phelps dodge Tyrone, Inc. P. O. Drawer 571, Tyrone, New Mexico 88065 • (505) 538-5331

December 27, 2005

Via UPS Overnight
Tracking #1Z8753E50199594747

Mr. Clint Marshall
New Mexico Environment Department
Mining Environmental Compliance Section
P.O. Box 26110
Santa Fe, New Mexico 87502

Dear Mr. Marshall:

Re: Phelps Dodge Tyrone, Inc., Supplemental Materials Characterization of the Leached Ore Stockpiles and Waste Rock Stockpiles Final Report DP 1341, Condition 80 Tyrone Mine

Attached are three hardcopies of the Phelps Dodge Tyrone, Inc., (Tyrone) Supplemental Materials Characterization of the Leached Ore Stockpiles and Waste Rock Stockpiles Final Report which is submitted as fulfillment of DP-1341, Condition 80 for the Tyrone Mine.

These copies were sent to your attention by EnviroGroup Limited on our behalf. Because of file size, electronic copies cannot be emailed, so CDs of the report are also attached.

Should you have questions or comments regarding this report, please contact Mr. Greg Schoen at (505)574-6359

Very truly yours,

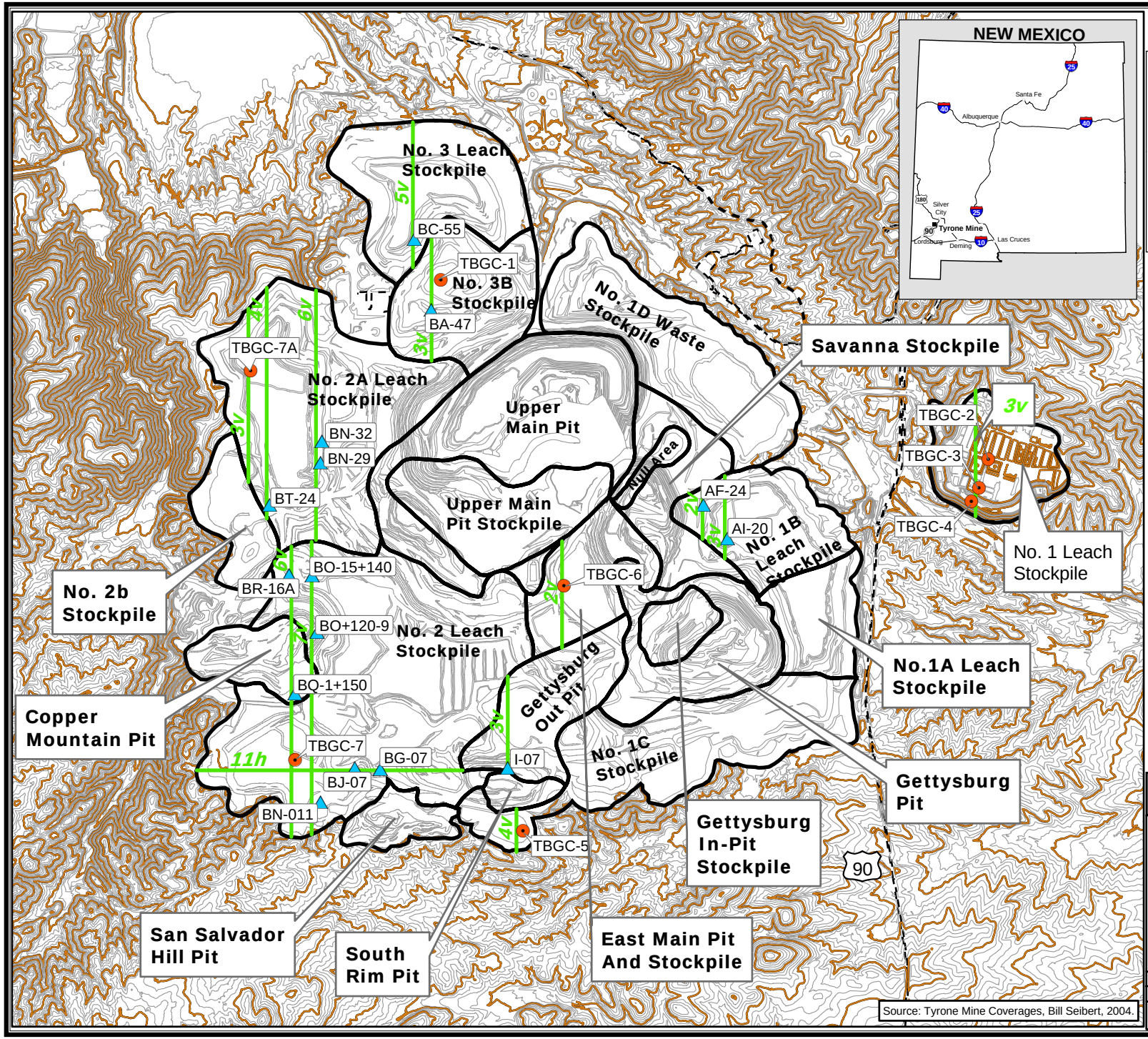
for

E. L. (Ned) Hall, Manager
Environment, Land & Water
New Mexico Operations

ELH:gs
Attachments
20051222-100

c Mary Ann Menetrey, NMED (w/o attachments)
Keith Ehlert, NMED (w/o attachments)
Holland Shepherd, MMD (w/o attachments)
David Ohori, MMD (with attachments)
Dusty Earley, EnviroGroup Ltd

APPENDIX F



phelps dodge Corporation

EnviroGroup Limited

TYRONE MINE

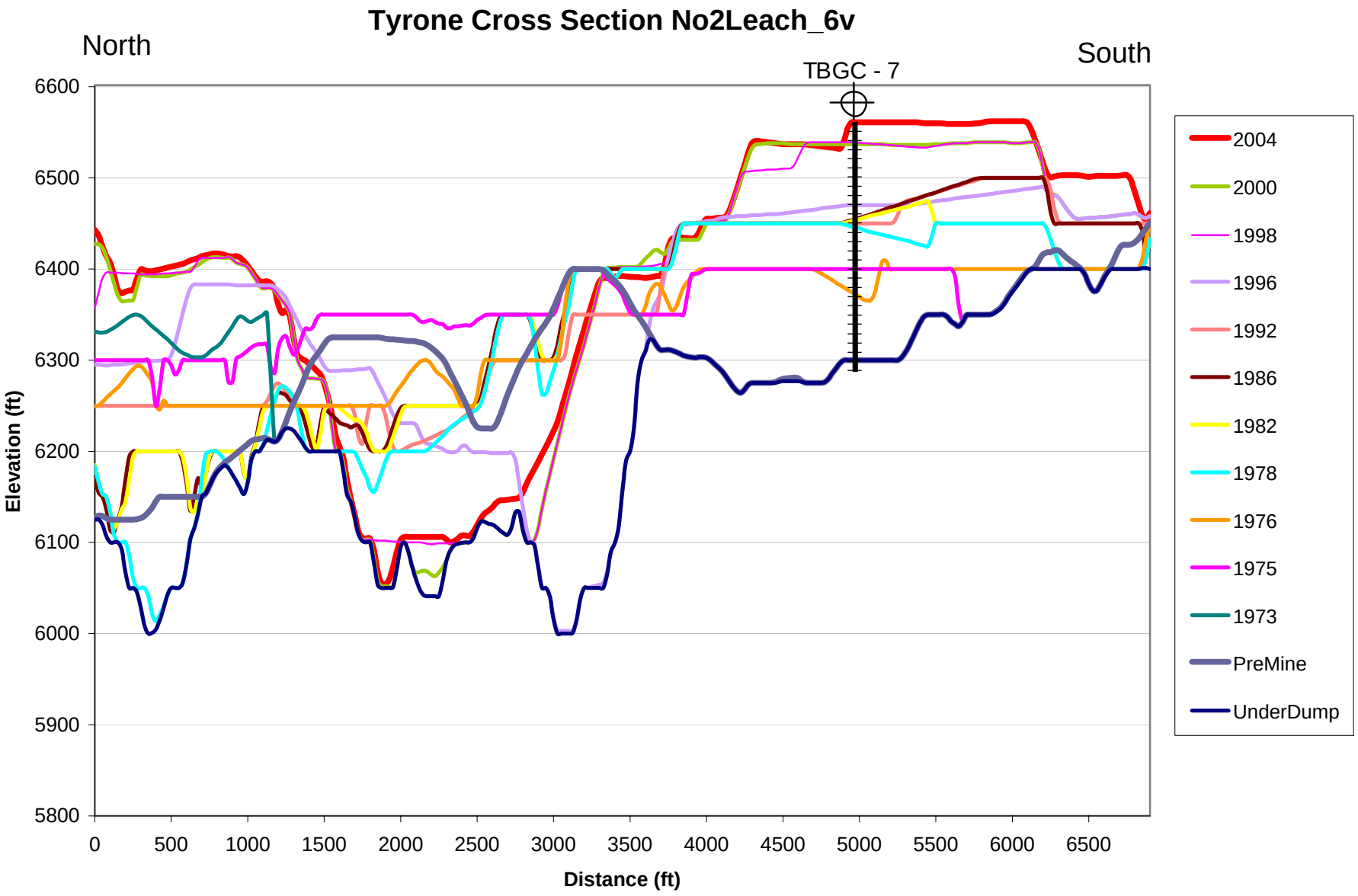
DP-1341, CONDITION 80
SUPPLEMENTAL MATERIALS
CHARACTERIZATION

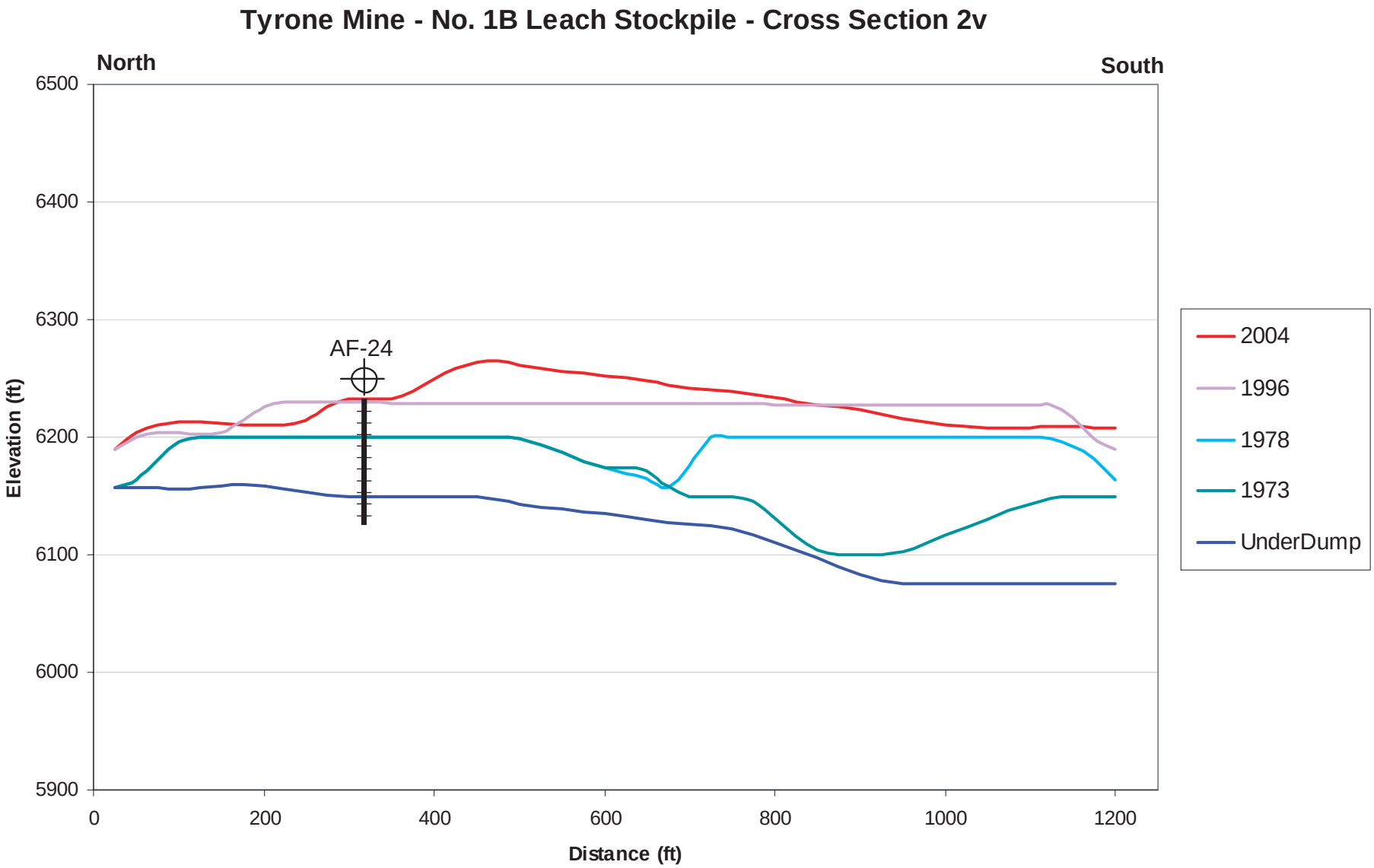
FIGURE F.1
Stockpile Characterization Locations
and
Cross-section Line Locations

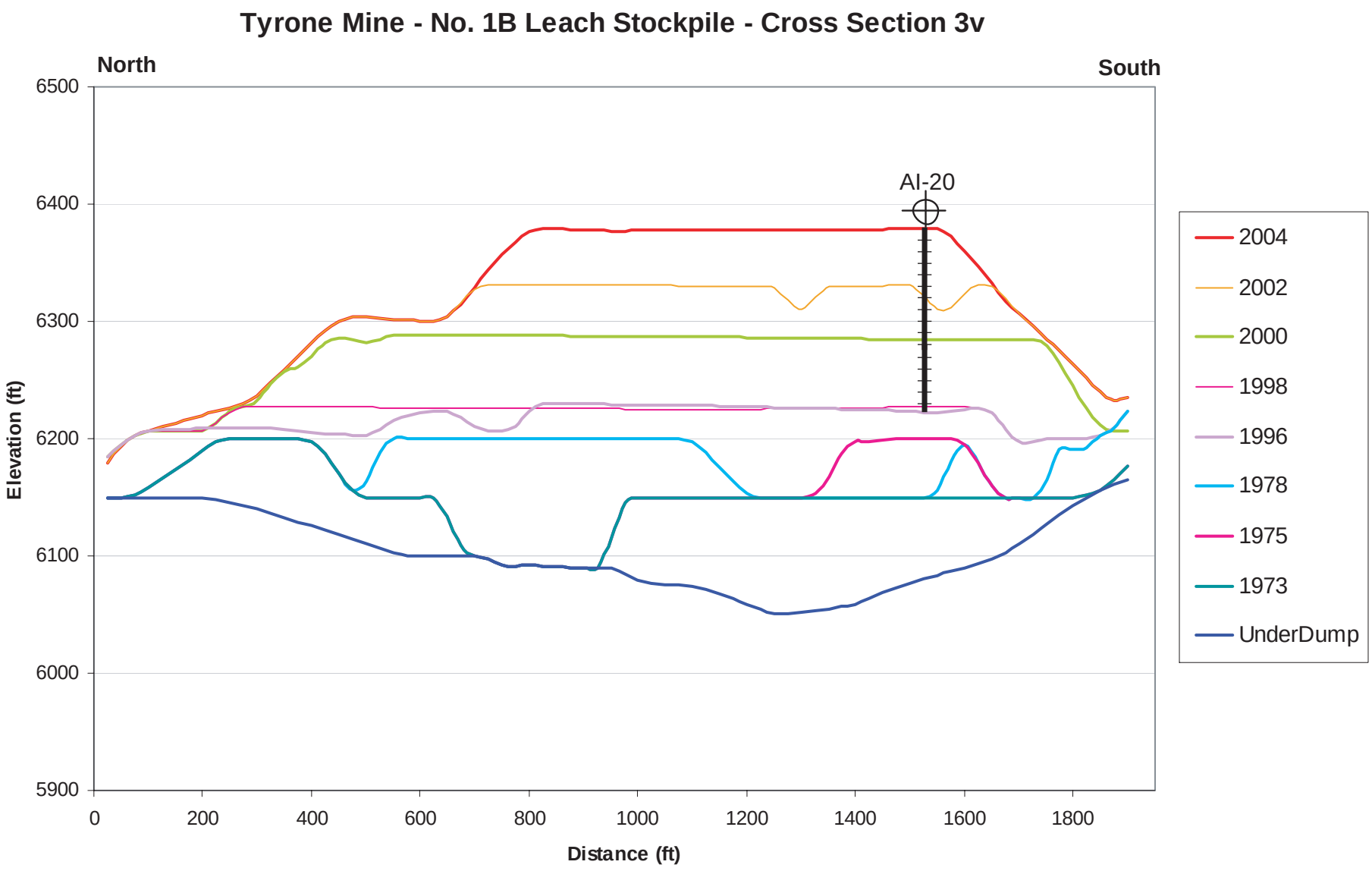
ANALYSIS AREA: Tyrone Mine, Grant County, New Mexico

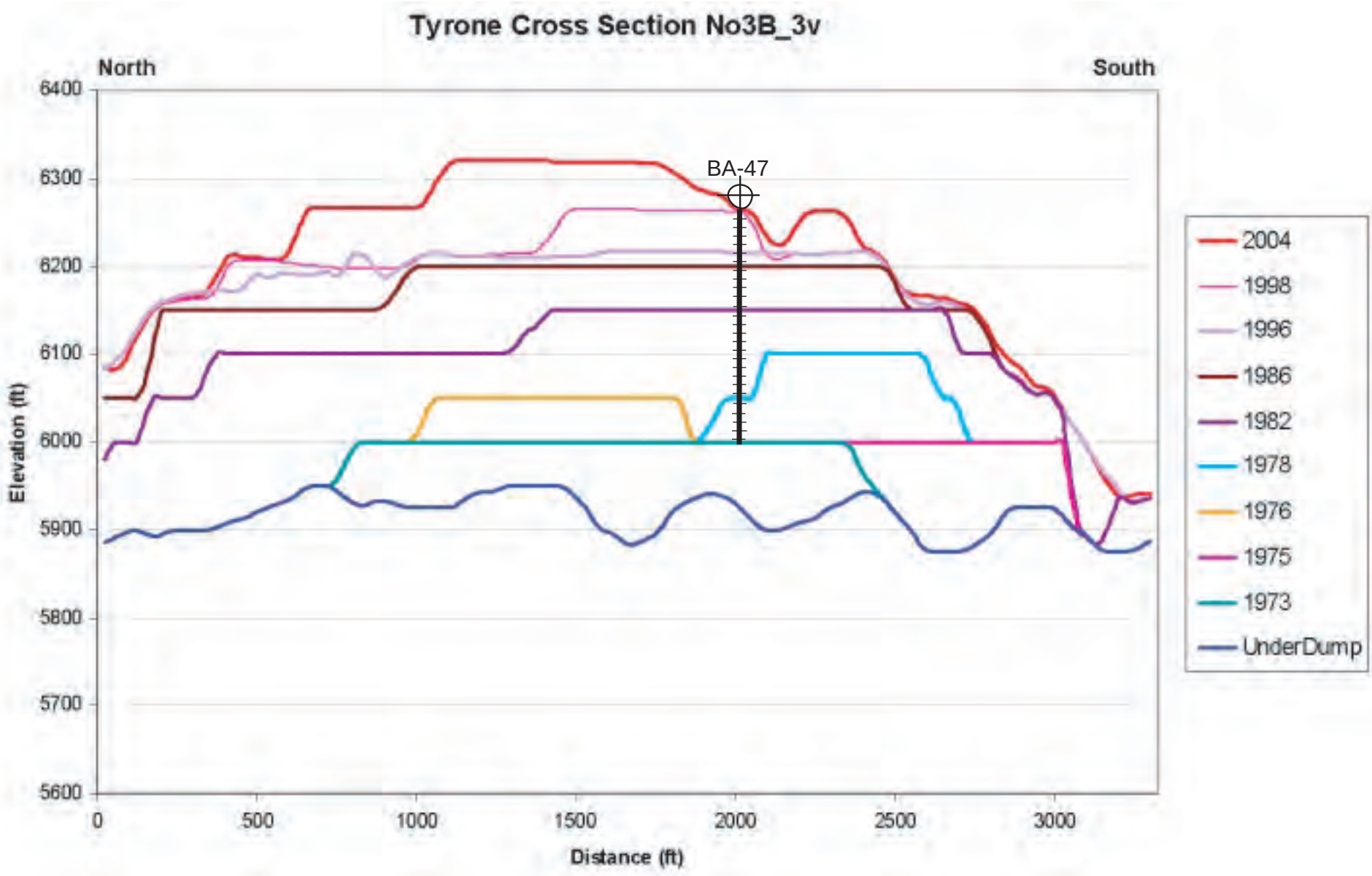
Date: 09/09/05	PD-0447	Drawn By: JCG

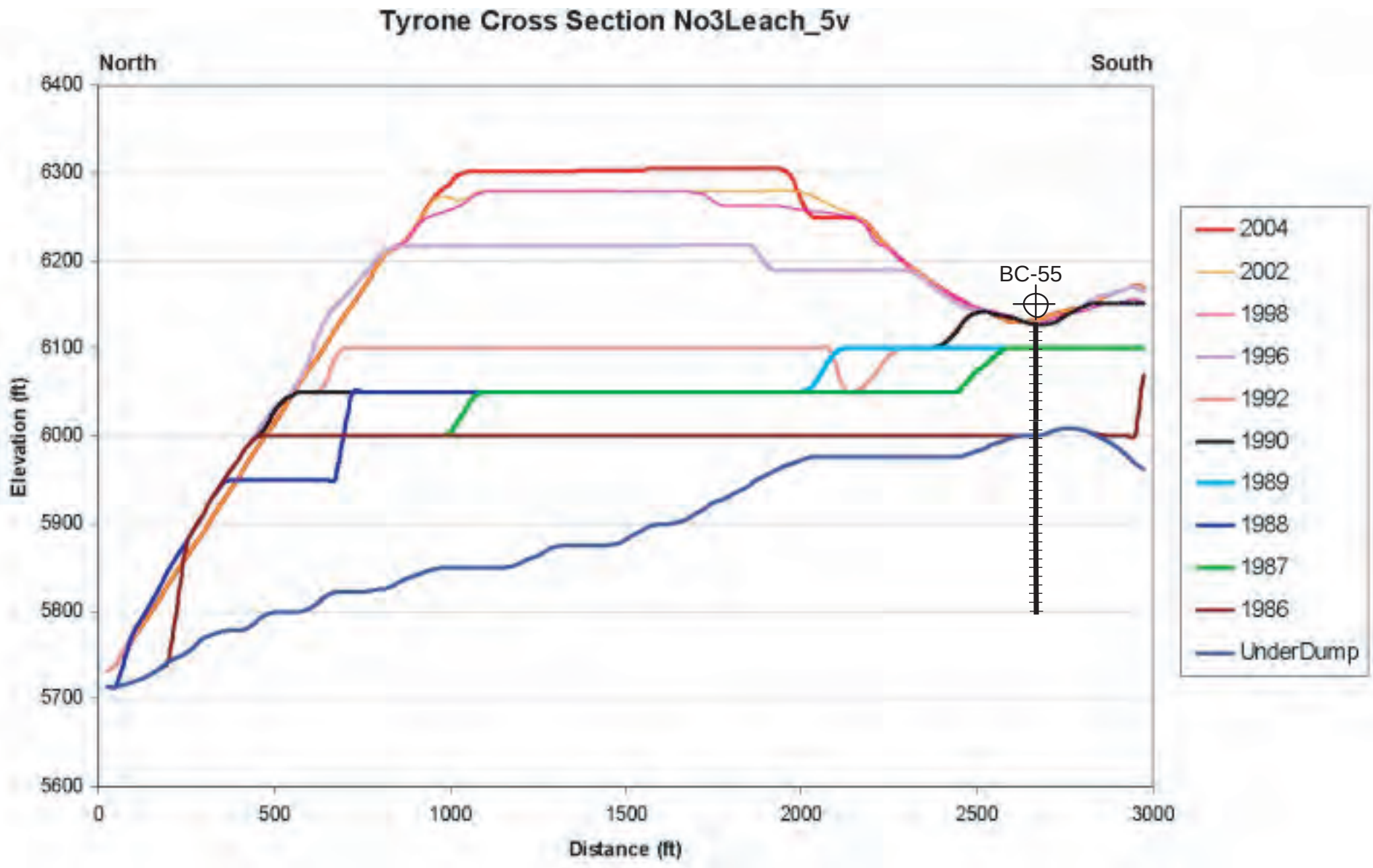
File: Project_Files on 'Eglserver' (R:)/PD-0447(Phelps-Dodge/EGL_Directory/GIS_Ops /Project_Files/Stockpile_Charac_Locations_FIG_1_1_with_xsection_lines.mxd

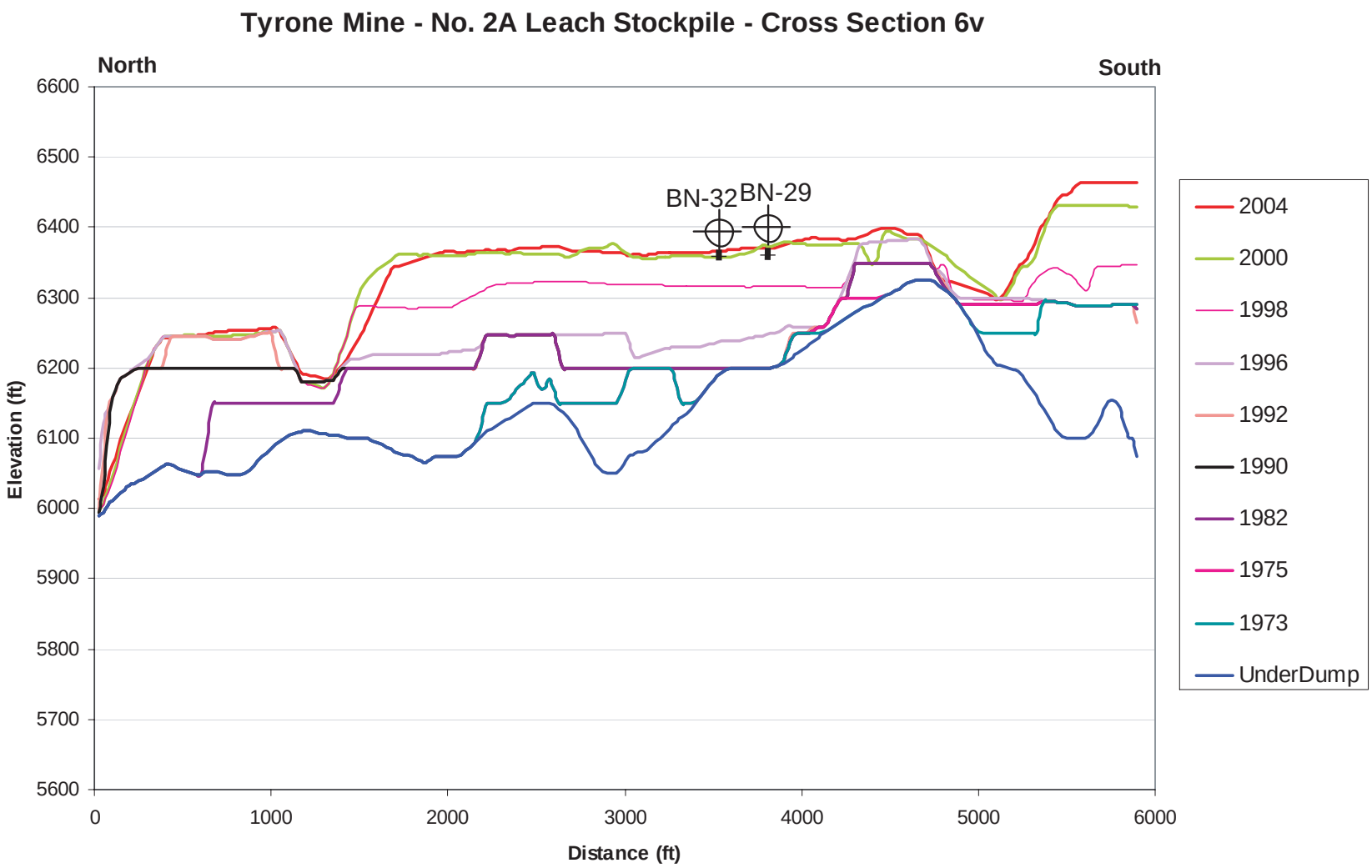

Tyrone Cross Section No2Leach_6v
North
South
TBGC - 7
Elevation (ft)
6600
6500
6400
6300
6200
6100
6000
5900
5800
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
Distance (ft)
2004
2000
1998
1996
1992
1986
1982
1978
1976
1975
1973
PreMine
UnderDump

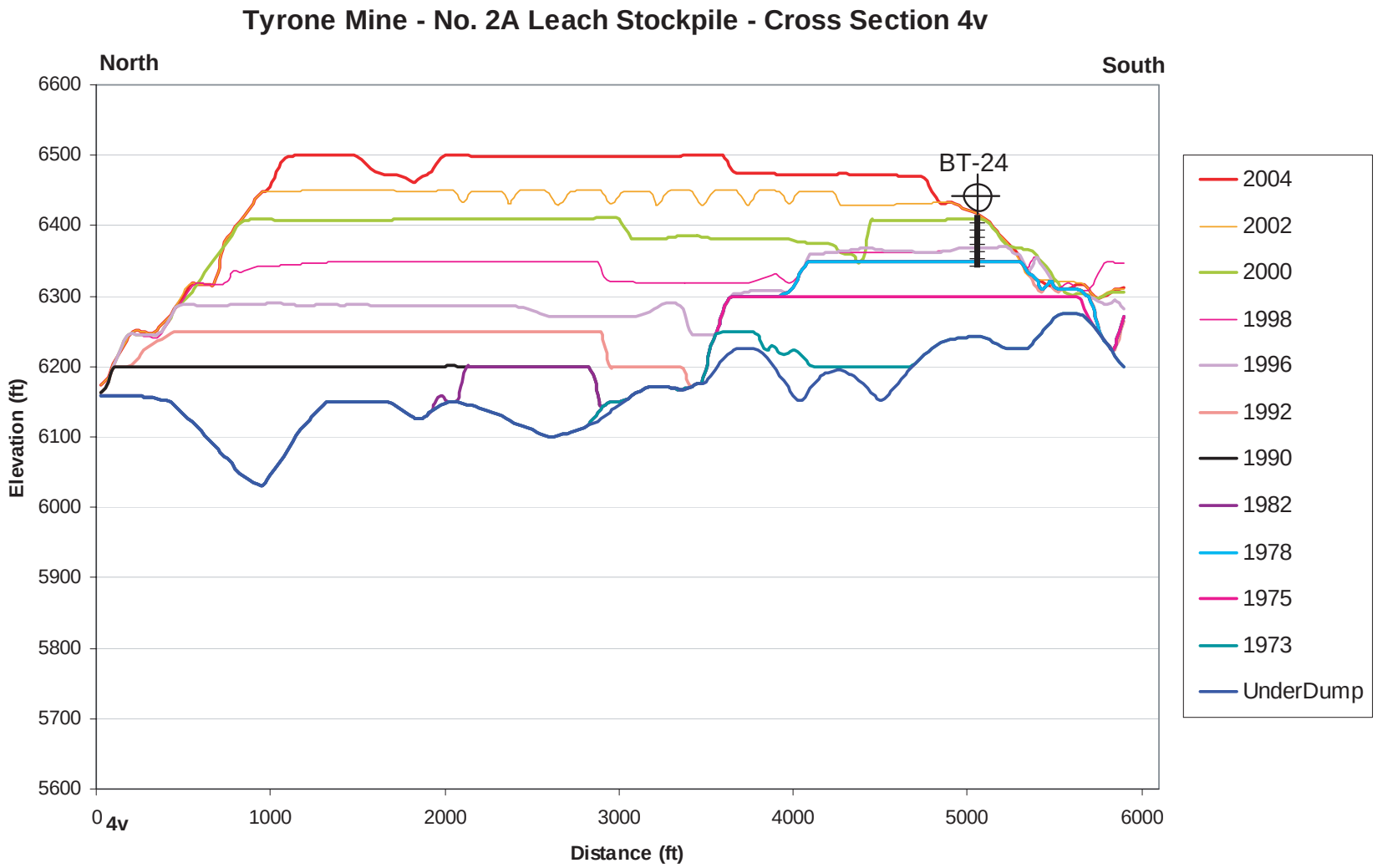

Tyrone Mine - No. 1B Leach Stockpile - Cross Section 2v
North
South
6500
6400
6300
6200
6100
6000
5900
Elevation (ft)
AF-24
0
200
400
600
800
1000
1200
Distance (ft)
2004
1996
1978
1973
UnderDump

