A;
- SD005 - Tailings Basin Cell 2W Seep B; and,
- SD006 – Power Line Access Road Culvert.

There is no station SD003; and, SD005 was dry during 2008. All of the Permit designated SD monitoring stations are seeps except for SD006. SD monitoring data is summarized in Table 4. Both SD and WS seep monitoring result trends are presented graphically as Figures 6A through 6J. Included on the graphs (Figures 6A through 6J) are the SD station calendar month average (CalMoAvg) limits, instantaneous maximum and calendar month maximum (CalMoMax) limits established within the Permit. CalMoAvg limits have been routinely exceeded for bicarbonates (Figure 6A) and hardness (Figure 6D) at all SD monitoring stations. CalMoAvg limits are routinely exceeded at SD004 for boron (Figure 6B); dissolved iron (Figure 6I) and turbidity (Figure 6H). The CalMoAvg limit for specific conductance (field measurement) has also been exceeded, although not routinely, at SD002, SD004, and SD006. Note that there are no Permit limits established for the WS stations although WS station information is

included on Figures 6A through 6J. Although Permit limits have been exceeded at several locations, there does not appear to be an overall trend (i.e., either increasing or decreasing) in concentration of constituents monitored. The exception is boron and fluoride concentrations which appear to be decreasing at all surface discharge locations.

Three (3) seeps designated WS monitoring stations are included in the Permit, including:

- WS011 - Tailings Basin Seep 1;
- WS012 - Tailings Basin Seep 2; and,
- WS013 - Tailings Basin Seep 3.

WS monitoring data is summarized in Table 5. As indicated above, both SD and WS seep monitoring trends are presented graphically on Figures 6A through 6J. The WS stations are used in part to monitor seepage from the vicinity of the hornfels rock (i.e., high sulfide waste) buried in the Tailings Basin. Specifically, metals and other parameters are required in the Permit to be monitored at WS013 (Table 5). WS013 analyte concentrations are presented graphically as Figures 7A and 7B. Copper and nickel have remained below reporting limits (2 ug/L). Manganese and molybdenum concentrations appear to have decreased while sulfate concentrations appear to have increased at WS013. WS013 was dry during April, July and October 2008 (Table 5).

5. KNOX CREEK HEADWATERS

Other Tailings Basin seep related information is summarized in this document. As indicated in Section 2 above, two (2) additional seeps (seep 32 and seep 33) have been identified at the south side of Tailings Basin Cell 1E (Figure 1). Seeps 32 and 33 have a combined flow rate greater than the combined flow rate of all other seeps identified in Table 1. Seeps 32 and 33 are located at the current headwaters of Knox Creek. Based on historic mine maps, the former headwaters of Knox Creek extended approximately one (1) mile north of Seeps 32 and 33 beneath Tailings Basin Cell 1E. Although the headwaters of Knox Creek is buried beneath Tailings Basin Cell 1E, water is most likely still conveyed along the buried drainage path, forming Seeps 32 and 33 at the south side of Cell 1E.

Knox Creek is part of the headwaters of Second Creek. Knox Creek discharges via the Second Creek headwaters culvert (outfall 251) which is included in the Hoyt Lakes Mine Area NPDES/SDS Permit MN0042536 as SD station SD026. Because the headwaters of Knox Creek is seep water from Tailings Basin Cell 1E, SD026 monitoring data has been included in Table 4 and is graphed on Figures 6A through 6J. The location of SD026 is included on Figure 1. Note that the CalMoAvg limits shown on Figures 6A through 6J do not apply to SD026 except for Specific Conductance (1000 mg/L) included as Figure 6G.

Surface discharge limits established in the Hoyt Lakes Mine Area NPDES/SDS Permit have been exceeded at SD026. A Compliance Schedule Report (December 16, 2002) is included as Appendix C that addresses trends in specific conductance at SD026.

Conceptual mitigation alternatives are discussed and continued monitoring per the Hoyt Lakes Mine Area NPDES/SDS Permit was recommended based on a decreasing trend of specific conductance at SD026 (1999 through 2002 data).

6. DISCUSSION

As indicated above, ground water and seep water quality has been impacted by the Tailings Basin and GW station and SD station limits established in the Permit have been exceeded (Figures 5A through 5H and Figures 6A through 6J). Most analyte trends do not appear to be increasing or decreasing significantly with the exception of decreased boron and fluoride concentrations at the surface discharge stations. Not all of the same analytes are monitored at the GW, SD, and WS stations. For example, analytes such as bicarbonate and hardness are not monitored at all stations and routinely exceed SD station CalMoAvg established in the Permit where they are monitored. Elevated bicarbonate and hardness concentrations may be attributed in part to the soda ash (sodium carbonate) metered onto the rod mill feed conveyor in the Fine Crushing Plant that discharged with tails to the Tailings Basin. In addition, specific conductance at the SD monitoring stations may be impacted by the presence of soda ash in the tailings. Specific conductance measurements exceed both the Permit limits and Mine Area NDPES Permit limits established for SD026.

Closure and/or future use (i.e., economic development) of the Tailings Basin and Mine Area may be affected by the Permit exceedences discussed above. If active remediation is required to meet Permit requirements, then mitigation alternatives such as those discussed in the Compliance Schedule Reports included as Appendix B and Appendix C should be evaluated in more depth. Similarly, Permit exceedences could affect future use of the Tailings Basin unless they can be addressed.

7. CONCLUSIONS AND RECOMMENDATIONS

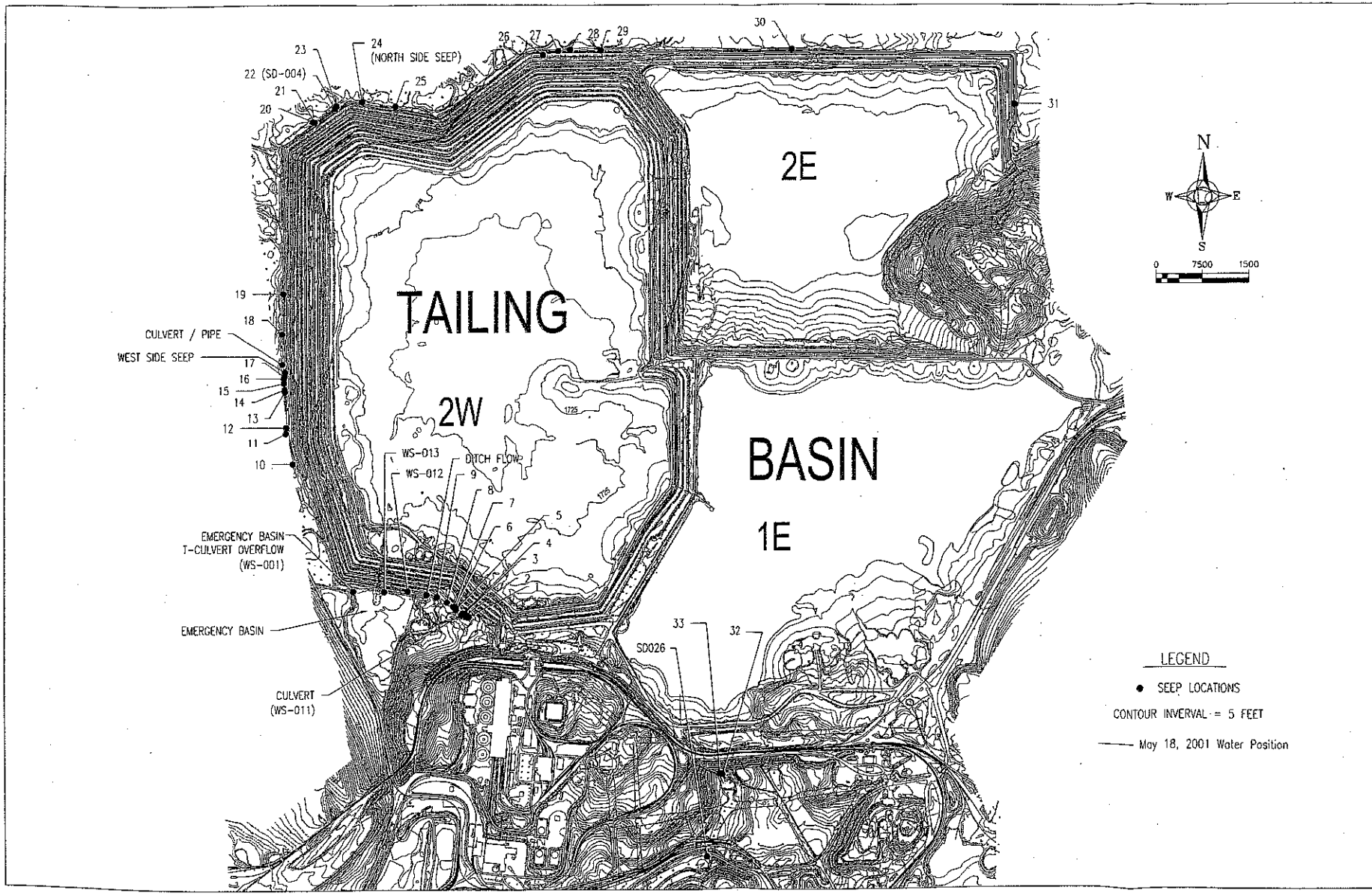
The following are conclusions and recommendations for the Tailings Basin:

1. Ground water and surface discharge requirements of the Permit have been exceeded;

2. Permit exceedences may be addressed as part of PolyMet Mining, Inc.'s environmental permitting process;

3. Monitoring should be continued based on Permit requirements.

FIGURES



DRAWING SOURCE

MARSHURG, PHOTOMAP, FROM AERIAL PHOTOGRAPHS TAKEN MAY 18, 2001
HORIZONTAL AND VERTICAL CONTROL FURNISHED BY BENCHMARK ENGINEERING

PROJECT #: 7157A.08
DATE: JANUARY, 2008
DWG. FILE: Fig1 SEEP
SCALE: 1" = 1500'

SEEP LOCATIONS
HOYT LAKES TAILINGS BASIN
POLYMET
HOYT LAKES MINNESOTA

FIGURE
1

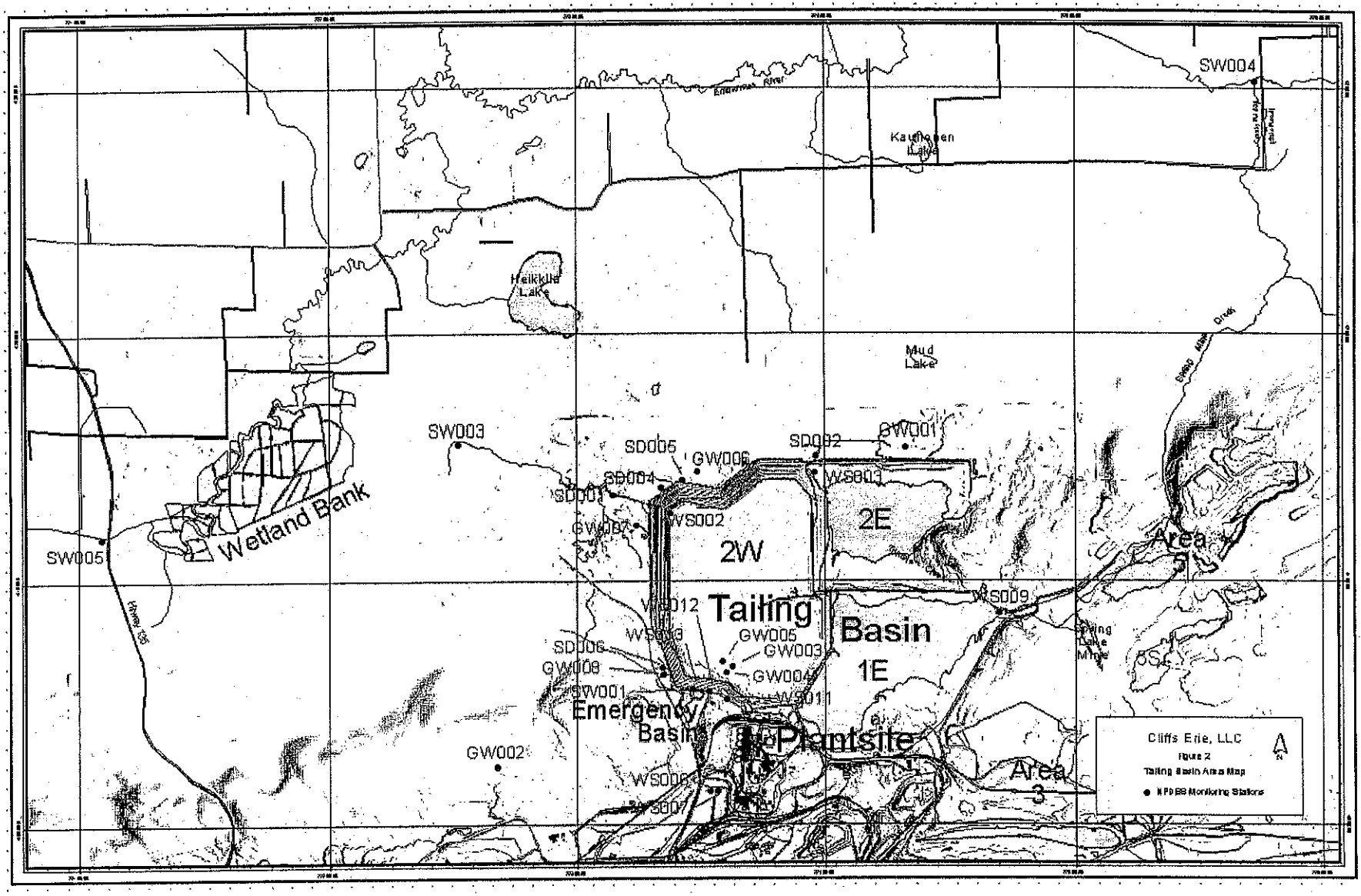
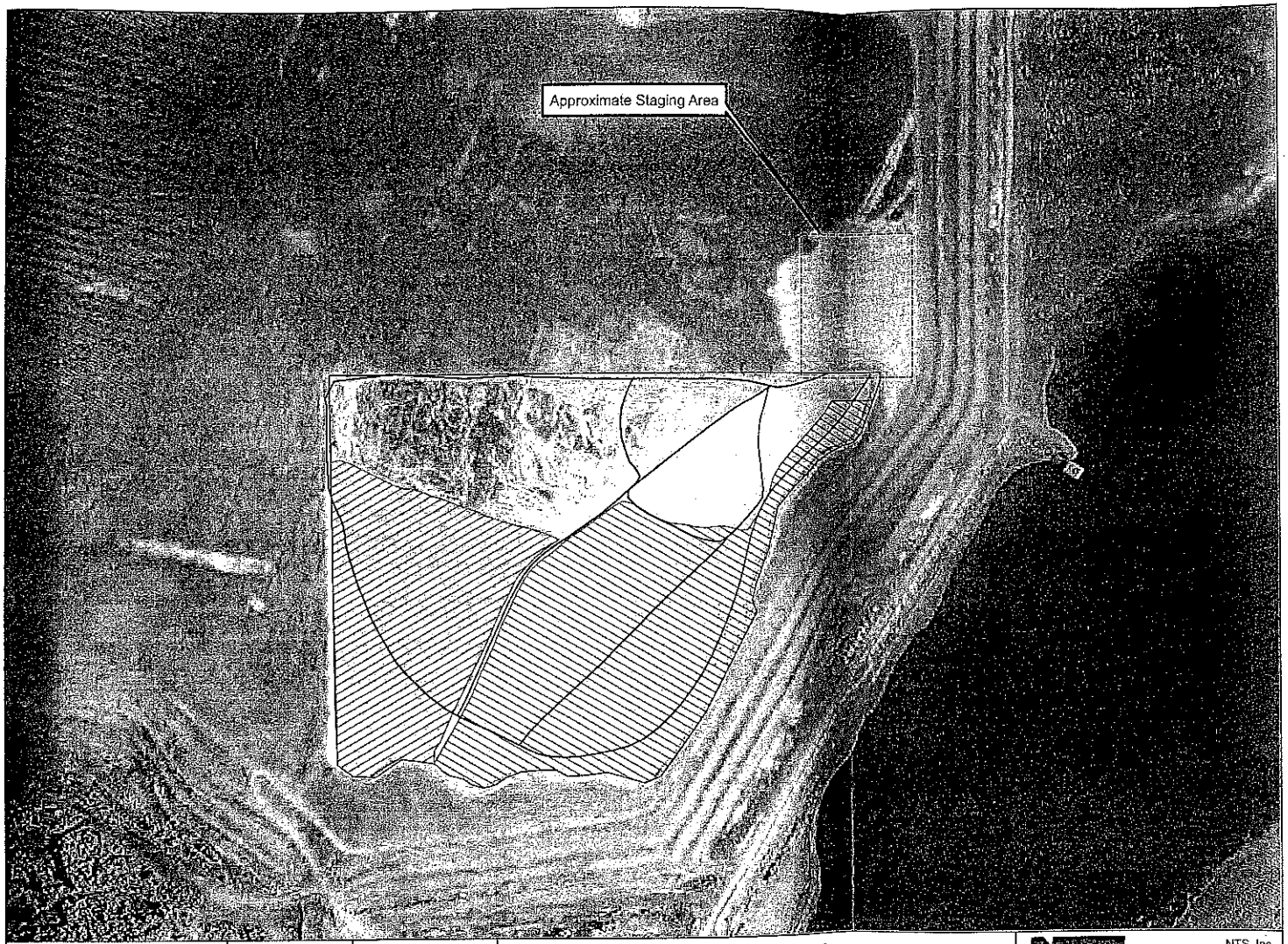


FIGURE 2	**NPDES Monitoring Stations** **Cliffs Erie, LLC Hoyt Lakes Tailings Basin** **Hoyt Lakes, MN**	**Figure 2** **Site Map**	NTS, Inc. 526 Chestnut Street P.O. Box 1142 Virginia, MN 55792



N
W
E
S

0 250 500 1,000
Feet
1:500

Landfarm Boundary

Current / Abandoned Access Roads

Plot used for Area 2 Shops Soil LEAK#00064Z3

Plot previously used for Knox Train Fueling Soil LEAK#00064Z9

NOTES:

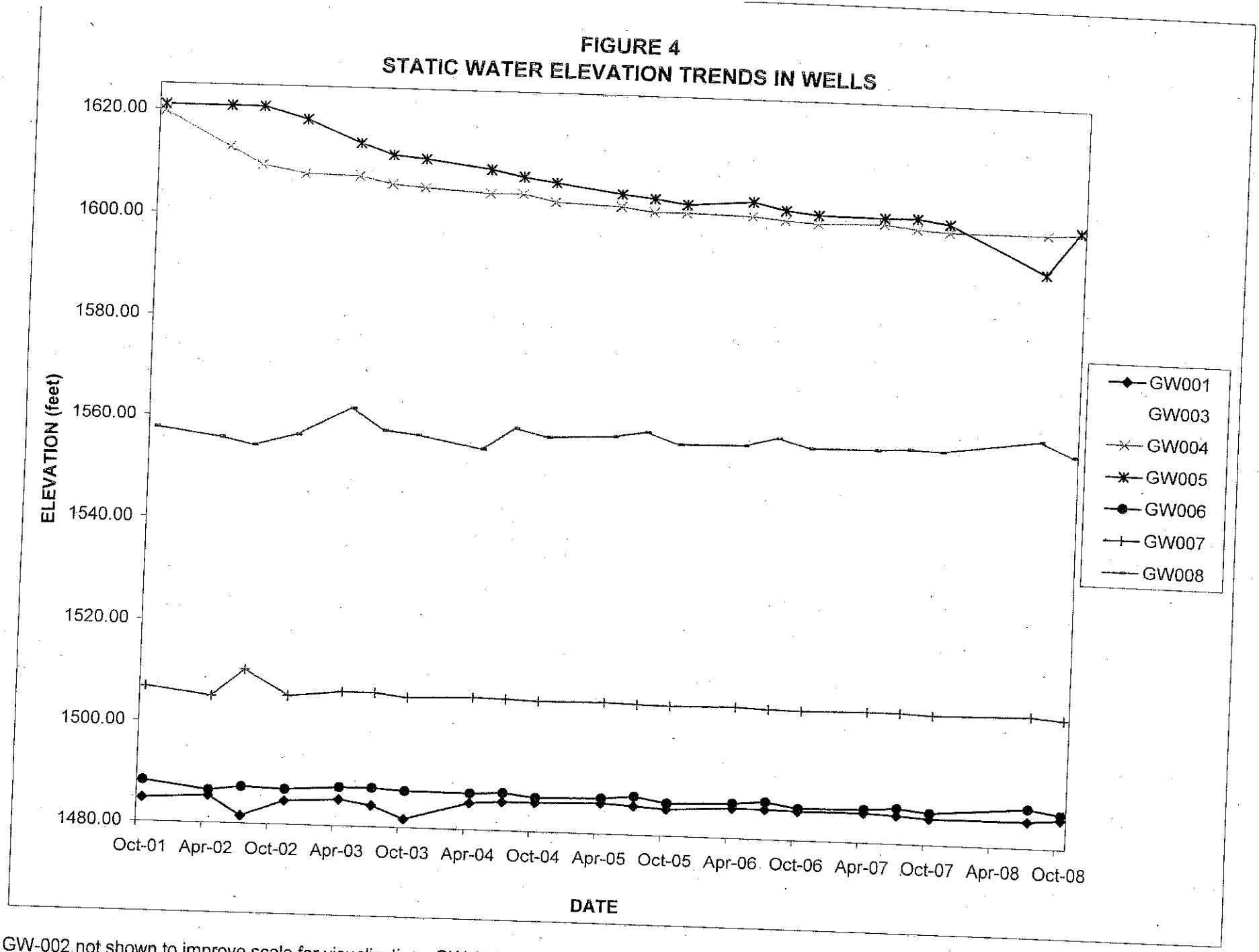
2008 NAIP Digital Aerial Photograph
Courtesy of MN Land Management
Information Center

Drawing File Path: GIS/GIS Projects/7157A/.mxd	Drawn By: SMJ Date: JAN 2009	Reviewed By: DAF Date: JAN 2009	Hoyt Lakes Tailing Basin Cliffs Erie LLC Hoyt Lakes, Minnesota	NTS, Inc. 526 Chestnut Street P.O. Box 1142 Virginia, MN 55792	Figure 3 Land Treatment Facility SW-625

3

GROUND WATER TRENDS

FIGURE 4
STATIC WATER ELEVATION TRENDS IN WELLS



GW-002 not shown to improve scale for visualization. GW-003 has been dry since April 2003.

FIGURE 5A
BORON

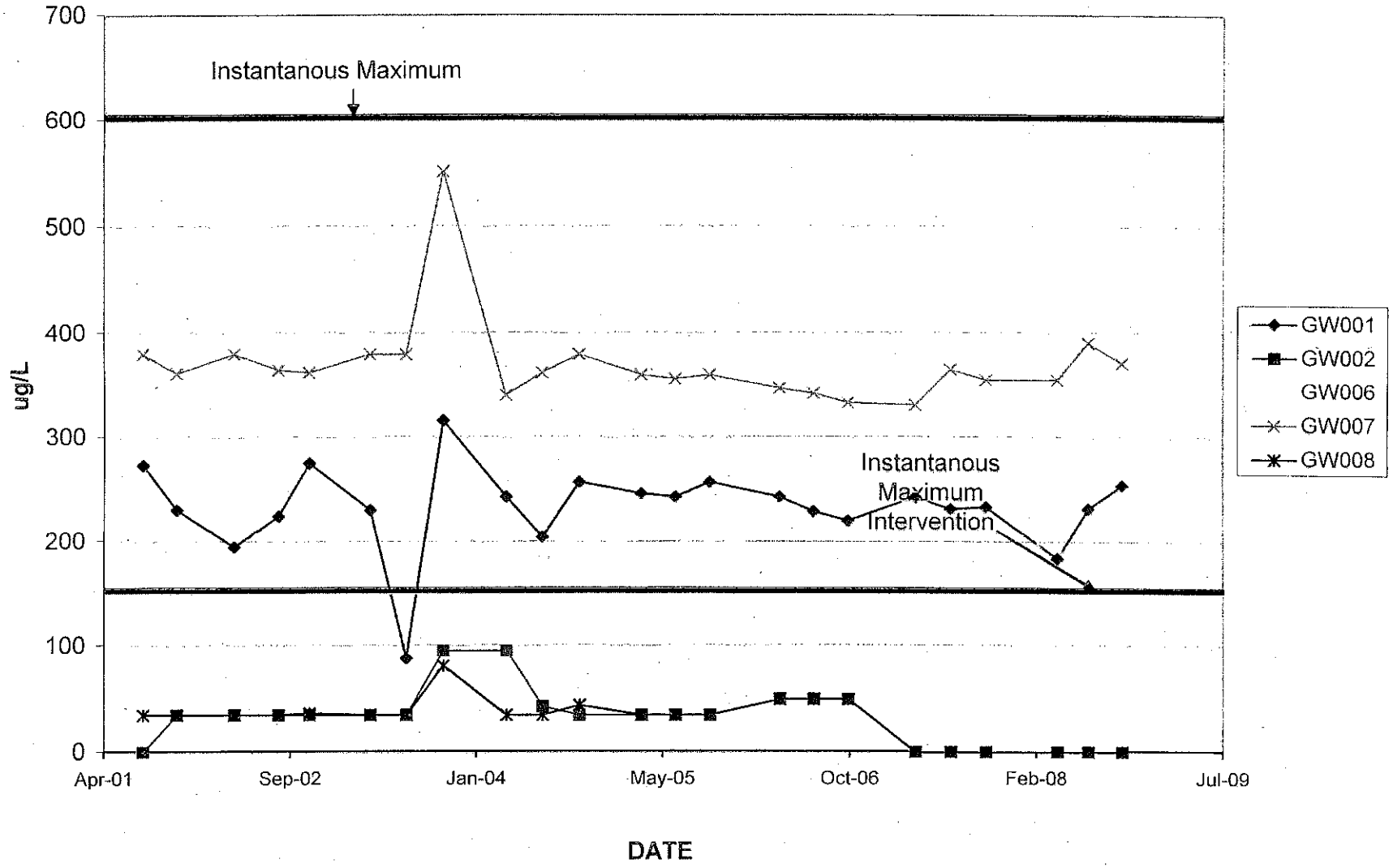


FIGURE 5B
CHLORIDE

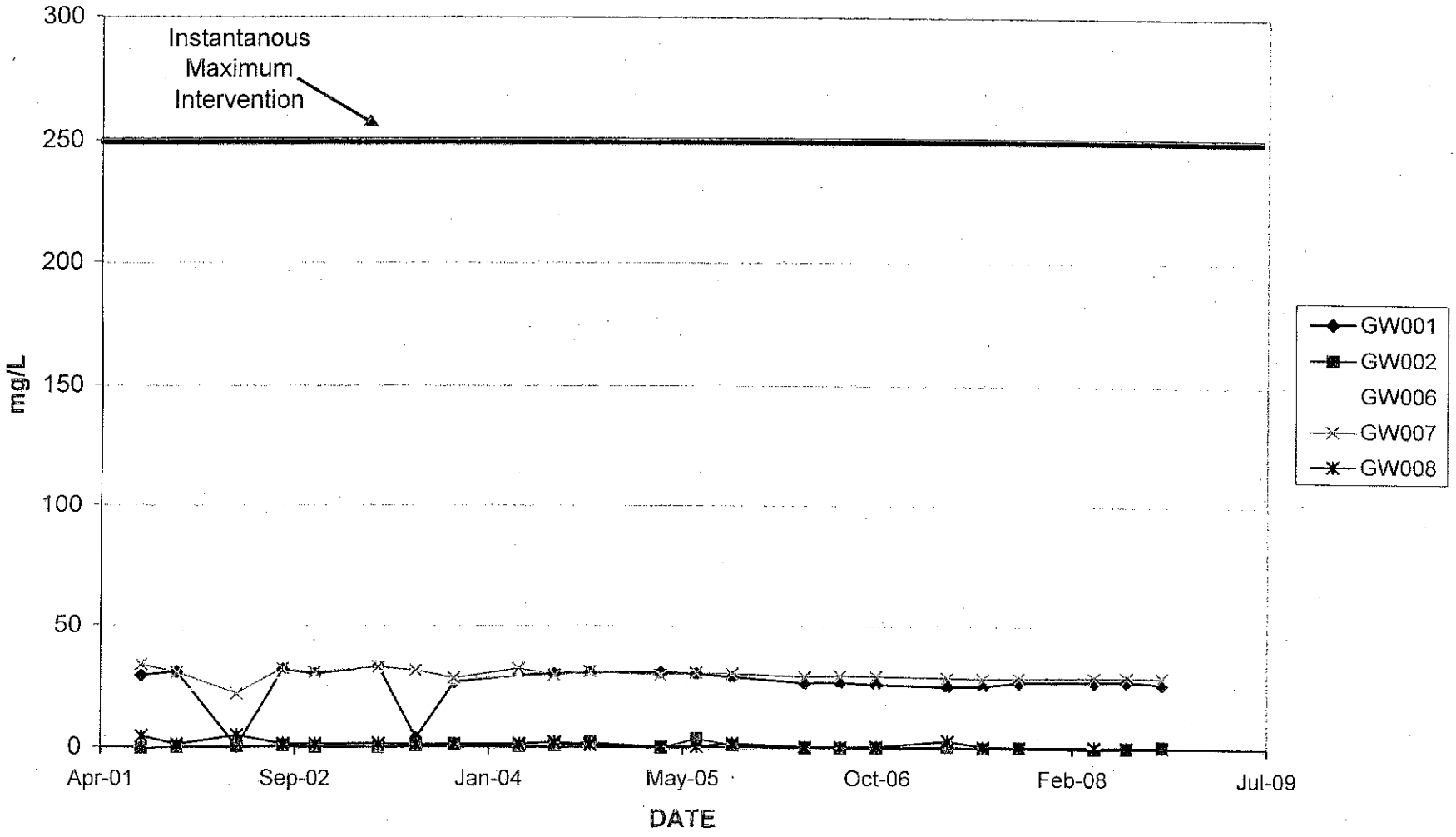


FIGURE 5C
FLUORIDE

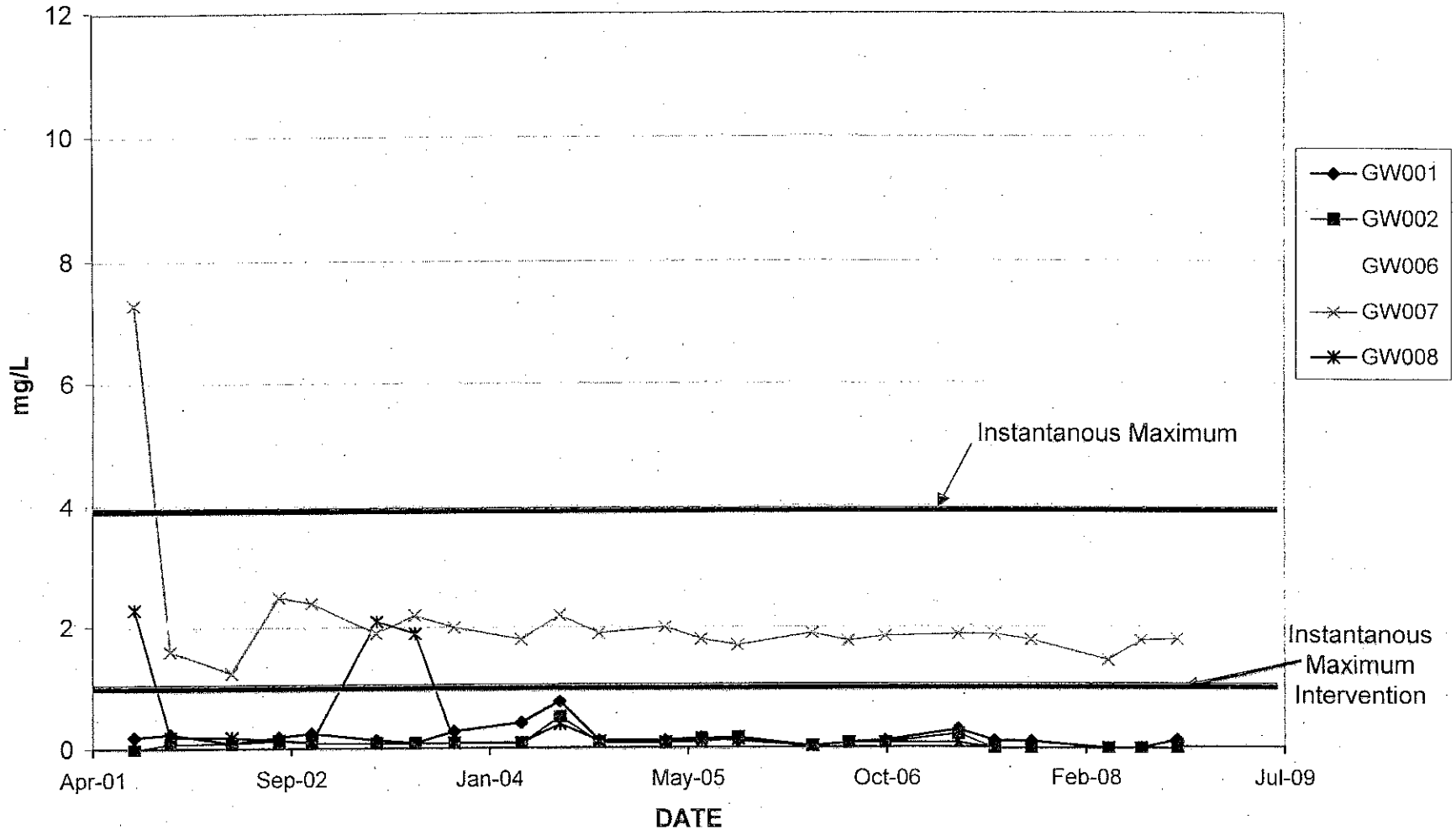


FIGURE 5D
MANGANESE

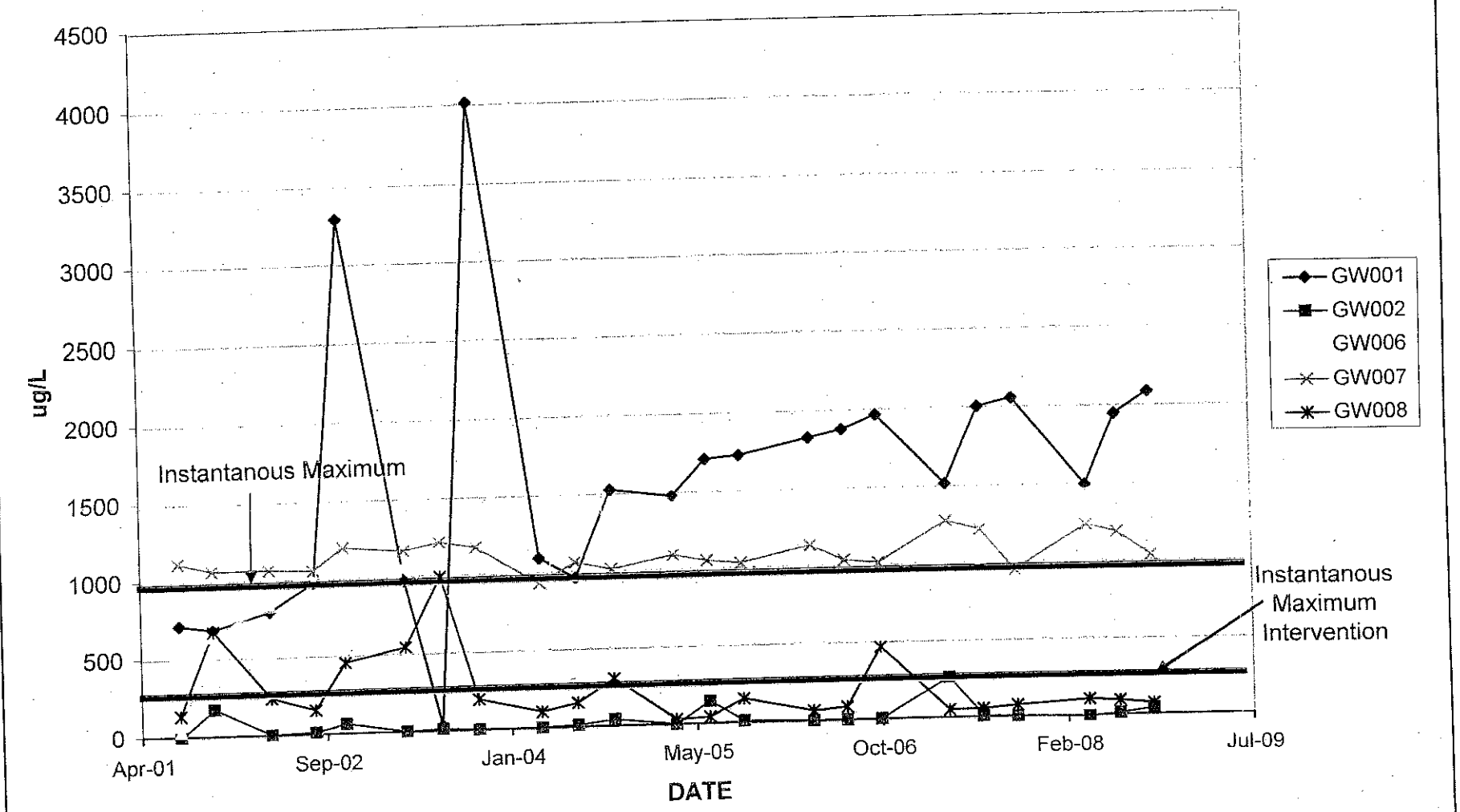


FIGURE 5E
MOLYBDENUM

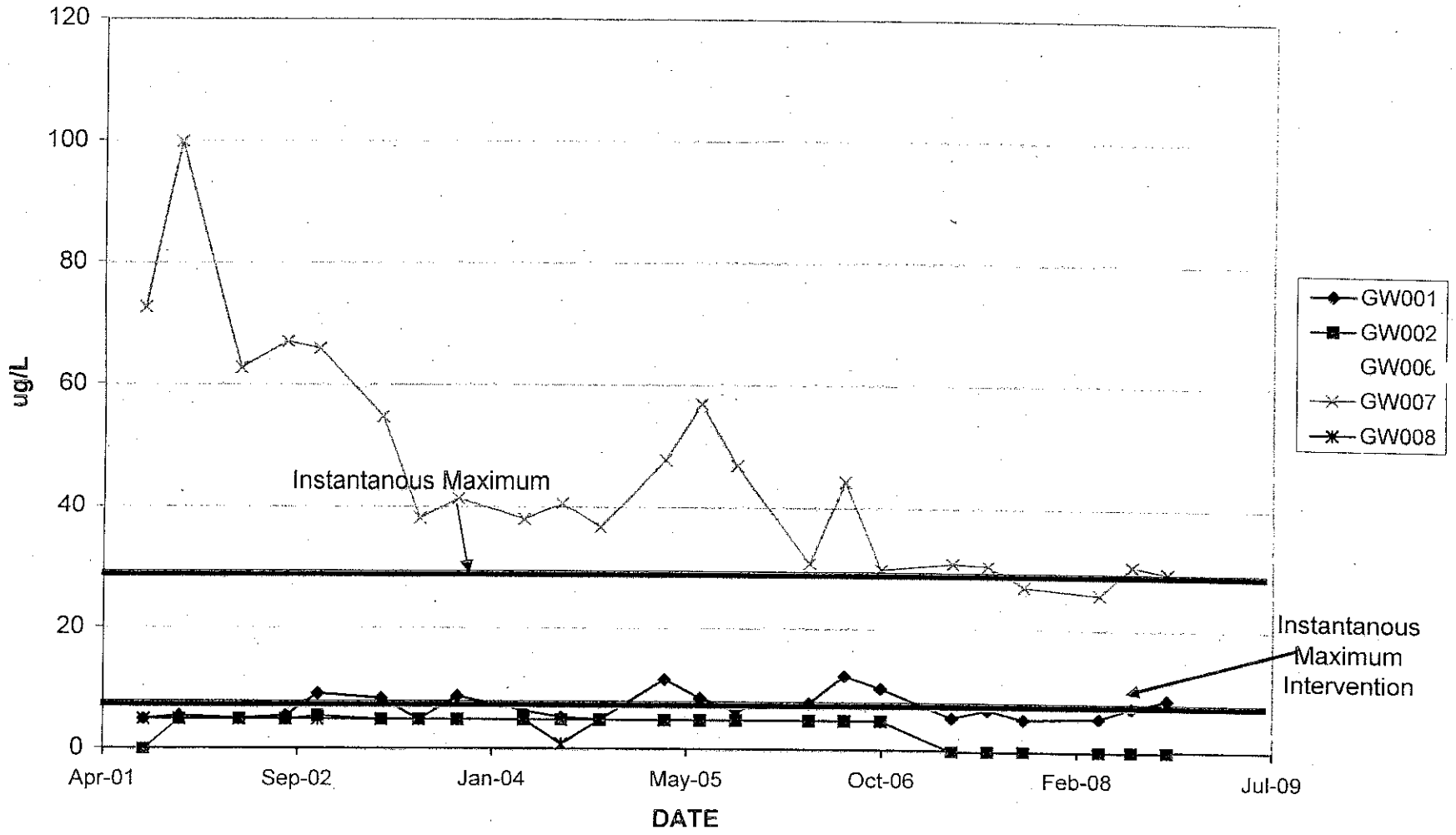


FIGURE 5F
TOTAL DISSOLVED SOLIDS

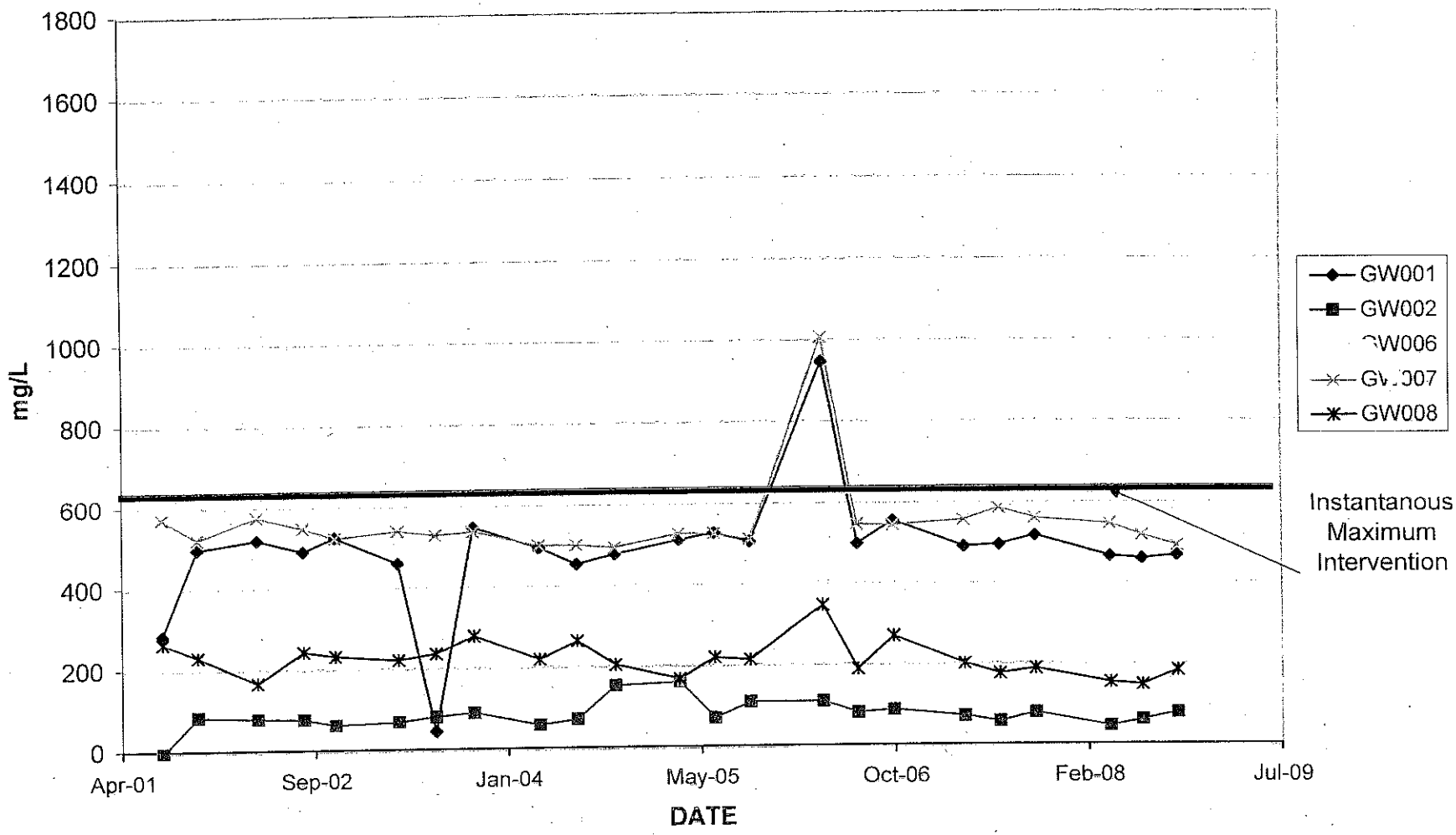


FIGURE 5G
SPECIFIC CONDUCTANCE

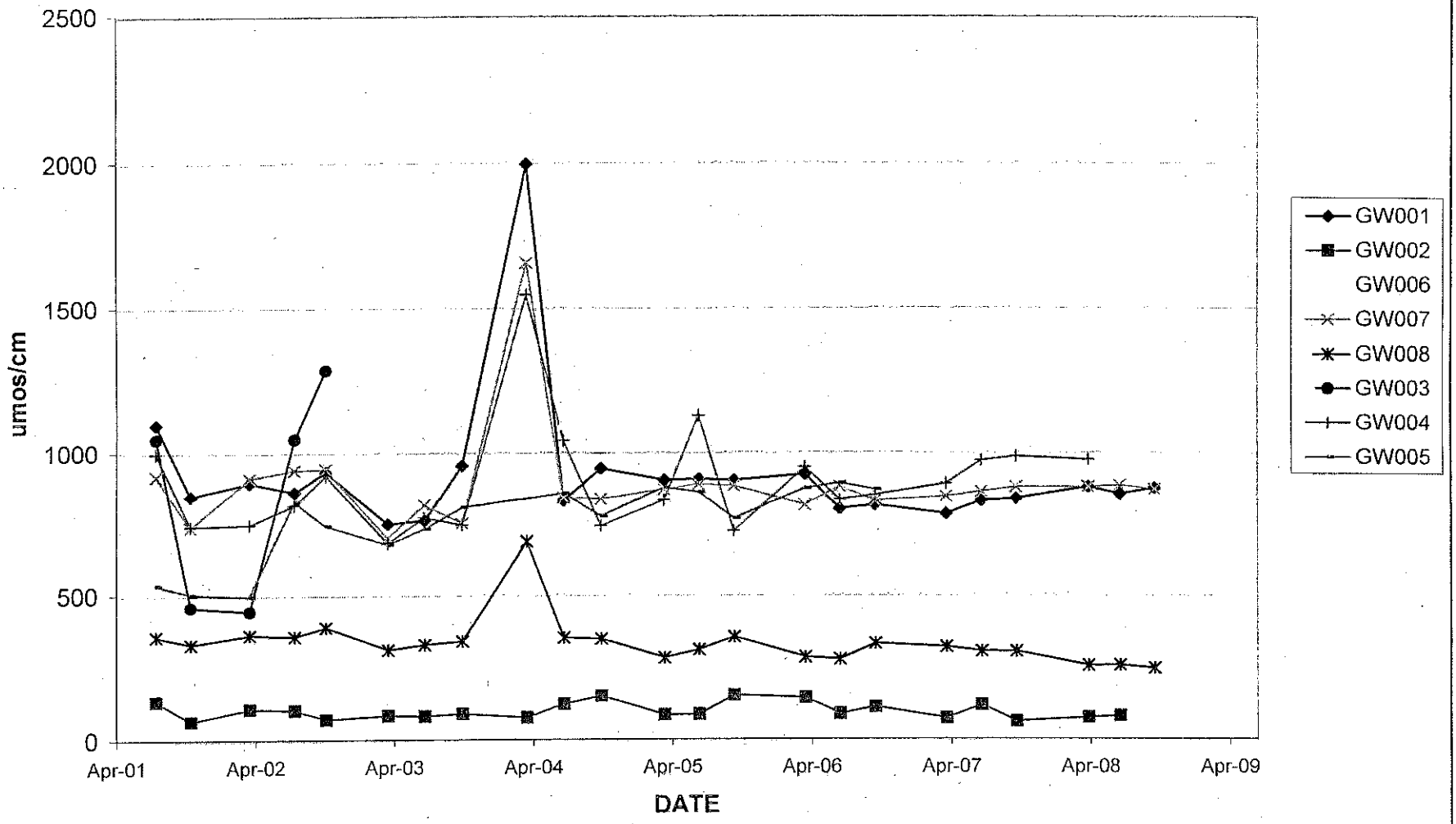
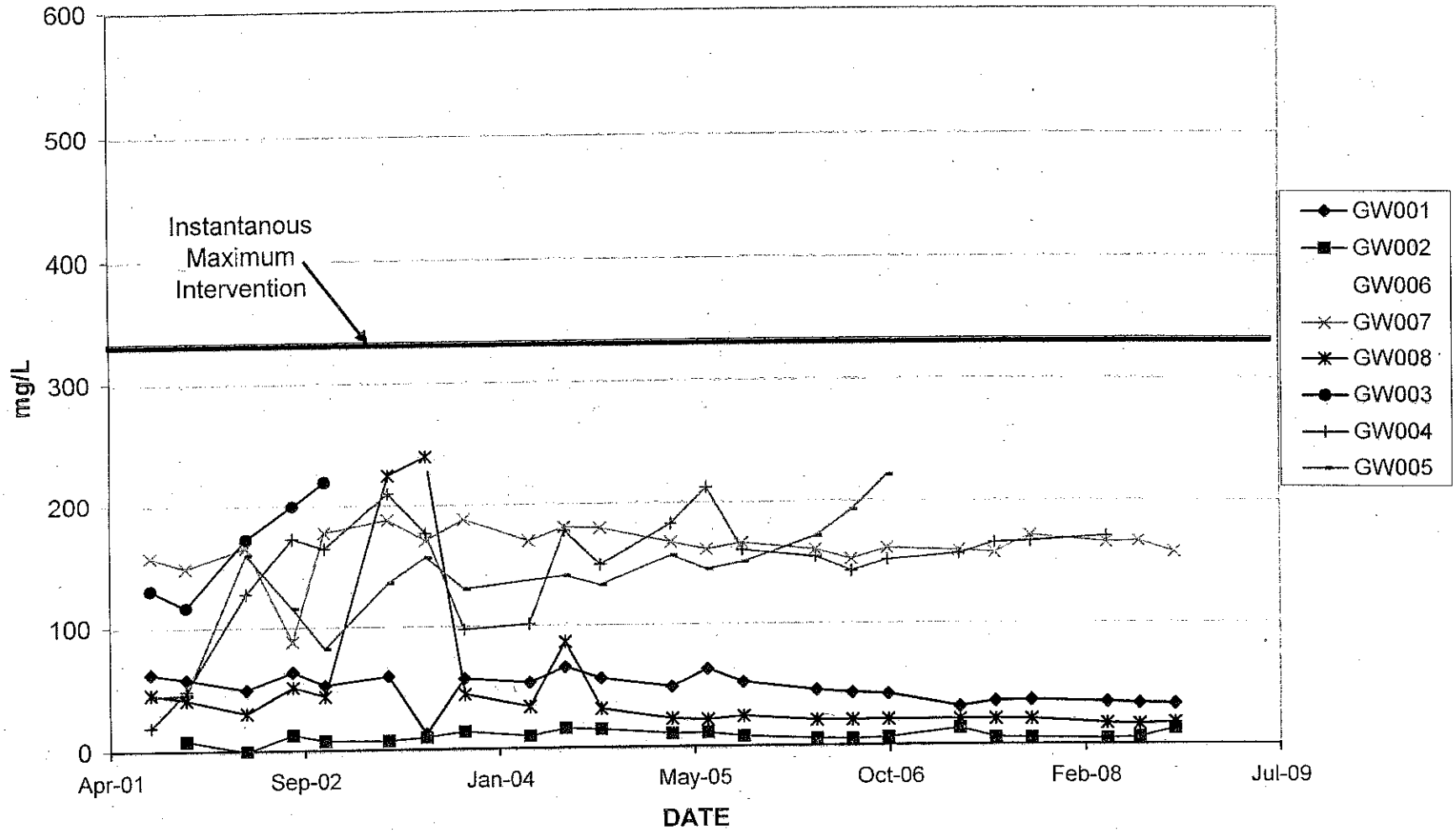