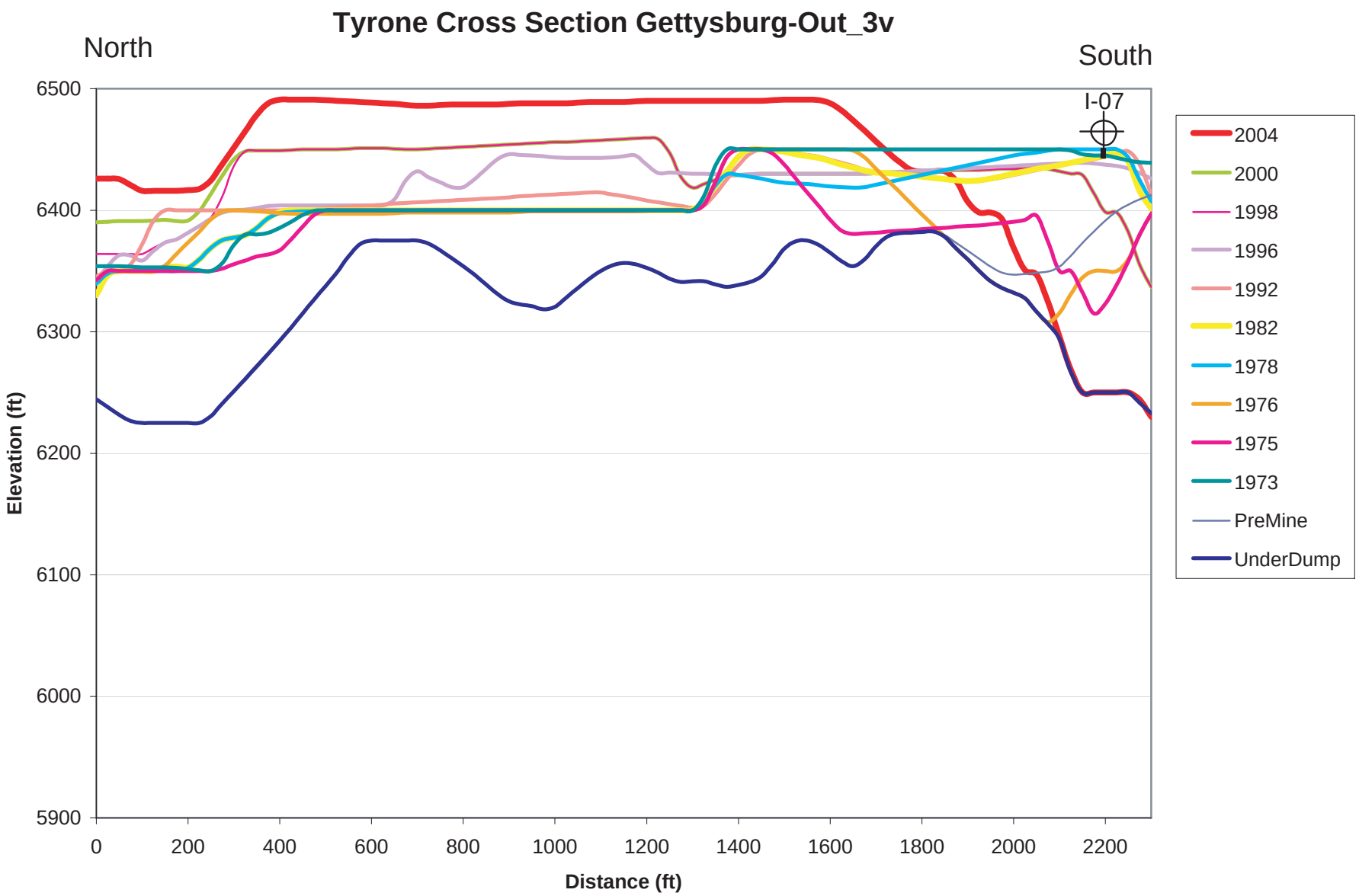

Tyrone Mine - No. 1B Leach Stockpile - Cross Section 3v
North
South
AI-20
Elevation (ft)
6500
6400
6300
6200
6100
6000
5900
0
200
400
600
800
1000
1200
1400
1600
1800
Distance (ft)
2004
2002
2000
1998
1996
1978
1975
1973
UnderDump

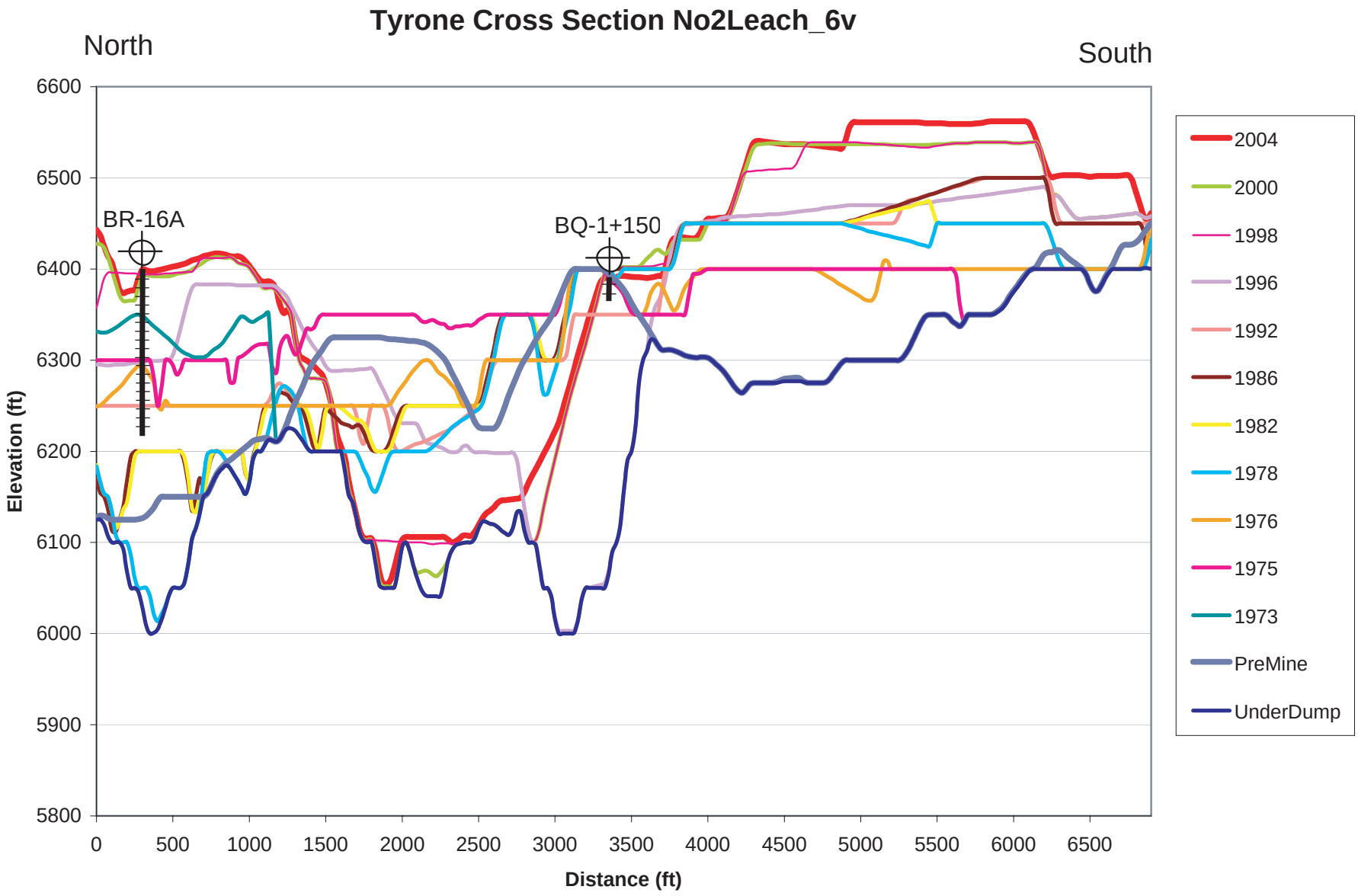

Tyrone Cross Section No3B_3v
North
South
BA-47
Elevation (ft)
6400
6300
6200
6100
6000
5900
5800
5700
5600
0
500
1000
1500
2000
2500
3000
Distance (ft)
2004
1998
1996
1986
1982
1978
1976
1975
1973
UnderDump

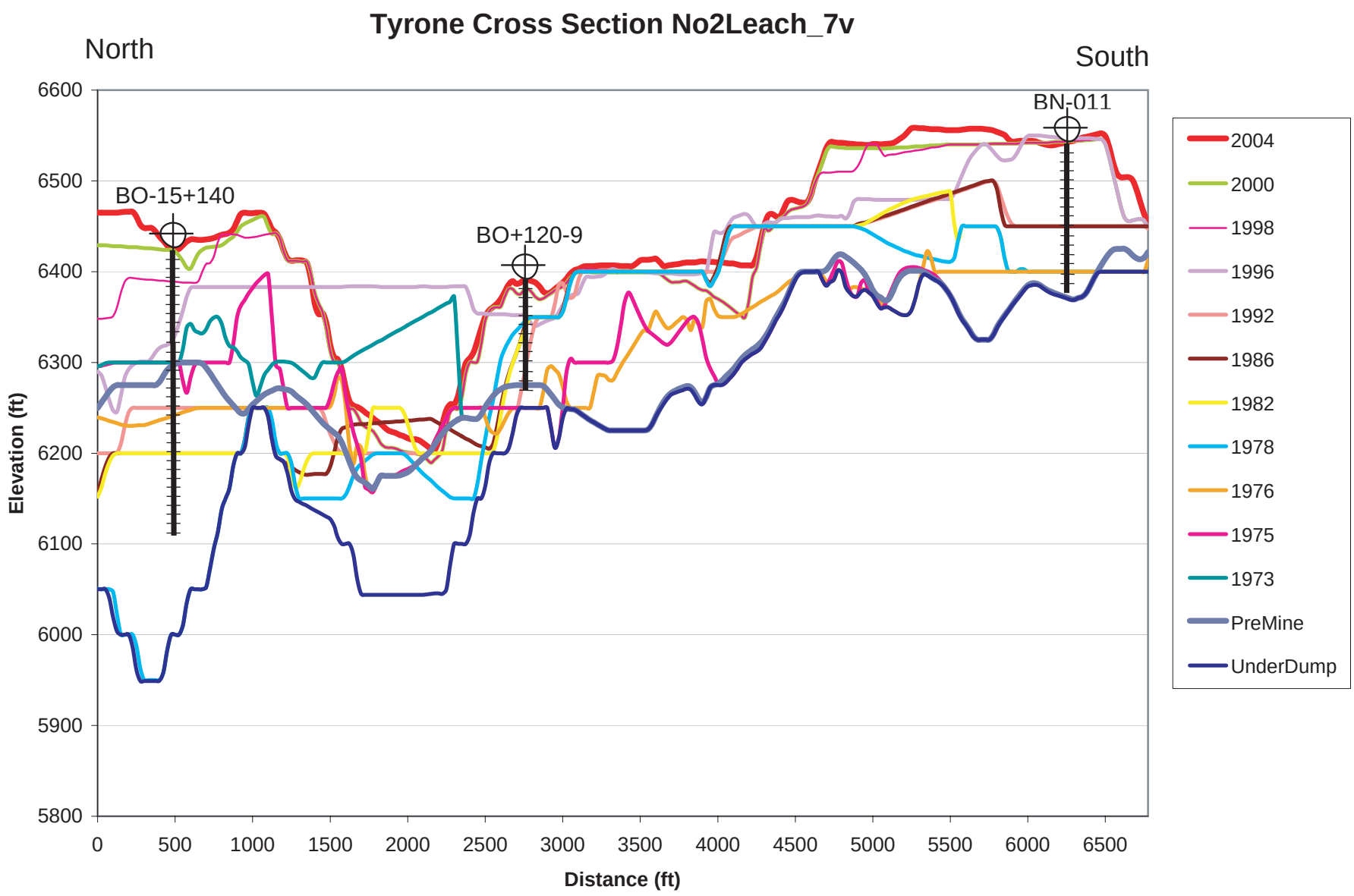

Tyrone Cross Section No3Leach_5v
North
South
BC-55
Elevation (ft)
6400
6300
6200
6100
6000
5900
5800
5700
5600
0
500
1000
1500
2000
2500
3000
Distance (ft)
2004
2002
1998
1996
1992
1990
1989
1988
1987
1986
UnderDump

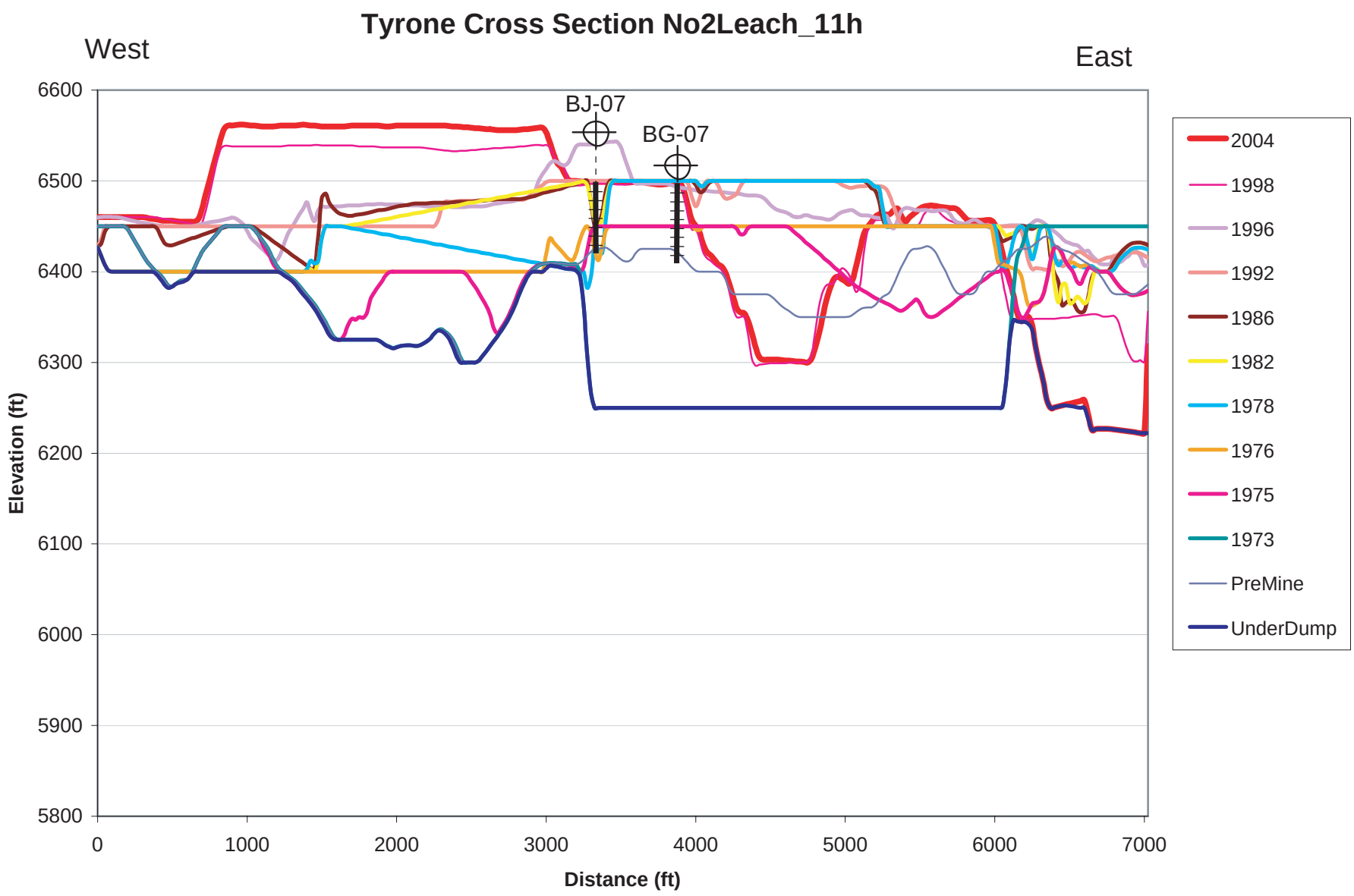

Tyrone Mine - No. 2A Leach Stockpile - Cross Section 6v
North
South
BN-32
BN-29
Elevation (ft)
6600
6500
6400
6300
6200
6100
6000
5900
5800
5700
5600
0
1000
2000
3000
4000
5000
6000
Distance (ft)
2004
2000
1998
1996
1992
1990
1982
1975
1973
UnderDump

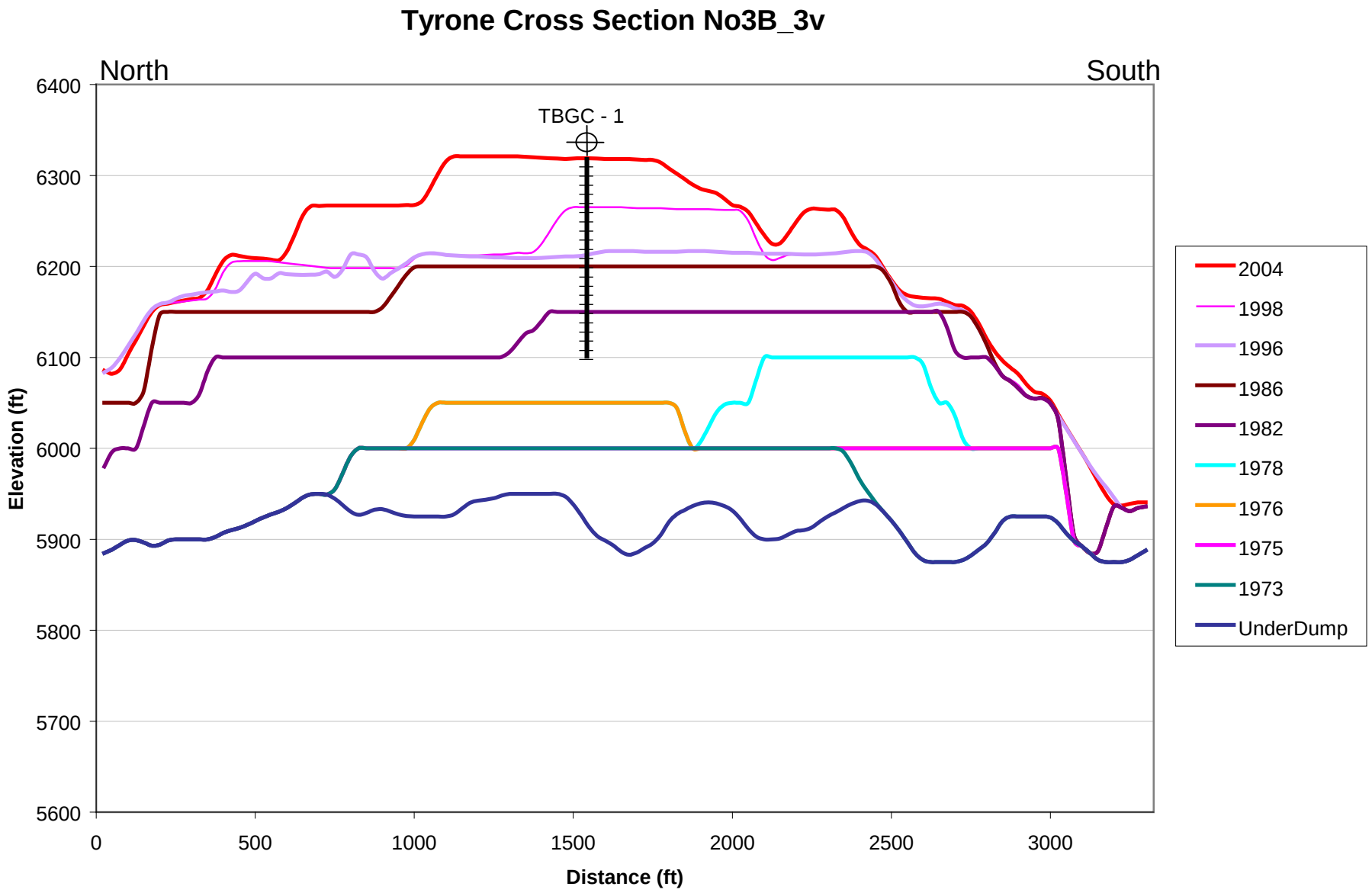

Tyrone Mine - No. 2A Leach Stockpile - Cross Section 4v
North
South
BT-24
Elevation (ft)
6600
6500
6400
6300
6200
6100
6000
5900
5800
5700
5600
0
4v
1000
2000
3000
4000
5000
6000
Distance (ft)
2004
2002
2000
1998
1996
1992
1990
1982
1978
1975
1973
UnderDump

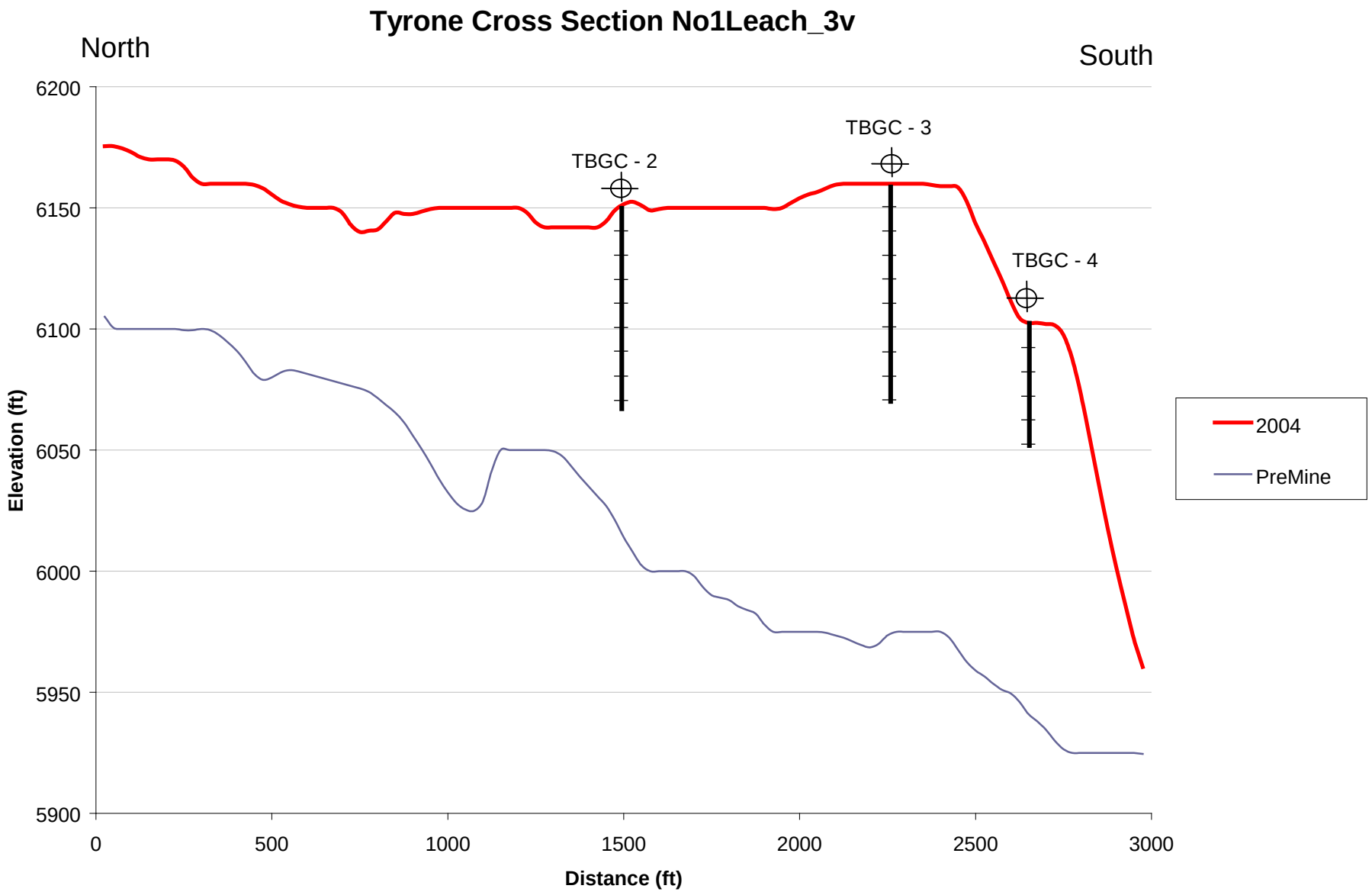

Tyrone Cross Section Gettysburg-Out_3v
North
South
I-07
Elevation (ft)
6500
6400
6300
6200
6100
6000
5900
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
Distance (ft)
2004
2000
1998
1996
1992
1982
1978
1976
1975
1973
PreMine
UnderDump

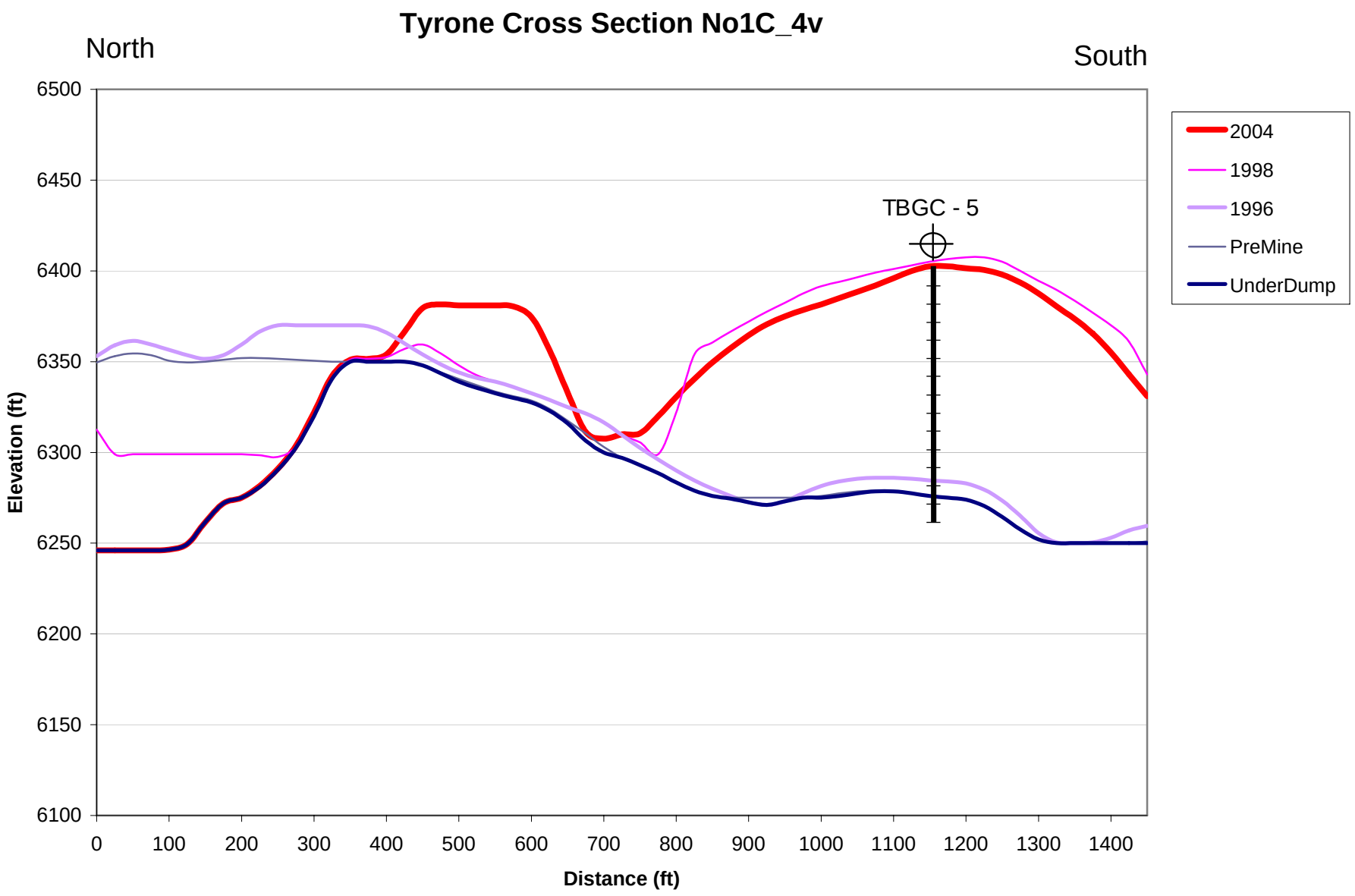

Tyrone Cross Section No2Leach_6v
North
South
BR-16A
BQ-1+150
Elevation (ft)
6600
6500
6400
6300
6200
6100
6000
5900
5800
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
Distance (ft)
2004
2000
1998
1996
1992
1986
1982
1978
1976
1975
1973
PreMine
UnderDump