FIGURE 5H
SULFATE



SURFACE DISCHARGE AND WASTE STREAM TRENDS

FIGURE 6A
BICARBONATES

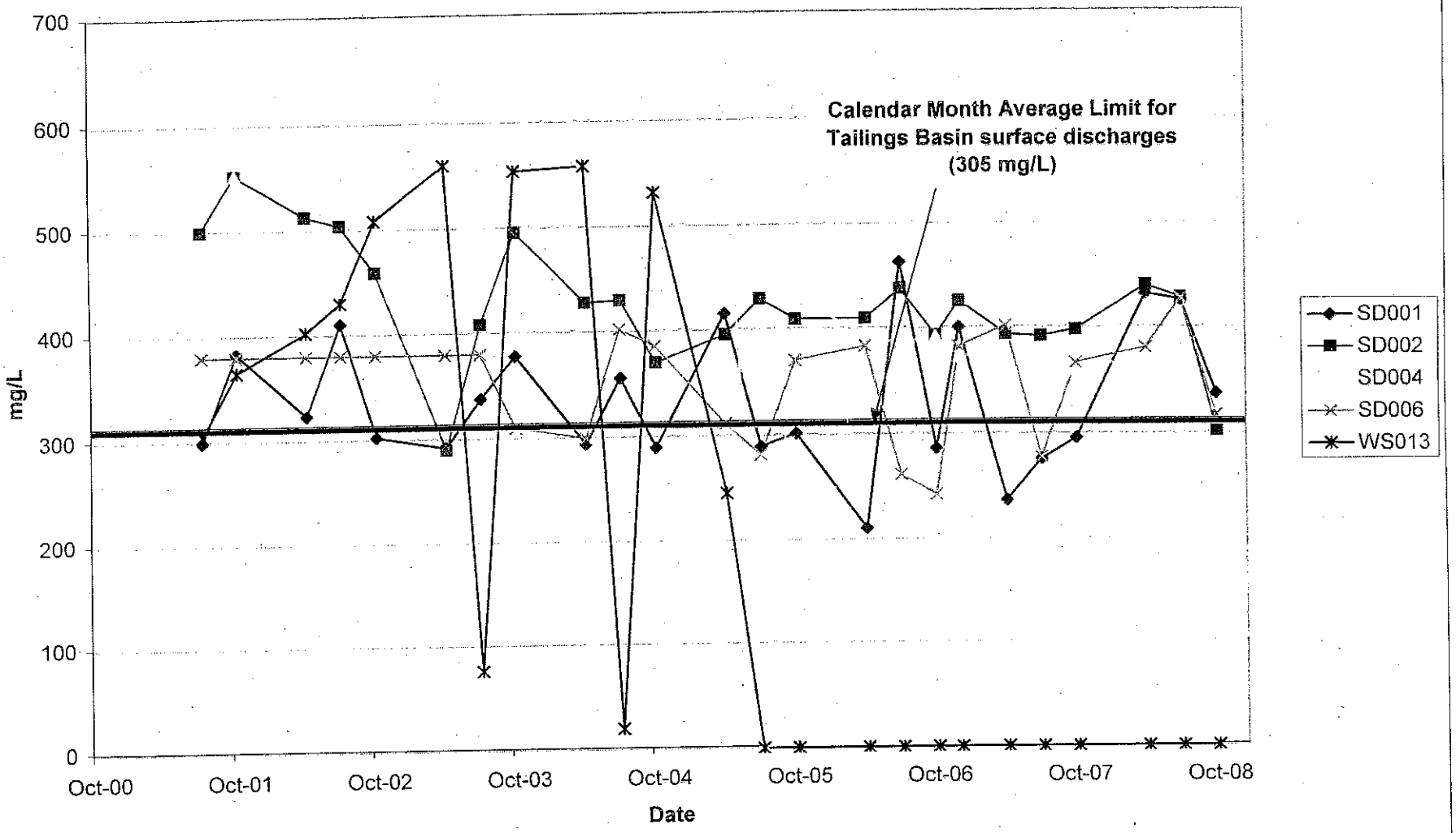


FIGURE 6B
BORON

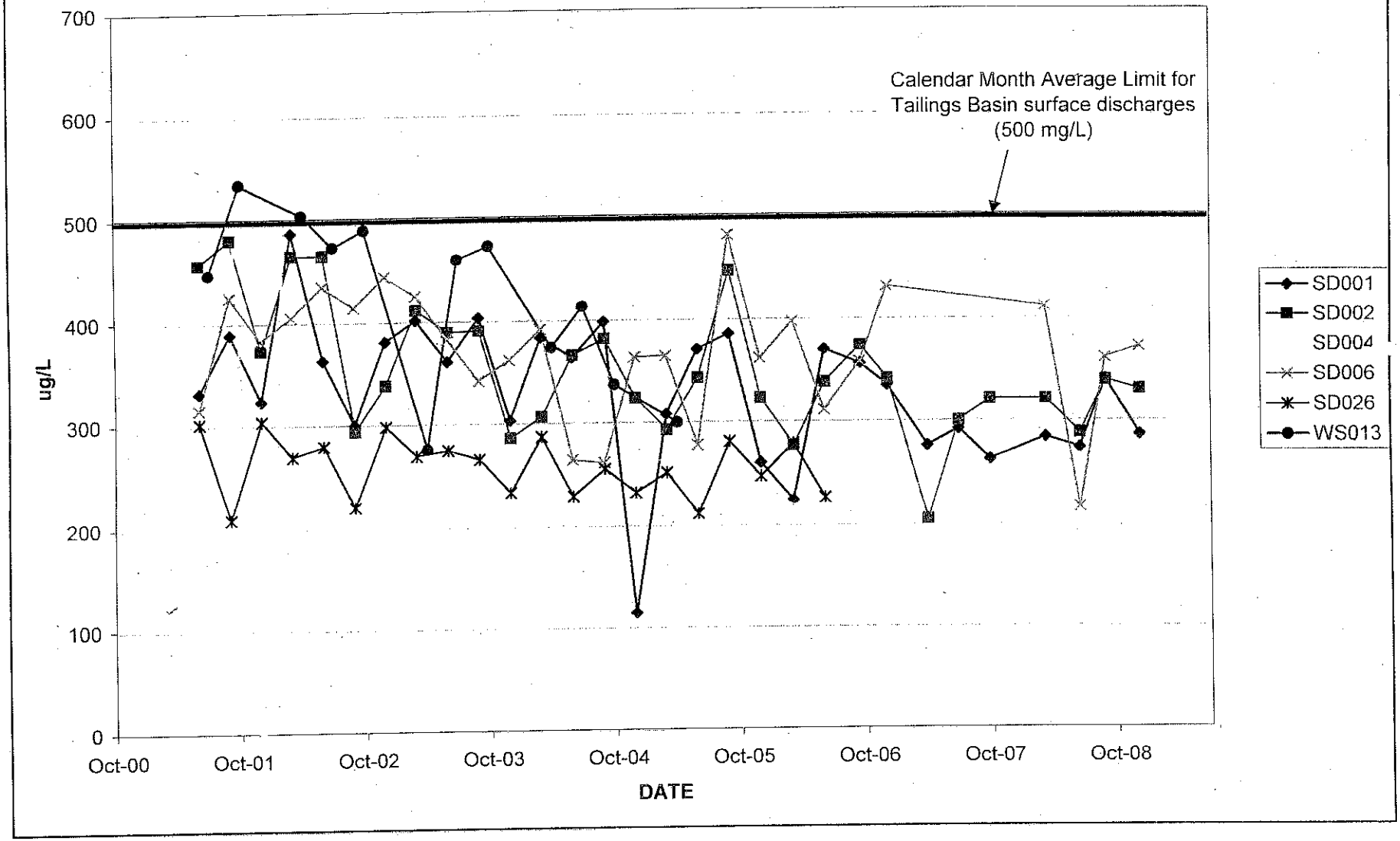


FIGURE 6C
FLUORIDE

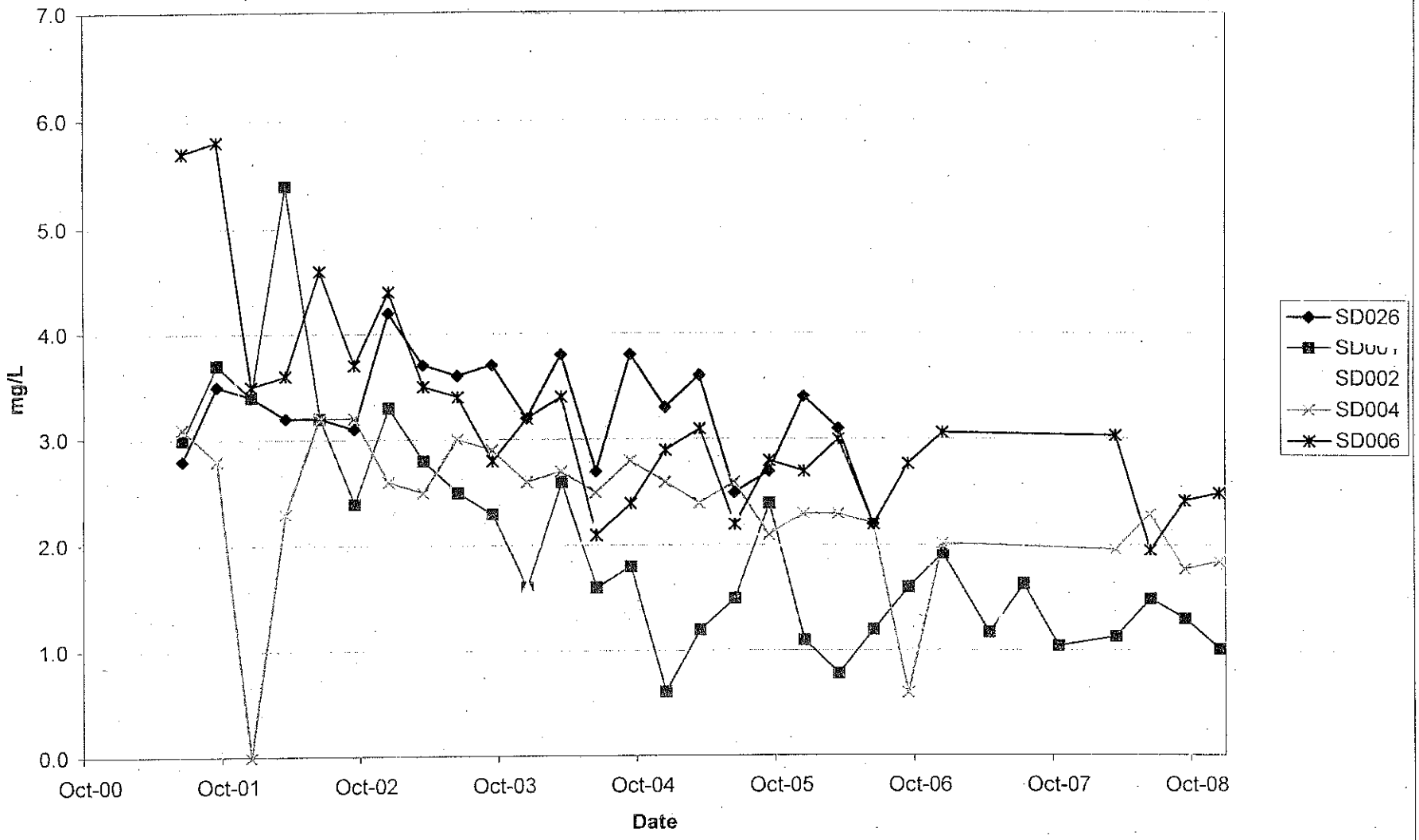


FIGURE 6D
HARDNESS

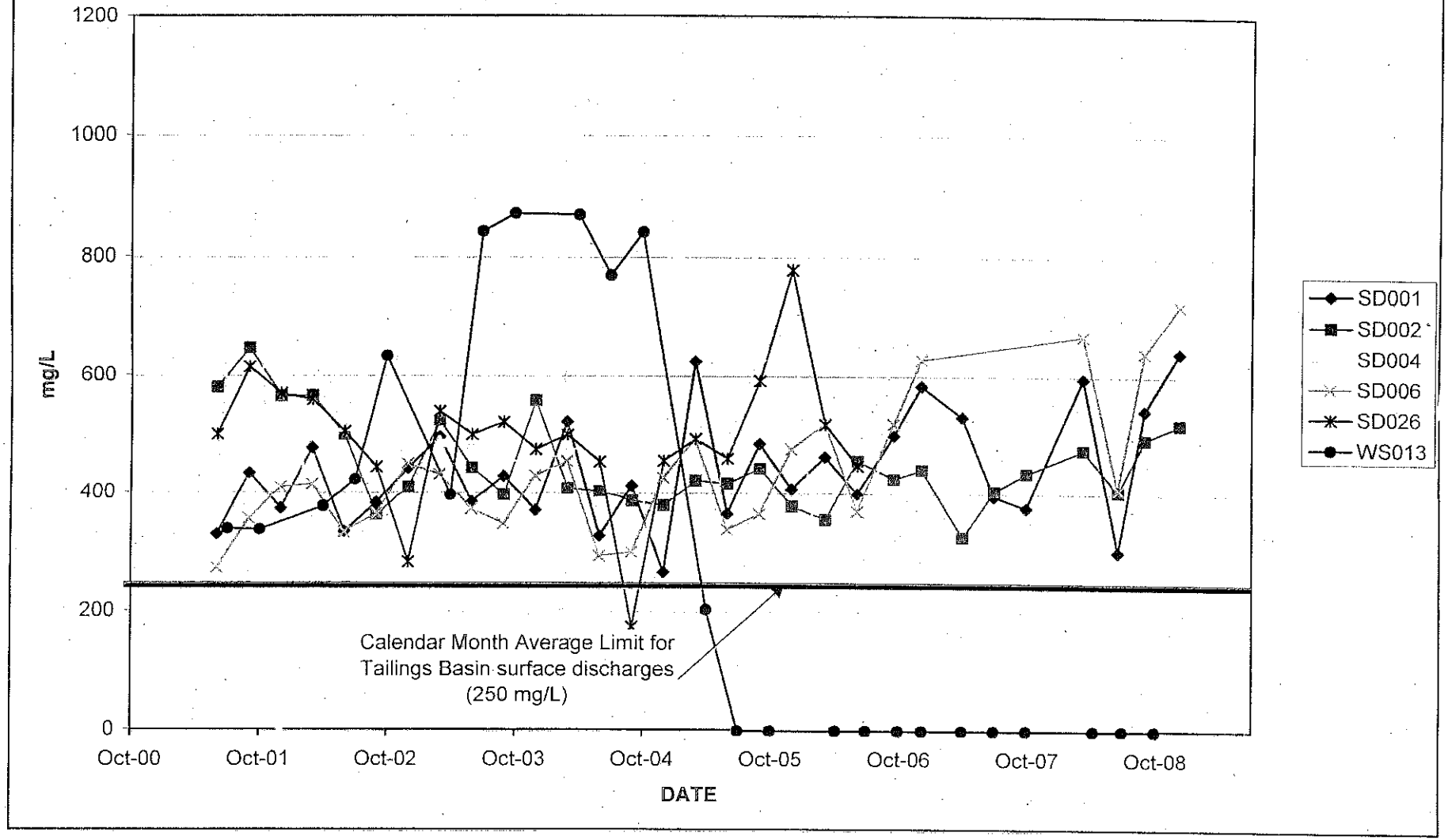


FIGURE 6E
MANGANESE

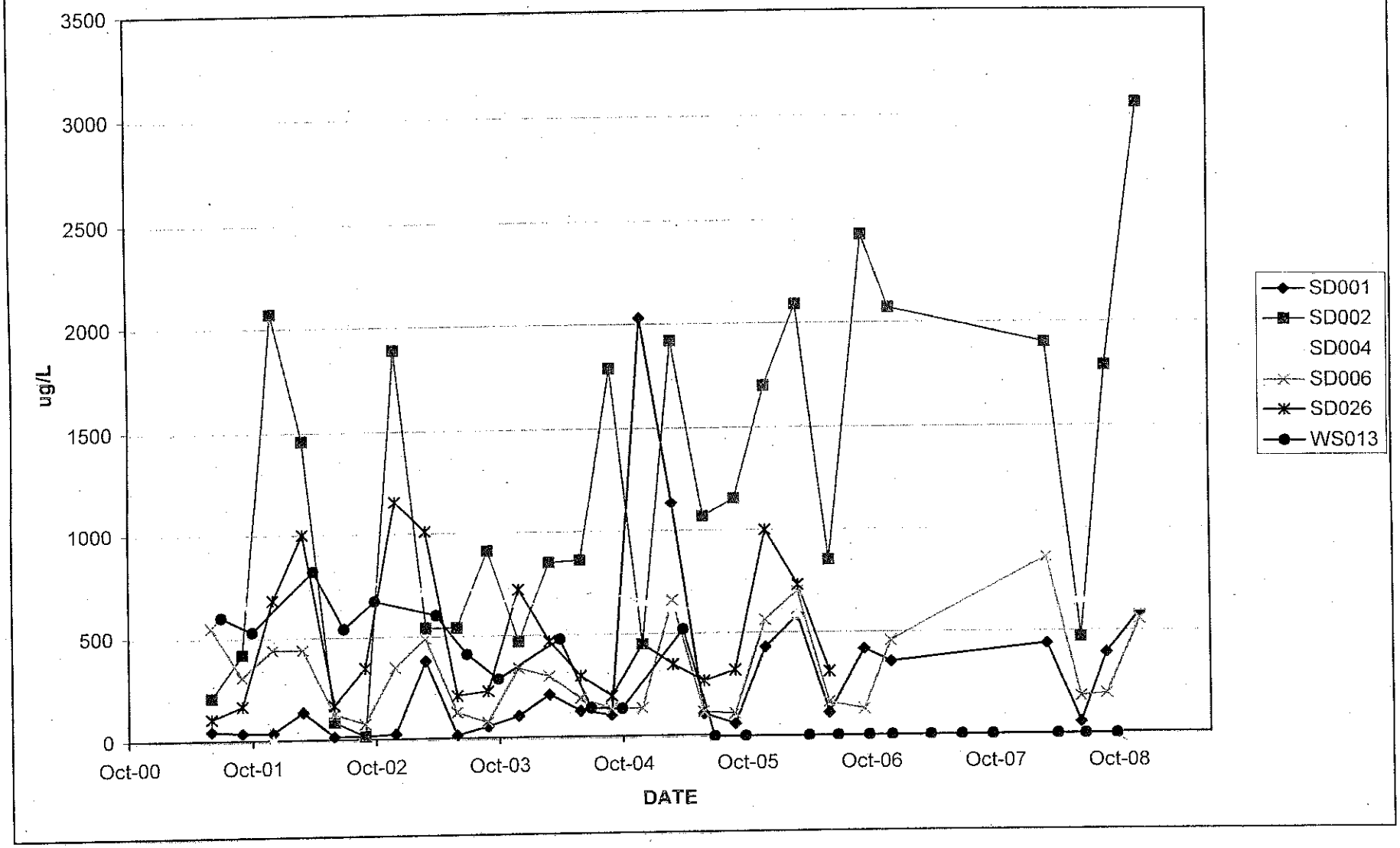
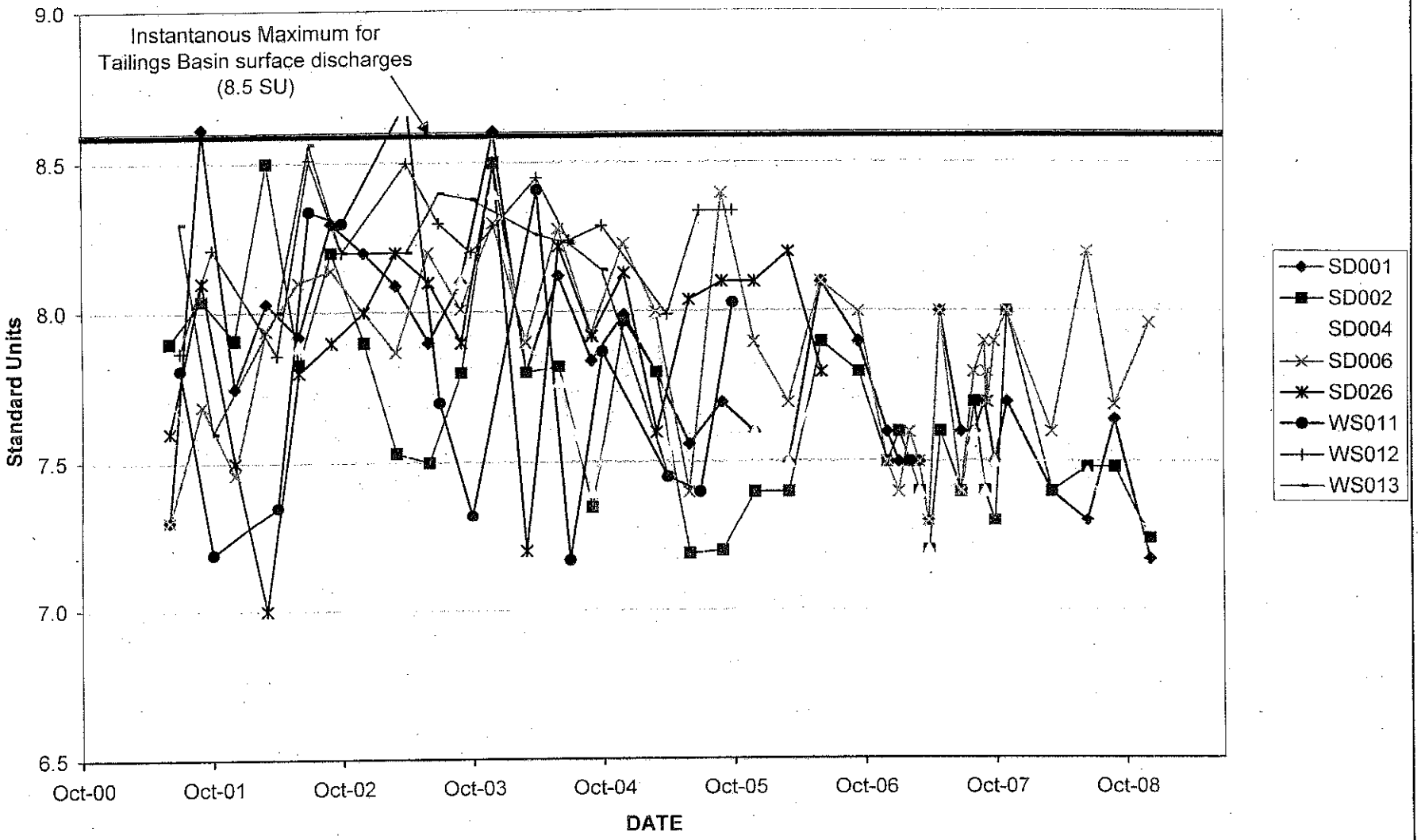


FIGURE 6F
pH


9.0
8.5
8.0
7.5
7.0
6.5
Standard Units