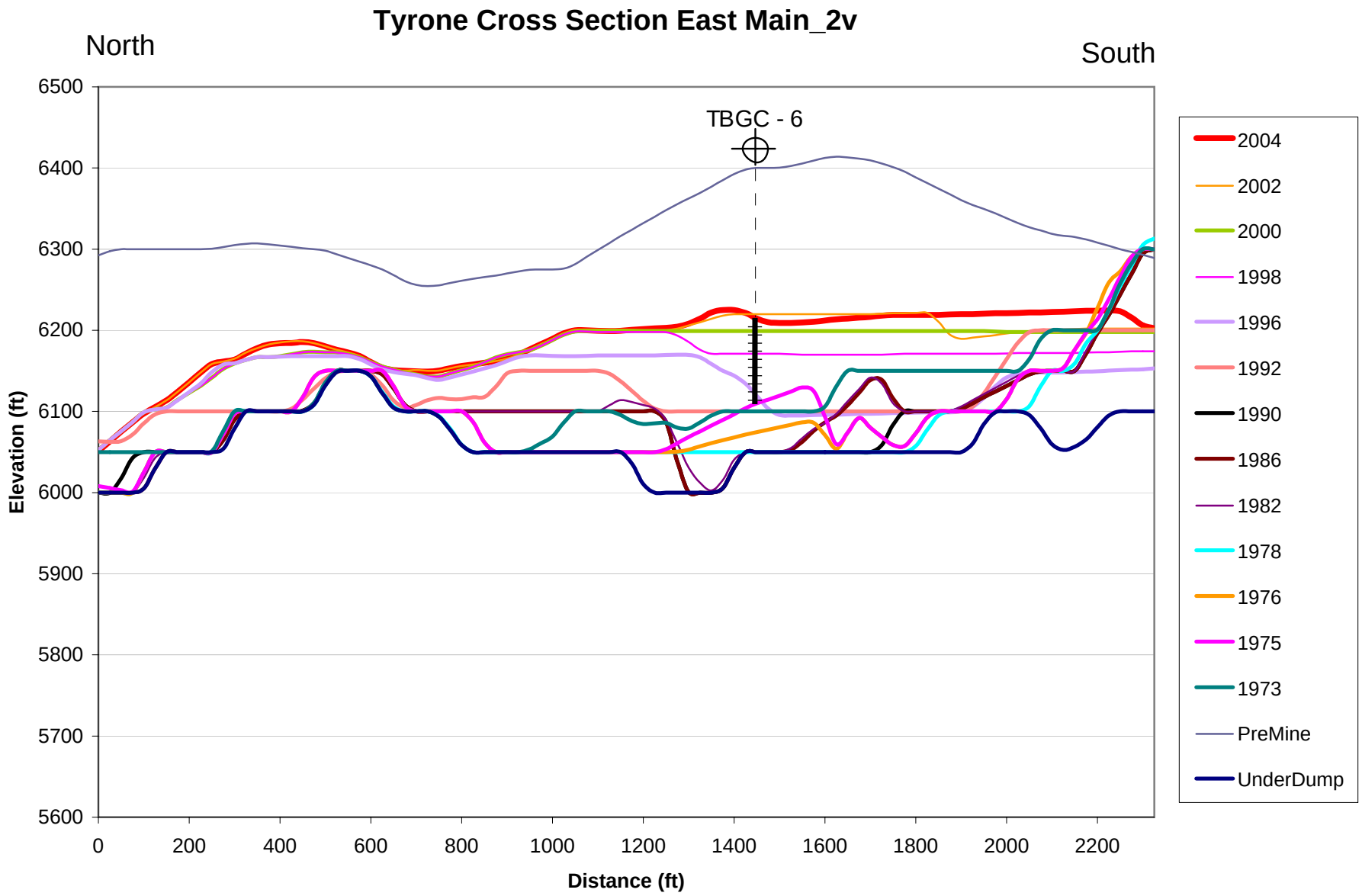

Tyrone Cross Section No2Leach_7v
North
South
BO-15+140
BO+120-9
BN-011
Elevation (ft)
6600
6500
6400
6300
6200
6100
6000
5900
5800
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
Distance (ft)
2004
2000
1998
1996
1992
1986
1982
1978
1976
1975
1973
PreMine
UnderDump

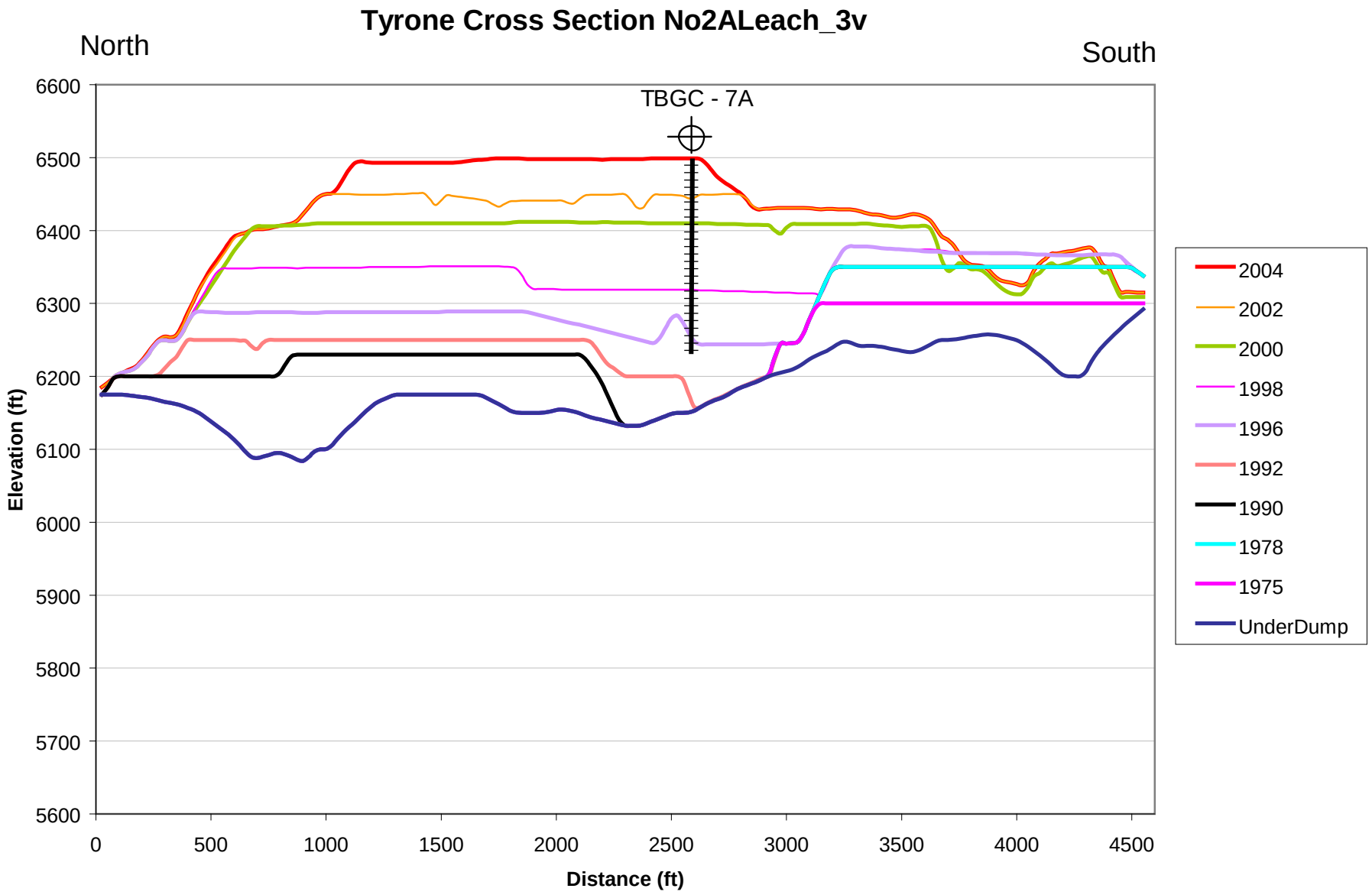

Tyrone Cross Section No2Leach_11h
West
East
BJ-07
BG-07
Elevation (ft)
6600
6500
6400
6300
6200
6100
6000
5900
5800
0
1000
2000
3000
4000
5000
6000
7000
Distance (ft)
2004
1998
1996
1992
1986
1982
1978
1976
1975
1973
PreMine
UnderDump


Tyrone Cross Section No3B_3v
North
South
TBGC - 1
Elevation (ft)
6400
6300
6200
6100
6000
5900
5800
5700
5600
0
500
1000
1500
2000
2500
3000
Distance (ft)
2004
1998
1996
1986
1982
1978
1976
1975
1973
UnderDump


Tyrone Cross Section No1Leach_3v
North
South
TBGC - 2
TBGC - 3
TBGC - 4
Elevation (ft)
6200
6150
6100
6050
6000
5950
5900
0
500
1000
1500
2000
2500
3000
Distance (ft)
2004
PreMine


Tyrone Cross Section No1C_4v
North
South
TBGC - 5
2004
1998
1996
PreMine
UnderDump
Elevation (ft)
6500
6450
6400
6350
6300
6250
6200
6150
6100
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
Distance (ft)


Tyrone Cross Section East Main_2v
North
South
TBGC - 6
Elevation (ft)
6500
6400
6300
6200
6100
6000
5900
5800
5700
5600
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
Distance (ft)
2004
2002
2000
1998
1996
1992
1990
1986
1982
1978
1976
1975
1973
PreMine
UnderDump

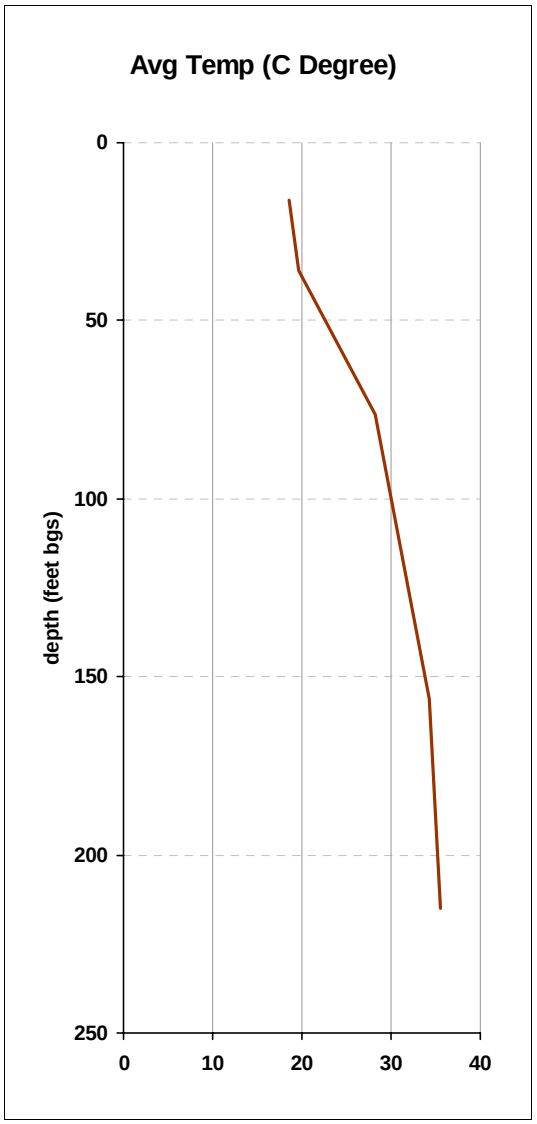

Tyrone Cross Section No2ALeach_3v
North
South
TBGC - 7A
Elevation (ft)
6600
6500
6400
6300
6200
6100
6000
5900
5800
5700
5600
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Distance (ft)
2004
2002
2000
1998
1996
1992
1990
1978
1975
UnderDump

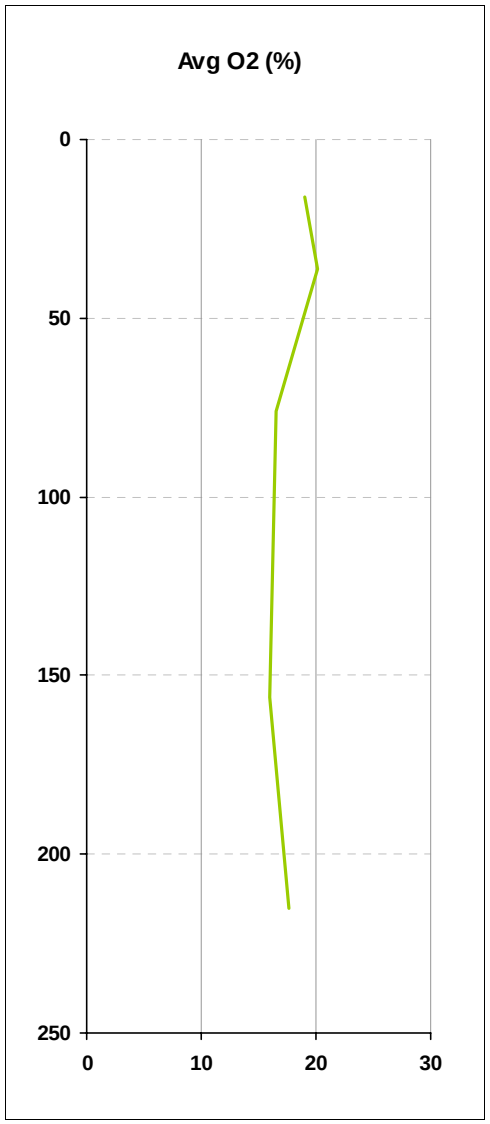
APPENDIX E

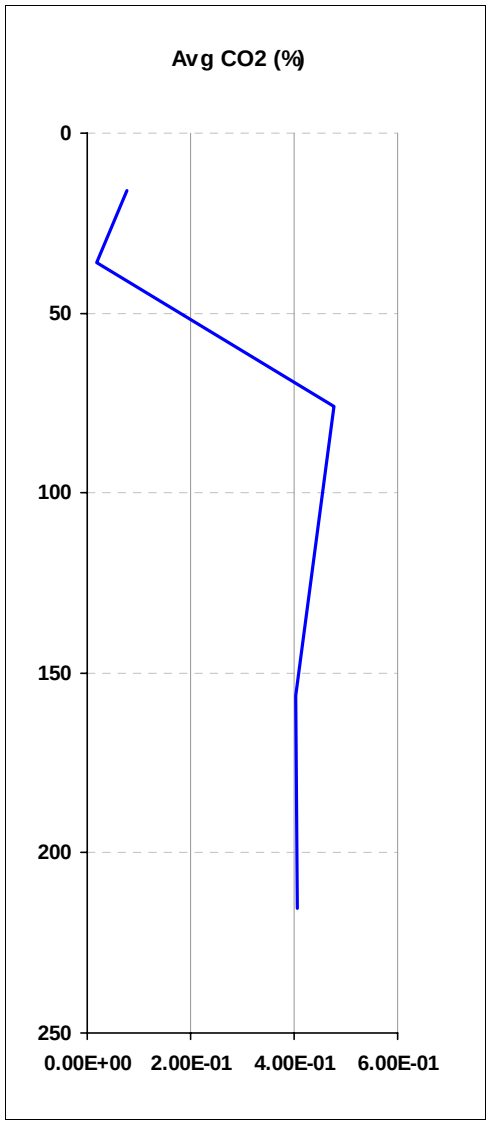
Tyrone Mine Gas Port Results (Depth v. Temperature, O2, CO2) by Sample Location

sample location:

TBGC-1







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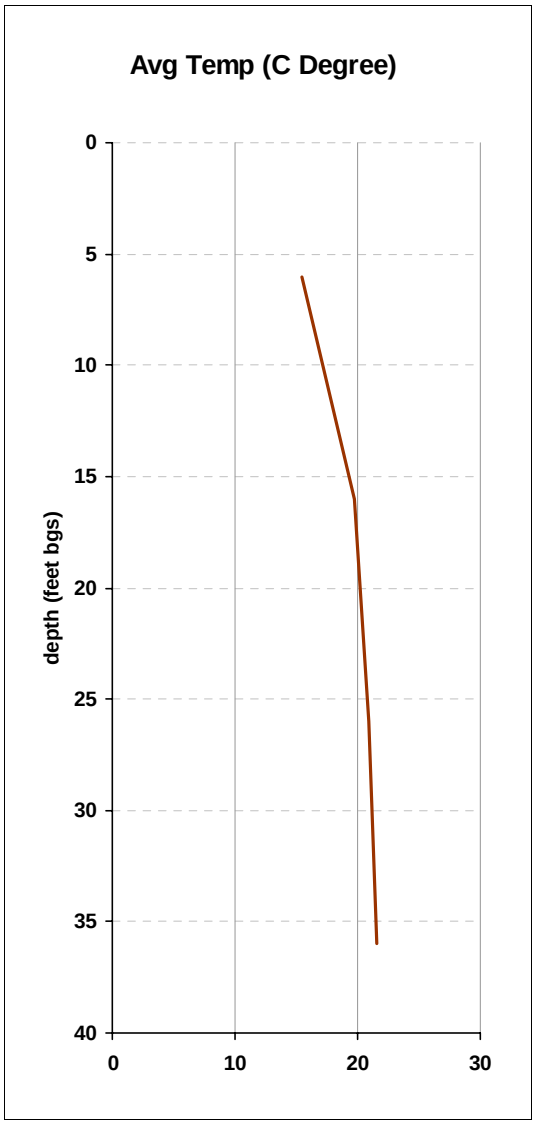
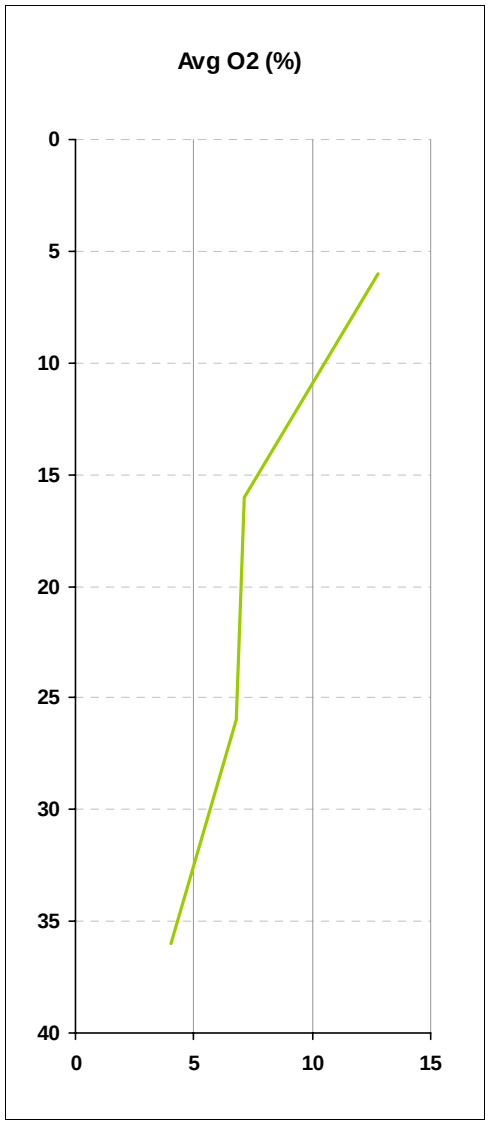
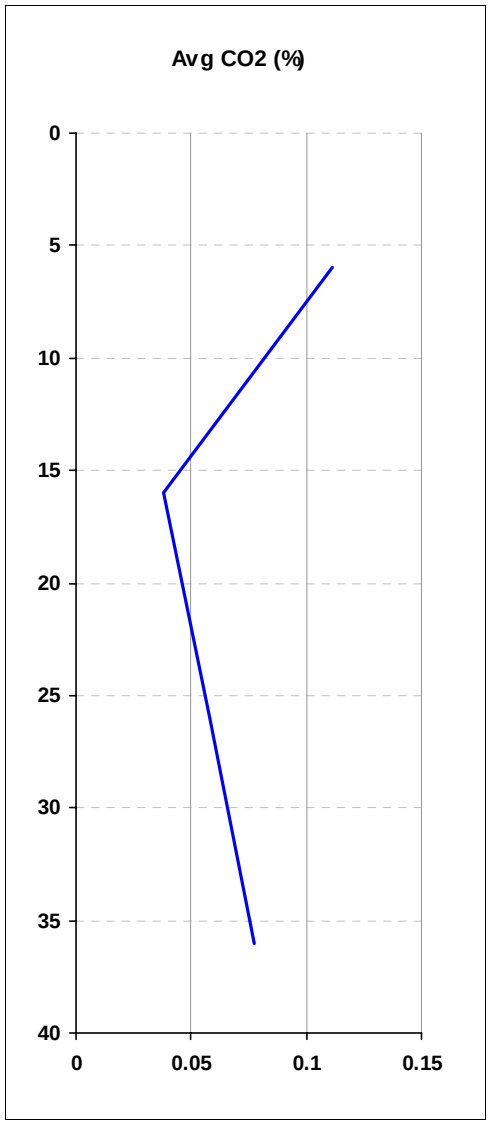
Tyrone Mine Gas Port Results (Depth v. Temperature, O2, CO2) by Sample Location

sample location:

TBGC-2







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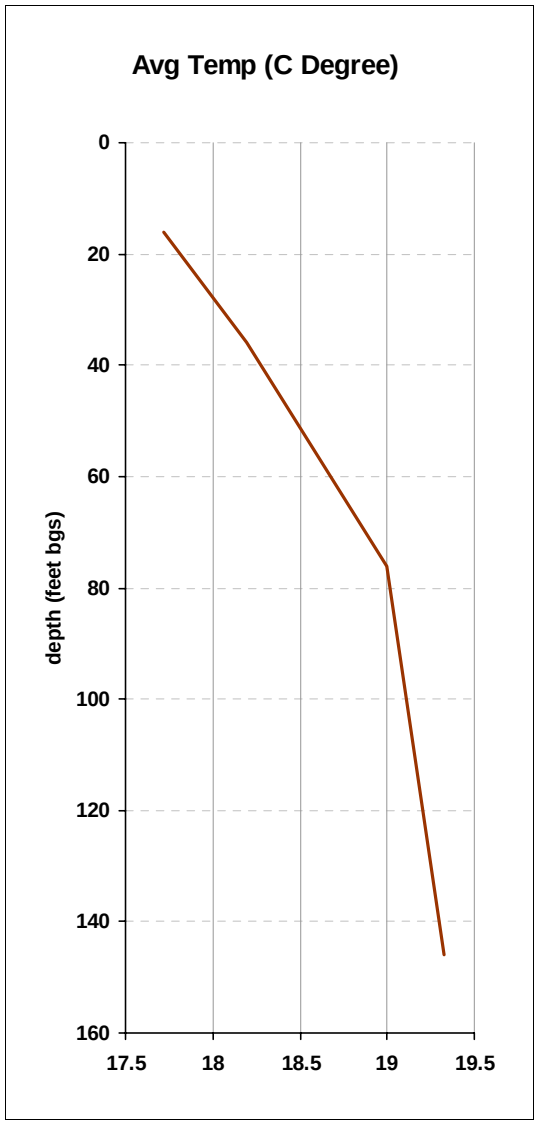
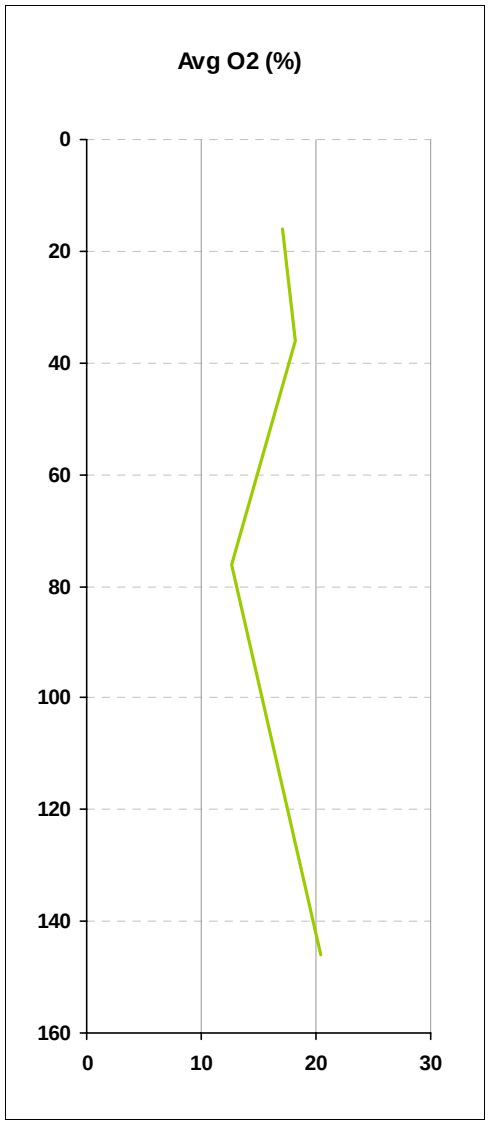
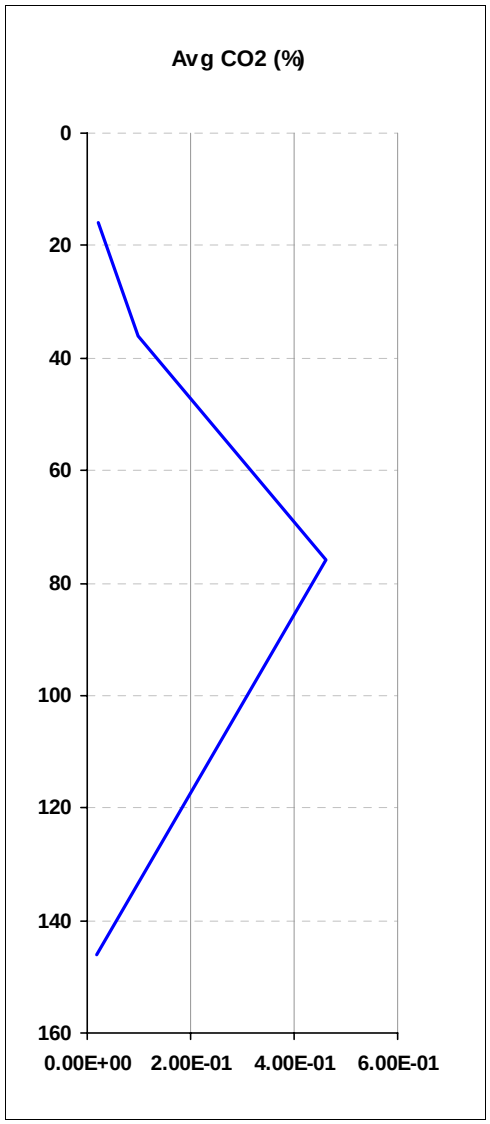
Tyrone Mine Gas Port Results (Depth v. Temperature, O2, CO2) by Sample Location

sample location:

TBGC-3







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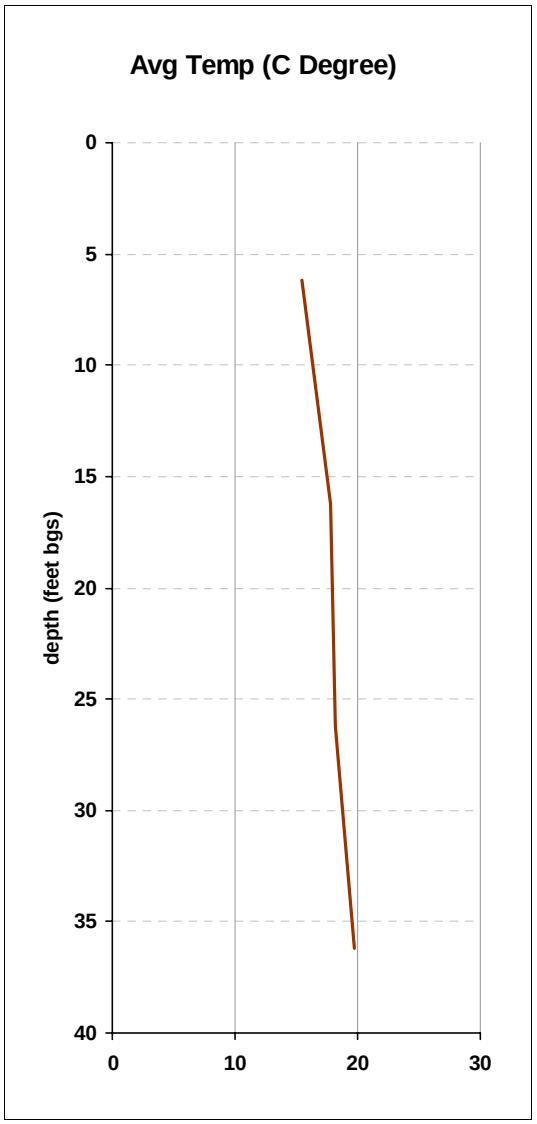
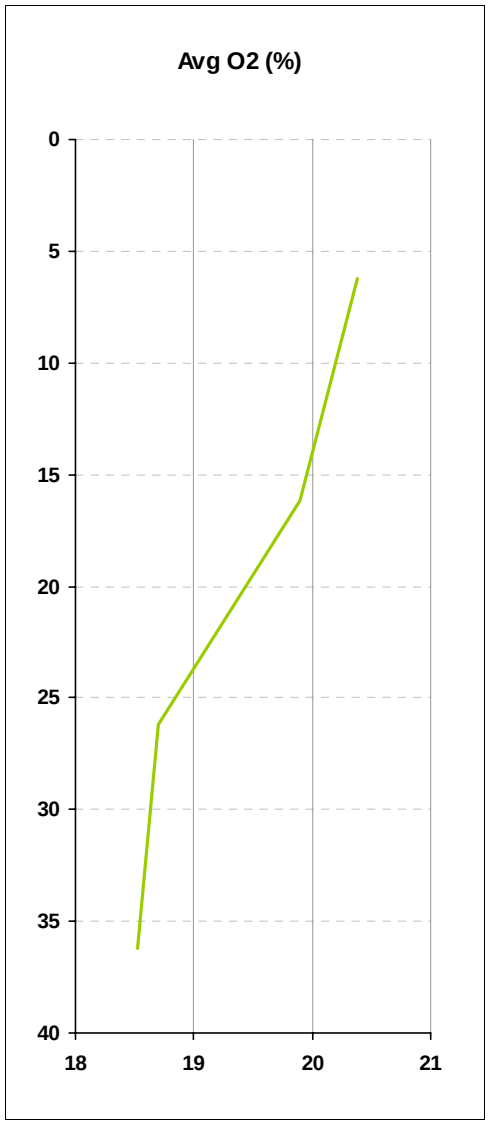
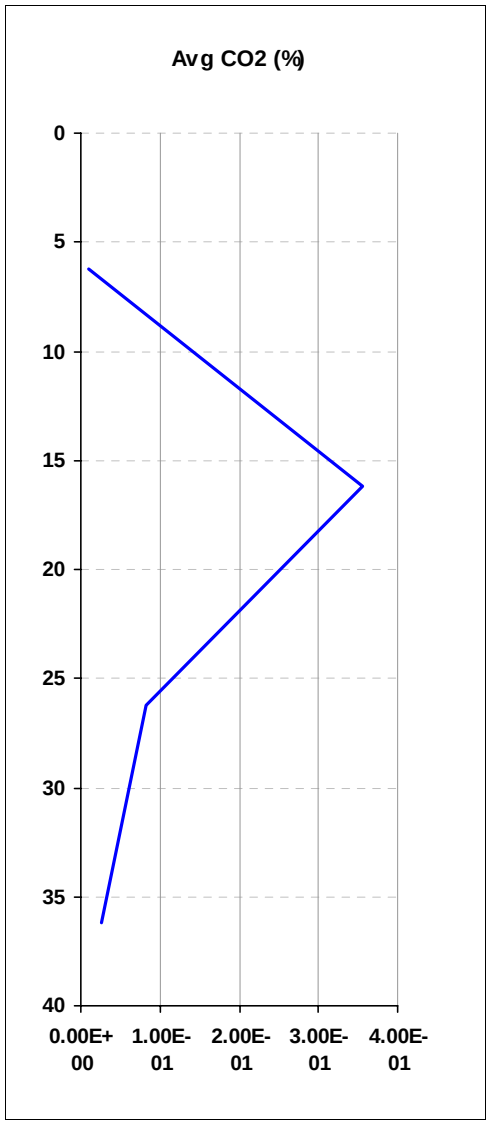
Tyrone Mine Gas Port Results (Depth v. Temperature, O2, CO2) by Sample Location

sample location:

TBGC-4







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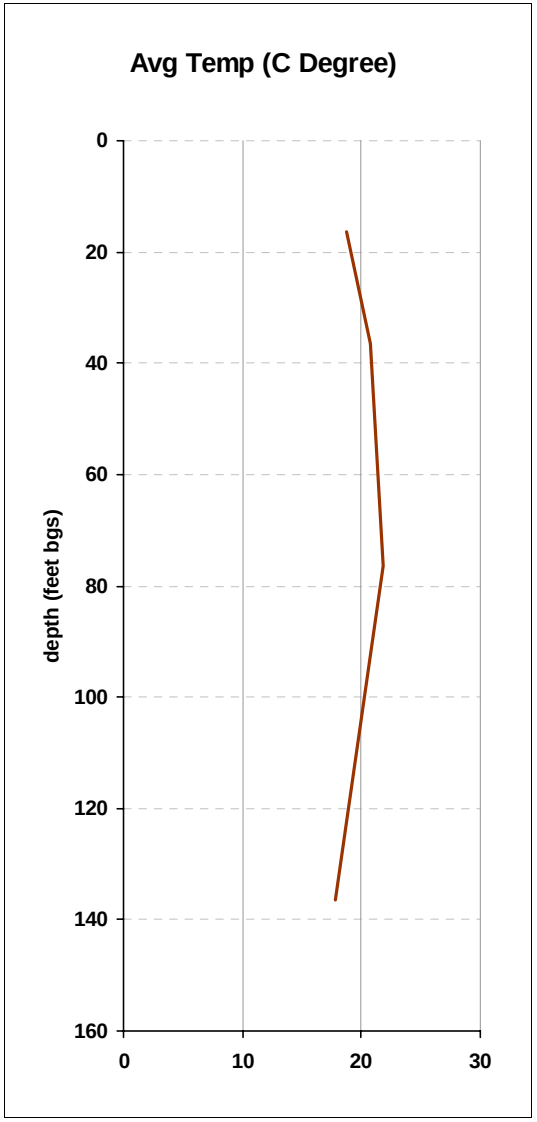
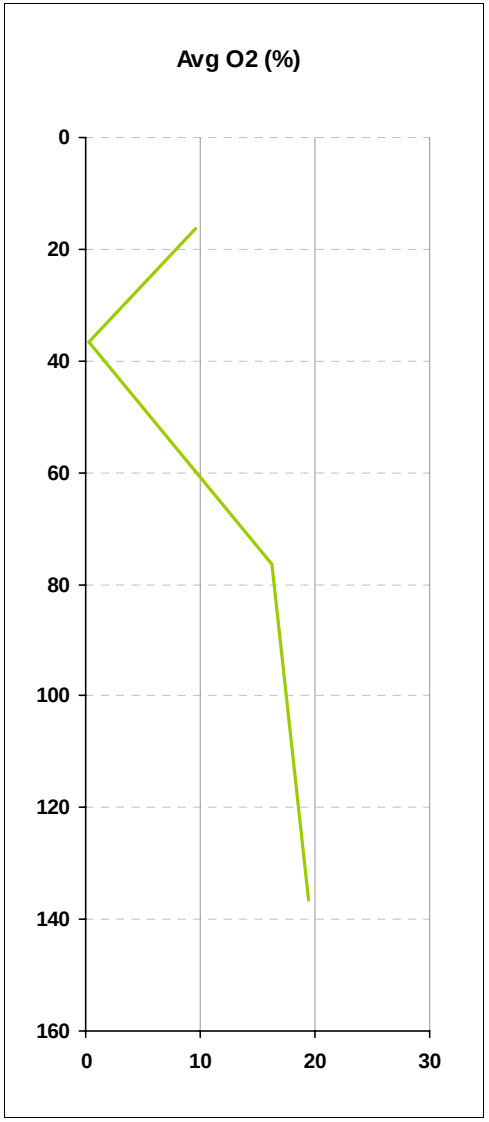
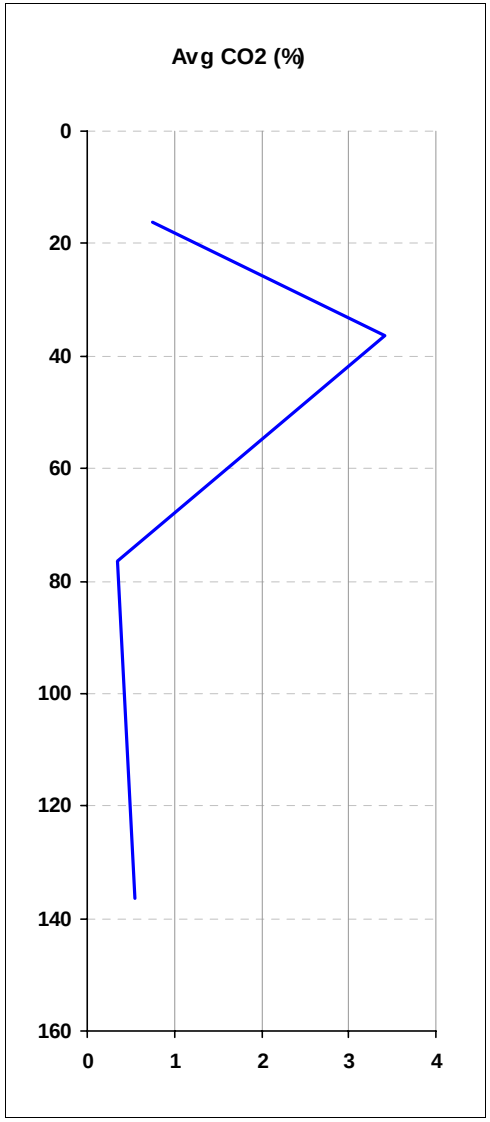
Tyrone Mine Gas Port Results (Depth v. Temperature, O2, CO2) by Sample Location

sample location:

TBGC-5







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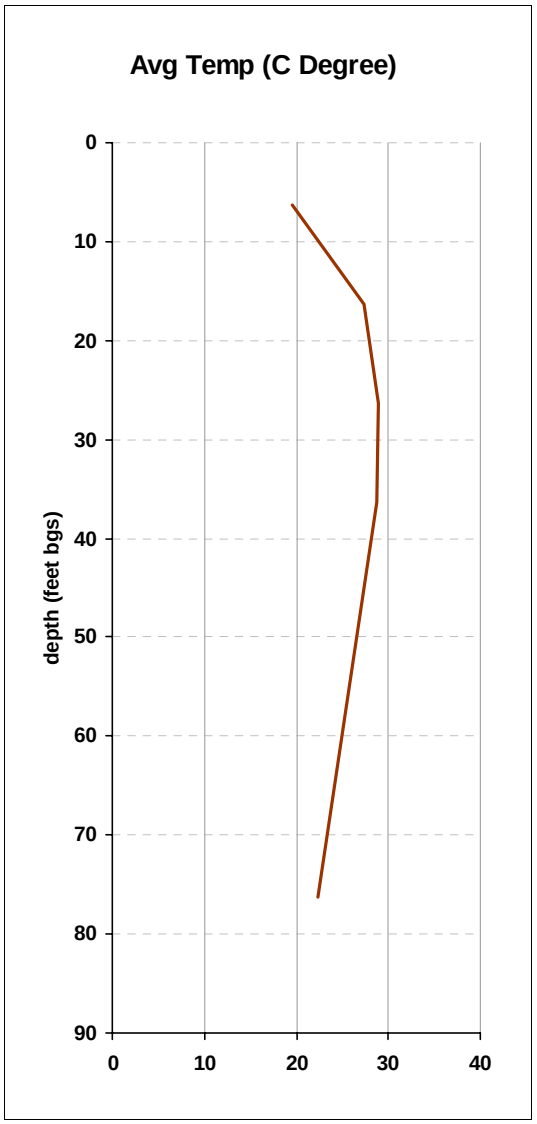
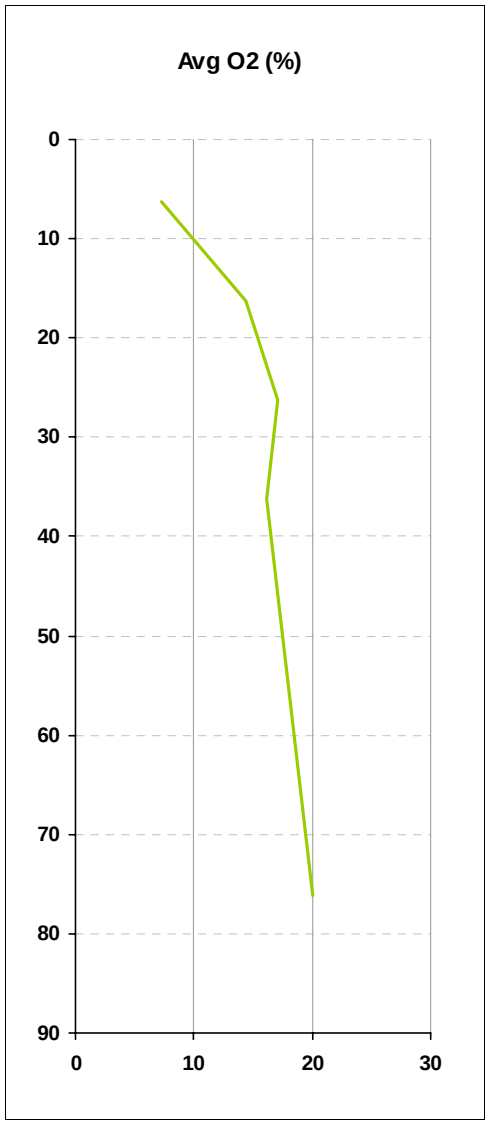
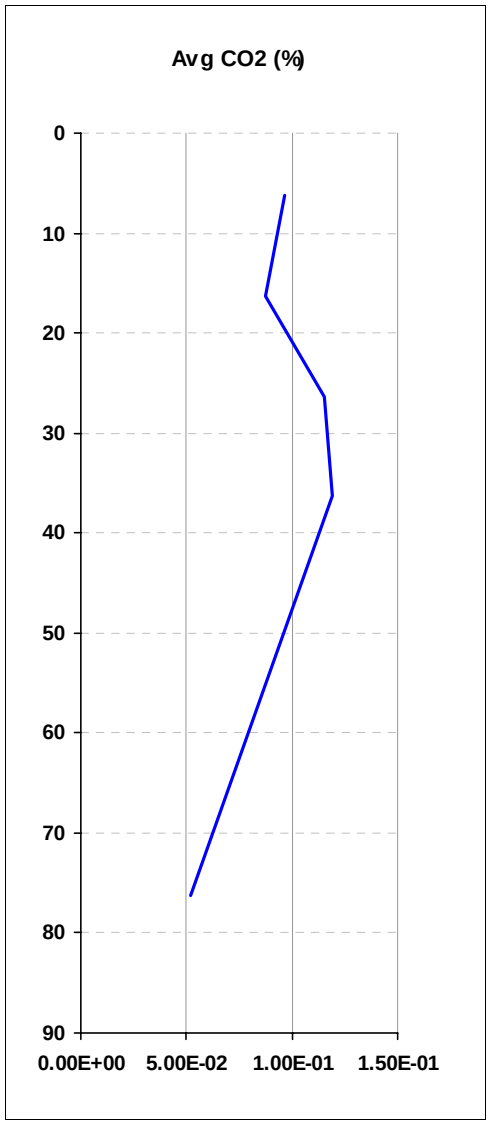
Tyrone Mine Gas Port Results (Depth v. Temperature, O2, CO2) by Sample Location

sample location:

TBGC-6





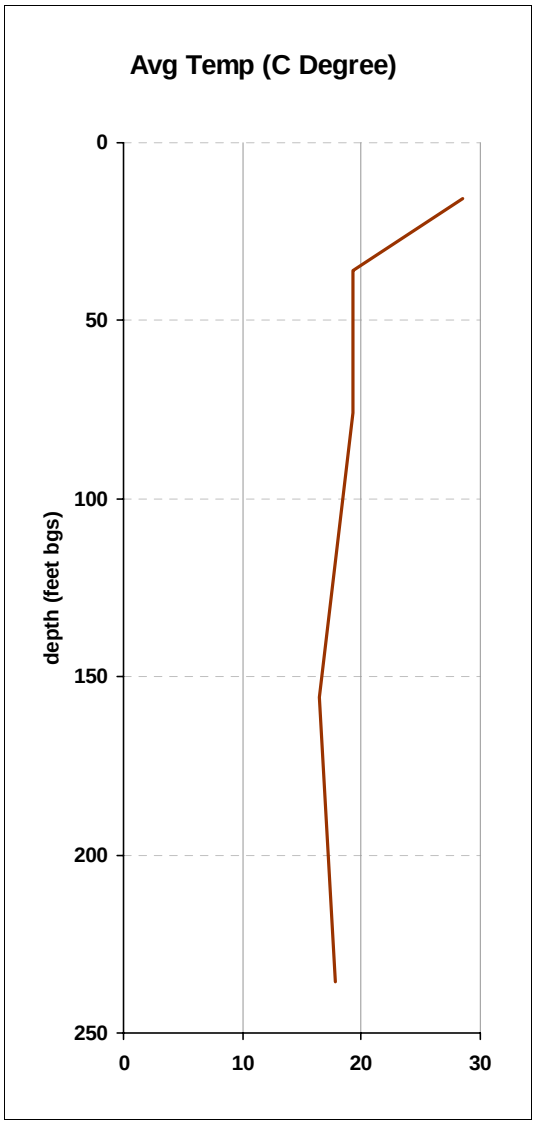


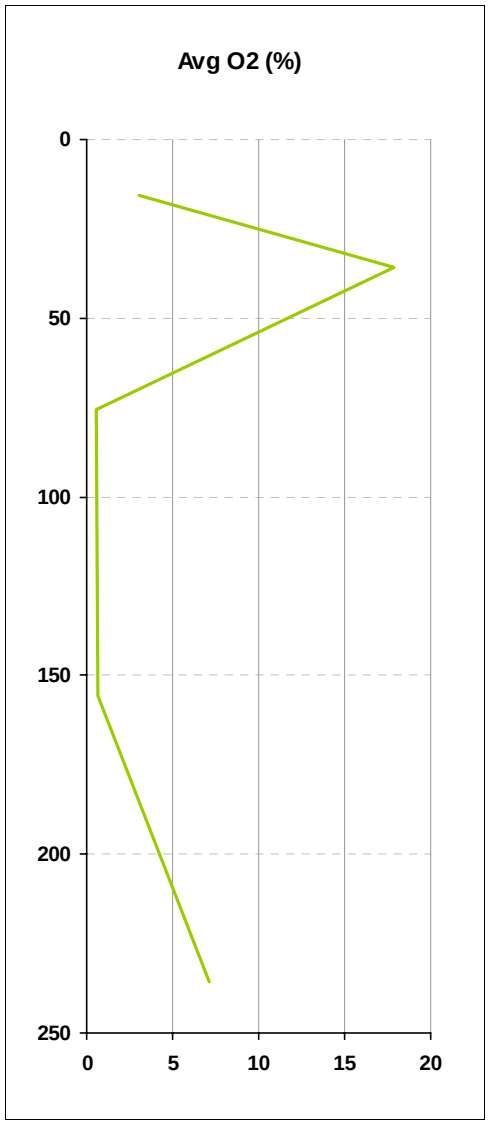
EnviroGroup Limited 2005

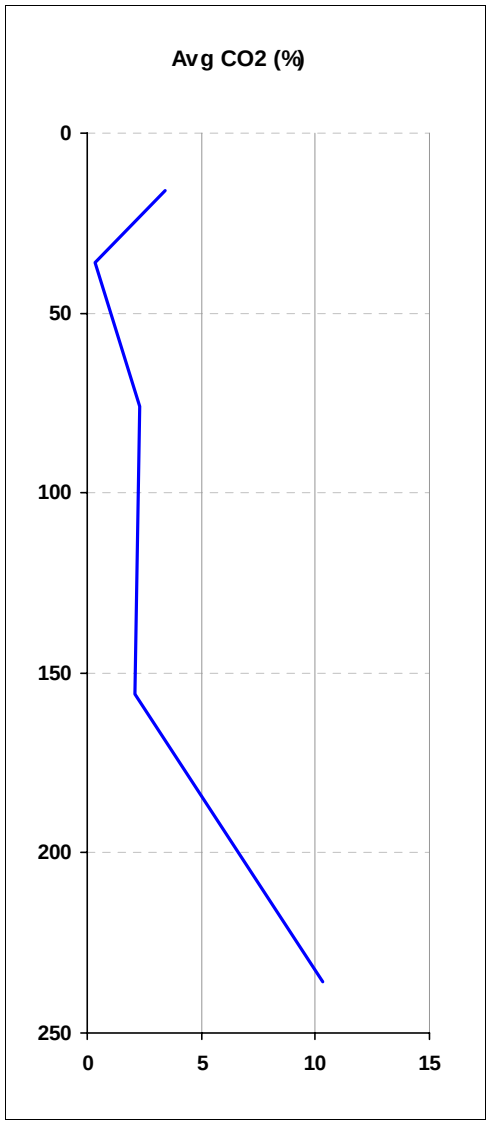
Tyrone Mine Gas Port Results (Depth v. Temperature, O2, CO2) by Sample Location

sample location:

TBGC-7





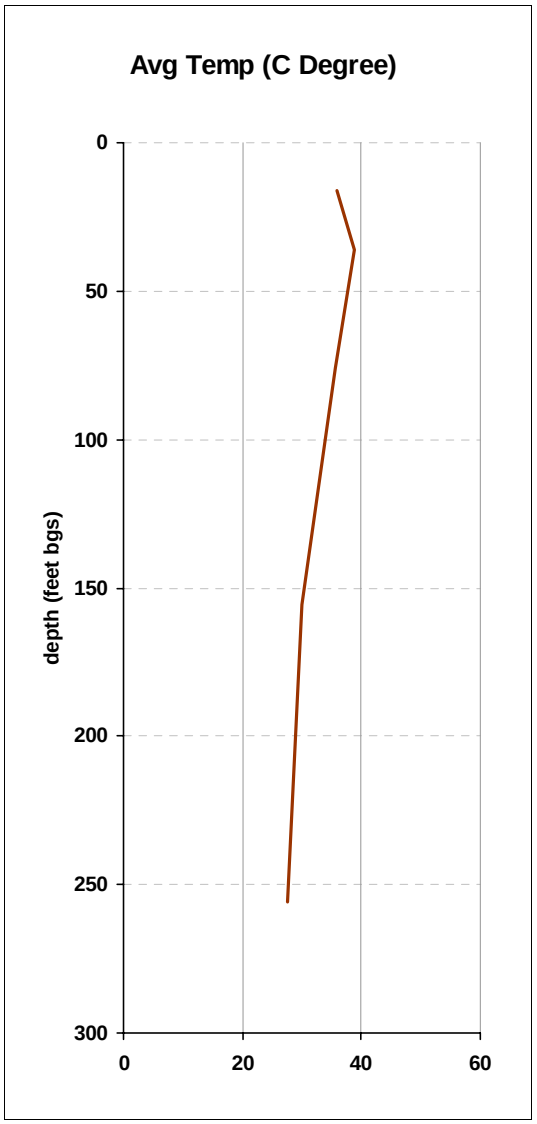


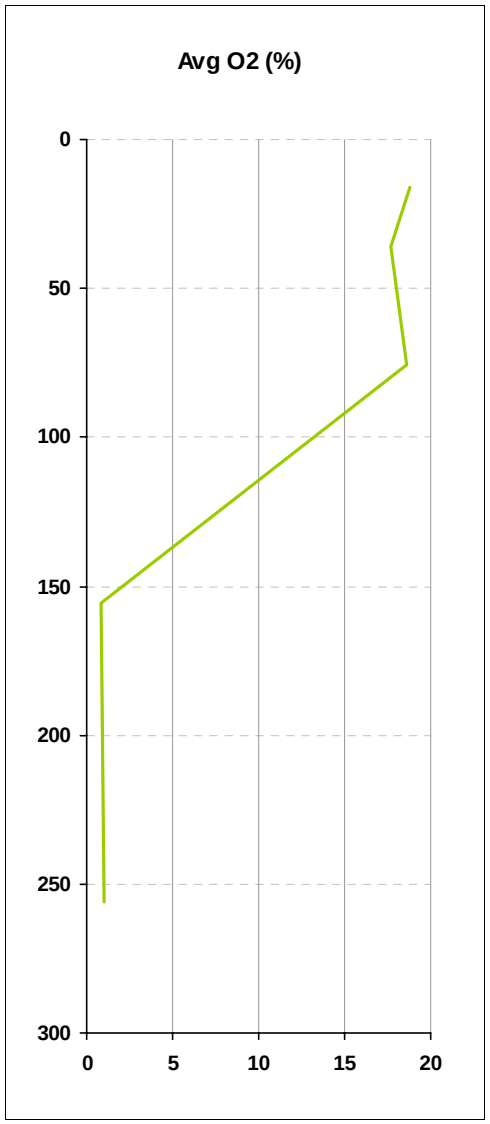
EnviroGroup Limited 2005

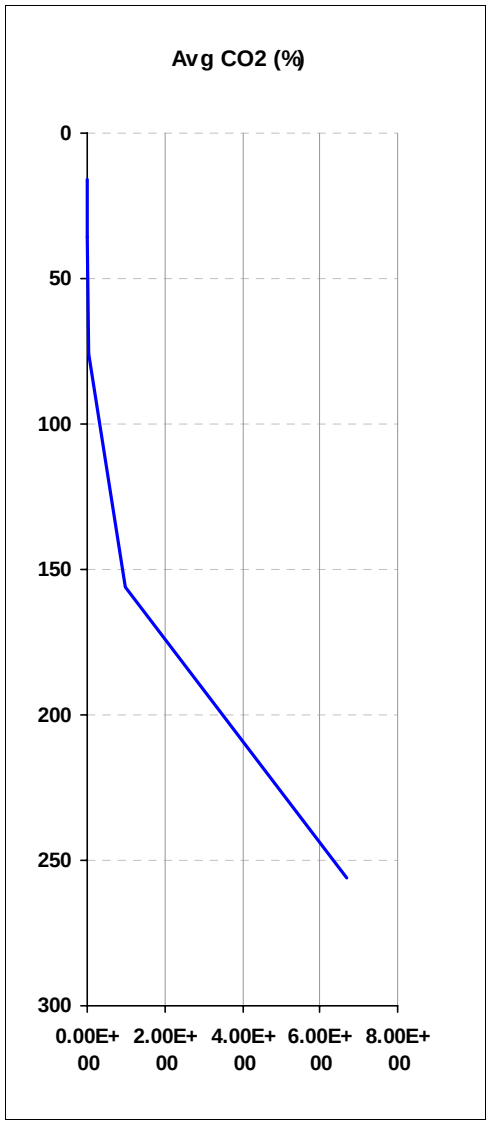
Tyrone Mine Gas Port Results (Depth v. Temperature, O2, CO2) by Sample Location

sample location:

TBGC-7A







EnviroGroup Limited 2005

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-1	10/16/2004	16.1	12:32:00 PM	21.6	---	---	---
TBGC-1	10/16/2004	16.1	12:42:00 PM	---	17	0.2	4.7
TBGC-1	10/16/2004	16.1	12:47:00 PM	---	17.1	0.3	4.7
TBGC-1	10/16/2004	16.1	12:52:00 PM	---	17.1	0.2	4.8
TBGC-1	12/3/2004	16.1	11:32:00 AM	19.1	---	---	---
TBGC-1	12/3/2004	16.1	11:42:00 AM	---	19.7	0.05	2.6
TBGC-1	12/3/2004	16.1	11:47:00 AM	---	19.5	0.05	2.5
TBGC-1	12/3/2004	16.1	11:52:00 AM	---	19.2	0.06	2.4
TBGC-1	12/18/2004	16.1	1:20:00 PM	18.6	---	---	---
TBGC-1	12/18/2004	16.1	1:23:00 PM	18.6	---	---	---
TBGC-1	12/18/2004	16.1	1:33:00 PM	---	19	0.05	2.8
TBGC-1	12/18/2004	16.1	1:38:00 PM	---	18.9	0.05	2.7
TBGC-1	12/18/2004	16.1	1:43:00 PM	---	19	0.05	2.7
TBGC-1	3/3/2005	16.1	4:33:00 PM	15.8	---	---	---
TBGC-1	3/3/2005	16.1	4:37:00 PM	15.8	---	---	---
TBGC-1	3/3/2005	16.1	4:47:00 PM	---	20.4	0.03	2.8
TBGC-1	3/3/2005	16.1	4:52:00 PM	---	20.5	0.03	2.9
TBGC-1	3/3/2005	16.1	4:57:00 PM	---	20.5	0.03	2.9
TBGC-1	7/15/2005	16.1	11:25:00 AM	17.3	---	---	---
TBGC-1	7/15/2005	16.1	11:35:00 AM	---	19.3	0.02	3.3
TBGC-1	7/15/2005	16.1	11:40:00 AM	---	19.2	0.02	3.2
TBGC-1	7/15/2005	16.1	11:45:00 AM	---	19.1	0.02	3.3
TBGC-1	11/6/2005	16.1	3:30:00 PM	20.2	---	---	---
TBGC-1	11/6/2005	16.1	3:35:00 PM	20.2	---	---	---
TBGC-1	11/6/2005	16.1	3:45:00 PM	---	19.4	0.09	2.9
TBGC-1	11/6/2005	16.1	3:50:00 PM	---	19.5	0.09	3
TBGC-1	11/6/2005	16.1	3:55:00 PM	---	19.5	0.08	2.9
TBGC-1	12/29/2005	16.1	2:13:00 PM	18.1	---	---	---
TBGC-1	12/29/2005	16.1	2:17:00 PM	18.1	---	---	---
TBGC-1	12/29/2005	16.1	2:27:00 PM	---	18.9	0.07	2.8
TBGC-1	12/29/2005	16.1	2:32:00 PM	---	18.8	0.07	2.9
TBGC-1	12/29/2005	16.1	2:37:00 PM	---	18.7	0.07	2.9
TBGC-1	10/16/2004	36.1	1:06:00 PM	20.3	20.6	0	5.1
TBGC-1	10/16/2004	36.1	1:11:00 PM	---	20.7	0	5.1
TBGC-1	10/16/2004	36.1	1:16:00 PM	---	20.7	0	5
TBGC-1	12/3/2004	36.1	11:53:00 AM	19.9	---	---	---
TBGC-1	12/3/2004	36.1	12:03:00 PM	---	19.3	0.04	2.3
TBGC-1	12/3/2004	36.1	12:08:00 PM	19.9	19.1	0.04	2.3
TBGC-1	12/3/2004	36.1	12:13:00 PM	---	19	0.04	2.2
TBGC-1	12/18/2004	36.1	1:20:00 PM	19.9	---	---	---
TBGC-1	12/18/2004	36.1	1:44:00 PM	19.9	---	---	---
TBGC-1	12/18/2004	36.1	1:54:00 PM	---	20.2	0.02	2.5
TBGC-1	12/18/2004	36.1	1:59:00 PM	---	20.2	0.02	2.4
TBGC-1	12/18/2004	36.1	2:04:00 PM	---	20.2	0.02	2.5
TBGC-1	3/3/2005	36.1	4:33:00 PM	20	---	---	---
TBGC-1	3/3/2005	36.1	4:58:00 PM	20	---	---	---
TBGC-1	3/3/2005	36.1	5:08:00 PM	---	21	0	2.8
TBGC-1	3/3/2005	36.1	5:13:00 PM	---	21	0	2.8