Instantanous Maximum for
Tailings Basin surface discharges
(8.5 SU)
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Oct-06
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SD006
SD026
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WS012
WS013

FIGURE 6G
SPECIFIC CONDUCTANCE

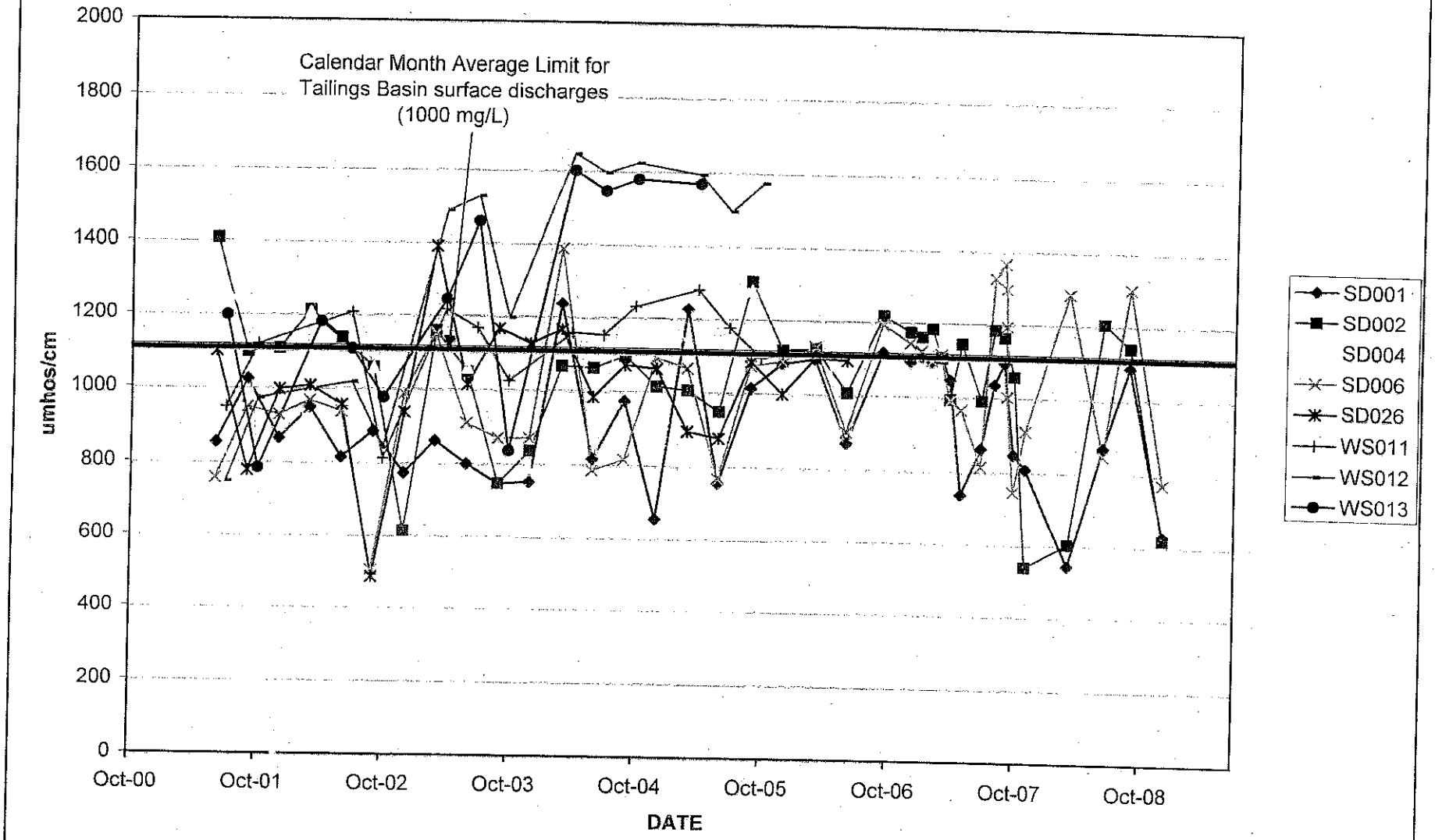


FIGURE 6H
TURBIDITY

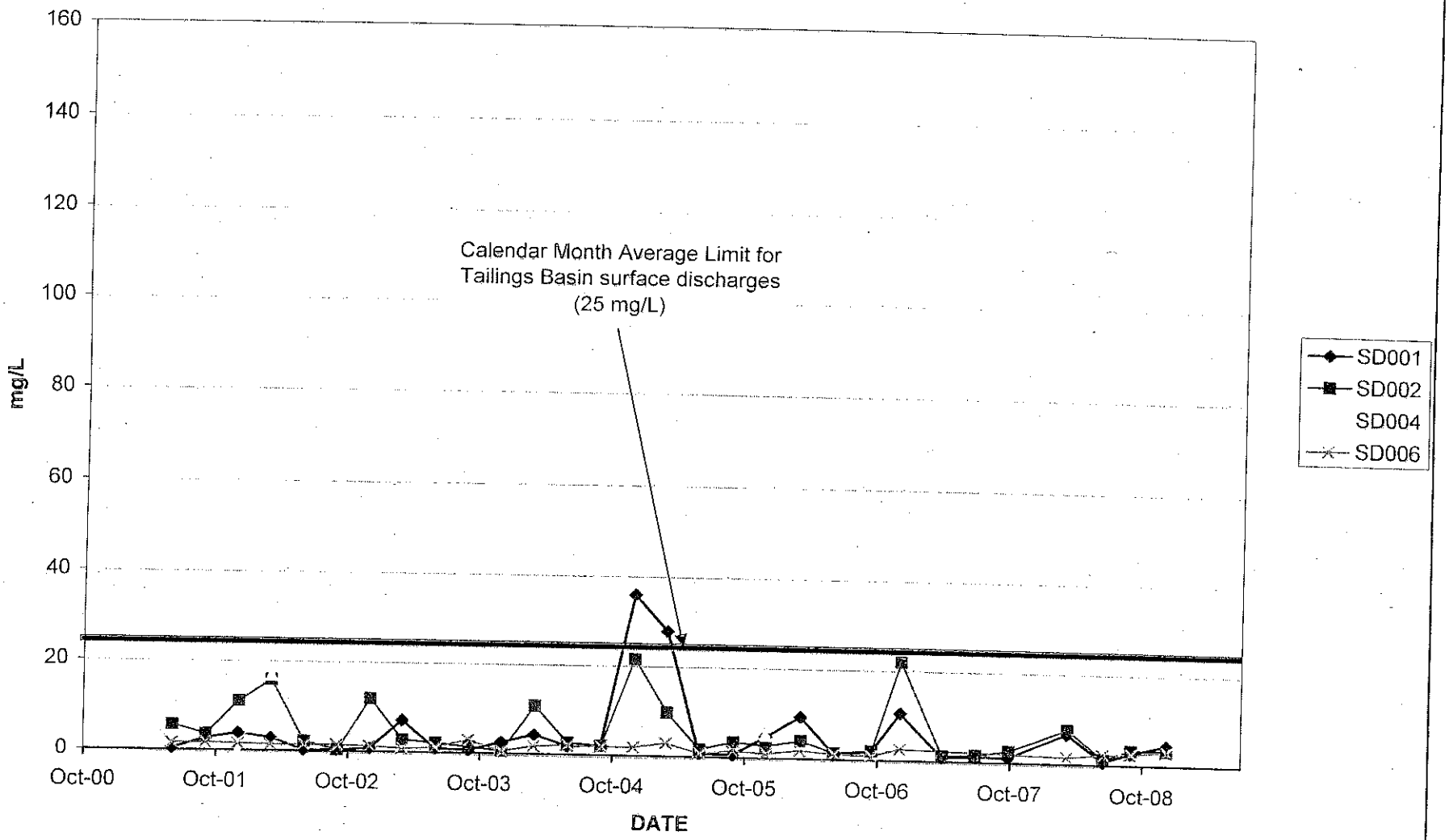


FIGURE 6I
IRON

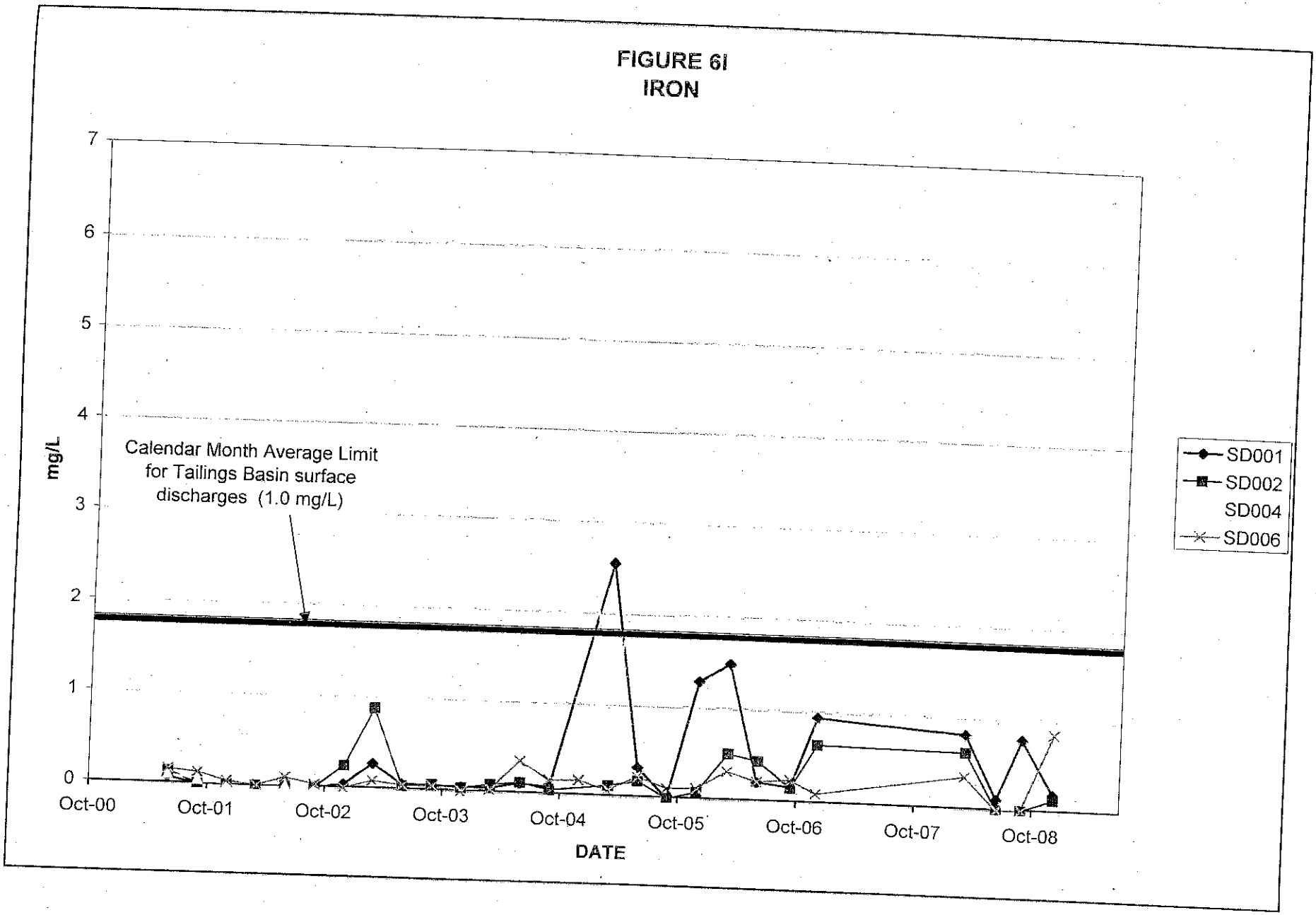
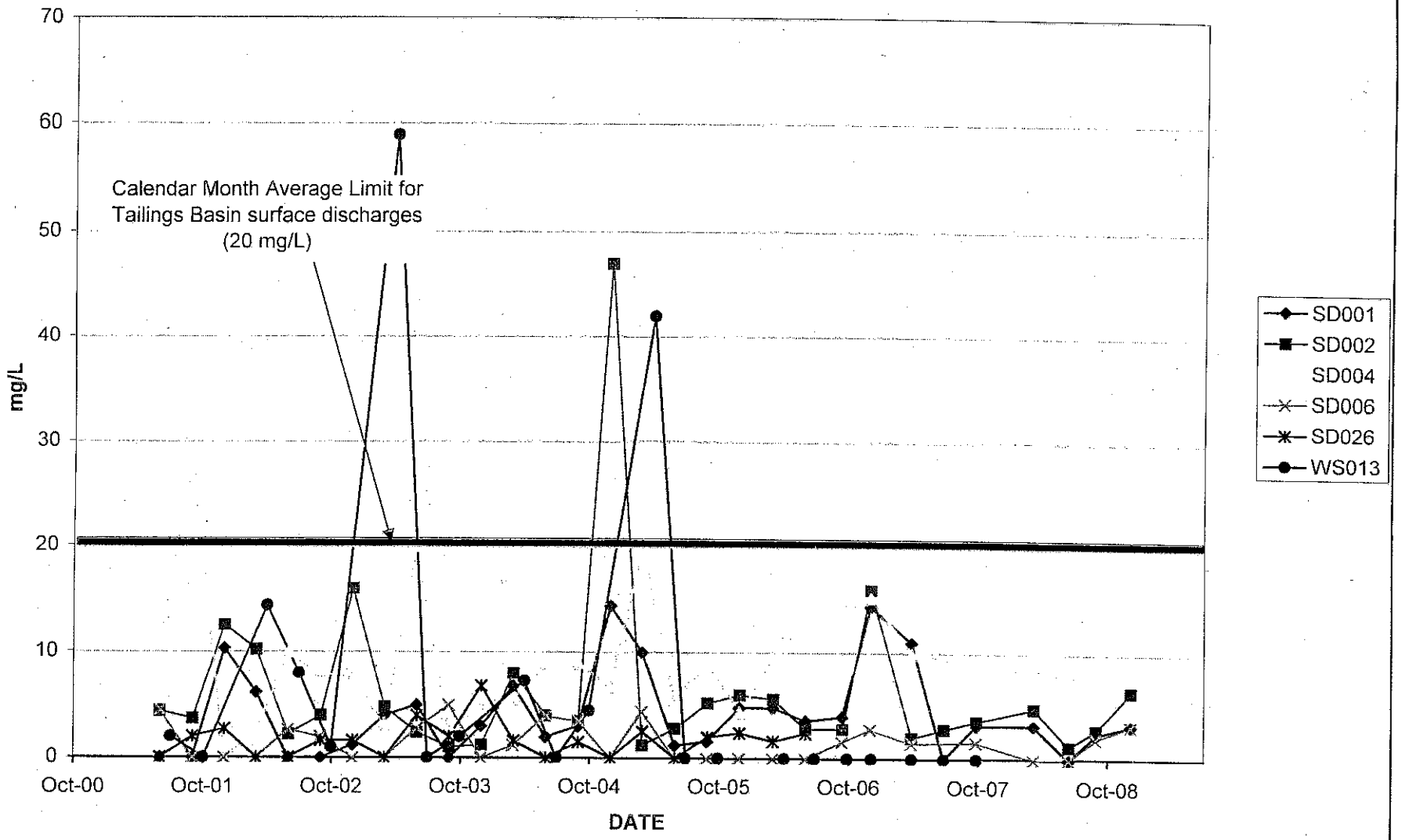


FIGURE 6J
TSS



WASTE STREAM WS013 TRENDS

FIGURE 7A
WS-013 DATA

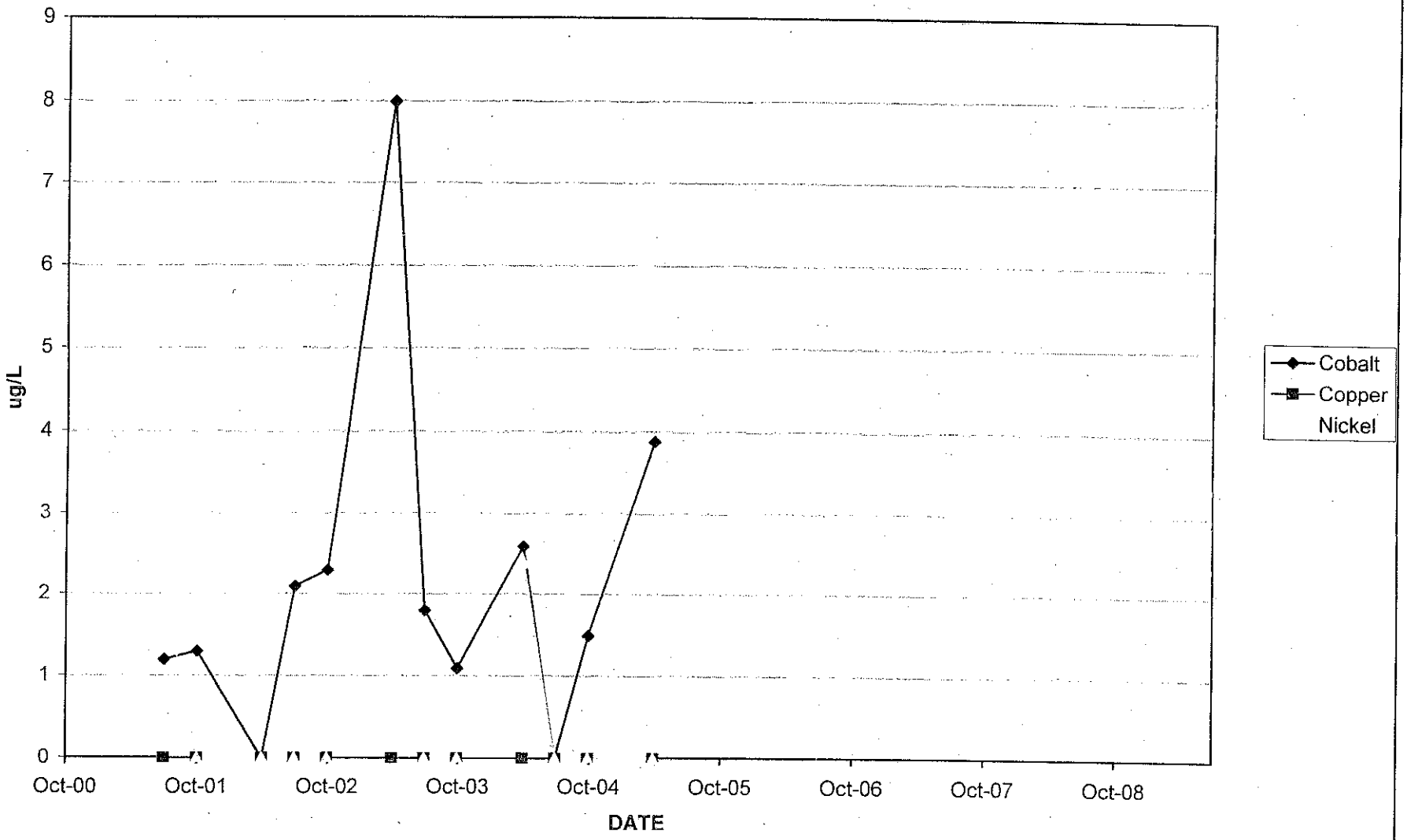
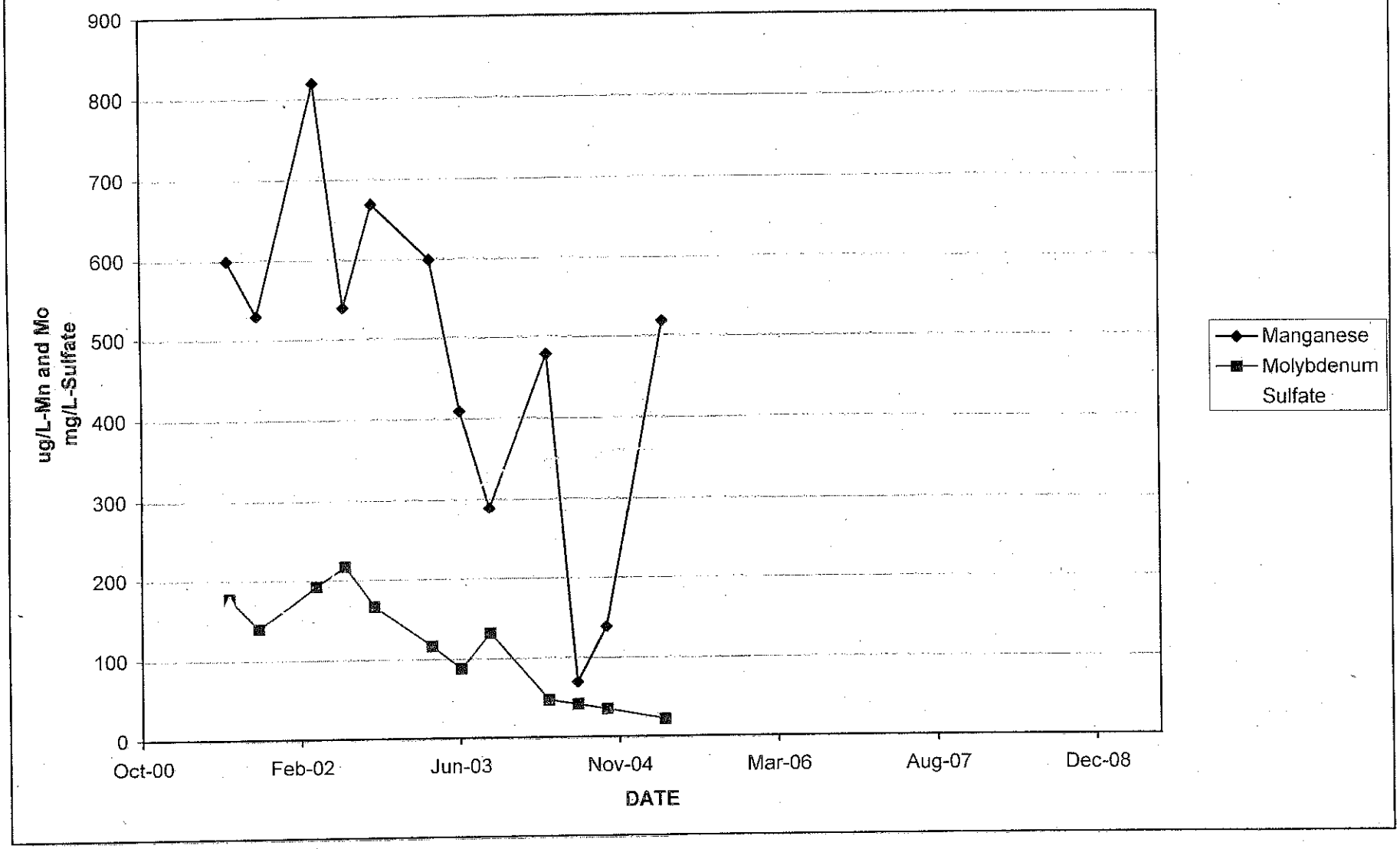


FIGURE 7B
WS-013 DATA



TABLES

TABLE 1
OCTOBER 2008 SEEP SURVEY INFORMATION
CLIFFS ERIE LLC HOYT LAKES TAILINGS BASIN

Seep ID	Description	Location UTM Coordinates (NAD 83)		October 29 & 30, 2008				Comments / Observations
		Easting	Northing	Estimated Flow (gpm)	pH (SU)	Temp (oC)	Conductance (umhos/cm)	
Seep 1	Emergency Basin area seep	15T 0564494	5272913	No flow observed at Seeps 1 - 4 and WS-011.				
Seep 2	Emergency Basin area seep	15T 0564480	5272921					
Seep 3	Emergency Basin area seep	15T 0564468	5272927					
Seep 4	Emergency Basin area seep	15T 0564464	5272930					
Culvert (WS-011)	Combined flow of seeps in area of and including seeps 1, 2, 3, & 4 near emergency basin.	15T 0564456	5272910					
Seep 5	Emergency Basin area seep	15T 0564426	5272950	Flows at individual seeps were to low to measure and/or to sample. The combined flow of the five seeps plus additional seepage flows to wier WS-012.				
Seep 6	Emergency Basin area seep	15T 0564420	5272964					
Seep 7	Emergency Basin area seep	15T 0564413	5272965					
Seep 8	Emergency Basin area approx. 4 seeps in one small area.	15T 0564377	5272990					
Seep 9	Emergency Basin area seep	15T 0564323	5273018					
Seeps A-E	Seeps A-E near Emergency Basin	15T 0564447	5272945	No flow observed.				
Ditch Flow	Ditch flow between WS-011 & WS-012 (Seeps 5-9)	15T 0564261	5273033	No flow observed.				
Weir (WS-012)	NPDES Permit station	15T 0564166	5273048	No flow observed at WS-012.				
EB Inflow	Combination of seeps on Emergency Basin side of road (i.e. south side of road between	15T 0564192	5273003	12	7.92	9.6	1528	——
EB Outflow	Emergency Basin outflow	15T 0563842	5273049	1100	7.94	5.4	1164	——
Seep 10	West side of TB	15T 0563545	5273732	No flow observed at Seeps 10-17.				
Seep 11	West side of TB	15T 0563507	5273894					
Seep 12	West side of TB	15T 0563510	5273924					
Seep 13	West side of TB	15T 0563503	5274114					
Seep 14	West side of TB	15T 0563502	5274128					
Seep 15	West side of TB	15T 0563498	5274162					
Seep 16	West side of TB	15T 0563498	5274188					
Seep 17	West side of TB	15T 0563500	5274197					
Seeps 13-17	West side of TB	15T 0563489	5274210	——	——	——	——	——
Weir (West Side Seep)	West side of TB	15T 0563503	5274221	No flow observed.				
Seep F	Pipe 25' from west side of seep	15T 0563480	5274226	Same site as "Culvert/Pipe" below				
Culvert/Pipe	Culvert/pipe beneath road.	15T 0563480	5274226	0.5	8.24	7.7	557	Same site as "Seep F" above
SD-006	NPDES Permit station	15T 563679	5273349	710	8.07	3.8	1136	——
Seep 18	West side of TB road	15T 0563488	5274426	No flow observed.				
Seep 19	West side of TB road	15T 0563494	5274646	No flow observed.				
Seep 20	Northwest side of TB pipe flow	15T 0563647	5275568	2.5	7.74	5.9	1218	——
Seep 21	Northwest side of TB	15T 0563658	5275565	No flow observed.				
Seep 22 (SD-004)	NPDES Permit station SD-004	15T 0563766	5275639	3.0	7.40	9.0	837	——
Seep 23	No pipe present	15T 0563774	5275652	No flow observed.				
SD-005	No pipe present	15T 0563786	5275692	——				
Seep 24 (North Side Seep)	Flow from pipe	15T 0563912	5275677	10	7.45	10.5	682	——
Seep 25	Flow from pipe	15T 0564094	5275643	No flow observed.				
Seep 26	North side of TB	15T 0564886	5275924	No flow observed.				
Seep 27	Flow from pipe	15T 0564967	5275945	No flow observed.				
Seep 28	Flow from pipe	15T 0565030	5275952	No flow observed.				
Seep 29 (North Central Seep)	Flow from pipe	15T 0565194	5275948	No flow observed.				
Seep 30	Three seeps in one small area, no pipe present.	15T 0566227	5275951	100	7.37	8.9	1303	——
Seep 31	Various seeps along northeast side of TB flowing onto the road.	15T 0567423	5275663	No flow observed.				
Seep 32	Knox Creek Headwaters, south of TB	15T 0565887	5272071	——				
Seep 33	Knox Creek Headwaters, south of TB	15T 0565839	5272061					
Seeps 32 & 33	Knox Creek Headwaters, south of TB	15T 0565839	5272061	600	7.31	9.3	1201	——
Inflow (culvert)	NE end of TB process water pond	15T567685	5274087	80	7.81	3.5	259	——
SD-026	Mine Area Permit surface discharge SD-026.	15T 0565847	5272062	660	8.05	9.2	1160	Flow from 11/5/2008 Mine Area NPDES Monitoring Event

TABLE 2
STATIC WATER ELEVATIONS IN WELLS
HOYT LAKES TAILINGS BASIN

	Elevation (feet)							
DATE	GW001	GW002	GW003	GW004	GW005	GW006	GW007	GW008
Jul-01	1484.95		1621.61	1619.89	1621.12	1488.36	1506.80	1557.84
Oct-01	1485.65	1783.05	1619.68	1613.21	1618.81	1486.67	1505.23	1556.14
Apr-02	1481.71	1783.81	1613.99	1609.79	1614.50	1487.46	1510.57	1554.72
Jul-02	1484.90	1784.33	1614.23	1608.30	1612.32	1487.19	1505.58	1557.00
Nov-02	1485.45	1785.07	1614.08	1608.19	1611.74	1487.84	1506.60	1562.42
Apr-03	1484.45	1781.70	Dry	1606.78	1610.07	1487.89	1506.59	1558.18
Jul-03	1481.95	1795.86	Dry	1606.21	1608.92	1487.49	1505.87	1557.56
Oct-03	1485.54	1785.61	Dry	1605.40	1607.96	1487.45	1506.30	1555.07
Apr-04	1485.96	1785.46	Dry	1605.53	Dry	1487.75	1506.21	1559.42
Jul-04	1486.02	1785.10	Dry	1604.10	1606.11	1486.99	1506.02	1557.90
Oct-04	1486.34	1785.35	Dry	1603.67	1605.37	1487.30	1506.22	1558.47
Apr-05	1485.97	1785.36	Dry	1602.82	1604.46	1487.85	1506.06	1559.52
Jul-05	1485.53	1785.13	Dry	1602.89	1605.4	1486.72	1505.91	1557.32
Oct-05	1486.19	1784.05	Dry	1602.67	1603.98	1487.15	1506.16	1557.58
Apr-06	1486.18	1784.81	Dry	1602.11	1603.32	1487.66	1505.94	1559.23
Jul-06	1486.01	1784.60	Dry	1601.74	1603.25	1486.57	1505.82	1557.44
Oct-06	1486.12	1784.59	Dry	1602.05	1603.36	1486.85	1506.11	1557.6
Apr-07	1485.84	1782.75	Dry	1601.31	1602.42	1487.26	1506.09	1557.94
Jul-07	1485.41	1784.77	Dry	1600.94	1593.15	1486.52	1505.8	1557.68
Oct-07	1485.52	1785.05	Dry	1600.97	1601.68	1488.00	1506.21	1560.34
Jul-08	1485.99	1785.26	Dry	1601.29	1601.68	1486.96	1505.72	1557.58
Oct-08	1485.91	1784.63	Dry	1601.52	1599.02	1486.96	1505.8	1557.51

TABLE 3
GROUND WATER MONITORING DATA SUMMARY
HOYT LAKES TAILINGS BASIN

PARAMETER	UNITS	DATE	GW001	GW002	GW003	GW004	GW005	GW006	GW007	GW008
Boron, Dissolved	ug/L	Jul-01	274	Dry		470		357	380	<35
		Sep-01						471	418	NS
		Oct-01	231	<35				446	362	<35
		Apr-02	195	<35				477	380	<35
		Jul-02	225	<35				473	365	<35
		Oct-02	276	<35				509	363	36.9
		Apr-03	231	<35				471	380	<35
		Jul-03	188.6	283				492	380	<35
		Aug-03		<35						
		Oct-03	317	93.4				588	553	81.3
		Apr-04	244	40				384	341	<35
		Jul-04	205	43.1				419	363	<35
		Oct-04	258	<35				470	380	44.3
		Apr-05	247	<35	Dry	451	301	330	361	<35
		Jul-05	244	<35	Dry	NR	NR	449	357	<35
		Oct-05	258	<35	Dry	NR	NR	508	361	<35
		Apr-06	244	<50	Dry	NR	NR	383	348	<50
		Jul-06	230	<50	Dry	NR	NR	422	343	<50
		Oct-06	221	<50	Dry	NR	NR	455	334	<50
		Apr-07	244	<50				370	332	<50
		Jul-07	232	<50				436	366	<50
		Oct-07	234	<50				302	356	<50
		Apr-08	184	<50	Dry	NR	NR	159	356	<50
		Jul-08	232	<50	Dry	NS	NR	452	391	<50
		Oct-08	255	<50	Dry	NS	NR	511	372	<50
			±12					±12	±9	±9
Chloride, Total	mg/L	Jul-01	29.5			11.3		21	34	4.9
		Sep-01			26.9			20.5	31.1	
		Oct-01	31	<0.5				21.8	30.7	1.6
		Apr-02	0.5	1				29	22.1	5.2
		Jul-02	31.9	1.3				28.1	32.3	1.8
		Oct-02	30.2	0.8				27.9	30.8	.2
		Apr-03	33.2	0.5				33.3	331	2.1
		Jul-03	4.1	31.2				31.8	31.7	1.9
		Aug-03		1.3						
		Oct-03	26.9	1.8				28.4	28.6	2
		Apr-04	29.7	1.1				29.5	32.6	2.1
		Jul-04	30.4	1.4				27.1	29.9	2.7
		Oct-04	31	2.7				28.4	31.4	1.7
		Apr-05	31.1	0.8	Dry	33.9	33.9	20.8	30	1.1
		Jul-05	30.5	4.1	Dry	NR	NR	25.8	31	1.2
		Oct-05	29.1	1.6	Dry	NR	NR	24.9	30.5	2.3
		Apr-06	26.7	0.62	Dry	NR	NR	24.8	29.3	1
		Jul-06	26.9	0.5	Dry	NR	NR	22.4	29.6	0.89
		Oct-06	26.1	0.62	Dry	NR	NR	23	29.4	0.97
		Apr-07	25.3	1.07				21.2	28.9	3.36
		Jul-07	25.5	0.58				22.3	28.5	1.1
		Oct-07	27.1	0.74				9.79	28.8	1
		Apr-08	27.2	<0.5	Dry	NR	NR	3.53	29	0.93
		Jul-08	26.7	0.5	Dry	NS	NR	19	29.1	0.98
		Oct-08	26.6	1.26	Dry	NS	NR	17.2	29	1.02
Copper, Dissolved	ug/L	Jul-01			10.1	32.3	10.6			
		Sep-01						9.1	<2	
		Oct-01			<2	<2	<2			
		Apr-02			<2	<2	<2			
		Jul-02			<2	<2	2.6			
		Oct-02			11.6	<2	<2			
		Apr-03			Dry	<2	<2			
		Jul-03			Dry	<2	<2			
		Oct-03			Dry	<2	<2			
		Apr-04			Dry	6.1	Dry			
		Jul-04			Dry	<2	<2			
		Oct-04			Dry	<2	<2			
		Apr-05	913	<10	Dry	<10	<10	<10	<10	<10
		Jul-05	NR	NR	Dry	2.3	13	NR	NR	NR
		Oct-05	NR	NR	Dry	<2	2.5	NR	NR	NR
		Apr-06	NR	NR	Dry	<2	<2	NR	NR	NR
		Jul-06	NR	NR	Dry	<2	2.5	NR	NR	NR
		Oct-06	NR	NR	Dry			NR	NR	NR
		Apr-07				<2	<2			
		Jul-07				<2	<2			
		Oct-07				<2	<2			
		Apr-08	NR	NR	Dry	<2	5.6	NR	NR	NR
		Jul-08	NR	NR	Dry	NS	<2	NR	NR	NR
		Oct-08	NR	NR	Dry	NS	<2	NR	NR	NR