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-1	3/3/2005	36.1	5:18:00 PM	---	21	0	2.8
TBGC-1	7/15/2005	36.1	11:46:00 AM	18.4	---	---	---
TBGC-1	7/15/2005	36.1	11:56:00 AM	---	19.6	0.01	3.1
TBGC-1	7/15/2005	36.1	12:01:00 PM	---	19.6	0.01	3.1
TBGC-1	7/15/2005	36.1	12:06:00 PM	---	19.6	0.01	3.2
TBGC-1	11/6/2005	36.1	3:30:00 PM	18.7	---	---	---
TBGC-1	11/6/2005	36.1	3:56:00 PM	18.7	---	---	---
TBGC-1	11/6/2005	36.1	4:06:00 PM	---	20.6	0.01	2.5
TBGC-1	11/6/2005	36.1	4:11:00 PM	---	20.7	0.01	2.4
TBGC-1	11/6/2005	36.1	4:16:00 PM	---	20.7	0.01	2.5
TBGC-1	12/29/2005	36.1	2:13:00 PM	20	---	---	---
TBGC-1	12/29/2005	36.1	2:38:00 PM	20	---	---	---
TBGC-1	12/29/2005	36.1	2:48:00 PM	---	19.4	0.05	2.5
TBGC-1	12/29/2005	36.1	2:53:00 PM	---	19.4	0.05	2.6
TBGC-1	12/29/2005	36.1	2:58:00 PM	---	19.4	0.05	2.4
TBGC-1	10/16/2004	76.1	1:17:00 PM	28.4	---	---	---
TBGC-1	10/16/2004	76.1	1:28:00 PM	---	15.1	0.6	3.4
TBGC-1	10/16/2004	76.1	1:33:00 PM	---	15.1	0.6	3.6
TBGC-1	10/16/2004	76.1	1:38:00 PM	---	15.1	0.6	3.7
TBGC-1	12/3/2004	76.1	12:24:00 PM	27.9	16.3	1.3	1.8
TBGC-1	12/3/2004	76.1	12:29:00 PM	---	16.5	1.2	1.8
TBGC-1	12/3/2004	76.1	12:34:00 PM	---	16.5	1.2	1.8
TBGC-1	12/3/2004	76.1	1:14:00 PM	27.9	---	---	---
TBGC-1	12/18/2004	76.1	1:20:00 PM	27.9	---	---	---
TBGC-1	12/18/2004	76.1	2:05:00 PM	27.9	---	---	---
TBGC-1	12/18/2004	76.1	2:15:00 PM	---	17.4	0.29	1.9
TBGC-1	12/18/2004	76.1	2:20:00 PM	---	17.4	0.28	1.9
TBGC-1	12/18/2004	76.1	2:25:00 PM	---	17.4	0.28	1.8
TBGC-1	3/3/2005	76.1	4:33:00 PM	27.8	---	---	---
TBGC-1	3/3/2005	76.1	5:19:00 PM	27.8	---	---	---
TBGC-1	3/3/2005	76.1	5:29:00 PM	---	17.6	0.26	2.7
TBGC-1	3/3/2005	76.1	5:34:00 PM	---	17.6	0.26	2.6
TBGC-1	3/3/2005	76.1	5:39:00 PM	---	17.6	0.26	2.5
TBGC-1	7/15/2005	76.1	12:07:00 PM	26.8	---	---	---
TBGC-1	7/15/2005	76.1	12:17:00 PM	---	14.1	0.36	2.4
TBGC-1	7/15/2005	76.1	12:22:00 PM	---	14.2	0.36	2.4
TBGC-1	7/15/2005	76.1	12:27:00 PM	---	13.9	0.36	2.3
TBGC-1	11/6/2005	76.1	3:30:00 PM	35.1	---	---	---
TBGC-1	11/6/2005	76.1	4:17:00 PM	25.1	---	---	---
TBGC-1	11/6/2005	76.1	4:27:00 PM	---	16.7	0.34	2.1
TBGC-1	11/6/2005	76.1	4:32:00 PM	---	16.7	0.33	2.2
TBGC-1	11/6/2005	76.1	4:37:00 PM	---	16.8	0.32	2.1
TBGC-1	12/29/2005	76.1	2:13:00 PM	27.9	---	---	---
TBGC-1	12/29/2005	76.1	2:59:00 PM	27.9	---	---	---
TBGC-1	12/29/2005	76.1	3:09:00 PM	---	18	0.27	1.8
TBGC-1	12/29/2005	76.1	3:14:00 PM	---	18.1	0.27	1.8
TBGC-1	12/29/2005	76.1	3:19:00 PM	---	18.1	0.27	1.8
TBGC-1	10/16/2004	156.2	1:39:00 PM	41.3	---	---	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-1	10/16/2004	156.2	1:50:00 PM	---	14.4	0.6	2.8
TBGC-1	10/16/2004	156.2	1:55:00 PM	---	14.4	0.6	2.7
TBGC-1	10/16/2004	156.2	2:00:00 PM	---	14.4	0.6	2.8
TBGC-1	12/3/2004	156.2	12:35:00 PM	40.3	---	---	---
TBGC-1	12/3/2004	156.2	12:45:00 PM	---	15.9	1.1	1.3
TBGC-1	12/3/2004	156.2	12:50:00 PM	---	15.9	1.1	1.3
TBGC-1	12/3/2004	156.2	12:55:00 PM	---	15.9	1.1	1.2
TBGC-1	12/18/2004	156.2	1:20:00 PM	39.7	---	---	---
TBGC-1	12/18/2004	156.2	2:26:00 PM	39.7	---	---	---
TBGC-1	12/18/2004	156.2	2:36:00 PM	---	17	0.24	1.4
TBGC-1	12/18/2004	156.2	2:41:00 PM	---	17	0.23	1.5
TBGC-1	12/18/2004	156.2	2:46:00 PM	---	17.1	0.23	1.4
TBGC-1	3/3/2005	156.2	4:33:00 PM	36	---	---	---
TBGC-1	3/3/2005	156.2	5:40:00 PM	36	---	---	---
TBGC-1	3/3/2005	156.2	5:50:00 PM	---	17.2	0.2	1.6
TBGC-1	3/3/2005	156.2	5:55:00 PM	---	17.3	0.19	1.6
TBGC-1	3/3/2005	156.2	6:00:00 PM	---	17.3	0.19	1.5
TBGC-1	7/15/2005	156.2	12:28:00 PM	26.8	---	---	---
TBGC-1	7/15/2005	156.2	12:38:00 PM	---	13.3	0.23	1.8
TBGC-1	7/15/2005	156.2	12:43:00 PM	---	13.3	0.22	1.7
TBGC-1	7/15/2005	156.2	12:48:00 PM	---	13.3	0.22	1.7
TBGC-1	11/6/2005	156.2	3:30:00 PM	4.5	---	---	---
TBGC-1	11/6/2005	156.2	4:48:00 PM	---	16.1	0.27	1.4
TBGC-1	11/6/2005	156.2	4:53:00 PM	---	16.2	0.26	1.4
TBGC-1	11/6/2005	156.2	4:58:00 PM	---	16.2	0.26	1.5
TBGC-1	12/29/2005	156.2	2:13:00 PM	39.4	---	---	---
TBGC-1	12/29/2005	156.2	3:20:00 PM	39.4	---	---	---
TBGC-1	12/29/2005	156.2	3:30:00 PM	---	17.6	0.22	1.4
TBGC-1	12/29/2005	156.2	3:35:00 PM	---	17.6	0.22	1.3
TBGC-1	12/29/2005	156.2	3:40:00 PM	---	17.6	0.21	1.4
TBGC-1	10/16/2004	215.2	2:01:00 PM	40.6	---	---	---
TBGC-1	10/16/2004	215.2	2:11:00 PM	---	16.6	1	7.2
TBGC-1	10/16/2004	215.2	2:16:00 PM	---	16.6	0.8	6.9
TBGC-1	10/16/2004	215.2	2:21:00 PM	---	16.6	0.8	6.4
TBGC-1	12/3/2004	215.2	12:56:00 PM	40	---	---	---
TBGC-1	12/3/2004	215.2	1:06:00 PM	---	17.1	0.9	1.0
TBGC-1	12/3/2004	215.2	1:11:00 PM	---	17.1	0.9	1.1
TBGC-1	12/3/2004	215.2	1:16:00 PM	---	17.1	0.9	1.1
TBGC-1	12/18/2004	215.2	1:20:00 PM	38.2	---	---	---
TBGC-1	12/18/2004	215.2	2:47:00 PM	38.2	---	---	---
TBGC-1	12/18/2004	215.2	2:57:00 PM	---	18.3	0.2	1.3
TBGC-1	12/18/2004	215.2	3:02:00 PM	---	18.4	0.2	1.3
TBGC-1	12/18/2004	215.2	3:07:00 PM	---	18.4	0.2	1.3
TBGC-1	3/3/2005	215.2	4:33:00 PM	34.1	---	---	---
TBGC-1	3/3/2005	215.2	6:01:00 PM	34.1	---	---	---
TBGC-1	3/3/2005	215.2	6:11:00 PM	---	18.6	0.2	1.3
TBGC-1	3/3/2005	215.2	6:16:00 PM	---	18.6	0.19	1.3
TBGC-1	3/3/2005	215.2	6:21:00 PM	---	18.7	0.19	1.3

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-1	7/15/2005	215.2	12:59:00 PM	---	15.9	0.23	1.4
TBGC-1	7/15/2005	215.2	1:04:00 PM	---	15.9	0.23	1.4
TBGC-1	7/15/2005	215.2	1:09:00 PM	---	15.8	0.23	1.5
TBGC-1	11/6/2005	215.2	3:30:00 PM	18.9	---	---	---
TBGC-1	11/6/2005	215.2	5:09:00 PM	---	18.1	0.24	1.2
TBGC-1	11/6/2005	215.2	5:14:00 PM	---	18.1	0.24	1.3
TBGC-1	11/6/2005	215.2	5:19:00 PM	---	18.2	0.23	1.3
TBGC-1	12/29/2005	215.2	2:13:00 PM	37.5	---	---	---
TBGC-1	12/29/2005	215.2	3:41:00 PM	37.5	---	---	---
TBGC-1	12/29/2005	215.2	3:51:00 PM	---	19	0.21	1.2
TBGC-1	12/29/2005	215.2	3:56:00 PM	---	19	0.21	1.2
TBGC-1	12/29/2005	215.2	4:01:00 PM	---	19	0.2	1.2
TBGC-2	10/20/2004	6	7:40:00 AM	20.8	---	---	---
TBGC-2	10/20/2004	6	7:54:00 AM	20.8	---	---	2.7
TBGC-2	10/20/2004	6	8:04:00 AM	---	9.1	0.3	2.7
TBGC-2	10/20/2004	6	8:09:00 AM	---	9.3	0.2	2.7
TBGC-2	10/20/2004	6	8:14:00 AM	---	9.1	0.2	2.7
TBGC-2	12/1/2004	6	2:51:00 PM	---	12.6	0.12	3.3
TBGC-2	12/1/2004	6	2:56:00 PM	---	12.5	0.12	3.1
TBGC-2	12/1/2004	6	3:01:00 PM	---	12.4	0.12	3.2
TBGC-2	12/17/2004	6	3:11:00 PM	13.2	---	---	---
TBGC-2	12/17/2004	6	3:13:00 PM	13.2	---	---	---
TBGC-2	12/17/2004	6	3:23:00 PM	---	12.6	0.08	3.1
TBGC-2	12/17/2004	6	3:28:00 PM	---	12.5	0.08	2.7
TBGC-2	12/17/2004	6	3:33:00 PM	---	12.5	0.08	2.7
TBGC-2	12/31/2004	6	3:47:00 PM	11.8	---	---	---
TBGC-2	12/31/2004	6	3:50:00 PM	11.8	---	---	---
TBGC-2	12/31/2004	6	4:00:00 PM	---	12.1	0.06	3.2
TBGC-2	12/31/2004	6	4:05:00 PM	---	12.1	0.06	3.2
TBGC-2	12/31/2004	6	4:10:00 PM	---	12.1	0.06	3.2
TBGC-2	12/31/2004	6	4:11:00 PM	---	12.1	0.06	3.2
TBGC-2	3/1/2005	6	1:13:00 PM	10.8	---	---	---
TBGC-2	3/1/2005	6	1:23:00 PM	---	14.1	0.12	3.3
TBGC-2	3/1/2005	6	1:28:00 PM	---	14.1	---	3.4
TBGC-2	3/1/2005	6	1:33:00 PM	---	14.1	0.12	3.3
TBGC-2	6/23/2005	6	2:08:00 PM	20.6	---	---	---
TBGC-2	6/23/2005	6	2:18:00 PM	---	17.5	0.08	4.2
TBGC-2	6/23/2005	6	2:23:00 PM	---	17.4	0.08	4.3
TBGC-2	6/23/2005	6	2:28:00 PM	---	17.4	0.08	4.2
TBGC-2	11/9/2005	6	12:14:00 PM	19.8	---	---	---
TBGC-2	11/9/2005	6	12:16:00 PM	19.8	---	---	---
TBGC-2	11/9/2005	6	12:26:00 PM	---	12.4	0.14	3.1
TBGC-2	11/9/2005	6	12:31:00 PM	---	12.5	0.14	3.2
TBGC-2	11/9/2005	6	12:36:00 PM	---	12.5	0.14	3.2
TBGC-2	10/20/2004	16	7:40:00 AM	21.2	---	---	---
TBGC-2	10/20/2004	16	8:15:00 AM	21.2	---	---	2.6
TBGC-2	10/20/2004	16	8:25:00 AM	---	0	0	2.5
TBGC-2	10/20/2004	16	8:30:00 AM	---	0	0	2.5

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-2	10/20/2004	16	8:35:00 AM	---	0.3	0	2.5
TBGC-2	12/1/2004	16	3:02:00 PM	20.8	---	---	---
TBGC-2	12/1/2004	16	3:12:00 PM	---	5.1	0.01	2.8
TBGC-2	12/1/2004	16	3:17:00 PM	---	6.4	0.02	2.9
TBGC-2	12/1/2004	16	3:22:00 PM	---	7	0.03	2.8
TBGC-2	12/17/2004	16	3:11:00 PM	20.4	---	---	---
TBGC-2	12/17/2004	16	3:34:00 PM	20.4	---	---	---
TBGC-2	12/17/2004	16	3:44:00 PM	---	5.4	0	2.9
TBGC-2	12/17/2004	16	3:49:00 PM	---	6	0.01	2.8
TBGC-2	12/17/2004	16	3:54:00 PM	---	6.5	0.01	2.8
TBGC-2	12/31/2004	16	3:47:00 PM	19.9	---	---	---
TBGC-2	12/31/2004	16	4:11:00 PM	19.9	---	---	---
TBGC-2	12/31/2004	16	4:21:00 PM	---	6	0	2.5
TBGC-2	12/31/2004	16	4:21:00 PM	19.9	---	---	---
TBGC-2	12/31/2004	16	4:26:00 PM	---	6	0	2.5
TBGC-2	12/31/2004	16	4:26:00 PM	---	6.9	0.01	3.1
TBGC-2	12/31/2004	16	4:31:00 PM	---	6.9	0.01	3.1
TBGC-2	12/31/2004	16	4:31:00 PM	---	7	0	2.9
TBGC-2	12/31/2004	16	4:32:00 PM	---	7	0	2.9
TBGC-2	3/1/2005	16	1:34:00 PM	17.7	---	---	---
TBGC-2	3/1/2005	16	1:44:00 PM	---	8.2	0.17	3
TBGC-2	3/1/2005	16	1:49:00 PM	---	10.4	0.15	3.1
TBGC-2	3/1/2005	16	1:54:00 PM	---	10.2	0.14	3
TBGC-2	6/23/2005	16	2:05:00 PM	17.4	---	---	---
TBGC-2	6/23/2005	16	2:29:00 PM	17.4	---	---	---
TBGC-2	6/23/2005	16	2:39:00 PM	---	11.3	0.04	3.7
TBGC-2	6/23/2005	16	2:44:00 PM	---	13.4	0.04	3.6
TBGC-2	6/23/2005	16	2:49:00 PM	---	14.9	0.04	3.7
TBGC-2	11/9/2005	16	12:14:00 PM	20.2	---	---	---
TBGC-2	11/9/2005	16	12:37:00 PM	20.2	---	---	---
TBGC-2	11/9/2005	16	12:47:00 PM	---	7.5	0.06	3
TBGC-2	11/9/2005	16	12:52:00 PM	---	8.8	0.08	3
TBGC-2	11/9/2005	16	12:57:00 PM	---	9.5	0.09	2.9
TBGC-2	10/20/2004	26	7:40:00 AM	21	---	---	---
TBGC-2	10/20/2004	26	8:37:00 AM	21	---	---	2.4
TBGC-2	10/20/2004	26	8:47:00 AM	---	0	0	2.5
TBGC-2	10/20/2004	26	8:52:00 AM	---	0	0	2.5
TBGC-2	10/20/2004	26	8:57:00 AM	---	0	0	2.5
TBGC-2	12/1/2004	26	3:23:00 PM	21.3	---	---	---
TBGC-2	12/1/2004	26	3:33:00 PM	---	9.4	0.03	2.6
TBGC-2	12/1/2004	26	3:38:00 PM	---	9.3	0.03	2.6
TBGC-2	12/1/2004	26	3:43:00 PM	---	9.3	0.03	2.6
TBGC-2	12/17/2004	26	3:11:00 PM	21.4	---	---	---
TBGC-2	12/17/2004	26	3:55:00 PM	21.4	---	---	---
TBGC-2	12/17/2004	26	4:05:00 PM	---	8.6	0.01	2.7
TBGC-2	12/17/2004	26	4:10:00 PM	---	8.6	0.01	2.7
TBGC-2	12/17/2004	26	4:15:00 PM	---	8.5	0.01	2.7
TBGC-2	12/31/2004	26	3:47:00 PM	21.4	---	---	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-2	12/31/2004	26	3:47:00 PM	21.4	---	---	---
TBGC-2	12/31/2004	26	4:32:00 PM	21.4	---	---	---
TBGC-2	12/31/2004	26	4:42:00 PM	---	8.2	0	5.3
TBGC-2	12/31/2004	26	4:42:00 PM	21.4	---	---	---
TBGC-2	12/31/2004	26	4:47:00 PM	---	8.2	0	5.3
TBGC-2	12/31/2004	26	4:47:00 PM	---	8.1	0	5.5
TBGC-2	12/31/2004	26	4:52:00 PM	---	8.1	0	5.5
TBGC-2	12/31/2004	26	4:53:00 PM	---	8.1	0	5.5
TBGC-2	3/1/2005	26	1:55:00 PM	20.7	---	---	---
TBGC-2	3/1/2005	26	2:05:00 PM	---	8.6	0.37	2.8
TBGC-2	3/1/2005	26	2:10:00 PM	---	8.5	0.36	2.7
TBGC-2	3/1/2005	26	2:15:00 PM	---	8.5	0.34	2.7
TBGC-2	6/23/2005	26	2:05:00 PM	19.5	---	---	---
TBGC-2	6/23/2005	26	2:50:00 PM	19.5	---	---	---
TBGC-2	6/23/2005	26	3:00:00 PM	---	5.2	0.03	3.4
TBGC-2	6/23/2005	26	3:05:00 PM	---	5.2	0.03	3.5
TBGC-2	6/23/2005	26	3:10:00 PM	---	5.1	0.03	3.4
TBGC-2	11/9/2005	26	12:14:00 PM	20.3	---	---	---
TBGC-2	11/9/2005	26	12:58:00 PM	20.3	---	---	---
TBGC-2	11/9/2005	26	1:08:00 PM	---	6.5	0.04	2.7
TBGC-2	11/9/2005	26	1:13:00 PM	---	6.5	0.04	2.7
TBGC-2	11/9/2005	26	1:18:00 PM	---	6.4	0.04	2.7
TBGC-2	10/20/2004	36	7:40:00 AM	21.5	---	---	---
TBGC-2	10/20/2004	36	8:58:00 AM	21.5	---	---	2.3
TBGC-2	10/20/2004	36	9:08:00 AM	---	0	0.1	2.3
TBGC-2	10/20/2004	36	9:13:00 AM	---	0	0	2.3
TBGC-2	10/20/2004	36	9:18:00 AM	---	0	0	2.3
TBGC-2	12/1/2004	36	3:44:00 PM	21.7	---	---	---
TBGC-2	12/1/2004	36	3:54:00 PM	---	3.8	0.04	2.4
TBGC-2	12/1/2004	36	3:59:00 PM	---	4.2	0.04	2.4
TBGC-2	12/1/2004	36	4:04:00 PM	---	4.3	0.04	2.4
TBGC-2	12/17/2004	36	3:11:00 PM	21.8	---	---	---
TBGC-2	12/17/2004	36	4:16:00 PM	21.8	---	---	---
TBGC-2	12/17/2004	36	4:26:00 PM	---	3.7	0.01	2.3
TBGC-2	12/17/2004	36	4:31:00 PM	---	4.2	0.01	2.4
TBGC-2	12/17/2004	36	4:36:00 PM	---	4.5	0.01	2.3
TBGC-2	12/31/2004	36	3:47:00 PM	21.9	---	---	---
TBGC-2	12/31/2004	36	3:47:00 PM	21.9	---	---	---
TBGC-2	12/31/2004	36	4:53:00 PM	21.9	---	---	---
TBGC-2	12/31/2004	36	5:03:00 PM	21.9	---	---	---
TBGC-2	12/31/2004	36	5:03:00 PM	---	4.3	0	5.3
TBGC-2	12/31/2004	36	5:08:00 PM	---	4.3	0	5.3
TBGC-2	12/31/2004	36	5:13:00 PM	---	4.3	0	5.3
TBGC-2	12/31/2004	36	5:13:00 PM	---	4.8	0	5.4
TBGC-2	12/31/2004	36	5:25:00 PM	---	4.8	0	5.4
TBGC-2	3/1/2005	36	2:16:00 PM	21.9	---	---	---
TBGC-2	3/1/2005	36	2:26:00 PM	---	5.8	0.5	2.4
TBGC-2	3/1/2005	36	2:31:00 PM	---	5.9	0.48	2.4

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-2	3/1/2005	36	2:36:00 PM	---	6.1	0.44	2.5
TBGC-2	6/23/2005	36	2:05:00 PM	21.3	---	---	---
TBGC-2	6/23/2005	36	3:11:00 PM	21.3	---	---	---
TBGC-2	6/23/2005	36	3:21:00 PM	---	4.5	0.03	3.2
TBGC-2	6/23/2005	36	3:26:00 PM	---	5	0.03	3.2
TBGC-2	6/23/2005	36	3:31:00 PM	---	5.1	0.03	3.2
TBGC-2	11/9/2005	36	12:14:00 PM	21.1	---	---	---
TBGC-2	11/9/2005	36	1:19:00 PM	21.1	---	---	---
TBGC-2	11/9/2005	36	1:29:00 PM	---	4	0.03	2.6
TBGC-2	11/9/2005	36	1:34:00 PM	---	4.3	0.03	2.6
TBGC-2	11/9/2005	36	1:39:00 PM	---	4.4	0.03	2.6
TBGC-3	10/18/2004	16	9:32:00 AM	19.5	---	---	---
TBGC-3	10/18/2004	16	9:42:00 AM	19.5	---	---	2.1
TBGC-3	10/18/2004	16	9:52:00 AM	---	14.7	0	2.1
TBGC-3	10/18/2004	16	9:57:00 AM	---	14.6	0	2.1
TBGC-3	10/18/2004	16	10:02:00 AM	---	14.5	0	2.2
TBGC-3	12/1/2004	16	1:12:00 PM	18.8	---	---	---
TBGC-3	12/1/2004	16	1:22:00 PM	---	18.5	0.01	1.7
TBGC-3	12/1/2004	16	1:27:00 PM	---	18.4	0.01	1.8
TBGC-3	12/1/2004	16	1:32:00 PM	---	18.8	0.01	2.0
TBGC-3	12/1/2004	16	2:41:00 PM	15.2	---	---	---
TBGC-3	12/17/2004	16	1:35:00 PM	18.2	---	---	---
TBGC-3	12/17/2004	16	1:40:00 PM	18.2	---	---	---
TBGC-3	12/17/2004	16	1:50:00 PM	---	18.7	0.01	1.7
TBGC-3	12/17/2004	16	1:55:00 PM	---	18.7	0.01	1.7
TBGC-3	12/17/2004	16	2:00:00 PM	---	18.8	0.01	1.8
TBGC-3	12/31/2004	16	2:16:00 PM	17.5	---	---	---
TBGC-3	12/31/2004	16	2:18:00 PM	17.5	---	---	---
TBGC-3	12/31/2004	16	2:28:00 PM	---	18.2	0.01	1.9
TBGC-3	12/31/2004	16	2:33:00 PM	---	18.3	0.01	2.1
TBGC-3	12/31/2004	16	2:38:00 PM	---	18.4	0.01	2.2
TBGC-3	3/1/2005	16	11:30:00 AM	15.3	---	---	---
TBGC-3	3/1/2005	16	11:35:00 AM	15.3	---	---	---
TBGC-3	3/1/2005	16	11:45:00 AM	---	17.3	0.01	1.9
TBGC-3	3/1/2005	16	11:50:00 AM	---	17.1	0.01	2
TBGC-3	3/1/2005	16	11:55:00 AM	---	17.1	0.01	1.9
TBGC-3	6/23/2005	16	12:25:00 PM	15.8	---	---	---
TBGC-3	6/23/2005	16	12:28:00 PM	15.8	---	---	---
TBGC-3	6/23/2005	16	12:38:00 PM	---	16.6	0.05	2.8
TBGC-3	6/23/2005	16	12:43:00 PM	---	16.6	0.05	2.7
TBGC-3	6/23/2005	16	12:48:00 PM	---	16.6	0.05	2.8
TBGC-3	6/23/2005	16	2:05:00 PM	20.6	---	---	---
TBGC-3	11/9/2005	16	10:41:00 AM	19.3	---	---	---
TBGC-3	11/9/2005	16	10:45:00 AM	19.3	---	---	---
TBGC-3	11/9/2005	16	10:55:00 AM	---	16.3	0.06	2.3
TBGC-3	11/9/2005	16	11:00:00 AM	---	16.1	0.07	2.2
TBGC-3	11/9/2005	16	11:05:00 AM	---	15.9	0.07	2.3
TBGC-3	10/18/2004	36	9:32:00 AM	18.2	---	---	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-3	10/18/2004	36	10:03:00 AM	18.2	---	---	1.2
TBGC-3	10/18/2004	36	10:13:00 AM	---	15	0.2	1.2
TBGC-3	10/18/2004	36	10:18:00 AM	---	14.8	0.2	1.2
TBGC-3	10/18/2004	36	10:23:00 AM	---	14.8	0.2	1.2
TBGC-3	12/1/2004	36	1:33:00 PM	18.3	---	---	---
TBGC-3	12/1/2004	36	1:43:00 PM	---	20.1	0.08	1.7
TBGC-3	12/1/2004	36	1:48:00 PM	---	20	0.08	1.6
TBGC-3	12/1/2004	36	1:53:00 PM	---	20	0.08	1.6
TBGC-3	12/17/2004	36	1:35:00 PM	18.3	---	---	---
TBGC-3	12/17/2004	36	2:01:00 PM	18.3	---	---	---
TBGC-3	12/17/2004	36	2:11:00 PM	---	20.1	0.08	1.7
TBGC-3	12/17/2004	36	2:16:00 PM	---	20.1	0.07	1.7
TBGC-3	12/17/2004	36	2:21:00 PM	---	20	0.07	1.7
TBGC-3	12/31/2004	36	2:16:00 PM	18.4	---	---	---
TBGC-3	12/31/2004	36	2:39:00 PM	18.4	---	---	---
TBGC-3	12/31/2004	36	2:49:00 PM	---	20.3	0.06	1.8
TBGC-3	12/31/2004	36	2:54:00 PM	---	20.2	0.06	1.7
TBGC-3	12/31/2004	36	2:59:00 PM	---	20.2	0.06	1.7
TBGC-3	3/1/2005	36	11:30:00 AM	18.4	---	---	---
TBGC-3	3/1/2005	36	11:56:00 AM	18.4	---	---	---
TBGC-3	3/1/2005	36	12:06:00 PM	---	19.1	0.05	1.7
TBGC-3	3/1/2005	36	12:11:00 PM	---	19.1	0.05	1.7
TBGC-3	3/1/2005	36	12:16:00 PM	---	19	0.05	1.7
TBGC-3	6/23/2005	36	12:25:00 PM	17.9	---	---	---
TBGC-3	6/23/2005	36	12:49:00 PM	17.9	---	---	---
TBGC-3	6/23/2005	36	12:59:00 PM	---	17.1	0.06	1.8
TBGC-3	6/23/2005	36	1:04:00 PM	---	17	0.07	1.8
TBGC-3	6/23/2005	36	1:09:00 PM	---	17	0.08	1.9
TBGC-3	11/9/2005	36	10:41:00 AM	17.9	---	---	---
TBGC-3	11/9/2005	36	11:06:00 AM	17.9	---	---	---
TBGC-3	11/9/2005	36	11:16:00 AM	---	16.2	0.15	1.7
TBGC-3	11/9/2005	36	11:21:00 AM	---	16.1	0.15	1.8
TBGC-3	11/9/2005	36	11:26:00 AM	---	16	0.15	1.7
TBGC-3	10/18/2004	76	9:32:00 AM	19	---	---	---
TBGC-3	10/18/2004	76	10:24:00 AM	19	---	---	1.2
TBGC-3	10/18/2004	76	10:34:00 AM	---	5.2	0.7	1.1
TBGC-3	10/18/2004	76	10:39:00 AM	---	5.3	0.6	1.2
TBGC-3	10/18/2004	76	10:44:00 AM	---	6	0.6	1.2
TBGC-3	12/1/2004	76	1:54:00 PM	19	---	---	---
TBGC-3	12/1/2004	76	2:04:00 PM	---	17.6	0.09	1.4
TBGC-3	12/1/2004	76	2:09:00 PM	---	17.8	0.09	1.6
TBGC-3	12/1/2004	76	2:14:00 PM	---	17.9	0.09	1.6
TBGC-3	12/17/2004	76	1:35:00 PM	19	---	---	---
TBGC-3	12/17/2004	76	2:22:00 PM	19	---	---	---
TBGC-3	12/17/2004	76	2:32:00 PM	---	17.3	0.07	1.4
TBGC-3	12/17/2004	76	2:37:00 PM	---	17.4	0.07	1.5
TBGC-3	12/17/2004	76	2:42:00 PM	---	17.6	0.07	1.5
TBGC-3	12/31/2004	76	2:16:00 PM	19	---	---	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-3	12/31/2004	76	3:00:00 PM	19	---	---	---
TBGC-3	12/31/2004	76	3:10:00 PM	---	16.8	0.08	1.5
TBGC-3	12/31/2004	76	3:15:00 PM	---	17	0.08	1.6
TBGC-3	12/31/2004	76	3:20:00 PM	---	17.3	0.07	1.6
TBGC-3	3/1/2005	76	11:30:00 AM	19	---	---	---
TBGC-3	3/1/2005	76	12:17:00 PM	19	---	---	---
TBGC-3	3/1/2005	76	12:27:00 PM	---	15.9	0.06	1.4
TBGC-3	3/1/2005	76	12:32:00 PM	---	15.9	0.06	1.4
TBGC-3	3/1/2005	76	12:37:00 PM	---	16	0.06	1.4
TBGC-3	6/23/2005	76	12:25:00 PM	19	---	---	---
TBGC-3	6/23/2005	76	1:10:00 PM	19	---	---	---
TBGC-3	6/23/2005	76	1:20:00 PM	---	4.5	2.1	1.7
TBGC-3	6/23/2005	76	1:25:00 PM	---	4.8	2	1.6
TBGC-3	6/23/2005	76	1:30:00 PM	---	4.7	2.1	1.6
TBGC-3	11/9/2005	76	10:41:00 AM	19	---	---	---
TBGC-3	11/9/2005	76	11:27:00 AM	19	---	---	---
TBGC-3	11/9/2005	76	11:37:00 AM	---	9.7	0.24	1.3
TBGC-3	11/9/2005	76	11:42:00 AM	---	10.1	0.24	1.4
TBGC-3	11/9/2005	76	11:47:00 AM	---	10.3	0.23	1.4
TBGC-3	10/18/2004	146	9:32:00 AM	19.2	---	---	---
TBGC-3	10/18/2004	146	10:47:00 AM	19.2	---	---	1.2
TBGC-3	10/18/2004	146	10:57:00 AM	---	20.9	0	1.4
TBGC-3	10/18/2004	146	11:02:00 AM	---	20.8	0	1.5
TBGC-3	10/18/2004	146	11:07:00 AM	---	20.7	0	1.5
TBGC-3	12/1/2004	146	2:15:00 PM	19.3	---	---	---
TBGC-3	12/1/2004	146	2:25:00 PM	---	21.5	0	1.7
TBGC-3	12/1/2004	146	2:30:00 PM	---	21.4	0	1.7
TBGC-3	12/1/2004	146	2:35:00 PM	---	21.4	0	1.7
TBGC-3	12/17/2004	146	1:35:00 PM	19.3	---	---	---
TBGC-3	12/17/2004	146	2:43:00 PM	19.3	---	---	---
TBGC-3	12/17/2004	146	2:53:00 PM	---	21.4	0	1.4
TBGC-3	12/17/2004	146	2:58:00 PM	---	21.4	0	1.6
TBGC-3	12/17/2004	146	3:03:00 PM	---	21.5	0	1.5
TBGC-3	12/31/2004	146	2:16:00 PM	19.3	---	---	---
TBGC-3	12/31/2004	146	3:21:00 PM	19.3	---	---	---
TBGC-3	12/31/2004	146	3:31:00 PM	---	21.8	0	1.7
TBGC-3	12/31/2004	146	3:36:00 PM	---	21.8	0	1.7
TBGC-3	12/31/2004	146	3:41:00 PM	---	21.8	0	1.7
TBGC-3	3/1/2005	146	11:30:00 AM	19.4	---	---	---
TBGC-3	3/1/2005	146	12:38:00 PM	19.4	---	---	---
TBGC-3	3/1/2005	146	12:48:00 PM	---	18.8	0.05	1.7
TBGC-3	3/1/2005	146	12:53:00 PM	---	18.7	0.05	1.6
TBGC-3	3/1/2005	146	12:58:00 PM	---	18.7	0.05	1.7
TBGC-3	6/23/2005	146	12:25:00 PM	19.4	---	---	---
TBGC-3	6/23/2005	146	1:31:00 PM	19.4	---	---	---
TBGC-3	6/23/2005	146	1:41:00 PM	---	18.9	0.05	2.1
TBGC-3	6/23/2005	146	1:46:00 PM	---	19.1	0.04	2
TBGC-3	6/23/2005	146	1:51:00 PM	---	19.2	0.04	1.9