1 2 3 4 5 6 7 8

TABLE 3
GROUND WATER MONITORING DATA SUMMARY
HOYT LAKES TAILINGS BASIN

PARAMETER	UNITS	DATE	GW001	GW002	GW003	GW004	GW005	GW006	GW007	GW008
Flouride	mg/L	Jul-01	0.2	Dry		4		9.6	7.3	2.3
		Sep-01	NS					3.3	4	NS
		Oct-01	0.25	<0.1				2.1	1.6	0.2
		Apr-02	0.1	<0.1				3	1.25	0.2
		Jul-02	0.2	0.15				2.2	2.5	0.15
		Oct-02	0.26	0.11				2.1	2.4	0.12
		Apr-03	0.15	<0.1				2	1.9	2.1
		Jul-03	<0.1	0.12				2.7	2.2	1.9
		Aug-03		<0.1						
		Oct-03	0.29	<0.1				2.5	2	0.11
		Apr-04	0.43	0.1				2.2	1.8	0.11
		Jul-04	0.78	0.53				4.9	2.2	0.41
		Oct-04	0.14	0.11				2.5	1.9	0.13
		Apr-05	0.14	<0.1	Dry	4.5	3.8	1.6	2	0.11
		Jul-05	0.18	0.17	Dry	NR	NR	2.9	1.8	0.12
		Oct-05	0.13	0.19	Dry	NR	NR	2.2	1.7	0.16
		Apr-06	<0.05	<0.05	Dry	NR	NR	2.2	1.9	<0.05
		Jul-06	<0.1	<0.1	Dry	NR	NR	2.43	1.77	<0.1
		Oct-06	0.13	<0.1	Dry	NR	NR	2.67	1.85	<0.1
		Apr-07	0.31	0.24				2.35	1.88	0.1
		Jul-07	0.12	<0.1				2.6	1.88	<0.1
		Oct-07	0.11	<0.1				1.78	1.78	<0.1
		Apr-08	<0.1	<0.1	Dry	NR	NR	0.86	1.44	<0.1
		Jul-08	<0.1	<0.1	Dry	NS	NR	2.28	1.77	<0.1
		Oct-08	0.13	<0.2	Dry	NS	NR	2.2	1.79	<0.1
Manganese, Dissoved	ug/L	Jul-01	720	Dry		2.33		40	1120	140
		Sep-01	NS					0.23	1240	NS
		Oct-01	690	180				650	1070	680
		Apr-02	800	<10				840	1070	240
		Jul-02	980	20				990	1060	160
		Oct-02	3300	70				1300	1200	460
		Apr-03	980	10				1070	1170	350
		Jul-03	40	1170				860	1220	1000
		Aug-03		20						
		Oct-03	4020	10				920	1180	200
		Apr-04	1100	10				530	940	110
		Jul-04	970	20				2220	1070	160
		Oct-04	1530	50				1120	1020	310
		Apr-05	1480	10	Dry	170	200	230	1100	40
		Jul-05	1710	150	Dry	NR	NR	1230	1060	50
		Oct-05	1730	20	Dry	NR	NR	1130	1040	160
		Apr-06	1830	10	Dry	NR	NR	630	1140	70
		Jul-06	1880	<10	Dry	NR	NR	1130	1040	89.4
		Oct-06	1970	11.5	Dry	NR	NR	1100	1020	473
		Apr-07	1520	267				777	1280	56.9
		Jul-07	2010	14.1				1030	1220	60.3
		Oct-07	2060	10.6				590	958	79.2
		Apr-08	1500	<10	Dry	NR	NR	253	1240	108
		Jul-08	1950	16.5	Dry	NS	NR	1310	1190	98.8
		Oct-08	2090	45.6	Dry	NS	NR	1330	1040	76.8
Molybdenum	ug/L	Jul-01	<5	Dry		293		45.8	72.8	<5
		Sep-01	NS					36.4	68.4	NS
		Oct-01	5.6	5				39.9	100	<5
		Apr-02	5.1	<5				55.2	62.8	<5
		Jul-02	5.6	<5				59.4	67.2	<5
		Oct-02	9.2	5.6				57.2	66	<5
		Apr-03	8.4	<5				61	54.8	<5
		Jul-03	<5	6.5				70.2	38.1	<5
		Aug-03		<5						
		Oct-03	8.8	<5				69	41.5	<5
		Apr-04	6.5	<5				48.8	38	<5
		Jul-04	5.4	<5				48.5	40.7	<5
		Oct-04	<5	<5				50.2	36.7	<5
		Apr-05	11.7	<5	Dry	143	54.2	55	47.8	<5
		Jul-05	8.6	<5	Dry	NR	NR	57	57	<5
		Oct-05	6.8	<5	Dry	NR	NR	45.6	46.9	<5
		Apr-06	7.8	<5	Dry	NR	NR	35.3	30.9	<5
		Jul-06	12.4	<5	Dry	NR	NR	51	44.4	<5
		Oct-06	10.3	<5	Dry	NR	NR	44.3	29.9	<5
		Apr-07	5.6	<5				37	31	<5
		Jul-07	6.89	<5				38.3	30.6	<5
		Oct-07	5.3	<5				25.6	27.2	<5
		Apr-08	5.58	<5	Dry	NR	NR	21.4	26	<5
		Jul-08	7.3	<5	Dry	NS	NR	31.1	30.6	<5
		Oct-08	8.65	<5	Dry	NS	NR	31.1	29.5	<5

TABLE 3
GROUND WATER MONITORING DATA SUMMARY
HOYT LAKES TAILINGS BASIN

PARAMETER	UNITS	DATE	GW001	GW002	GW003	GW004	GW005	GW006	GW007	GW008
Nickel, Dissolved	ug/L	Jul-01			2.7	24.2	<2			
		Sep-01						<2	<2	
		Oct-01			<5	<5	<5			
		Apr-02			<2	<2	<2			
		Jul-02			<2	<2	<2			
		Oct-02			11.9	40.2	<2			
		Apr-03			Dry	45.8	7.3			
		Jul-03			Dry	5.8	<2			
		Oct-03			Dry	3.6	2.3			
		Apr-04			Dry	<5	Dry			
		Jul-04			Dry	<2	<2			
		Oct-04			Dry	3.6	3.4			
		Apr-05	<5	<5	Dry	<5	<5	<5	<5	<5
		Jul-05	NR	NR	Dry	10.8	17.8	NR	NR	NR
		Oct-05	NR	NR	Dry	<2	<2	NR	NR	NR
		Apr-06	NR	NR	Dry	<2	<2	NR	NR	NR
		Jul-06	NR	NR	Dry	<2	<2	NR	NR	NR
		Oct-06	NR	NR	Dry			NR	NR	NR
		Apr-07				3.1 J	<2			
		Jul-07				5.6	<2			
		Oct-07				6.1 J	7.6			
		Apr-08	NR	NR	Dry	3.1 J	2.03 J	NR	NR	NR
		Jul-08	NR	NR	Dry	NS	<2 J	NR	NR	NR
		Oct-08	NR	NR	Dry	NS	<2 J	NR	NR	NR
pH, Field	SU	Jul-01	7.71	Dry	8.33	8.31	9.38	7.2	7.64	7.76
		Sep-01						<2	7.51	
		Oct-01	7.27	8.41	6.4	6.32	6.98	8.98	9.05	8.3
		Apr-02	7.6	7.9	7.12	6.74	7.11	7.4	7.5	7.6
		Jul-02	7.13	8.93	7.66	7.92	8.51	7.3	7.7	7.07
		Oct-02	7.16	6.24	7.84	7.8	8.25	7.35	7.66	6.96
		Apr-03	6.19	6.73	Dry	7.07	8.04	6.65	6.76	6.82
		Jul-03	6.93	7.15	Dry	7.4	8.41	7.13	7.29	6.49
		Oct-03	7.6	8.2	Dry	7.8	7.7	7.3	7.5	7.7
		Apr-04	7.17	8.28	Dry	7.56	Dry	7.43	7.68	7.61
		Jul-04	7.32	7.96	Dry	7.92	8.1	7.35	7.82	7.48
		Oct-04	7.36	7.09	Dry	7.71	8.76	7.51	7.47	7.14
		Apr-05	7.38	7.29	Dry	7.57	8.23	7.33	7.79	6.95
		Jul-05	7.15	8.1	Dry	7.53	8.18	7.12	7.49	6.91
		Oct-05	7.92	8.17	Dry	7.87	7.74	8.1	8.07	7.97
		Apr-06	7.59	7.16	Dry	7.32	8.14	7.37	7.69	7.71
		Jul-06	6.73	7.26	Dry	7.39	8.34	6.89	7.19	6.76
		Oct-06	6.84	6.73	Dry	7.43	8.19	6.93	7.46	7.06
		Apr-07	7.52	7.27		7.54	9.22	7.24	7.56	7.65
		Jul-07	6.87	7.56		6.97	8.09	7.16	7.55	6.91
		Oct-07	7.22	7.95		6.98	8.19	7.39	7.23	7.35
		Apr-08	6.75	7.08	Dry	6.87	8.24	7.08	7.41	7.1
		Jul-08	7.09	7.02	Dry	NS	7.22	7.21	7.79	7.53
		Oct-08	7.36	6.96	Dry	NS	7.16	7.42	7.66	7.69
Total Dissoved Solids	mg/L	Jul-01	287	Dry		1850		1300	575	268
		Sep-01			491			1340	527	
		Oct-01	498	88				1170	523	234
		Apr-02	521	83				1040	578	170
		Jul-02	492	81				974	550	246
		Oct-02	526	67				924	525	235
		Apr-03	461	73				793	542	225
		Jul-03	49	518				793	531	240
		Aug-03		86						
		Oct-03	549	94				710	539	282
		Apr-04	497	63				676	503	223
		Jul-04	455	76				824	503	268
		Oct-04	479	158				782	496	208
		Apr-05	513	165	Dry	602	540	729	529	173
		Jul-05	530	75	Dry	NR	NR	892	529	224
		Oct-05	508	114	Dry	NR	NR	1010	514	218
		Apr-06	950	114	Dry	NR	NR	1660	1010	350
		Jul-06	501	86	Dry	NR	NR	1070	549	193
		Oct-06	558	92	Dry	NR	NR	1180	547	273
		Apr-07	492	76				1100	559	205
		Jul-07	497	62				1150	588	180
		Oct-07	519	83				879	563	192
		Apr-08	467	50	Dry	NR	NR	682	548	157
		Jul-08	460	65	Dry	NS	NR	1250	519	151
		Oct-08	468	82	Dry	NS	NR	1400	492	186

TABLE 3
GROUND WATER MONITORING DATA SUMMARY
HOYT LAKES TAILINGS BASIN

PARAMETER	UNITS	DATE	GW001	GW002	GW003	GW004	GW005	GW006	GW007	GW008
Specific Conductance	uhmos/cm	Jul-01	1100	Dry	1050	1000	540	1970	920	360
		Oct-01	851	136	464	743	308	1320	741	333
		Apr-02	898	68.9	450	750	300	1507	913	366
		Jul-02	865	110	1050	819	831	1210	942	360
		Oct-02	936	106	1290	923	746	1475	946	393
		Apr-03	753	75	Dry	685	680	1018	704	314
		Jul-03	766	88	Dry	776	736	1070	821	332
		Oct-03	958	86	Dry	750	812	1100	756	344
		Apr-04	2000	94	Dry	1550	Dry	2240	1660	692
		Jul-04	836	81	Dry	1045	862	1104	846	357
		Oct-04	947	127	Dry	746	780	1022	841	352
		Apr-05	907	154	Dry	836	882	1188	875	286
		Jul-05	910	89.4	Dry	1131	865	1399	893	314
		Oct-05	906	91	Dry	727	772	1296	888	359
		Apr-06	927	136	Dry	952	879	1263	819	288
		Jul-06	806	147	Dry	838	897	1541	885	281
		Oct-06	819	92	Dry	854	874	1648	834	335
		Apr-07	788	116		894	893	1490	849	323
		Jul-07	834	76.7		974.3	922	1583	866	308
		Oct-07	842	122		989	908	1272	882	307
		Apr-08	882	66	Dry	977	914	1026	882	258
		Jul-08	857	79	Dry	NS	1044	1123	888	259
		Oct-08	878	84	Dry	NS	1104	1158	874	248
Sulfate	mg/L	Jul-01	62.6	Dry	131	19.9	44.8	401	158	46.1
		Sep-01			86.9			494	175	
		Oct-01	58.3	8.8	117	48.6	45.6	420	149	41.7
		Apr-02	49.6	<0.9	173	128	160	373	166	30.7
		Jul-02	64	13	200	173	116	317	89	51.2
		Oct-02	52.7	8	220	165	83	313	178	43.8
		Apr-03	60	7.9	Dry	210	136	286	188	225
		Jul-03	13.4	55.4	Dry	177	157	234	171	240
		Aug-03		10.5						
		Oct-03	57.7	14.8	Dry	97.7	131	248	188	44.8
		Apr-04	53.9	10.8	Dry	102	Dry	215	170	34.4
		Jul-04	66.2	16.9	Dry	178	141	301	181	86.8
		Oct-04	56.7	13.8	Dry	150	133	281	180	32.3
		Apr-05	49.3	11.7	Dry	183	157	217	168	23.8
		Jul-05	63.6	12.2	Dry	213	145	284	162	22.6
		Oct-05	52.6	9	Dry	161	151	363	167	25.3
		Apr-06	45.7	6.7	Dry	155	172	282	161	21.7
		Jul-06	43.3	6.18	Dry	143	193	307	153	21.7
		Oct-06	42.2	7.23	Dry	152	222	396	162	21.9
		Apr-07	31.8	14.4		157	239	370	160	21.8
		Jul-07	36	6.7		166	243	377	158	21.9
		Oct-07	36.6	6.29		167	314	246	172	21.7
		Apr-08	34.9	5.41	Dry	171	222	150	166	17.8
		Jul-08	33.9	6.23	Dry	NS	215	437	167	17
		Oct-08	33.3	13.6	Dry	NS	248	493	158	18.3
Temperature	Deg C	Jul-01	25.7	Dry	25.6	25.4	23.4	20	21.4	22.4
		Oct-01	8.1	8	12	12.3	7	10.5	8.4	10
		Apr-02	4.4	5	11.8	11.9	7.9	5.6	5.6	3.3
		Jul-02	11.46	11.2	10.1	15.9	8.7	10.7	10.3	10.4
		Oct-02	5	7.7	4.9	5.5	4.7	10.2	7.5	9.6
		Apr-03	9.1	5	Dry	7.8	15.6	8.6	8.7	8.6
		Jul-03	7.8	8	Dry	12.8	12	9.3	9.1	8
		Oct-03	6.9	7.7	Dry	9.2	9.4	10.2	7.6	9.2
		Apr-04	5.3	6.5	Dry	9.6	Dry	5.4	5.5	4.4
		Jul-04	13.7	13.3	Dry	13.1	13.2	17.6	13.3	13.7
		Oct-04	7	8.2	Dry	10.2	8.7	8.7	8.1	8.3
		Apr-05	4.1	7.4	Dry	11.2	14.7	6.1	5.8	4.1
		Jul-05	9.8	10.5	Dry	20.1	17.3	11.4	9.9	9.9
		Oct-05	7.2	9.3	Dry	12.2	12.2	8.1	8	8.4
		Apr-06	4.8	8.9	Dry	12.1	14	8.6	9.7	9.5
		Jul-06	12.9	10.6	Dry	11.9	13.1	10.3	9.2	11.8
		Oct-06	6.1	5.4	Dry	5.4	10.2	10.5	8.7	8.4
		Apr-07	7.7	6.7		7.7	7.3	6.2	6	5.5
		Jul-07	8.9	11.67		12.55	12.6	9.2	8.7	8.3
		Oct-07	5.7	8.9		10.5	11.7	10.1	9.2	10.7
		Apr-08	6.4	9.1	Dry	9.8	10.6	5.7	5.3	3.8
		Jul-08	11.5	12.1	Dry	NS	13.5	12.1	11.6	10.9
		Oct-08	9.4	10.3	Dry	NS	10.9	9.1	9.6	9.4

* Total Metals
NS is no sample taken, not enough recharge
NR is not requested on chain of custody

TABLE 4
SURFACE DISCHARGE MONITORING DATA SUMMARY
HOYT LAKES TAILINGS BASIN (AND MINE AREA SD026)

PARAMETER	UNITS	DATE	SD026	SD001	SD002	SD004	SD006
Bicarbonates	mg/L	Jun-01	404	299	500	434	260
		Sep-01	476	383	553	621	369
		Dec-01	446	324	513	Dry	356
		Mar-02	476	410	504	430	380
		Jun-02	448	303	459	394	310
		Sep-02	372	292	290	386	300
		Dec-02	476	338	408	392	402
		Mar-03	464	378	496	374	386
		Jun-03	430	294	428	372	312
		Sep-03	448	356	430	362	282
		Dec-03	418	290	370	360	371
		Mar-04	432	416	396	372	384
		Jun-04	374	290	430	384	262
		Sep-04	408	302	410	398	243
		Dec-04	428	211	410	416	383
		Mar-05	433	463	438	409	402
		Jun-05	346	287	393	397	278
		Sep-05	446	401	426	427	367
		Dec-05	439	237	394	426	381
		Mar-06	431	276	392	403	427
		Jun-06	401	296	398	432	317
		Sep-06		432	440	440	408
		Dec-06		426	428	435	475
		Apr-07		337	302		
		Jul-07		366	433		
		Oct-07		258	400		
		Mar-08		393	441	553	514
		Jun-08		221	389	562	309
		Sep-08		424	467	563	436
		Dec-08		394	436	546	496
Boron, Total	ug/L	Jun-01	302	332	458	566	316
		Sep-01	210	390	482	529	426
		Dec-01	304	324	373	Dry	383
		Mar-02	270	488	466	633	406
		Jun-02	280	363	466	615	436
		Sep-02	221	300	294	609	415
		Dec-02	298	381	338	612	445
		Mar-03	270	402	412	572	426
		Jun-03	275	361	390	522	383
		Sep-03	266	404	391	543	342
		Dec-03	234	303	286	511	362
		Mar-04	287	384	306	567	392
		Jun-04	230	364	366	492	265
		Sep-04	236	399	382	510	262
		Dec-04	233	115	324	528	364
		Mar-05	252	308	293	491	365
		Jun-05	212	371	343	521	278
		Sep-05	281	386	448	520	483
		Dec-05	248	361	323	E 511	362
		Mar-06	D 279	225	277	E 547	398
		Jun-06	D 227	370	338	495	311
		Sep-06		436	374	493	338
		Dec-06		335	341	E 514	432
		Apr-07		276	206		
		Jul-07		292	300		
		Oct-07		263	321		
		Mar-08		284	321	496	412
		Jun-08		274	288	476	217
		Sep-08		340	339	488	361
		Dec-08		286	330	E 526	372

TABLE 4
SURFACE DISCHARGE MONITORING DATA SUMMARY
HOYT LAKES TAILINGS BASIN (AND MINE AREA SD026)

PARAMETER	UNITS	DATE	SD026	SD001	SD002	SD004	SD006
Fluoride	mg/L	Jun-01	2.8	3.0	3.4	3.1	3.7
		Sep-01	3.5	3.7	4.2	2.8	3.8
		Dec-01	3.4	3.4	3.0	Dry	3.5
		Mar-02	3.2	5.4	2.7	2.3	3.6
		Jun-02	3.2	3.2	3.0	3.2	4.6
		Sep-02	3.1	2.4	1.7	3.2	3.7
		Dec-02	4.2	3.3	2.4	2.6	4.4
		Mar-03	3.7	2.8	2.0	2.5	3.5
		Jun-03	3.6	2.5	2.7	3.0	3.4
		Sep-03	3.7	2.3	2.6	2.9	2.8
		Dec-03	3.2	1.6	1.6	2.6	3.2
		Mar-04	3.8	2.6	1.8	2.7	3.4
		Jun-04	2.7	1.6	2.2	2.5	2.1
		Sep-04	3.8	1.8	2.7	2.8	2.4
		Dec-04	3.3	0.6	2.1	2.6	2.9
		Mar-05	3.6	1.2	1.7	2.4	3.1
		Jun-05	2.5	1.5	2.3	2.6	2.2
		Sep-05	2.7	2.4	2.0	2.1	2.8
		Dec-05	3.4	1.1	2.0	2.3	2.7
		Mar-06	3	0.8	1.9	2	3
		Jun-06	2	1.2	1.8	2	2
		Sep-06		1.6	1.9	0.6	2.8
		Dec-06		1.9	1.7	2.0	3.1
		Apr-07		1.17	1.02		
		Jul-07		1.63	1.94		
		Oct-07		1.04	1.77		
		Mar-08		1.13	1.66	2.0	3.0
		Jun-08		1.49	1.98	2.3	2.0
		Sep-08		1.3	1.71	1.8	2.4
		Dec-08		1.01	1.64	1.8	2.5
Hardness, Carbonate	mg/L	Jun-01	500	331	581	434	275
		Sep-01	616	434	649	1050	358
		Dec-01	570	375	566	Dry	410
		Mar-02	560	477	567	631	415
		Jun-02	505	336	499	515	335
		Sep-02	444	384	364	509	366
		Dec-02	284	442	410	482	450
		Mar-03	540	496	524	488	432
		Jun-03	500	385	443	480	374
		Sep-03	521	429	398	455	349
		Dec-03	475	372	559	454	430
		Mar-04	500	322	409	468	455
		Jun-04	454	329	404	500	295
		Sep-04	175	413	388	523	302
		Dec-04	456	268	380	159	427
		Mar-05	493	626	422	155	494
		Jun-05	460	367	417	494	340
		Sep-05	593	485	443	637	367
		Dec-05	780	408	379	692	476
		Mar-06	518	463	357	154	520
		Jun-06	448	400	456	147	371
		Sep-06		499	425	671	519
		Dec-06		584	441	650	629
		Apr-07		531	327		
		Jul-07		396	405		
		Oct-07		377	435		
		Mar-08		597	475	838	670
		Jun-08		303	404	871	408
		Sep-08		543	493	850	642
		Dec-08		642	519	914	721

TABLE 4
SURFACE DISCHARGE MONITORING DATA SUMMARY
HOYT LAKES TAILINGS BASIN (AND MINE AREA SD026)

PARAMETER	UNITS	DATE	SD026	SD001	SD002	SD004	SD006
Iron, Dissolved	mg/L	Jun-01		0.07	0.14	0.1	0.165
		Sep-01		<0.055	<0.068	0.05	0.13
		Dec-01		<0.035	<0.03	Dry	0.04
		Mar-02		<0.04	<0.033	0.17	<0.03
		Jun-02		<0.03	<0.03	<0.03	0.1
		Sep-02		<0.03	<0.03	<0.03	0.03
		Dec-02		0.04	0.25	3.49	<0.03
		Mar-03		0.28	0.89	3.21	0.09
		Jun-03		0.06	0.04	3.68	0.03
		Sep-03		0.06	0.07	3.12	0.05
		Dec-03		0.05	0.04	2.24	<0.03
		Mar-04		0.05	0.09	1.63	0.03
		Jun-04		0.11	0.12	3.1	0.36
		Sep-04		0.08	0.05	3.46	0.16
		Dec-04				3.26	0.17
		Mar-05		2.56	0.12	0.88	0.07
		Jun-05		0.33	0.18	2.82	0.23
		Sep-05		<0.05	<0.05	3.47	0.11
		Dec-05		1.3	0.08	3.7	0.12
		Mar-06		1.5	0.52	2.87	0.32
		Jun-06		0.21	0.45	2.57	0.22
		Sep-06		0.17	0.16	2.45	0.25
		Dec-06		0.948	0.652	2.92	0.106
		Apr-07					
		Jul-07					
		Oct-07					
		Mar-08		0.822	0.63	4.14	0.355
		Jun-08		0.117	<0.05	4.61	<0.05
		Sep-08		0.784	<0.05	5.54	<0.05
		Dec-08		0.185	0.126	5.97	0.852
Manganese, Total	ug/L	Jun-01	110	50	210	910	350
		Sep-01	170	40	420	760	310
		Dec-01	680	40	2070	Dry	440
		Mar-02	1000	140	1460	690	440
		Jun-02	170	20	90	850	130
		Sep-02	350	20	20	730	80
		Dec-02	1160	30	1890	800	350
		Mar-03	1010	380	540	720	490
		Jun-03	210	20	540	770	130
		Sep-03	230	60	910	670	80
		Dec-03	720	110	470	660	340
		Mar-04	470	210	850	640	300
		Jun-04	300	130	860	650	190
		Sep-04	200	110	1790	690	140
		Dec-04	450	2030	450	660	140
		Mar-05	350	1140	1920	630	660
		Jun-05	270	110	1070	610	120
		Sep-05	320	60	1160	630	110
		Dec-05	1000	430	1700	640	560
		Mar-06	730	580	2090	590	700
		Jun-06	310	110	850	600	160
		Sep-06		417	2430	620	127
		Dec-06		353	2070	590	458
		Apr-07					
		Jul-07					
		Oct-07					
		Mar-08		439	1900	632	858
		Jun-08		56	471	657	180
		Sep-08		392	1790	586	193
		Dec-08		590	3060	619	553

TABLE 4
SURFACE DISCHARGE MONITORING DATA SUMMARY
HOYT LAKES TAILINGS BASIN (AND MINE AREA SD026)

Ponded

PARAMETER	UNITS	DATE	SD026	SD001	SD002	SD004	SD006
pH, Field (maximum)	SU	Jun-01	7.6	7.3	7.9	7.7	7.3
		Sep-01	8.1	8.6	8.0	7.6	7.7
		Dec-01	7.5	7.8	7.9	Dry	7.5
		Mar-02	7.0	8.0	8.5	7.8	7.9
		Jun-02	7.8	7.9	7.8	7.9	8.1
		Sep-02	7.9	8.3	8.2	7.6	8.1
		Dec-02	8.0	8.2	7.9	7.4	8.0
		Mar-03	8.2	8.1	7.5	7.4	7.9
		Jun-03	8.1	7.9	7.5	7.7	8.2
		Sep-03	7.9	8.1	7.8	8.1	8.0
		Dec-03	8.5	8.6	8.5	8.4	8.3
		Mar-04	7.2	7.8	7.8	7.9	7.9
		Jun-04	8.2	8.1	7.8	7.8	8.3
		Sep-04	7.9	7.8	7.4	7.4	7.9
		Dec-04	8.1	8.0	8.0	7.8	8.3
		Mar-05	7.6	7.8	7.8	8.0	8.0
		Jun-05	8.04	7.6	7.2	6.9	7.4
		Sep-05	8.1	7.7	7.2	7.6	8.4
		Dec-05	8.1	7.6	7.4	7.6	7.9
		Mar-06	8.2	7.5	7.4	7.5	7.7
		Jun-06	7.8	8.1	7.9	7.8	8.1
		Sep-06		7.9	7.8	7.7	8.0
		Dec-06		7.6	7.5	7.4	7.5
		Jan-07		7.5	7.6	7.1	7.4
		Feb-07		7.5	7.5		7.6
		Mar-07		7.5	7.4	7.4	7.5
		Apr-07		7.3	7.2	7.2	7.3
		May-07		8.0	7.6		8.0
		Jul-07		7.6	7.4		7.4
		Aug-07		7.6	7.7	7.6	7.8
		Sep-07		7.7	7.4	7.4	7.9
		Sep-07					7.7
		Sep-07					7.8
		Sep-07					7.7
		Oct-07		7.5	7.3	7.5	7.9
		Nov-07		7.7	8		8
		Mar-08		7.4	7.4	7.5	7.6
		Jun-08		7.3	7.48	7.46	8.2
		Sep-08		7.64	7.48	7.3	7.69
		Dec-08		7.17	7.24	7.28	7.96
TSS	mg/L	Jun-01	8	<1.4	4.4	10.7	4.5
		Sep-01	2	<1.2	3.7	28.5	<1
		Dec-01	2.7	10.33	12.55	Dry	<1
		Mar-02	<1	6.17	10.2	2.4	<1
		Jun-02	<1.1	<1.44	2.2	10	2.65
		Sep-02	1.6	<1	4	8	2
		Dec-02	1.6	1.2	16	7.6	<1
		Mar-03	<1	4	4.8	3.2	<1
		Jun-03	4	5	2.4	20	2.8
		Sep-03	2	<1	1	3	5
		Dec-03	6.8	3	1.2	4.8	<1
		Mar-04	1.6	6.8	8	5.6	1.2
		Jun-04	<1	2	4	9	4
		Sep-04	1.5	3	3.5	9	3.5
		Dec-04	<1	14.4	47	6.8	<1
		Mar-05	2.5	10	1.2	20	4.4
		Jun-05	<1	1.2	2.8	5.6	<1
		Sep-05	2.0	1.6	5.2	9.2	<2.73
		Dec-05	2.4	4.8	6	4.4	<1
		Mar-06	1.6	4.8	5.6	9.2	<1
		Jun-06	2.4	3.6	2.8	14	<1
		Sep-06		4	2.8	16	1.6
		Dec-06		14.4	16	15.2	2.8
		Apr-07		11	2	10	1.5
		Jul-07		<1	2.8		
		Oct-07		3.2	3.6		1.6
		Mar-08		3.2	4.8	8.4	<1
		Jun-08		<1	1.2	8	<1
		Sep-08		2.4	2.8	12.4	2
		Dec-08		3.2	6.4	20.4	3.2

TABLE 4
SURFACE DISCHARGE MONITORING DATA SUMMARY
HOYT LAKES TAILINGS BASIN (AND MINE AREA SD026)

PARAMETER	UNITS	DATE	SD026	SD001	SD002	SD004	SD006
Specific Conductance	uhmos/cm	Jun-01	1102	855	1410	1320	760
		Sep-01	780	1026	1100	1180	950
		Dec-01	1000	867	1110	Dry	930
		Mar-02	1010	950	1215	1210	969
		Jun-02	960	818	1140	1450	940
		Sep-02	487	888	1060	1060	507
		Dec-02	940	777	616	1245	990
		Mar-03	1393	864	1162	1254	1155
		Jun-03	1017	803	1051	1062	912
		Sep-03	1170	750	750	880	873
		Dec-03	1130	756	840	790	874
		Mar-04	1170	1240	1070	1730	1390
		Jun-04	988	821	1067	767	790
		Sep-04	1075	978	1100	1301	820
		Dec-04	1067	639	1019	1280	1096
		Mar-05	898	1230	1010	1130	1069
		Jun-05	881	760	953	1178	772
		Sep-05	1089	1018	1308	1283	1078
		Dec-05	1004	1086	1122	1380	1092
		Mar-06	1103	1099	1127	1290	1133
		Jun-06	1097	874	1011	838	904
		Sep-06		1121	1222	1376	1198
		Dec-06		1098	1178	1301	1148
		Jan-07		1112	1166	150	1128
		Feb-07		1098	1188		1101
		Mar-07		1111	1110	1311	1118
		Apr-07		1050	999	1408	996
		May-07		741	1149		970
		Jul-07		866	996		818
		Aug-07		1039	1188	1496	1330
		Sep-07		1098	1167	1518	1370
		Sep-07					1301
		Sep-07					1198
		Sep-07					1008
		Oct-07		852	1062	1385	750
		Nov-07		813	541		915
		Mar-08		546	606	1487	1290
		Jun-08		873	1209	1576	852
		Sep-08		1090	1144	1601	1305
		Dec-08		632	621	1656	777
Turbidity	mg/L	Jun-01		0.58	5.89	26.5	1.82
		Sep-01		2.96	3.88	134	1.97
		Dec-01		4.14	11.18	Dry	1.78
		Mar-02		3.1	15.9	16.9	1.63
		Jun-02		0.46	2.5	73.2	1.7
		Sep-02		0.5	0.6	60	1.7
		Dec-02		1	12	55	1.5
		Mar-03		7.4	3.1	45	1.1
		Jun-03		1.2	2.4	70	1.4
		Sep-03		0.95	1.7	45	3.3
		Dec-03		2.8	0.9	45	0.8
		Mar-04		4.6	11	50	2.1
		Jun-04		2.2	3	44.7	2.4
		Sep-04		2.4	2.4	36	2.2
		Dec-04		36.1	21.7	57.3	2.2
		Mar-05		28	10	80	3.2
		Jun-05		1.1	2	29	1.1
		Sep-05		0.85	3.8	33.4	1.73
		Dec-05		5	3	5.4	1.3
		Mar-06		9.6	4.3	38	2.1
		Jun-06		1.6	1.7	11	1.5
	NTU	Sep-06		2.1	2.3	23	1.2
		Dec-06		10.8	22	56.2	2.8
		Apr-07		1.2	1.5		
		Jul-07		1.4	1.8		
		Oct-07		1.4	2.8		
		Mar-08		6.9	7.9	49.2	1.8
		Jun-08		0.9	1.4	65.1	2.5
		Sep-08		2.8	3.5	92.9	2.7
		Dec-08		4.6	3.5	99.4	3.2

* Total Metals

** Analyzed After Holding Time

WS013 DATE	Bicarbonates mg/L	Boron ug/L	Fluoride mg/L	Hardness mg/L	Manganese ug/L	pH, maximum Standard Units	TSS mg/L	Specific Conductance umhos/cm
Jul-01	305	448	6.6	340	600	8.3	2	1200
Oct-01	365	536	5.4	339	530	7.6	0	787
Apr-02	402	505	6.2	378	820	8	14.4	1183
Jul-02	430	474	5.4	423	540	8.56	8	1110
Oct-02	508	490	4.6	635	670	8.2	1	980
Apr-03	560	276	3.4	397	600	8.2	59	1250
Jul-03	76	461	2.8	843	410	8.4	0	1460
Oct-03	554	474	2.9	873	290	8.38	2	840
Apr-04	558	374	1.7	871	480	8.26	7.3	1603
Jul-04	20.3	414	2.4	771	143	8.23	<1	1548
Oct-04	532	337	1.7	842	140	8.14	4.5	1582
Apr-05	246	300	1.6	204	520	7.46	42	1571
Jul-05	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Oct-05	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Apr-06	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Jul-06	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Oct-06	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Dec-06	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Apr-07	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Jul-07	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Oct-07	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Apr-08	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Jul-08	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Oct-08	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

WS011 DATE	pH, maximum Standard Units	Specific Conductance umhos/cm
Jul-01	7.81	950
Oct-01	7.19	1120
Apr-02	7.35	Not Sampled
Jul-02	8.34	1210
Oct-02	8.3	816
Apr-03	8.7	1220
Jul-03	7.7	1170
Oct-03	7.32	1028
Apr-04	8.41	1160
Jul-04	7.17	1155
Oct-04	7.87	1235
Apr-05	7.45	1283
Jul-05	7.4	1180
Oct-05	8.03	1100
Apr-06	Dry	Dry
Jul-06	Dry	Dry
Oct-06	Dry	Dry
Apr-07	Dry	Dry
Jul-07	Dry	Dry
Oct-07	Dry	Dry
Apr-08	Dry	Dry
Jul-08	Dry	Dry
Oct-08	Dry	Dry

WS012 DATE	pH, maximum Standard Units	Specific Conductance umhos/cm
Jul-01	7.87	750
Oct-01	8.21	975
Apr-02	7.86	Not Sampled
Jul-02	8.51	1020
Oct-02	8.2	844
Apr-03	8.5	1490
Jul-03	8.3	1530
Oct-03	8.2	1200
Apr-04	8.45	1649
Jul-04	8.24	1598
Oct-04	8.29	1626
Apr-05	7.99	1597
Jul-05	8.34	1496
Oct-05	8.34	1576
Apr-06	Dry	Dry
Jul-06	Dry	Dry
Oct-06	Dry	Dry
Apr-07	Dry	Dry
Jul-07	Dry	Dry
Oct-07	Dry	Dry
Apr-08	Dry	Dry
Jul-08	Dry	Dry
Oct-08	Dry	Dry

APPENDIX A
ALTERNATIVE MONITORING PROPOSAL LETTER

Cliffs Erie LLC
PO Box 900
Hoyt Lakes, Minnesota 55750

May 20, 2003

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

RE: **Alternative Monitoring Proposal, Cliffs Erie LLC Hoyt Lakes Tailings Basin Area NPDES/SDS Permit No. MN0054089**

Dear Mr. Clark:

The purpose of this letter is to propose alternative monitoring based on Chapter 1, Section 1.5 of Cliffs Erie LLC Hoyt Lakes Tailings Basin Area NPDES/SDS Permit No. MN0054089 (NPDES Permit). The alternative monitoring proposed is as follows:

- Discontinue monitoring GW-003 and abandon GW-003 per Minnesota Department of Health (MDH) regulations.
- Continue monitoring GW-004 and GW-005 per the NPDES Permit until such time as the saturated zone drops below the base of the respective well screens.
- As GW-004 and GW-005 become dry, these wells should also be abandoned per MDH regulations.

Basis for Alternative Monitoring Proposal

During routine NPDES Permit monitoring conducted on April 4, 2003, ground water station GW-003 was observed to be dry. As indicated in Chapter 1, Section 1.5 of the NPDES Permit: "If the elevation of the saturated zone falls below the base of the screen in a monitoring well, the Permittee within 60 days shall install a new well to monitor the saturated zone, subject to the same permit requirements as those for the original well, and as approved in advance by the MPCA, or, for wells GW003-GW005, shall propose alternative monitoring of that saturated zone consistent with past MPCA approval for the maintenance of the Virginia Formation mine waste in a saturated condition."

NPDES ground water monitoring stations GW-003, GW-004 and GW-005 were installed within Hoyt Lakes Tailings Basin Cell 2W to monitor the saturated zone and ensure that "Virginia Formation mine waste" (broken hornfels) placed in Cell 2W remain in a saturated condition. Hoyt Lakes Tailings Basin Cell 2W is undergoing closure, will remain inactive, and the hornfels (Virginia Formation mine waste) can no longer be maintained in a saturated condition.

The Hoyt Lakes facility and tailings basin has been inactive since January 2001. Cell 2W is currently dry and the saturated zone has dropped below the hornfels. The bottom of the broken hornfels located in Cell 2W ranges in elevation from 1643 to 1686 feet above mean sea level (Dunka Mine Updated Final Closure Plan, revised March 15, 1996). Ground water elevations

Cliffs Erie LLC
PO Box 900
Hoyt Lakes, Minnesota 55750

within GW-004 and GW-005 were 1606.78 and 1610.07, respectively, on April 4, 2003. The saturated zone of ground water is currently located more than 30 feet below the hornfels.

Approximately 40 feet of tailings overlie the hornfels and approximately 180 feet of tailings underlie the hornfels. Neutralizing material (dolomite limestone) was mixed with the hornfels as they were placed in Cell 2W. The neutralizing material was mixed in a ratio to provide more than the required neutralization. In addition, the area above the hornfels has dried up and has been vegetated. This will minimize the amount of water infiltration that will impact the hornfels. The only cycling of exposure to water followed by exposure to oxygen that causes leaching will be due to infiltration of precipitation. This is expected to have minimal impact.

Maintaining the hornfels in a saturated condition was intended to prevent alternating dry then wet conditions of the hornfels that could lead to weathering and subsequent leaching of potential contaminants from the hornfels. Closure of Cell 2W will minimize cycling of exposure to water followed by exposure to oxygen. Given the neutralizing material placed with the hornfels and neutralizing potential of the tailings within the basin, leaching of potential contaminants to ground water is expected to be minimal. Since the intent of the NPDES Permit is to ensure that potential contaminants are not discharged to the environment, the intent of the NPDES Permit is being met by Cell 2W closure with respect to the hornfels. Therefore, monitoring ground water elevations is no longer necessary to demonstrate that the hornfels is maintained in a saturated condition.

Sincerely,
Cliffs Erie LLC

J. R. Scott
Manager, Operations

JRS/ml

Encl.

cc: Letter & Report
D.L. Schubbe (NTS – Secondary Data Retention)

Letter Only
D.Z. Skolasinski (CMSC – Northshore)
D.B. Crouch (CCI – Cleveland)

APPENDIX B

DECEMBER 19, 2002

TAILINGS BASIN COMPLIANCE SCHEDULE REPORT

Cliffs Erie LLC
PO Box 900
Hoyt Lakes, Minnesota 55750

December 19, 2002

Mr. Richard Clark
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155

RE: Compliance Schedule Report, Cliffs Erie LLC Hoyt Lakes Tailings Basin Area NPDES Permit #MN0054089

Dear Mr. Clark:

Please accept this document as the Compliance Schedule Report required per Chapter 6 Section 7.3 of Cliffs Erie LLC's Hoyt Lakes Tailings Basin Area NPDES Permit #MN0054089 (The Permit). The Permit requires a report within 365 days after the date on which the instantaneous maximum limit for boron, fluoride, manganese, or molybdenum is exceeded in samples obtained from groundwater monitoring stations GW-001, GW-006, GW-007 and GW-008. The Permit specifies the report to address:

a. "The trends in concentration of the ground water pollutant; including an evaluation of the possible changes in ground water quality resulting from the changes in the operation of the facility;" and,

b. "The mitigation alternatives, and their associated costs, to achieve compliance with the limit."

BACKGROUND INFORMATION

Plant operations have ceased at the Hoyt Lakes facility and process water is no longer pumped to the Hoyt Lakes Tailings Basin. Seepage water formerly recovered and pumped to the tailings basin is discharged directly to surface water. This surface discharge has been addressed as part of a request for permit variance (Hoyt Lakes Tailings Basin NPDES Permit #MN0054089) that was submitted to the Minnesota Pollution Control Agency (MPCA) during July 2002. The premise of the variance is, in part, that pumping water to the tailings basin continues to recharge waters that infiltrate through the tailings, become degraded while infiltrating, and supply degraded water to seeps that ultimately discharge water of a lesser quality to surface water. The variance request is considered to have fulfilled the Compliance Schedule Report requirement (due date January 1, 2003) per Chapter 6 Section 7.1 and 7.2 of Cliffs Erie LLC's Hoyt Lakes Tailings Basin Area NPDES Permit #MN0054089.

TRENDS IN CONCENTRATION

Graphical analysis of boron, fluoride, manganese and molybdenum concentrations within groundwater samples obtained from GW-001, GW-006, GW-007, and GW-008 are attached. In

addition, groundwater monitoring data is summarized in an attached table. GW-006, GW-007, and GW-008 where installed during the summer of 2001. Instantaneous maximum limits for fluoride (GW-006 and GW-007), manganese (GW-007) and molybdenum (GW-006 and GW-007) were exceeded during the first sampling event (July 18, 2001) for one or more of these recently installed wells.

Concentrations have remained relatively constant except for during the first (July 2001) and the last (October 2002) sampling events. The concentration of manganese within GW-007 has consistently remained above the instantaneous maximum limit. Similarly, the concentration of molybdenum within GW-006 and GW-007 has consistently remained above the instantaneous maximum limit. There is not enough historical data to make statements with regard to long term concentration trends of boron, fluoride, manganese or molybdenum (i.e., a downward or upward concentration trend). However, concentrations of these compounds may eventually decline given that plant operations (including pumping of process water into the tailings basin) at the Hoyt Lakes facility have ceased.

CONCEPTUAL MITIGATION ALTERNATIVES

As indicated above, groundwater monitoring stations GW-006, GW-007, and GW-008 were recently installed and monitoring began during July 2001. Due to the recent installation of groundwater monitoring stations (wells), there is a lack of historical data available to evaluate concentration trends of boron, fluoride, manganese, and molybdenum. Similarly, there is not enough data (including characterization of the physical setting of the tailings basin and the nature and extent of impacts to groundwater from the tailings basin) to allow a mitigation alternative to be selected that could ensure with an acceptable degree of certainty that the instantaneous maximum limit would be met.

The Minnesota Department of Natural Resources (MDNR) is currently conducting an investigation that will provide information regarding the physical setting (i.e., hydrology, hydrogeology, etc.) of the Hoyt Lakes Tailings Basin. In addition, groundwater monitoring will continue as part of the NPDES permit. It is anticipated that upon receipt of MDNR investigation results, all available data will be evaluated to determine if the nature and extent of boron, fluoride, manganese and molybdenum has been adequately characterized to allow the risk to human health and the environment to be assessed, and to allow a mitigation alternative to be selected that will ensure that instantaneous maximum limits for groundwater will be met. Therefore, conceptual mitigation alternatives are presented below with associated costs.

Change In Plant Operations

As discussed above, process water pumped to the Hoyt Lakes Tailings Basin is assumed to be a source of boron, fluoride, manganese and molybdenum within seeps (i.e., groundwater). Given that process water is no longer pumped to the tailings basin, the quality of groundwater may eventually allow instantaneous maximum limits to be met. Therefore, changing plant operations by ceasing pumping to the tailings basin, along with continued monitoring as part of the Hoyt

Lakes Tailings Basin NPDES Permit, is considered a mitigation alternative. There is no additional cost associated with this mitigation alternative.

Groundwater Recovery And Treatment

Recovery and treatment of groundwater is not considered a viable mitigation alternative due to the potential negative impact to surrounding wetlands. Groundwater recovery would cause drawdown of the surface water table, in affect dewatering surrounding wetlands. Costs associated with this mitigation alternative would most likely extend into the multi-million dollar range.

Passive Groundwater Treatment

Passive groundwater treatment could include mitigation alternatives ranging from more complex buried, man-made, flow-through type treatment cells to enhancement of natural wetlands. Passive groundwater treatment technologies require maintenance and are only "passive" in the sense that they do not require removal of groundwater from the ground for treatment. Costs associated with man-made treatment cell mitigation alternatives would most likely extend into the multi-million dollar range. Mitigation costs associated with natural wetlands enhancement could be in the range of a million dollars.

RECOMMENDATIONS

At this time, continued groundwater monitoring as part of the Hoyt Lakes Tailings Basin NPDES Permit is recommended while the MDNR investigation is completed. Upon completion of the MDNR investigation, all data (including additional historical groundwater monitoring data) should be evaluated to determine if the nature and extent of boron, fluoride, manganese and molybdenum has been adequately characterized to allow the risk to human health and the environment to be assessed and to allow an appropriate mitigation alternative to be selected.