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-3	11/9/2005	146	12:03:00 AM	---	20.1	0.03	1.7
TBGC-3	11/9/2005	146	12:08:00 AM	---	20.1	0.03	1.7
TBGC-3	11/9/2005	146	10:41:00 AM	19.4	---	---	---
TBGC-3	11/9/2005	146	11:48:00 AM	19.4	---	---	---
TBGC-3	11/9/2005	146	11:58:00 AM	---	20.1	0.03	1.7
TBGC-4	10/18/2004	6.2	7:20:00 AM	19.4	---	---	---
TBGC-4	10/18/2004	6.2	7:55:00 AM	19.4	---	---	3
TBGC-4	10/18/2004	6.2	8:05:00 AM	---	20.7	0	2.7
TBGC-4	10/18/2004	6.2	8:10:00 AM	---	20.4	0	2.7
TBGC-4	10/18/2004	6.2	8:15:00 AM	---	20.2	0	2.7
TBGC-4	12/1/2004	6.2	11:40:00 AM	14.6	---	---	---
TBGC-4	12/1/2004	6.2	11:50:00 AM	---	20.7	0.01	3.3
TBGC-4	12/1/2004	6.2	11:55:00 AM	---	20.6	0.01	3.3
TBGC-4	12/1/2004	6.2	12:00:00 PM	---	20.5	0.01	3.3
TBGC-4	12/17/2004	6.2	11:35:00 AM	12.8	---	---	---
TBGC-4	12/17/2004	6.2	11:47:00 AM	12.8	---	---	---
TBGC-4	12/17/2004	6.2	11:57:00 AM	---	20.4	0.01	3.3
TBGC-4	12/17/2004	6.2	12:02:00 PM	---	20.1	0.01	3.3
TBGC-4	12/17/2004	6.2	12:07:00 PM	---	19.9	0.01	3.3
TBGC-4	12/31/2004	6.2	12:35:00 PM	11.7	---	---	---
TBGC-4	12/31/2004	6.2	12:44:00 PM	11.7	---	---	---
TBGC-4	12/31/2004	6.2	12:54:00 PM	---	20.7	0.01	2.8
TBGC-4	12/31/2004	6.2	12:59:00 PM	---	20.7	0.01	2.8
TBGC-4	12/31/2004	6.2	1:04:00 PM	---	20.2	0.01	3.0
TBGC-4	3/1/2005	6.2	9:50:00 AM	10.4	---	---	---
TBGC-4	3/1/2005	6.2	9:54:00 AM	10.4	---	---	---
TBGC-4	3/1/2005	6.2	10:04:00 AM	---	20.6	0.01	3.2
TBGC-4	3/1/2005	6.2	10:09:00 AM	---	20.5	0.01	3.2
TBGC-4	3/1/2005	6.2	10:14:00 AM	---	20.3	0	3.2
TBGC-4	6/28/2005	6.2	1:25:00 PM	20.2	---	---	---
TBGC-4	6/28/2005	6.2	1:30:00 PM	20.2	---	---	---
TBGC-4	6/28/2005	6.2	1:40:00 PM	---	20.6	0.01	3.8
TBGC-4	6/28/2005	6.2	1:45:00 PM	---	20.4	0.01	3.8
TBGC-4	6/28/2005	6.2	1:50:00 PM	---	20.3	0.01	3.8
TBGC-4	11/8/2005	6.2	10:25:00 AM	18.5	---	---	---
TBGC-4	11/8/2005	6.2	10:32:00 AM	18.5	---	---	---
TBGC-4	11/8/2005	6.2	10:42:00 AM	---	20.2	0.01	3
TBGC-4	11/8/2005	6.2	10:47:00 AM	---	20.1	0.02	3
TBGC-4	11/8/2005	6.2	10:52:00 AM	---	20	0.02	3
TBGC-4	10/18/2004	16.2	7:20:00 AM	19.4	---	---	---
TBGC-4	10/18/2004	16.2	8:16:00 AM	19.4	---	---	2.5
TBGC-4	10/18/2004	16.2	8:26:00 AM	---	19.9	0.2	2.5
TBGC-4	10/18/2004	16.2	8:31:00 AM	---	20.7	0.2	2.5
TBGC-4	10/18/2004	16.2	8:36:00 AM	---	20.5	0.2	2.6
TBGC-4	12/1/2004	16.2	12:01:00 PM	18.7	---	---	---
TBGC-4	12/1/2004	16.2	12:11:00 PM	---	20.3	0.04	2.9
TBGC-4	12/1/2004	16.2	12:16:00 PM	---	20.2	0.04	2.8
TBGC-4	12/1/2004	16.2	12:21:00 PM	---	20.1	0.03	2.9

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-4	12/17/2004	16.2	11:35:00 AM	18.2	---	---	---
TBGC-4	12/17/2004	16.2	12:08:00 PM	18.2	---	---	---
TBGC-4	12/17/2004	16.2	12:18:00 PM	---	19.6	0.03	3.1
TBGC-4	12/17/2004	16.2	12:23:00 PM	---	19.5	0.03	3
TBGC-4	12/17/2004	16.2	12:28:00 PM	---	19.4	0.03	3
TBGC-4	12/31/2004	16.2	12:35:00 PM	17.7	---	---	---
TBGC-4	12/31/2004	16.2	1:05:00 PM	17.7	---	---	---
TBGC-4	12/31/2004	16.2	1:20:00 PM	---	20	0.04	3.0
TBGC-4	12/31/2004	16.2	1:25:00 PM	---	20	0.03	3.1
TBGC-4	12/31/2004	16.2	4:15:00 PM	---	20	0.04	3.2
TBGC-4	3/1/2005	16.2	9:50:00 AM	15.6	---	---	---
TBGC-4	3/1/2005	16.2	10:15:00 AM	15.6	---	---	---
TBGC-4	3/1/2005	16.2	10:25:00 AM	---	20	0.14	2.4
TBGC-4	3/1/2005	16.2	10:30:00 AM	---	19.9	0.11	2.6
TBGC-4	3/1/2005	16.2	10:35:00 AM	---	19.8	0.09	2.5
TBGC-4	6/28/2005	16.2	1:25:00 PM	16.1	---	---	---
TBGC-4	6/28/2005	16.2	1:51:00 PM	16.1	---	---	---
TBGC-4	6/28/2005	16.2	2:01:00 PM	---	19.7	0.04	3.3
TBGC-4	6/28/2005	16.2	2:06:00 PM	---	19.5	0.04	3.3
TBGC-4	6/28/2005	16.2	2:11:00 PM	---	19.3	0.04	3.4
TBGC-4	11/8/2005	16.2	10:25:00 AM	19.1	---	---	---
TBGC-4	11/8/2005	16.2	10:53:00 AM	19.1	---	---	---
TBGC-4	11/8/2005	16.2	11:03:00 AM	---	19.8	0.07	2.8
TBGC-4	11/8/2005	16.2	11:08:00 AM	---	19.8	6	2.9
TBGC-4	11/8/2005	16.2	11:13:00 AM	---	19.9	0.05	2.8
TBGC-4	10/18/2004	26.2	7:20:00 AM	18.5	---	---	---
TBGC-4	10/18/2004	26.2	8:37:00 AM	18.5	---	---	2.5
TBGC-4	10/18/2004	26.2	8:47:00 AM	---	18	0.2	2.5
TBGC-4	10/18/2004	26.2	8:52:00 AM	---	18.1	0.2	2.5
TBGC-4	10/18/2004	26.2	8:57:00 AM	---	17.9	0.2	2.5
TBGC-4	12/1/2004	26.2	12:22:00 PM	18.7	---	---	---
TBGC-4	12/1/2004	26.2	12:32:00 PM	---	19.6	0.03	2.6
TBGC-4	12/1/2004	26.2	12:37:00 PM	---	19.6	0.03	2.6
TBGC-4	12/1/2004	26.2	12:42:00 PM	---	19.5	0.03	2.6
TBGC-4	12/17/2004	26.2	11:35:00 AM	18.7	---	---	---
TBGC-4	12/17/2004	26.2	12:29:00 PM	18.7	---	---	---
TBGC-4	12/17/2004	26.2	12:39:00 PM	---	18.9	0.03	2.8
TBGC-4	12/17/2004	26.2	12:44:00 PM	---	18.9	0.03	2.8
TBGC-4	12/17/2004	26.2	12:49:00 PM	---	18.9	0.03	2.8
TBGC-4	12/31/2004	26.2	12:35:00 PM	18.7	---	---	---
TBGC-4	12/31/2004	26.2	1:26:00 PM	18.7	---	---	---
TBGC-4	12/31/2004	26.2	1:36:00 PM	---	19.5	0.03	2.6
TBGC-4	12/31/2004	26.2	1:41:00 PM	---	19.4	0.03	2.5
TBGC-4	12/31/2004	26.2	1:46:00 PM	---	19.3	0.03	2.5
TBGC-4	3/1/2005	26.2	9:50:00 AM	18	---	---	---
TBGC-4	3/1/2005	26.2	10:36:00 AM	18	---	---	---
TBGC-4	3/1/2005	26.2	10:46:00 AM	18	19.2	0.06	2.6
TBGC-4	3/1/2005	26.2	10:51:00 AM	---	19.2	0.06	2.5

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-4	3/1/2005	26.2	10:56:00 AM	---	19.2	0.07	2.5
TBGC-4	6/28/2005	26.2	1:25:00 PM	16.9	---	---	---
TBGC-4	6/28/2005	26.2	2:12:00 PM	16.9	---	---	---
TBGC-4	6/28/2005	26.2	2:22:00 PM	---	17.4	0.13	2.9
TBGC-4	6/28/2005	26.2	2:27:00 PM	---	17.1	0.13	3
TBGC-4	6/28/2005	26.2	2:32:00 PM	---	16.9	0.13	3
TBGC-4	11/8/2005	26.2	10:25:00 AM	18.1	---	---	---
TBGC-4	11/8/2005	26.2	11:14:00 AM	18.1	---	---	---
TBGC-4	11/8/2005	26.2	11:24:00 AM	---	18.7	0.1	2.7
TBGC-4	11/8/2005	26.2	11:29:00 AM	---	18.7	0.1	2.6
TBGC-4	11/8/2005	26.2	11:34:00 AM	---	18.7	0.1	2.6
TBGC-4	10/18/2004	36.2	7:20:00 AM	18.5	---	---	---
TBGC-4	10/18/2004	36.2	8:58:00 AM	18.5	---	---	2.3
TBGC-4	10/18/2004	36.2	9:08:00 AM	---	18.8	0	2.4
TBGC-4	10/18/2004	36.2	9:13:00 AM	---	18.6	0	2.3
TBGC-4	10/18/2004	36.2	9:20:00 AM	---	18.6	0	2.3
TBGC-4	12/1/2004	36.2	12:43:00 PM	18.6	---	---	---
TBGC-4	12/1/2004	36.2	12:53:00 PM	---	19.2	0.02	2.3
TBGC-4	12/1/2004	36.2	12:58:00 PM	---	19.2	0.02	2.6
TBGC-4	12/1/2004	36.2	1:02:00 PM	---	19.2	0.02	2.5
TBGC-4	12/17/2004	36.2	11:35:00 AM	18.7	---	---	---
TBGC-4	12/17/2004	36.2	12:50:00 PM	18.7	---	---	---
TBGC-4	12/17/2004	36.2	1:00:00 PM	---	18.6	0.02	2.6
TBGC-4	12/17/2004	36.2	1:05:00 PM	---	18.6	0.02	2.7
TBGC-4	12/17/2004	36.2	1:10:00 PM	---	18.6	0.02	2.6
TBGC-4	12/31/2004	36.2	12:35:00 PM	18.7	---	---	---
TBGC-4	12/31/2004	36.2	1:47:00 PM	18.7	---	---	---
TBGC-4	12/31/2004	36.2	1:57:00 PM	---	19	0.02	2.5
TBGC-4	12/31/2004	36.2	2:02:00 PM	---	19	0.02	2.5
TBGC-4	12/31/2004	36.2	2:07:00 PM	---	19.1	0.02	2.5
TBGC-4	3/1/2005	36.2	9:50:00 AM	36.2	---	---	---
TBGC-4	3/1/2005	36.2	10:57:00 AM	18.7	---	---	---
TBGC-4	3/1/2005	36.2	11:07:00 AM	---	18.6	0.03	2.3
TBGC-4	3/1/2005	36.2	11:12:00 AM	---	18.7	0.03	2.4
TBGC-4	3/1/2005	36.2	11:17:00 AM	---	18.7	0.02	2.3
TBGC-4	6/28/2005	36.2	1:25:00 PM	17.9	---	---	---
TBGC-4	6/28/2005	36.2	2:33:00 PM	17.9	---	---	---
TBGC-4	6/28/2005	36.2	2:43:00 PM	---	16.8	0.04	2.8
TBGC-4	6/28/2005	36.2	2:48:00 PM	---	17	0.04	2.8
TBGC-4	6/28/2005	36.2	2:53:00 PM	---	17.2	0.04	2.8
TBGC-4	11/8/2005	36.2	10:25:00 AM	17.9	---	---	---
TBGC-4	11/8/2005	36.2	11:35:00 AM	17.9	---	---	---
TBGC-4	11/8/2005	36.2	11:45:00 AM	---	18.6	0.06	2.5
TBGC-4	11/8/2005	36.2	11:50:00 AM	---	18.5	0.06	2.5
TBGC-4	11/8/2005	36.2	11:55:00 AM	---	18.4	0.06	2.5
TBGC-5	10/7/2004	16.3	1:06:00 PM	---	7.3	0.8	---
TBGC-5	10/7/2004	16.3	1:11:00 PM	---	6.3	0.8	---
TBGC-5	10/7/2004	16.3	1:16:00 PM	---	6.9	0.8	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-5	10/20/2004	16.3	2:16:00 PM	20.7	---	---	---
TBGC-5	10/20/2004	16.3	2:21:00 PM	20.7	---	---	---
TBGC-5	10/20/2004	16.3	2:31:00 PM	---	4.1	0.8	2.7
TBGC-5	10/20/2004	16.3	2:36:00 PM	---	4.2	0.8	2.6
TBGC-5	10/20/2004	16.3	2:41:00 PM	---	4.5	0.8	2.7
TBGC-5	12/2/2004	16.3	12:18:00 PM	19.8	---	---	---
TBGC-5	12/2/2004	16.3	12:28:00 PM	---	12.9	1.6	2.7
TBGC-5	12/2/2004	16.3	12:33:00 PM	---	12.9	1.5	2.6
TBGC-5	12/2/2004	16.3	12:38:00 PM	---	12.9	1.5	2.5
TBGC-5	12/14/2004	16.3	9:40:00 AM	19.4	---	---	---
TBGC-5	12/14/2004	16.3	9:49:00 AM	19.4	---	---	---
TBGC-5	12/14/2004	16.3	9:59:00 AM	---	11.9	0.49	2.8
TBGC-5	12/14/2004	16.3	10:04:00 AM	---	11.9	0.48	2.7
TBGC-5	12/14/2004	16.3	10:09:00 AM	---	11.9	0.47	2.7
TBGC-5	12/29/2004	16.3	8:13:00 AM	18.7	---	---	---
TBGC-5	12/29/2004	16.3	8:23:00 AM	---	10.7	0.58	2.7
TBGC-5	12/29/2004	16.3	8:28:00 AM	---	10.8	0.58	2.5
TBGC-5	12/29/2004	16.3	8:33:00 AM	---	10.9	0.57	2.6
TBGC-5	3/3/2005	16.3	10:05:00 AM	15.9	---	---	---
TBGC-5	3/3/2005	16.3	10:10:00 AM	15.9	---	---	---
TBGC-5	3/3/2005	16.3	10:20:00 AM	---	13.2	0.33	2.9
TBGC-5	3/3/2005	16.3	10:25:00 AM	---	13	0.32	2.9
TBGC-5	3/3/2005	16.3	10:30:00 AM	---	12.8	0.32	2.9
TBGC-5	6/24/2005	16.3	3:05:00 PM	16.9	---	---	---
TBGC-5	6/24/2005	16.3	3:20:00 PM	16.9	---	---	---
TBGC-5	6/24/2005	16.3	3:30:00 PM	---	9.9	0.55	3.3
TBGC-5	6/24/2005	16.3	3:35:00 PM	---	9.9	0.55	3.3
TBGC-5	6/24/2005	16.3	3:40:00 PM	---	9.8	0.55	3.4
TBGC-5	11/6/2005	16.3	9:16:00 AM	20.5	---	---	---
TBGC-5	11/6/2005	16.3	9:22:00 AM	20.5	---	---	---
TBGC-5	11/6/2005	16.3	9:32:00 AM	---	7.7	0.92	2.8
TBGC-5	11/6/2005	16.3	9:37:00 AM	---	6.9	0.97	2.8
TBGC-5	11/6/2005	16.3	9:42:00 AM	---	6.5	1	2.8
TBGC-5	10/7/2004	36.5	12:44:00 PM	---	0.1	3.4	---
TBGC-5	10/7/2004	36.5	12:49:00 PM	---	0	2.8	---
TBGC-5	10/7/2004	36.5	12:54:00 PM	---	0	2.2	---
TBGC-5	10/20/2004	36.5	2:16:00 PM	20.9	---	---	---
TBGC-5	10/20/2004	36.5	2:42:00 PM	20.9	---	---	---
TBGC-5	10/20/2004	36.5	2:52:00 PM	---	0	3.6	1.9
TBGC-5	10/20/2004	36.5	2:57:00 PM	---	0	3.5	2
TBGC-5	10/20/2004	36.5	3:02:00 PM	---	0	3.4	1.7
TBGC-5	12/2/2004	36.5	12:39:00 PM	21.1	---	---	---
TBGC-5	12/2/2004	36.5	12:49:00 PM	---	0	3.6	1.9
TBGC-5	12/2/2004	36.5	12:54:00 PM	---	0	3.5	1.8
TBGC-5	12/2/2004	36.5	12:59:00 PM	---	0	3.4	1.8
TBGC-5	12/14/2004	36.5	9:40:00 AM	21.1	---	---	---
TBGC-5	12/14/2004	36.5	10:10:00 AM	21.1	---	---	---
TBGC-5	12/14/2004	36.5	10:20:00 AM	---	0.1	3.6	2

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-5	12/14/2004	36.5	10:25:00 AM	---	0	3.6	2.1
TBGC-5	12/14/2004	36.5	10:30:00 AM	---	0.1	3.5	1.9
TBGC-5	12/29/2004	36.5	8:34:00 AM	21.2	---	---	---
TBGC-5	12/29/2004	36.5	8:44:00 AM	---	0	4	2
TBGC-5	12/29/2004	36.5	8:49:00 AM	---	0	3.8	1.9
TBGC-5	12/29/2004	36.5	8:54:00 AM	---	0	3.7	1.8
TBGC-5	3/3/2005	36.5	10:05:00 AM	21.1	---	---	---
TBGC-5	3/3/2005	36.5	10:31:00 AM	21.1	---	---	---
TBGC-5	3/3/2005	36.5	10:41:00 AM	---	0	3.7	2.2
TBGC-5	3/3/2005	36.5	10:46:00 AM	---	0	3.5	2.2
TBGC-5	3/3/2005	36.5	10:51:00 AM	---	0	3.3	2.2
TBGC-5	6/24/2005	36.5	3:05:00 PM	20.3	---	---	---
TBGC-5	6/24/2005	36.5	3:41:00 PM	20.3	---	---	---
TBGC-5	6/24/2005	36.5	3:51:00 PM	---	2	1.75	2.4
TBGC-5	6/24/2005	36.5	3:56:00 PM	---	2	1.63	2.4
TBGC-5	6/24/2005	36.5	4:01:00 PM	---	1.9	1.57	2.4
TBGC-5	11/6/2005	36.5	9:16:00 AM	19.8	---	---	---
TBGC-5	11/6/2005	36.5	9:43:00 AM	19.8	---	---	---
TBGC-5	11/6/2005	36.5	9:53:00 AM	---	0	5.4	2.2
TBGC-5	11/6/2005	36.5	9:58:00 AM	---	0	4.9	2.2
TBGC-5	11/6/2005	36.5	10:03:00 AM	---	0	4.6	2.2
TBGC-5	10/7/2004	76.5	12:23:00 PM	---	14.8	0.6	---
TBGC-5	10/7/2004	76.5	12:28:00 PM	---	15	0.5	---
TBGC-5	10/7/2004	76.5	12:33:00 PM	---	14.7	0.6	---
TBGC-5	10/20/2004	76.5	2:16:00 PM	21.5	---	---	---
TBGC-5	10/20/2004	76.5	3:06:00 PM	21.5	---	---	1.6
TBGC-5	10/20/2004	76.5	3:16:00 PM	---	15.3	0.6	1.7
TBGC-5	10/20/2004	76.5	3:21:00 PM	---	15.4	0.6	1.7
TBGC-5	10/20/2004	76.5	3:26:00 PM	---	15.6	0.6	1.7
TBGC-5	12/2/2004	76.5	1:00:00 PM	21.6	---	---	---
TBGC-5	12/2/2004	76.5	1:10:00 PM	---	18.2	0.8	1.8
TBGC-5	12/2/2004	76.5	1:15:00 PM	---	18.2	0.8	1.8
TBGC-5	12/2/2004	76.5	1:20:00 PM	---	18.3	0.8	1.8
TBGC-5	12/14/2004	76.5	9:40:00 AM	21.6	---	---	---
TBGC-5	12/14/2004	76.5	10:31:00 AM	21.6	---	---	---
TBGC-5	12/14/2004	76.5	10:41:00 AM	---	17.5	0.39	1.8
TBGC-5	12/14/2004	76.5	10:46:00 AM	---	17.5	0.15	1.8
TBGC-5	12/14/2004	76.5	10:51:00 AM	---	17.4	0.15	1.8
TBGC-5	12/29/2004	76.5	8:55:00 AM	21.7	---	---	---
TBGC-5	12/29/2004	76.5	9:06:00 AM	---	19	0.12	1.8
TBGC-5	12/29/2004	76.5	9:10:00 AM	---	19	0.12	1.9
TBGC-5	12/29/2004	76.5	9:15:00 AM	---	19	0.11	1.8
TBGC-5	3/3/2005	76.5	10:05:00 AM	21.8	---	---	---
TBGC-5	3/3/2005	76.5	10:52:00 AM	21.8	---	---	---
TBGC-5	3/3/2005	76.5	11:02:00 AM	---	17	0.12	2.2
TBGC-5	3/3/2005	76.5	11:07:00 AM	---	17	0.12	2.1
TBGC-5	3/3/2005	76.5	11:12:00 AM	---	16.9	0.12	2.2
TBGC-5	6/24/2005	76.5	3:05:00 PM	22	---	---	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-5	6/24/2005	76.5	4:02:00 PM	22	---	---	---
TBGC-5	6/24/2005	76.5	4:12:00 PM	---	12.5	0.21	2.3
TBGC-5	6/24/2005	76.5	4:17:00 PM	---	12.4	0.21	2.4
TBGC-5	6/24/2005	76.5	4:22:00 PM	---	12.3	0.21	2.3
TBGC-5	11/6/2005	76.5	9:16:00 AM	22.3	---	---	---
TBGC-5	11/6/2005	76.5	10:04:00 AM	22.3	---	---	---
TBGC-5	11/6/2005	76.5	10:14:00 AM	---	16	0.14	1.9
TBGC-5	11/6/2005	76.5	10:19:00 AM	---	16	0.14	2
TBGC-5	11/6/2005	76.5	10:24:00 AM	---	16	0.14	2
TBGC-5	10/7/2004	136.5	12:01:00 PM	---	20.1	0.4	---
TBGC-5	10/7/2004	136.5	12:06:00 PM	---	19.7	0.4	---
TBGC-5	10/7/2004	136.5	12:11:00 PM	---	19.7	0.4	---
TBGC-5	10/20/2004	136.5	2:16:00 PM	17.6	---	---	---
TBGC-5	10/20/2004	136.5	3:27:00 PM	17.6	---	---	---
TBGC-5	10/20/2004	136.5	3:37:00 PM	---	20.4	0.6	1.4
TBGC-5	10/20/2004	136.5	3:42:00 PM	---	20.2	0.4	1.3
TBGC-5	10/20/2004	136.5	3:47:00 PM	---	20.4	0.4	1.4
TBGC-5	12/2/2004	136.5	1:21:00 PM	17.7	---	---	---
TBGC-5	12/2/2004	136.5	1:31:00 PM	---	19.5	1.5	1.5
TBGC-5	12/2/2004	136.5	1:36:00 PM	---	19.6	1.5	1.4
TBGC-5	12/2/2004	136.5	1:41:00 PM	---	19.8	1.4	1.4
TBGC-5	12/14/2004	136.5	9:40:00 AM	17.7	---	---	---
TBGC-5	12/14/2004	136.5	10:52:00 AM	17.7	---	---	---
TBGC-5	12/14/2004	136.5	11:02:00 AM	---	18.6	0.39	1.4
TBGC-5	12/14/2004	136.5	11:07:00 AM	---	18.8	0.2	1.6
TBGC-5	12/14/2004	136.5	11:12:00 AM	---	18.8	0.19	1.5
TBGC-5	12/29/2004	136.5	9:16:00 AM	17.7	---	---	---
TBGC-5	12/29/2004	136.5	9:26:00 AM	---	20	0.51	1.4
TBGC-5	12/29/2004	136.5	9:31:00 AM	---	20.1	0.47	1.4
TBGC-5	12/29/2004	136.5	9:36:00 AM	---	20.1	0.37	1.5
TBGC-5	3/3/2005	136.5	10:05:00 AM	17.8	---	---	---
TBGC-5	3/3/2005	136.5	11:13:00 AM	17.8	---	---	---
TBGC-5	3/3/2005	136.5	11:23:00 AM	---	18.4	0.47	1.7
TBGC-5	3/3/2005	136.5	11:28:00 AM	---	18.5	0.42	1.7
TBGC-5	3/3/2005	136.5	11:33:00 AM	---	18.5	0.34	1.8
TBGC-5	6/24/2005	136.5	3:05:00 PM	17.8	---	---	---
TBGC-5	6/24/2005	136.5	4:23:00 PM	17.8	---	---	---
TBGC-5	6/24/2005	136.5	4:33:00 PM	---	18.4	0.65	1.9
TBGC-5	6/24/2005	136.5	4:38:00 PM	---	18.4	0.62	1.8
TBGC-5	6/24/2005	136.5	4:43:00 PM	---	18.5	0.58	1.8
TBGC-5	11/6/2005	136.5	9:16:00 AM	18	---	---	---
TBGC-5	11/6/2005	136.5	10:25:00 AM	18	---	---	---
TBGC-5	11/6/2005	136.5	10:35:00 AM	---	20.4	0.38	1.7
TBGC-5	11/6/2005	136.5	10:40:00 AM	---	20.5	0.35	1.6
TBGC-5	11/6/2005	136.5	10:45:00 AM	---	20.5	0.29	1.7
TBGC-6	10/20/2004	6.3	10:23:00 AM	27.3	---	---	---
TBGC-6	10/20/2004	6.3	11:39:00 AM	27.3	---	---	2.7
TBGC-6	10/20/2004	6.3	11:49:00 AM	---	2.3	0.2	2.7

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-6	10/20/2004	6.3	11:54:00 AM	---	2.2	0.2	2.7
TBGC-6	10/20/2004	6.3	11:59:00 AM	---	1.9	0.2	2.7
TBGC-6	12/3/2004	6.3	1:50:00 PM	16.9	---	---	---
TBGC-6	12/3/2004	6.3	2:00:00 PM	---	8.8	0.07	3.5
TBGC-6	12/3/2004	6.3	2:05:00 PM	---	8.8	0.06	3.5
TBGC-6	12/3/2004	6.3	2:10:00 PM	---	8.8	0.07	3.4
TBGC-6	12/18/2004	6.3	3:34:00 PM	15.2	---	---	---
TBGC-6	12/18/2004	6.3	3:44:00 PM	---	9.7	0.05	3.1
TBGC-6	12/18/2004	6.3	3:49:00 PM	---	9.7	0.05	3
TBGC-6	12/18/2004	6.3	3:53:00 PM	---	9.8	0.05	3.2
TBGC-6	12/31/2004	6.3	10:08:00 AM	14.1	---	---	---
TBGC-6	12/31/2004	6.3	10:12:00 AM	14.1	---	---	---
TBGC-6	12/31/2004	6.3	10:22:00 AM	---	9.4	0.06	3.1
TBGC-6	12/31/2004	6.3	10:27:00 AM	---	9.4	0.06	3.2
TBGC-6	12/31/2004	6.3	10:32:00 AM	---	9.4	0.06	3.1
TBGC-6	3/1/2005	6.3	3:39:00 PM	13.4	---	---	---
TBGC-6	3/1/2005	6.3	3:49:00 PM	---	8.6	0.07	3.2
TBGC-6	3/1/2005	6.3	3:54:00 PM	---	8.7	0.07	3
TBGC-6	3/1/2005	6.3	3:59:00 PM	---	8.8	0.07	3.1
TBGC-6	11/7/2005	6.3	9:25:00 AM	23.8	---	---	---
TBGC-6	11/7/2005	6.3	9:31:00 AM	23.8	---	---	---
TBGC-6	11/7/2005	6.3	9:41:00 AM	---	4.9	0.13	3.1
TBGC-6	11/7/2005	6.3	9:46:00 AM	---	4.8	0.13	3
TBGC-6	11/7/2005	6.3	9:51:00 AM	---	4.7	0.14	3
TBGC-6	10/20/2004	16.3	10:23:00 AM	27.4	---	---	---
TBGC-6	10/20/2004	16.3	12:00:00 PM	27.4	---	---	2.6
TBGC-6	10/20/2004	16.3	12:10:00 PM	---	12.3	0.2	2.5
TBGC-6	10/20/2004	16.3	12:15:00 PM	---	12.5	0.1	2.5
TBGC-6	10/20/2004	16.3	12:20:00 PM	---	12.5	0.2	2.5
TBGC-6	12/3/2004	16.3	2:11:00 PM	27.4	---	---	---
TBGC-6	12/3/2004	16.3	2:21:00 PM	---	15.3	0.06	3.0
TBGC-6	12/3/2004	16.3	2:26:00 PM	---	15.2	0.06	2.9
TBGC-6	12/3/2004	16.3	2:31:00 PM	---	15.2	0.06	2.8
TBGC-6	12/18/2004	16.3	3:54:00 PM	27.1	---	---	---
TBGC-6	12/18/2004	16.3	4:04:00 PM	---	15.6	0.05	2.9
TBGC-6	12/18/2004	16.3	4:09:00 PM	---	15.6	0.05	2.8
TBGC-6	12/18/2004	16.3	4:14:00 PM	---	15.6	0.05	2.8
TBGC-6	12/31/2004	16.3	10:08:00 AM	26.7	---	---	---
TBGC-6	12/31/2004	16.3	10:43:00 AM	---	14.9	0.07	2.8
TBGC-6	12/31/2004	16.3	10:48:00 AM	---	14.8	0.07	2.8
TBGC-6	12/31/2004	16.3	10:53:00 AM	---	14.7	0.07	2.8
TBGC-6	3/1/2005	16.3	4:00:00 PM	25.2	---	---	---
TBGC-6	3/1/2005	16.3	4:10:00 PM	---	15.7	0.06	2.9
TBGC-6	3/1/2005	16.3	4:15:00 PM	---	15.6	0.06	3
TBGC-6	3/1/2005	16.3	4:20:00 PM	---	15.6	0.06	2.9
TBGC-6	11/7/2005	16.3	9:25:00 AM	29.1	---	---	---
TBGC-6	11/7/2005	16.3	9:52:00 AM	29.1	---	---	---
TBGC-6	11/7/2005	16.3	10:02:00 AM	---	13.1	0.12	2.8