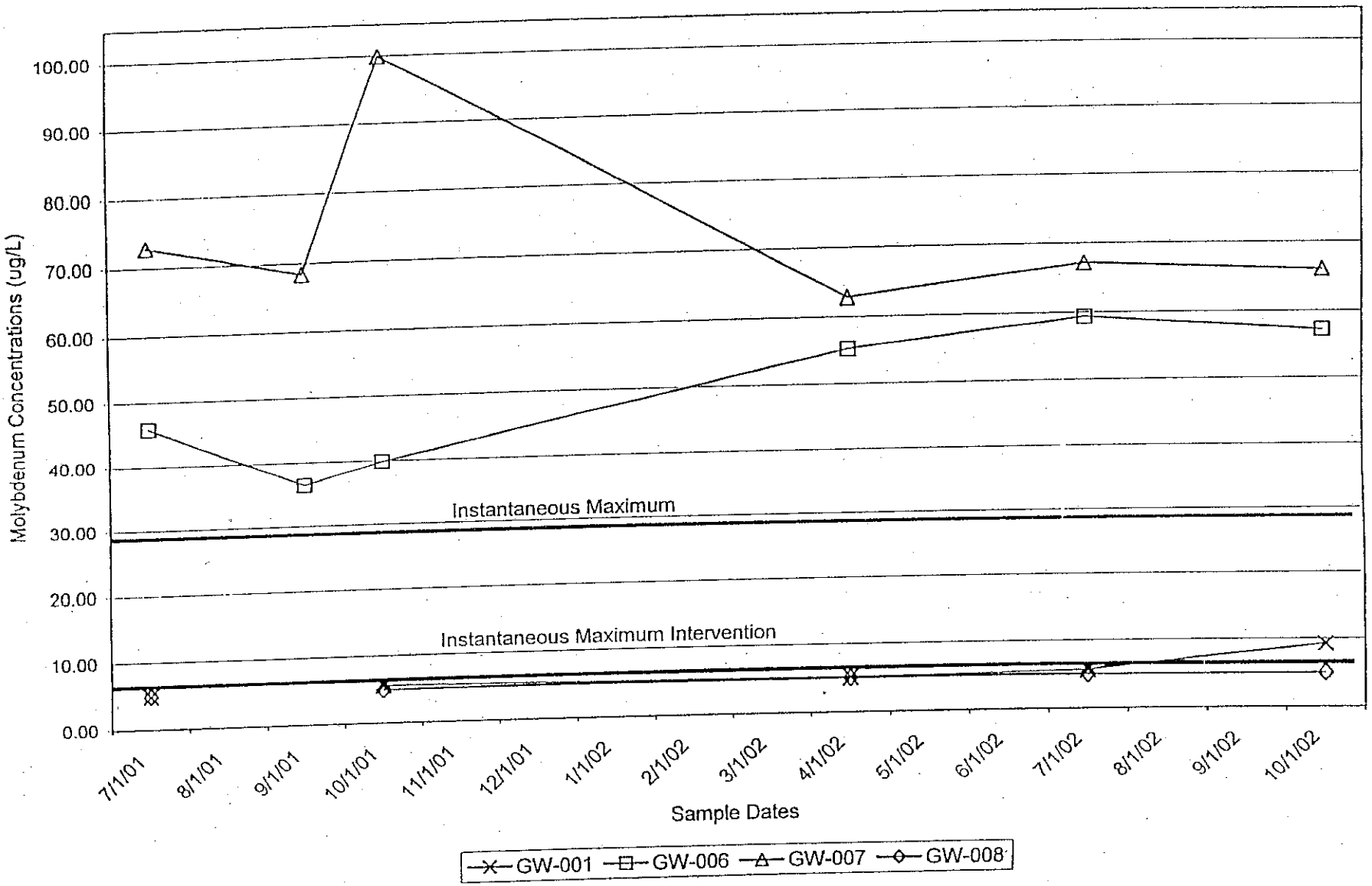
If you have questions regarding this report or the recommendations, please feel free to contact Dennis Schubbe, Northeast Technical Services, Inc., at (218) 742-1035.

Sincerely,

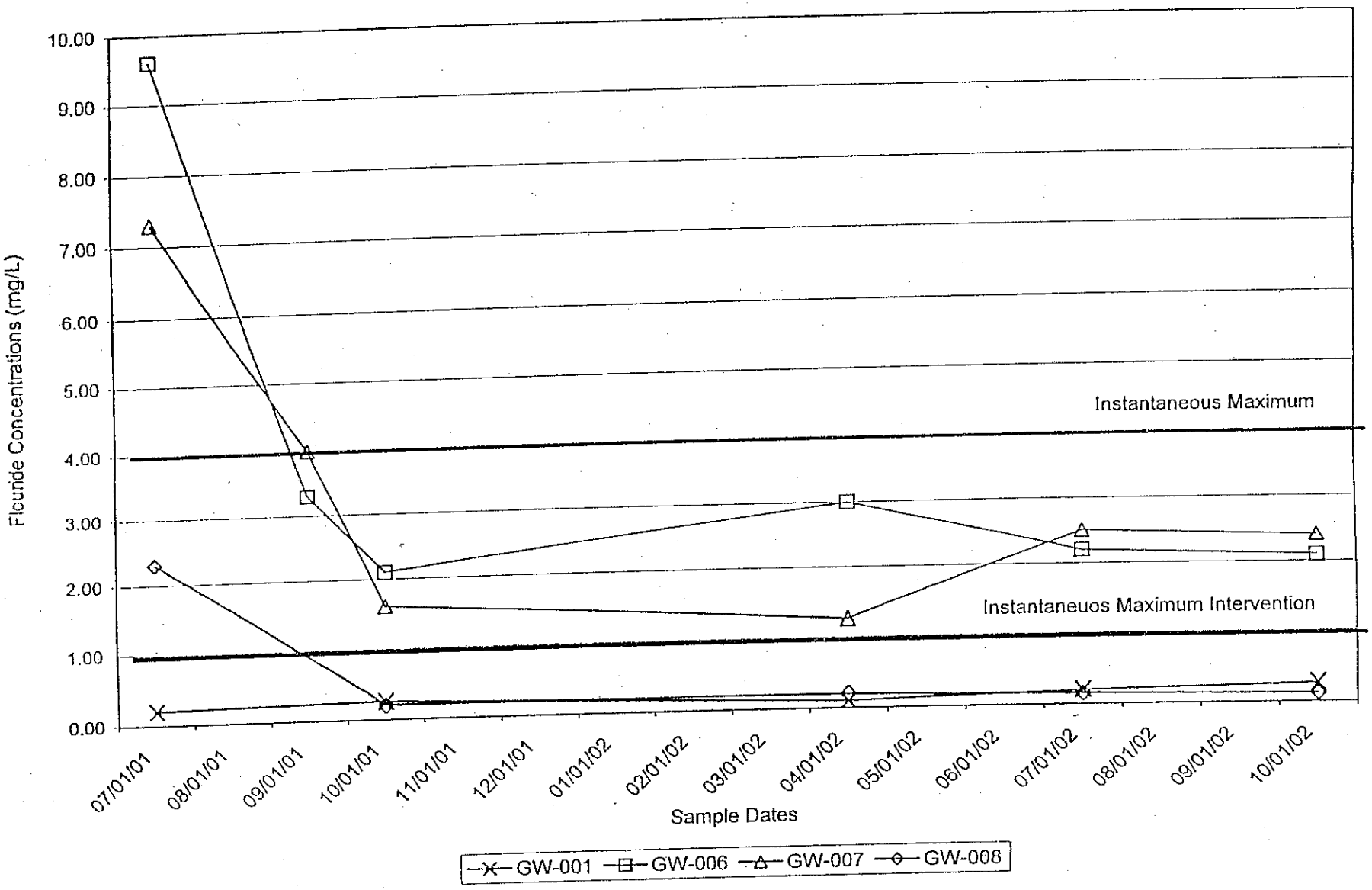
Jim Scott
Manager, Operations

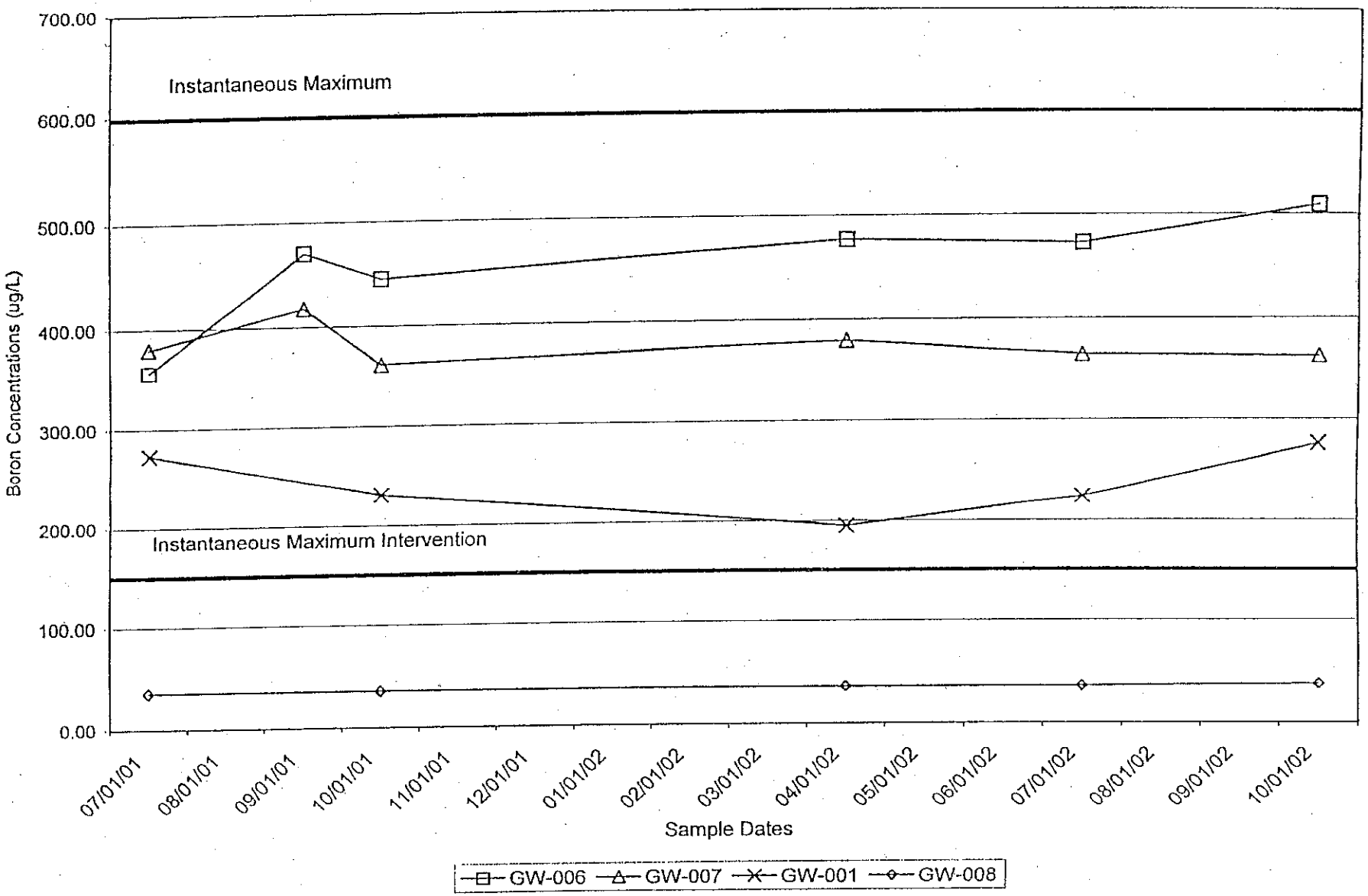
DJV
Attach.
cc: Letter & Attachments
D.L. Schubbe (NTS – Primary Data Retention)
D.Z. Skolansinski (CCI – Duluth – Secondary Data Retention)

Cliffs Erie, LLC Hoyt Lakes Tailings Basin
NPDES Permit #0054089

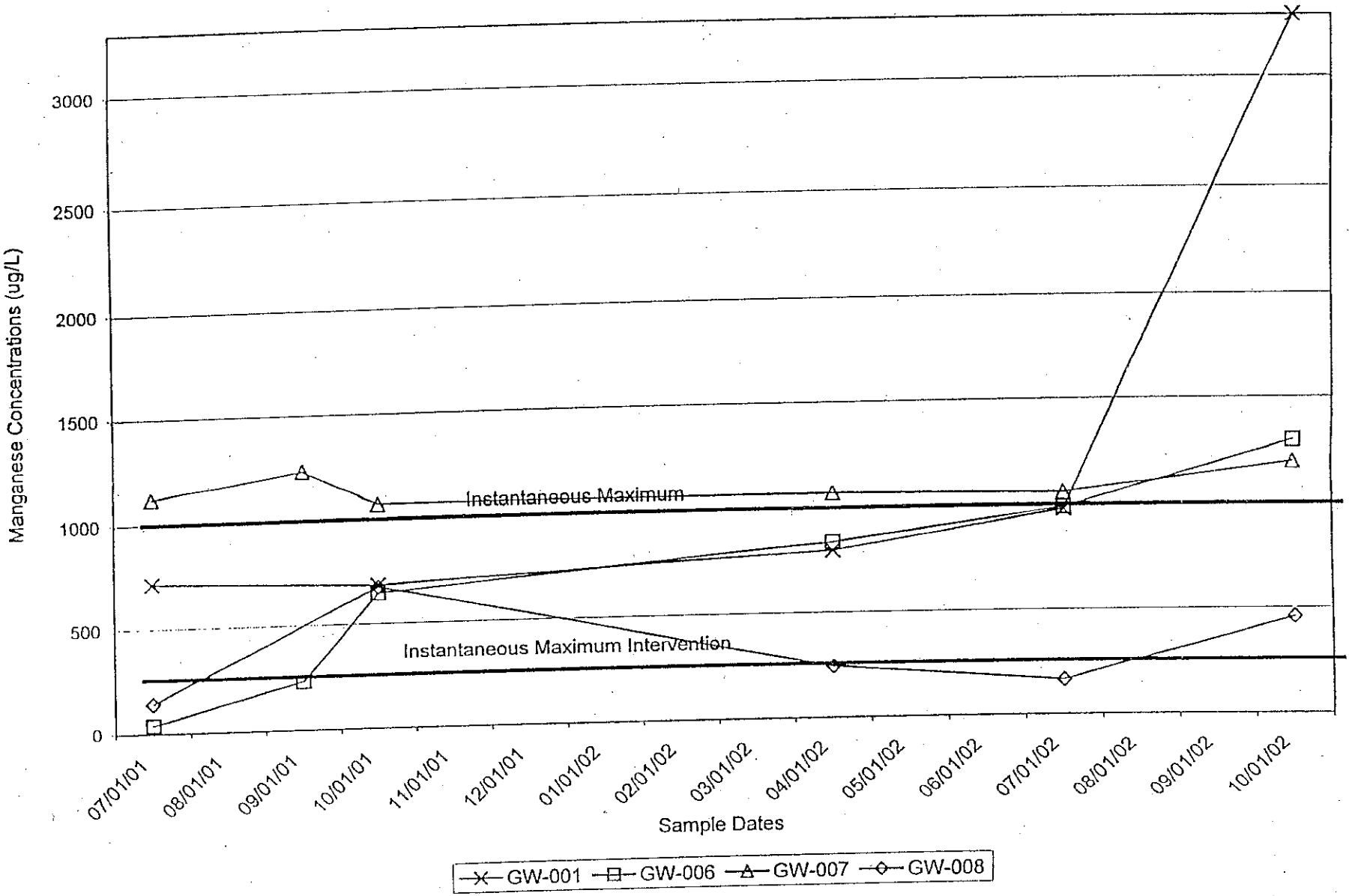


Cliffs Erie, LLC Hoyt Lakes Tailings Basin
NPDES Permit #MN0054089




700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
Instantaneous Maximum
Instantaneous Maximum Intervention
Boron Concentrations (ug/L)
07/01/01
08/01/01
09/01/01
10/01/01
11/01/01
12/01/01
01/01/02
02/01/02
03/01/02
04/01/02
05/01/02
06/01/02
07/01/02
08/01/02
09/01/02
10/01/02
Sample Dates
GW-006
GW-007
GW-001
GW-008

Cliffs Erie, LLC Hoyt Lakes Tailings Basin
NPDES Permit #0054089



GROUNDWATER MONITORING DATA SUMMARY
Cliffs Erie, LLC Hoyt Lakes Tailings Basin
NPDES Permit #MN0054089

Sampling Location	Sample Date	Sampling Parameters			
		Boron (ug/L)	Flouride (mg/L)	Manganese (mg/L)	Molybdenum (ug/L)
GW-001	07/31/01	274	0.20	720	<5
	09/12/01	NS	NS	NS	NS
	10/30/01	231	0.25	690	5.60
	04/03/02	195	<0.1	800	5.10
	07/31/02	225	0.20	980	5.60
	10/22/02	276	0.26	3300	9.20
GW-006	07/18/01	357	9.60	40	45.80
	09/12/01	471	3.30	230	36.40
	10/30/01	446	2.10	650	39.90
	04/03/02	477	3.00	840	55.20
	07/30/02	473	2.20	990	59.40
	10/21/02	509	2.10	1300	57.20
GW-007	07/18/01	380	7.30	1120	72.80
	09/12/01	418	4.00	1240	68.40
	10/30/01	362	1.60	1070	100.00
	04/03/02	380	1.25	1070	62.80
	07/30/02	365	2.50	1060	67.20
	10/21/02	363	2.40	1200	66.00
GW-008	07/18/01	<35	2.30	140	<5
	09/12/01	NS	NS	NS	NS
	10/30/01	<35	0.20	680	<5
	04/03/02	<35	0.20	240	<5
	07/30/02	<35	0.15	160	<5
	10/21/02	36.9	0.12	460	<5
Intervention Limit		150	1	250	7.5
Instantaneous Maximum		600	4	1000	30
Lab Reporting Limit		35	0.1	10	5

= Not Sampled

APPENDIX C

DECEMBER 16, 2002

MINE AREA COMPLIANCE SCHEDULE REPORT

Cliffs Erie LLC
PO Box 900
Hoyt Lakes, Minnesota 55750

December 16, 2002

Mr. Richard Clark
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155

RE: Compliance Schedule Report, Cliffs Erie LLC Mine Area NPDES Permit #MN0042536

Dear Mr. Clark:

Please accept this document as the Compliance Schedule Report required for surface discharge station SD-026 (2nd Creek headwaters culvert outfall 251) per Chapter 6 Section 7 of Cliffs Erie LLC's Mine Area NPDES Permit #MN0042536 (The Permit). The Permit requires a report by January 1, 2003 that addresses:

a. The trends in concentration of specific conductance at outfall SD-026; and,

b. The mitigation alternatives, and their associated costs, to achieve compliance with the effluent limits for specific conductance at outfall SD-026.

SPECIFIC CONDUCTANCE TRENDS

The Permit specifies a "calendar month average" limit of 1000 micro mohs/cm^2 (umh/cm) for specific conductance (field measurement). The trend in specific conductance values has been decreasing based on data obtained from June 1999 through December 2002. From May 1996 through May 1999 specific conductance values were consistently greater than 1000 umh/cm within SD-026 (with the except of only 3 or 4 values). The calendar monthly average limit of 1000 umh/cm was exceeded 6 of 7 times during the later part of 1999, 10 of 12 times during 2000, 6 of 12 times during 2001, and 4 of 12 times during 2002. Specific conductance data from June 1999 through December 2002 are presented in Table 1 (attached). Graphical trend analysis of specific conductance data from June 1999 through December 2002 is presented as Figure 1 (attached).

POTENTIAL MITIGATION ALTERNATIVES

Continued Monitoring

Given that the decreasing trend in specific conductance continues, it is estimated that compliance with the 1000 umh/cm calendar monthly average limit could be sustainable within approximately 2 years. Therefore, a viable mitigation alternative is continued monitoring of SD-026 per the current NPDES permit. There would be no additional costs associated with the continued monitoring option.

Water Treatment

Temporary treatment of water is another mitigation alternative that could be utilized until the calendar monthly average limit is met. Based on historical flow data, a maximum flow of rate of approximately 700 gallons per minute (gpm) has occurred at SD-026. A granulated activated carbon

(GAC) water treatment system that could handle a 700 gpm flow rate can be leased on a monthly basis to treat water. Estimated costs associated with this mitigation alternative were obtained in part from US Filter, Inc. and are as follows:

GAC System Lease Cost (23 months)	$58,000
Set-up & Delivery Fee (+ 1st month lease)	$40,000
Demobilization & Spent Carbon Disposal	$25,000
Operation & Maintenance (2 years + 1 GAC change out)	$58,000
Engineering Design & Specifications	$15,000
Plumbing, Electrical, Enclosure/building, etc.	$60.000
Total Estimated Associated Costs:	**$256,000**

ONGOING CLEANUP AND OTHER REGULATORY INVOLVEMENT

A Minnesota Pollution Control Agency (MPCA) approved Corrective Action Plan (CAP) is currently being implemented for mitigation of the source of petroleum contamination within SD-026. The CAP was approved to address petroleum releases associated with Knox Fueling Station, MPCA Leaking Underground Storage tank (LUST) site ID Number 6499 (Ms. Laurie Kania, MPCA LUST Project Manager). Annual reporting for the LUST site is required and an evaluation of CAP implementation effectiveness will be provided in the Knox Fueling Station CAP annual report (anticipated completion February 2002). In addition, the Knox Fueling Station site is identified as an area of concern included in the MPCA Voluntary Investigation and Cleanup (VIC) Program (Ms. Amy Miller, MPCA VIC Project Manager).

RECOMMENDATION

Given the decreasing trend in specific conductance values, and additional regulatory oversight by MPCA LUST and VIC Program staff, continued monitoring as part of the Permit is the mitigation alternative recommended at this time.

If you have questions regarding this report or the recommendation, please feel free to contact Dennis Schubbe, Northeast Technical Services, Inc., at (218) 742-1035.

Sincerely,

Jim Scott
Manager, Operations

DJV
Attach.
cc: Letter & Attachments
D.L. Schubbe (NTS – Primary Data Retention)
D.Z. Skolansinski (CCI – Duluth – Secondary Data Retention)

Cliffs Erie, LLC
Hoyt Lakes Mine Area
NPDES Permit #MN0042536

Table 1

SD-026 Specific Conductance Measurements

SD-026 (251)	
DATE	Specific Conductance
06/16/1999	1060
07/08/1999	782
07/16/1999	720
08/06/1999	1090
08/20/1999	1040
09/03/1999	1180
09/17/1999	1241
10/05/1999	1108
10/19/1999	1150
11/04/1999	1140
11/24/1999	1270
12/07/1999	1249
12/23/1999	1317
01/04/00	1240
01/18/00	1190
02/01/00	1240
02/16/00	1190
03/07/00	1130
03/23/00	1190
04/03/00	1050
04/19/00	1180
05/02/00	1050
05/18/00	1070
06/07/00	1130
06/22/00	945
07/06/00	1160
07/18/00	1240
08/02/00	1210
08/17/00	1320
09/07/00	943
09/20/00	990
10/05/00	1020
10/16/00	982
11/08/00	950
11/24/00	1002
12/05/00	1070
12/15/00	1012

SD-026 (251)	
DATE	Specific Conductance
01/05/01	1010
01/22/01	995
02/06/01	1012
02/22/01	1156
03/09/01	1150
03/29/01	1100
04/12/01	619
04/27/01	835
05/07/01	979
06/19/01	1102
07/26/01	940
08/23/01	1060
09/20/01	780
10/19/01	700
11/13/01	758
12/11/01	1000
01/07/02	1060
02/28/02	1030
03/11/02	1010
04/05/02	1132
05/07/02	940
06/07/02	910
06/17/02	1010
07/20/02	522
08/28/02	850
09/19/02	487
10/15/02	451
11/08/02	868
12/03/02	940

Cliffs Erie, LLC
Hoyt Lakes Mine Area
NPDES Permit #MN0042536

SD-026 Specific Conductance Measurements