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-6	11/7/2005	16.3	10:07:00 AM	---	13	0.12	2.9
TBGC-6	11/7/2005	16.3	10:12:00 AM	---	13	0.12	3.0
TBGC-6	10/20/2004	26.3	10:23:00 AM	22.6	---	---	---
TBGC-6	10/20/2004	26.3	12:21:00 PM	22.6	---	---	2.3
TBGC-6	10/20/2004	26.3	12:31:00 PM	---	16.8	0.2	2.4
TBGC-6	10/20/2004	26.3	12:36:00 PM	---	16.8	0.2	2.4
TBGC-6	10/20/2004	26.3	12:41:00 PM	---	16.8	0.2	2.4
TBGC-6	12/3/2004	26.3	2:32:00 PM	30.1	---	---	---
TBGC-6	12/3/2004	26.3	2:42:00 PM	---	17.1	0.09	2.3
TBGC-6	12/3/2004	26.3	2:47:00 PM	---	17.2	0.09	2.2
TBGC-6	12/3/2004	26.3	2:52:00 PM	---	17.2	0.09	2.2
TBGC-6	12/18/2004	26.3	4:16:00 PM	30.4	---	---	---
TBGC-6	12/18/2004	26.3	4:26:00 PM	---	17.4	0.07	2.4
TBGC-6	12/18/2004	26.3	4:31:00 PM	---	17.5	0.07	2.6
TBGC-6	12/18/2004	26.3	4:36:00 PM	---	17.5	0.07	2.5
TBGC-6	12/31/2004	26.3	10:08:00 AM	30.5	---	---	---
TBGC-6	12/31/2004	26.3	11:04:00 AM	---	17	0.09	2.4
TBGC-6	12/31/2004	26.3	11:09:00 AM	---	17	0.09	2.3
TBGC-6	12/31/2004	26.3	11:14:00 AM	---	16.9	0.09	2.3
TBGC-6	3/1/2005	26.3	4:21:00 PM	30.5	---	---	---
TBGC-6	3/1/2005	26.3	4:31:00 PM	---	17.6	0.08	2.4
TBGC-6	3/1/2005	26.3	4:36:00 PM	---	17.6	0.08	2.4
TBGC-6	3/1/2005	26.3	4:41:00 PM	---	17.6	0.08	2.3
TBGC-6	11/7/2005	26.3	9:25:00 AM	32.1	---	---	---
TBGC-6	11/7/2005	26.3	10:13:00 AM	32.1	---	---	---
TBGC-6	11/7/2005	26.3	10:23:00 AM	---	17	0.16	2.4
TBGC-6	11/7/2005	26.3	10:28:00 AM	---	16.9	0.16	2.4
TBGC-6	11/7/2005	26.3	10:33:00 AM	---	16.8	0.17	2.4
TBGC-6	10/20/2004	36.3	12:42:00 PM	27.3	---	---	2.2
TBGC-6	10/20/2004	36.3	12:52:00 PM	---	16.1	0.2	2.3
TBGC-6	10/20/2004	36.3	12:57:00 PM	---	16.1	0.2	2.3
TBGC-6	10/20/2004	36.3	1:02:00 PM	---	16	0.2	2.4
TBGC-6	12/3/2004	36.3	2:53:00 PM	28	---	---	---
TBGC-6	12/3/2004	36.3	3:03:00 PM	---	15.2	0.1	2.3
TBGC-6	12/3/2004	36.3	3:08:00 PM	---	15.3	0.1	2.3
TBGC-6	12/3/2004	36.3	3:13:00 PM	---	15.4	0.1	2.4
TBGC-6	12/18/2004	36.3	4:37:00 PM	28.1	---	---	---
TBGC-6	12/18/2004	36.3	4:47:00 PM	---	15.6	0.08	2.5
TBGC-6	12/18/2004	36.3	4:52:00 PM	---	15.6	0.08	2.4
TBGC-6	12/18/2004	36.3	4:57:00 PM	---	15.6	0.07	2.5
TBGC-6	12/31/2004	36.3	10:08:00 AM	28.4	---	---	---
TBGC-6	12/31/2004	36.3	11:25:00 AM	---	15.9	0.09	2.5
TBGC-6	12/31/2004	36.3	11:30:00 AM	---	15.8	0.09	2.7
TBGC-6	12/31/2004	36.3	11:35:00 AM	---	15.8	0.09	2.7
TBGC-6	3/1/2005	36.3	4:42:00 PM	29.1	---	---	---
TBGC-6	3/1/2005	36.3	4:52:00 PM	---	17.1	0.08	2.7
TBGC-6	3/1/2005	36.3	4:57:00 PM	---	17.3	0.08	2.6
TBGC-6	3/1/2005	36.3	5:02:00 PM	---	17.3	0.08	2.5

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-6	11/7/2005	36.3	9:25:00 AM	30.2	---	---	---
TBGC-6	11/7/2005	36.3	10:34:00 AM	30.2	---	---	---
TBGC-6	11/7/2005	36.3	10:44:00 AM	---	17.1	0.17	2.6
TBGC-6	11/7/2005	36.3	10:49:00 AM	---	17.1	0.17	2.6
TBGC-6	11/7/2005	36.3	10:54:00 AM	---	17.1	0.17	2.6
TBGC-6	10/20/2004	76.2	10:23:00 AM	---	---	---	---
TBGC-6	10/20/2004	76.2	1:03:00 PM	---	---	---	2
TBGC-6	10/20/2004	76.2	1:13:00 PM	---	20.4	0	2
TBGC-6	10/20/2004	76.2	1:18:00 PM	---	20.3	0.1	2
TBGC-6	10/20/2004	76.2	1:23:00 PM	---	20.3	0	2
TBGC-6	12/3/2004	76.2	3:14:00 PM	22.5	---	---	---
TBGC-6	12/3/2004	76.2	3:24:00 PM	---	20.8	0.04	2.2
TBGC-6	12/3/2004	76.2	3:29:00 PM	---	20.8	0.04	2.1
TBGC-6	12/3/2004	76.2	3:34:00 PM	---	20.8	0.04	2.2
TBGC-6	12/18/2004	76.2	4:58:00 PM	22.5	---	---	---
TBGC-6	12/18/2004	76.2	5:08:00 PM	---	20.9	0.03	2
TBGC-6	12/18/2004	76.2	5:13:00 PM	---	20.9	0.02	2.1
TBGC-6	12/18/2004	76.2	5:18:00 PM	---	20.9	0.03	2.1
TBGC-6	12/31/2004	76.2	11:36:00 AM	22.6	---	---	---
TBGC-6	12/31/2004	76.2	11:46:00 AM	---	19.2	0.05	2.4
TBGC-6	12/31/2004	76.2	11:51:00 AM	---	19.2	0.06	2.3
TBGC-6	12/31/2004	76.2	11:56:00 AM	---	19.2	0.05	2.2
TBGC-6	3/1/2005	76.2	5:03:00 PM	22.6	---	---	---
TBGC-6	3/1/2005	76.2	5:13:00 PM	---	21	0.03	2.3
TBGC-6	3/1/2005	76.2	5:18:00 PM	---	21	0.03	2.3
TBGC-6	3/1/2005	76.2	5:23:00 PM	---	21	0.03	2.2
TBGC-6	11/7/2005	76.2	10:55:00 AM	21.8	---	---	---
TBGC-6	11/7/2005	76.2	11:05:00 AM	---	18.2	0.13	2.3
TBGC-6	11/7/2005	76.2	11:10:00 AM	---	18.3	0.13	2.3
TBGC-6	11/7/2005	76.2	11:15:00 AM	---	18.2	0.13	2.2
TBGC-7	10/7/2004	15.8	11:19:00 AM	---	20.5	0	---
TBGC-7	10/7/2004	15.8	11:24:00 AM	---	20.5	0	---
TBGC-7	10/7/2004	15.8	11:29:00 AM	---	20.5	0	---
TBGC-7	10/20/2004	15.8	4:20:00 PM	30.3	---	---	---
TBGC-7	10/20/2004	15.8	4:35:00 PM	30.3	---	---	---
TBGC-7	10/20/2004	15.8	4:45:00 PM	---	0	4	2.3
TBGC-7	10/20/2004	15.8	4:50:00 PM	---	0	3.9	2.3
TBGC-7	10/20/2004	15.8	4:55:00 PM	---	0	4	2.4
TBGC-7	12/2/2004	15.8	1:58:00 PM	31.3	---	---	---
TBGC-7	12/2/2004	15.8	2:08:00 PM	---	3.7	3.5	2.2
TBGC-7	12/2/2004	15.8	2:13:00 PM	---	3.7	3.4	2.2
TBGC-7	12/2/2004	15.8	2:18:00 PM	---	3.6	3.5	2.2
TBGC-7	12/14/2004	15.8	11:28:00 AM	31	---	---	---
TBGC-7	12/14/2004	15.8	11:31:00 AM	31	---	---	---
TBGC-7	12/14/2004	15.8	11:41:00 AM	---	0	7.5	2.3
TBGC-7	12/14/2004	15.8	11:46:00 AM	---	0	6.4	2.2
TBGC-7	12/14/2004	15.8	11:51:00 AM	---	0	5.8	2.2
TBGC-7	12/29/2004	15.8	9:52:00 AM	30.3	---	---	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-7	12/29/2004	15.8	9:57:00 AM	30.3	---	---	---
TBGC-7	12/29/2004	15.8	10:07:00 AM	---	0	4.1	2.2
TBGC-7	12/29/2004	15.8	10:12:00 AM	---	0	3.9	2.1
TBGC-7	12/29/2004	15.8	10:17:00 AM	---	0	3.9	2.1
TBGC-7	3/3/2005	15.8	11:47:00 AM	26	---	---	---
TBGC-7	3/3/2005	15.8	11:50:00 AM	26	---	---	---
TBGC-7	3/3/2005	15.8	12:00:00 PM	---	0	4.4	2.4
TBGC-7	3/3/2005	15.8	12:05:00 PM	---	0	4.3	2.3
TBGC-7	3/3/2005	15.8	12:10:00 PM	---	0	4	2.2
TBGC-7	7/15/2005	15.8	8:22:00 AM	23.3	---	---	---
TBGC-7	7/15/2005	15.8	8:40:00 AM	23.3	---	---	---
TBGC-7	7/15/2005	15.8	8:50:00 AM	---	0	3.1	2.4
TBGC-7	7/15/2005	15.8	8:55:00 AM	---	0	4.7	2.6
TBGC-7	7/15/2005	15.8	9:00:00 AM	---	0	4.2	2.6
TBGC-7	11/6/2005	15.8	11:00:00 AM	28.9	---	---	---
TBGC-7	11/6/2005	15.8	11:04:00 AM	28.9	---	---	---
TBGC-7	11/6/2005	15.8	11:14:00 AM	28.9	0	1.03	2.2
TBGC-7	11/6/2005	15.8	11:19:00 AM	---	0	0.96	2.3
TBGC-7	11/6/2005	15.8	11:24:00 AM	---	0	0.91	2.2
TBGC-7	10/7/2004	35.8	10:58:00 AM	---	4.6	3.2	---
TBGC-7	10/7/2004	35.8	11:03:00 AM	---	3.1	2.5	---
TBGC-7	10/7/2004	35.8	11:08:00 AM	---	8.5	2.5	---
TBGC-7	10/20/2004	35.8	4:20:00 PM	21.9	---	---	---
TBGC-7	10/20/2004	35.8	4:56:00 PM	21.9	---	---	---
TBGC-7	10/20/2004	35.8	5:06:00 PM	---	19.7	0	2.7
TBGC-7	10/20/2004	35.8	5:11:00 PM	---	19.5	0	2.7
TBGC-7	10/20/2004	35.8	5:16:00 PM	---	19.7	0	2.6
TBGC-7	12/2/2004	35.8	2:19:00 PM	22.2	---	---	---
TBGC-7	12/2/2004	35.8	2:29:00 PM	---	20.5	0.01	2.7
TBGC-7	12/2/2004	35.8	2:34:00 PM	---	20.5	0.01	2.4
TBGC-7	12/2/2004	35.8	2:39:00 PM	---	20.6	0.01	2.5
TBGC-7	12/14/2004	35.8	12:02:00 AM	---	19.9	0.02	2.7
TBGC-7	12/14/2004	35.8	12:07:00 AM	---	19.9	0.02	2.7
TBGC-7	12/14/2004	35.8	12:12:00 AM	---	19.9	0.01	2.7
TBGC-7	12/14/2004	35.8	11:28:00 AM	22.6	---	---	---
TBGC-7	12/14/2004	35.8	11:52:00 AM	22.6	---	---	---
TBGC-7	12/29/2004	35.8	9:52:00 AM	22.5	---	---	---
TBGC-7	12/29/2004	35.8	10:18:00 AM	22.5	---	---	---
TBGC-7	12/29/2004	35.8	10:28:00 AM	---	20.3	0.01	2.7
TBGC-7	12/29/2004	35.8	10:33:00 AM	---	20.1	0.01	2.7
TBGC-7	12/29/2004	35.8	10:38:00 AM	---	19.9	0.01	2.7
TBGC-7	3/3/2005	35.8	11:47:00 AM	16.4	---	---	---
TBGC-7	3/3/2005	35.8	12:11:00 PM	16.4	---	---	---
TBGC-7	3/3/2005	35.8	12:21:00 PM	---	20	0.01	3
TBGC-7	3/3/2005	35.8	12:26:00 PM	---	19.9	0.01	3.1
TBGC-7	3/3/2005	35.8	12:31:00 PM	---	19	0	3
TBGC-7	7/15/2005	35.8	8:22:00 AM	15.9	---	---	---
TBGC-7	7/15/2005	35.8	9:01:00 AM	15.9	---	---	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-7	7/15/2005	35.8	9:11:00 AM	---	18.2	0.02	3.4
TBGC-7	7/15/2005	35.8	9:16:00 AM	---	17.9	0.02	3.3
TBGC-7	7/15/2005	35.8	9:21:00 AM	---	17.8	0.02	3.4
TBGC-7	11/6/2005	35.8	11:00:00 AM	14.9	---	---	---
TBGC-7	11/6/2005	35.8	11:25:00 AM	14.9	---	---	---
TBGC-7	11/6/2005	35.8	11:35:00 AM	---	20	0.01	2.8
TBGC-7	11/6/2005	35.8	11:40:00 AM	---	19.9	0.01	2.8
TBGC-7	11/6/2005	35.8	11:45:00 AM	---	19.7	0.01	2.8
TBGC-7	10/7/2004	75.8	10:37:00 AM	---	0.4	1.3	---
TBGC-7	10/7/2004	75.8	10:42:00 AM	---	0	1	---
TBGC-7	10/7/2004	75.8	10:47:00 AM	---	2.8	0.8	---
TBGC-7	10/20/2004	75.8	4:20:00 PM	19.1	---	---	---
TBGC-7	10/20/2004	75.8	5:17:00 PM	19.1	---	---	---
TBGC-7	10/20/2004	75.8	5:27:00 PM	---	0	2.8	1.9
TBGC-7	10/20/2004	75.8	5:32:00 PM	---	0	2.2	1.9
TBGC-7	10/20/2004	75.8	5:37:00 PM	---	0	2	1.9
TBGC-7	12/2/2004	75.8	2:40:00 PM	19.4	---	---	---
TBGC-7	12/2/2004	75.8	2:50:00 PM	---	3	2.1	1.8
TBGC-7	12/2/2004	75.8	2:55:00 PM	---	3.4	1.9	1.8
TBGC-7	12/2/2004	75.8	3:00:00 PM	---	3.5	1.8	1.8
TBGC-7	12/14/2004	75.8	11:28:00 AM	19.5	---	---	---
TBGC-7	12/14/2004	75.8	12:13:00 PM	19.5	---	---	---
TBGC-7	12/14/2004	75.8	12:23:00 PM	---	0	4.1	1.8
TBGC-7	12/14/2004	75.8	12:28:00 PM	---	0	3.3	1.8
TBGC-7	12/14/2004	75.8	12:33:00 PM	---	0	2.9	1.8
TBGC-7	12/29/2004	75.8	9:52:00 AM	19.5	---	---	---
TBGC-7	12/29/2004	75.8	10:39:00 AM	19.5	---	---	---
TBGC-7	12/29/2004	75.8	10:49:00 AM	---	0	4.7	1.8
TBGC-7	12/29/2004	75.8	10:54:00 AM	---	0	3.9	1.8
TBGC-7	12/29/2004	75.8	10:59:00 AM	---	0	3.4	1.7
TBGC-7	3/3/2005	75.8	11:47:00 AM	20.1	---	---	---
TBGC-7	3/3/2005	75.8	12:32:00 PM	20.1	---	---	---
TBGC-7	3/3/2005	75.8	12:42:00 PM	---	0	3.9	2.1
TBGC-7	3/3/2005	75.8	12:47:00 PM	---	0	3.3	2.1
TBGC-7	3/3/2005	75.8	12:52:00 PM	---	0	3	2
TBGC-7	7/15/2005	75.8	8:22:00 AM	18.1	---	---	---
TBGC-7	7/15/2005	75.8	9:22:00 AM	18.1	---	---	---
TBGC-7	7/15/2005	75.8	9:32:00 AM	---	0	1.34	2.2
TBGC-7	7/15/2005	75.8	9:37:00 AM	---	0	1.16	2.3
TBGC-7	7/15/2005	75.8	9:42:00 AM	---	0	1.07	2.2
TBGC-7	11/6/2005	75.8	12:01:00 AM	---	0	0.93	2.1
TBGC-7	11/6/2005	75.8	12:06:00 AM	---	0	0.82	1.9
TBGC-7	11/6/2005	75.8	11:00:00 AM	19.2	---	---	---
TBGC-7	11/6/2005	75.8	11:46:00 AM	19.2	---	---	---
TBGC-7	11/6/2005	75.8	11:56:00 AM	---	0	1.12	1.9
TBGC-7	10/7/2004	155.8	10:16:00 AM	---	4.3	3.5	---
TBGC-7	10/7/2004	155.8	10:21:00 AM	---	3.3	1.3	---
TBGC-7	10/7/2004	155.8	10:26:00 AM	---	7.5	1.4	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-7	10/20/2004	155.8	4:20:00 PM	16.8	---	---	---
TBGC-7	10/20/2004	155.8	5:38:00 PM	16.8	---	---	---
TBGC-7	10/20/2004	155.8	5:48:00 PM	---	0	5.6	1.5
TBGC-7	10/20/2004	155.8	5:53:00 PM	---	0	6.5	1.5
TBGC-7	10/20/2004	155.8	5:58:00 PM	---	0	4.9	1.5
TBGC-7	12/2/2004	155.8	3:01:00 PM	17	---	---	---
TBGC-7	12/2/2004	155.8	3:11:00 PM	---	0	2.5	1.3
TBGC-7	12/2/2004	155.8	3:16:00 PM	---	0	3	1.3
TBGC-7	12/2/2004	155.8	3:21:00 PM	---	0	2.7	1.3
TBGC-7	12/14/2004	155.8	11:28:00 AM	17	---	---	---
TBGC-7	12/14/2004	155.8	12:34:00 PM	17	---	---	---
TBGC-7	12/14/2004	155.8	12:44:00 PM	---	0	1.32	1.4
TBGC-7	12/14/2004	155.8	12:49:00 PM	---	0	1.49	1.4
TBGC-7	12/14/2004	155.8	12:54:00 PM	---	0	1.3	1.3
TBGC-7	12/29/2004	155.8	9:52:00 AM	16.8	---	---	---
TBGC-7	12/29/2004	155.8	11:00:00 AM	16.8	---	---	---
TBGC-7	12/29/2004	155.8	11:10:00 AM	16.8	0	1.37	1.3
TBGC-7	12/29/2004	155.8	11:15:00 AM	---	0	1.63	1.3
TBGC-7	12/29/2004	155.8	11:20:00 AM	---	0	1.45	1.3
TBGC-7	3/3/2005	155.8	11:47:00 AM	16	---	---	---
TBGC-7	3/3/2005	155.8	12:53:00 PM	16	---	---	---
TBGC-7	3/3/2005	155.8	1:03:00 PM	---	0	1.23	1.6
TBGC-7	3/3/2005	155.8	1:08:00 PM	---	0	1.52	1.6
TBGC-7	3/3/2005	155.8	1:13:00 PM	---	0	1.13	1.6
TBGC-7	7/15/2005	155.8	8:22:00 AM	15.4	---	---	---
TBGC-7	7/15/2005	155.8	9:43:00 AM	15.4	---	---	---
TBGC-7	7/15/2005	155.8	9:53:00 AM	---	0.3	1.56	1.7
TBGC-7	7/15/2005	155.8	9:58:00 AM	---	0.2	1.4	1.7
TBGC-7	7/15/2005	155.8	10:03:00 AM	---	0.1	1.21	1.7
TBGC-7	11/6/2005	155.8	12:07:00 AM	16.3	---	---	---
TBGC-7	11/6/2005	155.8	12:17:00 AM	---	0	0.63	1.6
TBGC-7	11/6/2005	155.8	12:22:00 AM	---	0	0.67	1.6
TBGC-7	11/6/2005	155.8	12:27:00 AM	---	0	0.72	1.5
TBGC-7	11/6/2005	155.8	11:00:00 AM	16.3	---	---	---
TBGC-7	10/7/2004	235.8	9:55:00 AM	---	6.4	3.1	---
TBGC-7	10/7/2004	235.8	10:00:00 AM	---	11	1.8	---
TBGC-7	10/7/2004	235.8	10:05:00 AM	---	10.8	1.8	---
TBGC-7	10/20/2004	235.8	4:20:00 PM	19	---	---	---
TBGC-7	10/20/2004	235.8	5:59:00 PM	19	---	---	---
TBGC-7	10/20/2004	235.8	6:09:00 PM	---	4.3	10.2	1.4
TBGC-7	10/20/2004	235.8	6:14:00 PM	---	4.7	8.7	1.3
TBGC-7	10/20/2004	235.8	6:19:00 PM	---	4.7	7.2	1.3
TBGC-7	12/2/2004	235.8	3:22:00 PM	18.7	---	---	---
TBGC-7	12/2/2004	235.8	3:32:00 PM	---	6.2	13.9	1.2
TBGC-7	12/2/2004	235.8	3:37:00 PM	---	6.2	13.3	1.2
TBGC-7	12/2/2004	235.8	3:42:00 PM	---	6.4	12.7	1.2
TBGC-7	12/14/2004	235.8	11:28:00 AM	18.6	---	---	---
TBGC-7	12/14/2004	235.8	12:55:00 PM	18.6	---	---	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-7	12/14/2004	235.8	1:05:00 PM	---	6.5	11.9	1.3
TBGC-7	12/14/2004	235.8	1:10:00 PM	---	6.8	10.3	1.3
TBGC-7	12/14/2004	235.8	1:15:00 PM	---	7	9	1.3
TBGC-7	12/29/2004	235.8	9:52:00 AM	18.5	---	---	---
TBGC-7	12/29/2004	235.8	11:21:00 AM	18.5	---	---	---
TBGC-7	12/29/2004	235.8	11:31:00 AM	---	0.1	12	1.2
TBGC-7	12/29/2004	235.8	11:36:00 AM	---	0.1	11.3	1.2
TBGC-7	12/29/2004	235.8	11:41:00 AM	---	0.1	10.8	1.2
TBGC-7	3/3/2005	235.8	11:47:00 AM	18.1	---	---	---
TBGC-7	3/3/2005	235.8	1:14:00 PM	18.1	---	---	---
TBGC-7	3/3/2005	235.8	1:24:00 PM	---	11.5	22.6	1.2
TBGC-7	3/3/2005	235.8	1:29:00 PM	---	10.7	20.5	.6
TBGC-7	3/3/2005	235.8	1:34:00 PM	---	10.3	20.9	.4
TBGC-7	7/15/2005	235.8	8:22:00 AM	16.7	---	---	---
TBGC-7	7/15/2005	235.8	10:04:00 AM	16.7	---	---	---
TBGC-7	7/15/2005	235.8	10:14:00 AM	---	8.7	5.5	.6
TBGC-7	7/15/2005	235.8	10:19:00 AM	---	8.6	5.7	.5
TBGC-7	7/15/2005	235.8	10:24:00 AM	---	10.2	2.6	.4
TBGC-7	11/6/2005	235.8	12:28:00 AM	15.7	---	---	---
TBGC-7	11/6/2005	235.8	12:38:00 AM	---	10.4	10.9	1.3
TBGC-7	11/6/2005	235.8	12:43:00 AM	---	10.3	10.7	1.3
TBGC-7	11/6/2005	235.8	12:48:00 AM	---	9.7	10.6	1.3
TBGC-7	11/6/2005	235.8	11:00:00 AM	15.7	---	---	---
TBGC-7A	10/16/2004	16	3:05:00 PM	41.3	---	---	---
TBGC-7A	10/16/2004	16	3:20:00 PM	---	18.3	0	11
TBGC-7A	10/16/2004	16	3:25:00 PM	---	18.3	0	10.6
TBGC-7A	10/16/2004	16	3:30:00 PM	---	18.4	0	11.3
TBGC-7A	12/2/2004	16	9:56:00 AM	38	---	---	---
TBGC-7A	12/2/2004	16	10:06:00 AM	---	19.4	0	2.7
TBGC-7A	12/2/2004	16	10:11:00 AM	---	19.2	0	2.7
TBGC-7A	12/2/2004	16	10:16:00 AM	---	19	0	2.4
TBGC-7A	12/14/2004	16	1:42:00 PM	37.1	---	---	---
TBGC-7A	12/14/2004	16	1:45:00 PM	37.1	---	---	---
TBGC-7A	12/14/2004	16	1:55:00 PM	---	20.3	0	2.7
TBGC-7A	12/14/2004	16	2:00:00 PM	---	20.2	0	2.7
TBGC-7A	12/14/2004	16	2:05:00 PM	---	20.1	0	2.7
TBGC-7A	12/29/2004	16	12:08:00 PM	35.9	---	---	---
TBGC-7A	12/29/2004	16	12:12:00 PM	35.9	---	---	---
TBGC-7A	12/29/2004	16	12:22:00 PM	35.9	17.7	0	2.7
TBGC-7A	12/29/2004	16	12:27:00 PM	---	17.6	0	2.5
TBGC-7A	12/29/2004	16	12:32:00 PM	---	17.4	0	2.4
TBGC-7A	3/3/2005	16	2:19:00 PM	32.4	---	---	---
TBGC-7A	3/3/2005	16	2:24:00 PM	32.4	---	---	---
TBGC-7A	3/3/2005	16	2:34:00 PM	---	19.2	0	2.8
TBGC-7A	3/3/2005	16	2:39:00 PM	---	19.4	0	2.9
TBGC-7A	3/3/2005	16	2:44:00 PM	---	19.4	0	2.9
TBGC-7A	6/24/2005	16	11:15:00 AM	33.8	---	---	---
TBGC-7A	6/24/2005	16	11:23:00 AM	33.8	---	---	---

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-7A	6/24/2005	16	11:33:00 AM	---	19	0	3.2
TBGC-7A	6/24/2005	16	11:38:00 AM	---	18.9	0	3.3
TBGC-7A	6/24/2005	16	11:43:00 AM	---	18.8	0	3.3
TBGC-7A	11/6/2005	16	1:18:00 PM	36.1	---	---	---
TBGC-7A	11/6/2005	16	1:25:00 PM	36.1	---	---	---
TBGC-7A	11/6/2005	16	1:35:00 PM	---	18.1	0.01	2.8
TBGC-7A	11/6/2005	16	1:40:00 PM	---	18	0	2.7
TBGC-7A	11/6/2005	16	1:45:00 PM	---	18.1	0	2.8
TBGC-7A	10/16/2004	35.9	3:31:00 PM	43	---	---	---
TBGC-7A	10/16/2004	35.9	3:42:00 PM	---	17.9	0	8
TBGC-7A	10/16/2004	35.9	3:47:00 PM	---	18	0	7.5
TBGC-7A	10/16/2004	35.9	3:52:00 PM	---	18	0	7
TBGC-7A	12/2/2004	35.9	10:17:00 AM	41.9	---	---	---
TBGC-7A	12/2/2004	35.9	10:27:00 AM	---	16.9	0.01	2.9
TBGC-7A	12/2/2004	35.9	10:32:00 AM	---	16.8	0	2.8
TBGC-7A	12/2/2004	35.9	10:37:00 AM	---	16.7	0	2.5
TBGC-7A	12/14/2004	35.9	1:42:00 PM	41.6	---	---	---
TBGC-7A	12/14/2004	35.9	2:06:00 PM	41.6	---	---	---
TBGC-7A	12/14/2004	35.9	2:16:00 PM	---	17.3	0	2.2
TBGC-7A	12/14/2004	35.9	2:21:00 PM	---	17.3	0	2.2
TBGC-7A	12/14/2004	35.9	2:26:00 PM	---	17.3	0	2.2
TBGC-7A	12/29/2004	35.9	12:08:00 PM	41.2	---	---	---
TBGC-7A	12/29/2004	35.9	12:33:00 PM	41.2	---	---	---
TBGC-7A	12/29/2004	35.9	12:43:00 PM	---	17.3	0	2.3
TBGC-7A	12/29/2004	35.9	12:48:00 PM	---	17.4	---	2.2
TBGC-7A	3/3/2005	35.9	2:19:00 PM	38.4	---	---	---
TBGC-7A	3/3/2005	35.9	2:45:00 PM	38.4	---	---	---
TBGC-7A	3/3/2005	35.9	2:55:00 PM	38.4	17.9	0	2.5
TBGC-7A	3/3/2005	35.9	3:00:00 PM	---	17.8	0	2.4
TBGC-7A	3/3/2005	35.9	3:05:00 PM	---	17.8	0	2.3
TBGC-7A	6/24/2005	35.9	12:04:00 AM	---	18.1	0	2.6
TBGC-7A	6/24/2005	35.9	11:15:00 AM	35.5	---	---	---
TBGC-7A	6/24/2005	35.9	11:44:00 AM	35.5	---	---	---
TBGC-7A	6/24/2005	35.9	11:54:00 AM	---	18.1	0	2.5
TBGC-7A	6/24/2005	35.9	11:59:00 AM	---	18	0	2.6
TBGC-7A	11/6/2005	35.9	1:18:00 PM	34.7	---	---	---
TBGC-7A	11/6/2005	35.9	1:46:00 PM	34.7	---	---	---
TBGC-7A	11/6/2005	35.9	1:56:00 PM	---	18.2	0	2.4
TBGC-7A	11/6/2005	35.9	2:01:00 PM	---	18.2	0	2.4
TBGC-7A	11/6/2005	35.9	2:06:00 PM	---	18.2	0	2.3
TBGC-7A	12/29/2005	35.9	12:53:00 PM	---	17.5	---	2.1
TBGC-7A	10/16/2004	75.9	3:53:00 PM	43	---	---	---
TBGC-7A	10/16/2004	75.9	4:03:00 PM	---	18.1	0	5.5
TBGC-7A	10/16/2004	75.9	4:08:00 PM	---	18.2	0	4.8
TBGC-7A	10/16/2004	75.9	4:13:00 PM	---	18.2	0	5
TBGC-7A	12/2/2004	75.9	10:38:00 AM	40.5	---	---	---
TBGC-7A	12/2/2004	75.9	10:48:00 AM	---	18.2	0.02	2.3
TBGC-7A	12/2/2004	75.9	10:53:00 AM	---	18.3	0.02	2.3

Stockpile Monitoring Data for Geochemical Boreholes

Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-7A	12/2/2004	75.9	10:58:00 AM	---	18.3	0.02	2.2
TBGC-7A	12/14/2004	75.9	1:42:00 PM	39.9	---	---	---
TBGC-7A	12/14/2004	75.9	2:27:00 PM	39.9	---	---	---
TBGC-7A	12/14/2004	75.9	2:37:00 PM	---	19	0.01	1.7
TBGC-7A	12/14/2004	75.9	2:42:00 PM	---	19.2	0.01	1.8
TBGC-7A	12/14/2004	75.9	2:47:00 PM	---	19.3	0.01	1.7
TBGC-7A	12/29/2004	75.9	12:08:00 PM	39.1	---	---	---
TBGC-7A	3/3/2005	75.9	2:19:00 PM	35	---	---	---
TBGC-7A	3/3/2005	75.9	3:06:00 PM	35	---	---	---
TBGC-7A	3/3/2005	75.9	3:16:00 PM	---	18.1	0.01	1.9
TBGC-7A	3/3/2005	75.9	3:21:00 PM	---	18.1	0.01	1.8
TBGC-7A	3/3/2005	75.9	3:26:00 PM	---	18.1	0.01	1.9
TBGC-7A	6/24/2005	75.9	11:15:00 AM	29.6	---	---	---
TBGC-7A	6/24/2005	75.9	12:05:00 PM	29.6	---	---	---
TBGC-7A	6/24/2005	75.9	12:15:00 PM	---	18.1	0.03	2
TBGC-7A	6/24/2005	75.9	12:20:00 PM	---	18.2	0.03	1.9
TBGC-7A	6/24/2005	75.9	12:25:00 PM	---	18.4	0.02	1.9
TBGC-7A	11/6/2005	75.9	1:18:00 PM	28.4	---	---	---
TBGC-7A	11/6/2005	75.9	2:07:00 PM	28.4	---	---	---
TBGC-7A	11/6/2005	75.9	2:17:00 PM	---	19.7	0.05	2
TBGC-7A	11/6/2005	75.9	2:22:00 PM	---	20	0.03	2
TBGC-7A	11/6/2005	75.9	2:27:00 PM	---	20	0.02	2.1
TBGC-7A	12/29/2005	75.9	12:54:00 PM	39.1	---	---	---
TBGC-7A	12/29/2005	75.9	1:04:00 PM	---	18.5	0.06	1.8
TBGC-7A	12/29/2005	75.9	1:09:00 PM	---	18.6	0.05	1.8
TBGC-7A	12/29/2005	75.9	1:14:00 PM	---	18.7	0.04	1.8
TBGC-7A	10/16/2004	155.8	4:14:00 PM	35.6	---	---	---
TBGC-7A	10/16/2004	155.8	4:24:00 PM	---	3.7	1.8	4.5
TBGC-7A	10/16/2004	155.8	4:29:00 PM	---	0.6	2.4	5.5
TBGC-7A	10/16/2004	155.8	4:34:00 PM	---	0	1.7	4
TBGC-7A	12/2/2004	155.8	10:59:00 AM	34.5	---	---	---
TBGC-7A	12/2/2004	155.8	11:09:00 AM	---	4.2	1.9	1.6
TBGC-7A	12/2/2004	155.8	11:14:00 AM	---	4.1	1.8	1.5
TBGC-7A	12/2/2004	155.8	11:19:00 AM	---	4.2	1.6	1.4
TBGC-7A	12/14/2004	155.8	1:42:00 PM	34	---	---	---
TBGC-7A	12/14/2004	155.8	2:47:00 PM	34	---	---	---
TBGC-7A	12/14/2004	155.8	2:58:00 PM	---	0	1.09	1.4
TBGC-7A	12/14/2004	155.8	3:03:00 PM	---	0	0.84	1.3
TBGC-7A	12/14/2004	155.8	3:08:00 PM	---	0	0.61	1.3
TBGC-7A	12/29/2004	155.8	12:08:00 PM	33.3	---	---	---
TBGC-7A	3/3/2005	155.8	2:19:00 PM	30.1	---	---	---
TBGC-7A	3/3/2005	155.8	3:27:00 PM	30.1	---	---	---
TBGC-7A	3/3/2005	155.8	3:37:00 PM	---	0	0.59	1.5
TBGC-7A	3/3/2005	155.8	3:42:00 PM	---	0	0.5	1.5
TBGC-7A	3/3/2005	155.8	3:47:00 PM	---	0	0.36	1.5
TBGC-7A	6/24/2005	155.8	11:15:00 AM	25.7	---	---	---
TBGC-7A	6/24/2005	155.8	12:26:00 PM	25.7	---	---	---
TBGC-7A	6/24/2005	155.8	12:36:00 PM	---	0	0.63	1.6

Stockpile Monitoring Data for Geochemical Boreholes

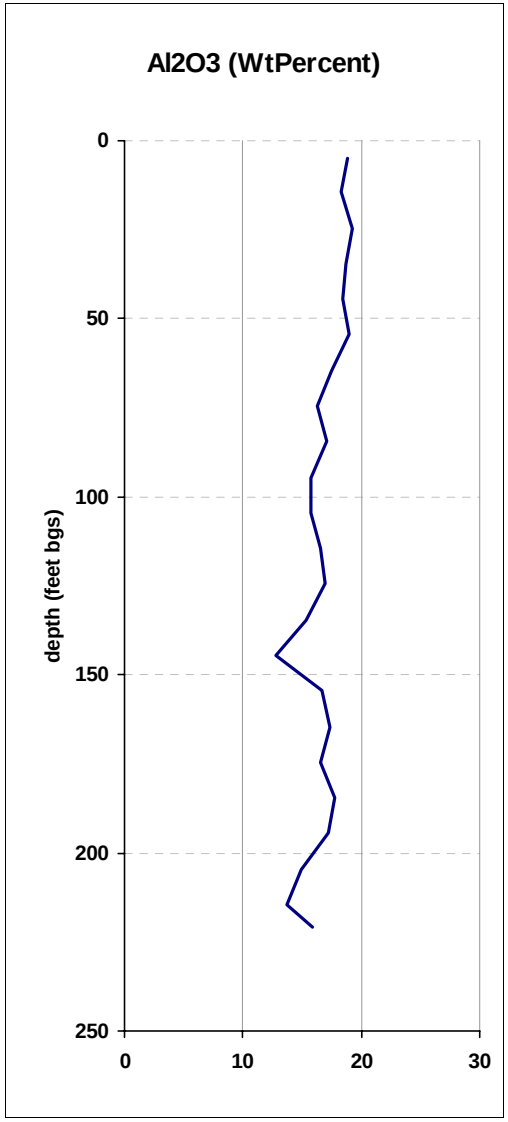
Borehole ID	Date	Depth (ft)	Time	Temp (Celsius)	O_2 (%)	CO_2 (%)	Flow (L/min)
TBGC-7A	6/24/2005	155.8	12:41:00 PM	---	0	0.47	1.5
TBGC-7A	6/24/2005	155.8	12:46:00 PM	---	0	0.43	1.5
TBGC-7A	11/6/2005	155.8	1:18:00 PM	21.8	---	---	---
TBGC-7A	11/6/2005	155.8	2:28:00 PM	21.8	---	---	---
TBGC-7A	11/6/2005	155.8	2:38:00 PM	---	0	0.69	1.6
TBGC-7A	11/6/2005	155.8	2:43:00 PM	---	0	0.5	1.5
TBGC-7A	11/6/2005	155.8	2:48:00 PM	---	0.1	0.41	1.6
TBGC-7A	12/29/2005	155.8	1:15:00 PM	33.3	---	---	---
TBGC-7A	12/29/2005	155.8	1:25:00 PM	---	0	0.94	1.4
TBGC-7A	12/29/2005	155.8	1:30:00 PM	---	0	0.76	1.3
TBGC-7A	12/29/2005	155.8	1:35:00 PM	---	0	0.54	1.4
TBGC-7A	10/16/2004	255.8	4:35:00 PM	28.2	---	---	---
TBGC-7A	10/16/2004	255.8	4:45:00 PM	---	6.9	14.6	3.3
TBGC-7A	10/16/2004	255.8	4:50:00 PM	---	7.1	12.8	3.2
TBGC-7A	10/16/2004	255.8	4:55:00 PM	---	7.1	10.9	3.4
TBGC-7A	12/2/2004	255.8	11:20:00 AM	28.3	---	---	---
TBGC-7A	12/2/2004	255.8	11:30:00 AM	---	0	5.6	1
TBGC-7A	12/2/2004	255.8	11:35:00 AM	---	0	5.3	1.1
TBGC-7A	12/2/2004	255.8	11:40:00 AM	---	0	5.2	1.1
TBGC-7A	12/14/2004	255.8	1:42:00 PM	28.2	---	---	---
TBGC-7A	12/14/2004	255.8	3:09:00 PM	28.2	---	---	---
TBGC-7A	12/14/2004	255.8	3:19:00 PM	---	0.1	6	1.2
TBGC-7A	12/14/2004	255.8	3:24:00 PM	---	0.1	5.6	1.2
TBGC-7A	12/14/2004	255.8	3:29:00 PM	---	0.1	5.3	1.2
TBGC-7A	12/29/2004	255.8	12:08:00 PM	28.2	---	---	---
TBGC-7A	3/3/2005	255.8	2:19:00 PM	27.9	---	---	---
TBGC-7A	3/3/2005	255.8	3:48:00 PM	27.9	---	---	---
TBGC-7A	3/3/2005	255.8	3:58:00 PM	---	0	5.9	1.2
TBGC-7A	3/3/2005	255.8	4:03:00 PM	---	0	5.6	1.2
TBGC-7A	3/3/2005	255.8	4:08:00 PM	---	0	5.3	1.2
TBGC-7A	6/24/2005	255.8	11:15:00 AM	27.1	---	---	---
TBGC-7A	6/24/2005	255.8	12:47:00 PM	27.1	---	---	---
TBGC-7A	6/24/2005	255.8	12:57:00 PM	---	0	7.3	1.3
TBGC-7A	6/24/2005	255.8	1:02:00 PM	---	0	6.8	1.4
TBGC-7A	6/24/2005	255.8	1:07:00 PM	---	0	5.6	1.2
TBGC-7A	11/6/2005	255.8	1:18:00 PM	25.6	---	---	---
TBGC-7A	11/6/2005	255.8	2:49:00 PM	25.6	---	---	---
TBGC-7A	11/6/2005	255.8	2:59:00 PM	---	0	5.6	1.2
TBGC-7A	11/6/2005	255.8	3:04:00 PM	---	0	5.3	1.2
TBGC-7A	11/6/2005	255.8	3:09:00 PM	---	0	5.2	1.3
TBGC-7A	12/29/2005	255.8	1:36:00 PM	28.2	---	---	---
TBGC-7A	12/29/2005	255.8	1:46:00 PM	---	0.1	6	1.2
TBGC-7A	12/29/2005	255.8	1:51:00 PM	---	0	5.5	1.2
TBGC-7A	12/29/2005	255.8	1:56:00 PM	---	0	5.4	1.3

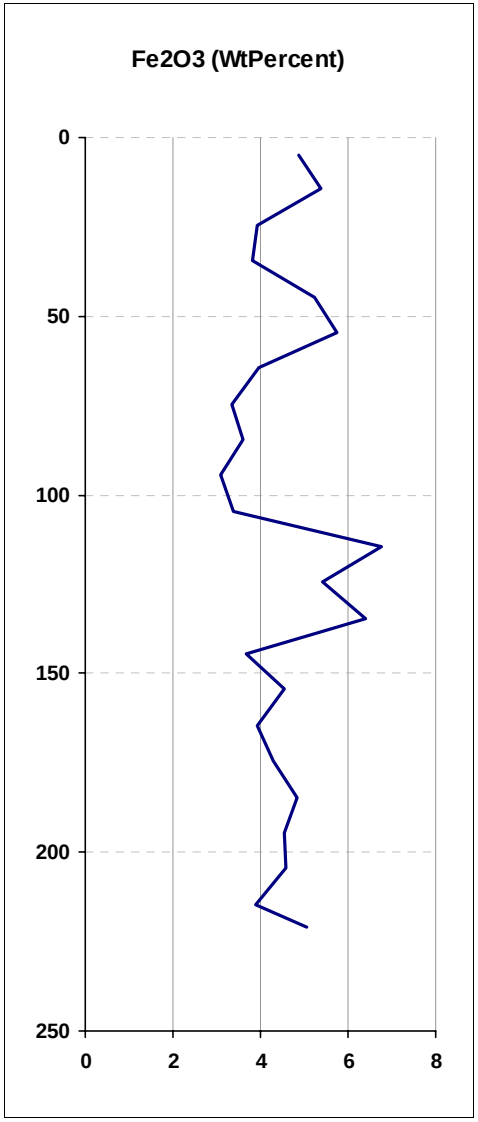
APPENDIX D

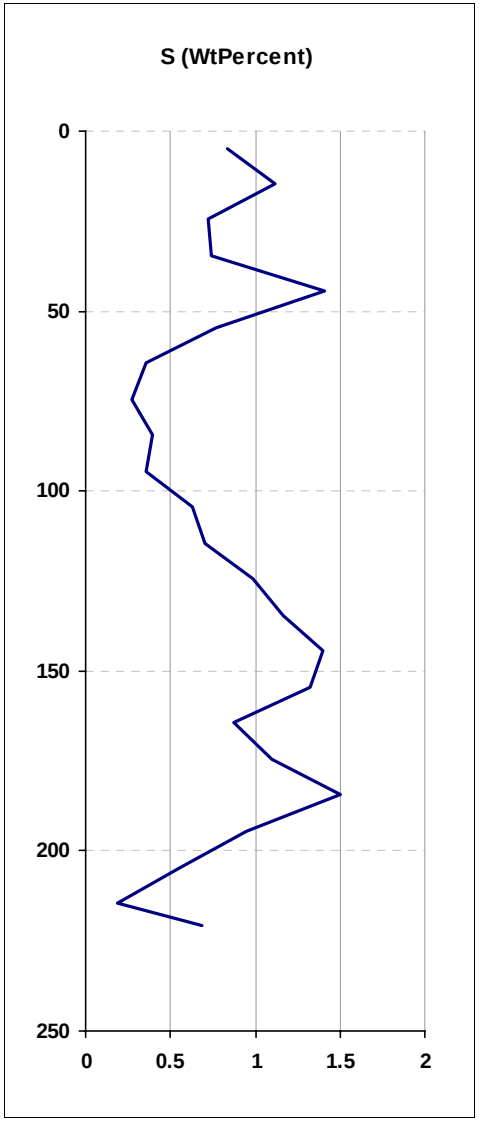
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-1

Test Type: WR







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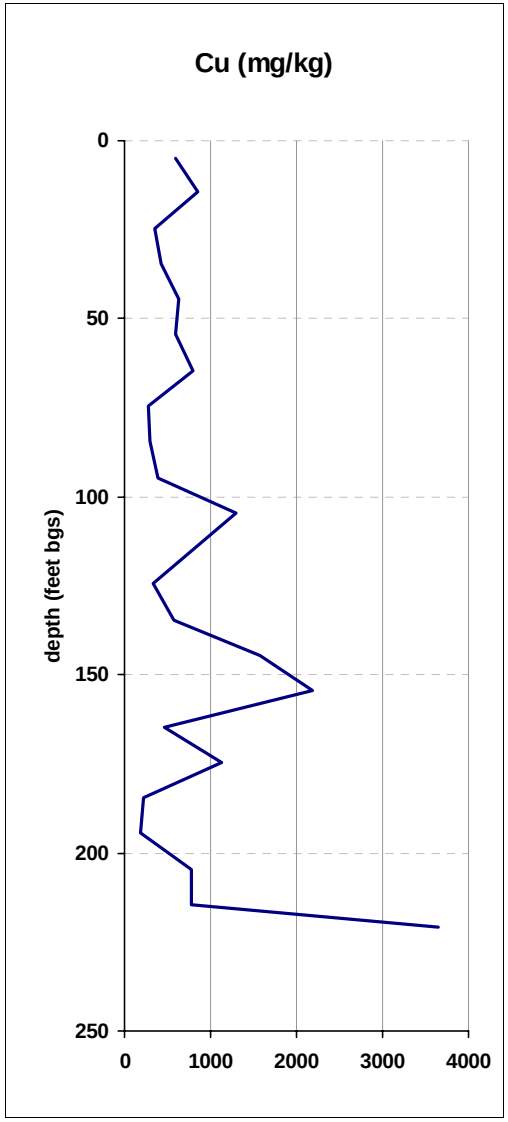
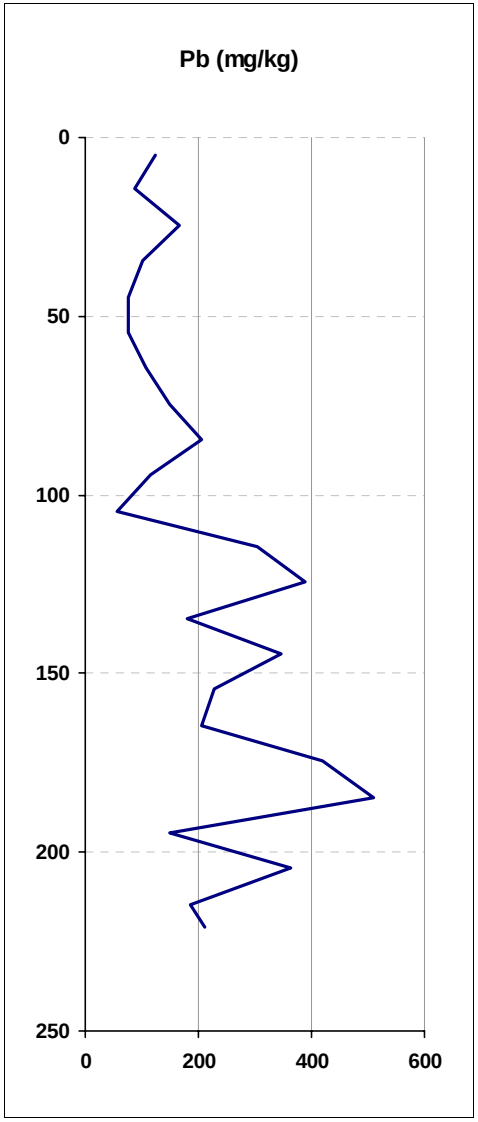
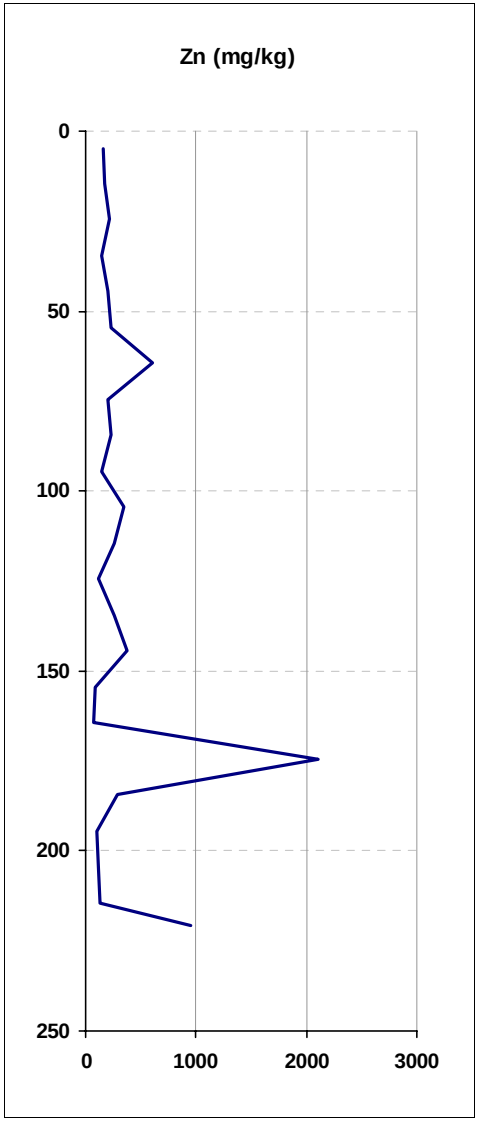
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-1

Test Type: WR







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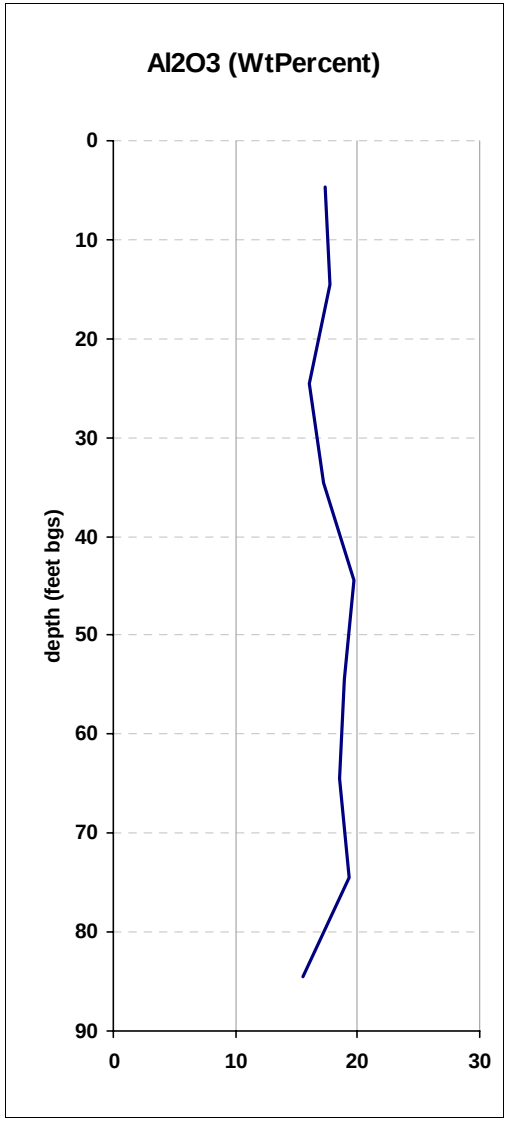
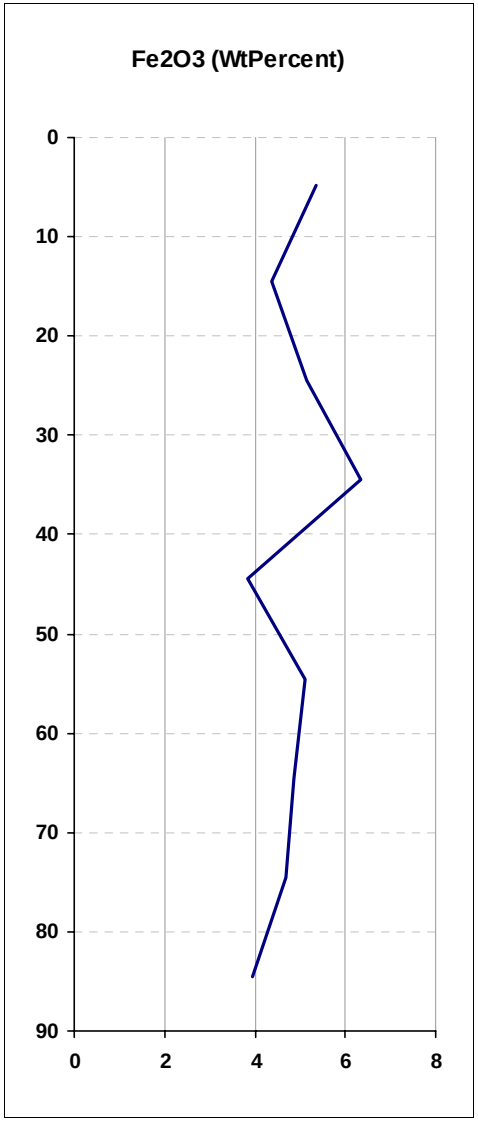
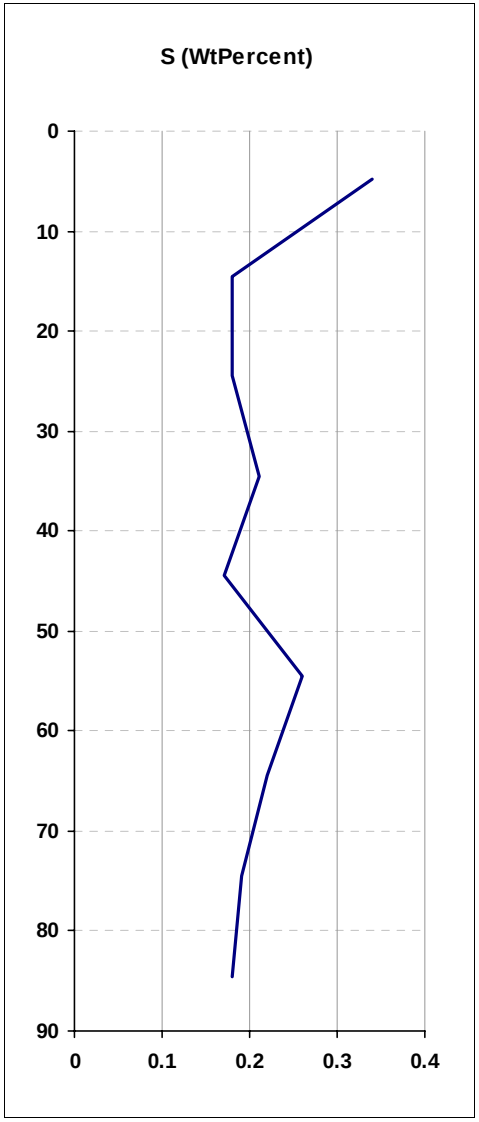
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-2

Test Type: WR







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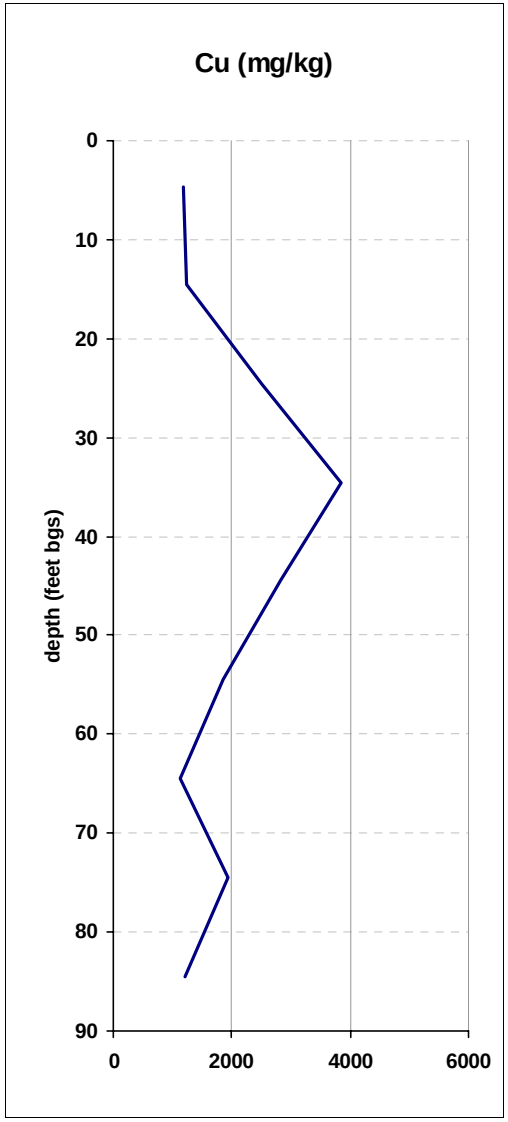
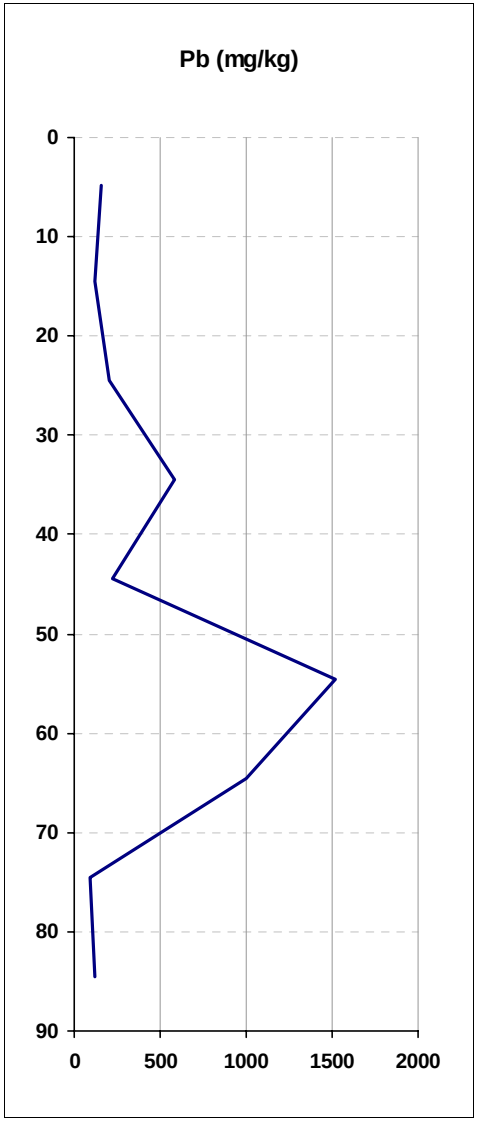
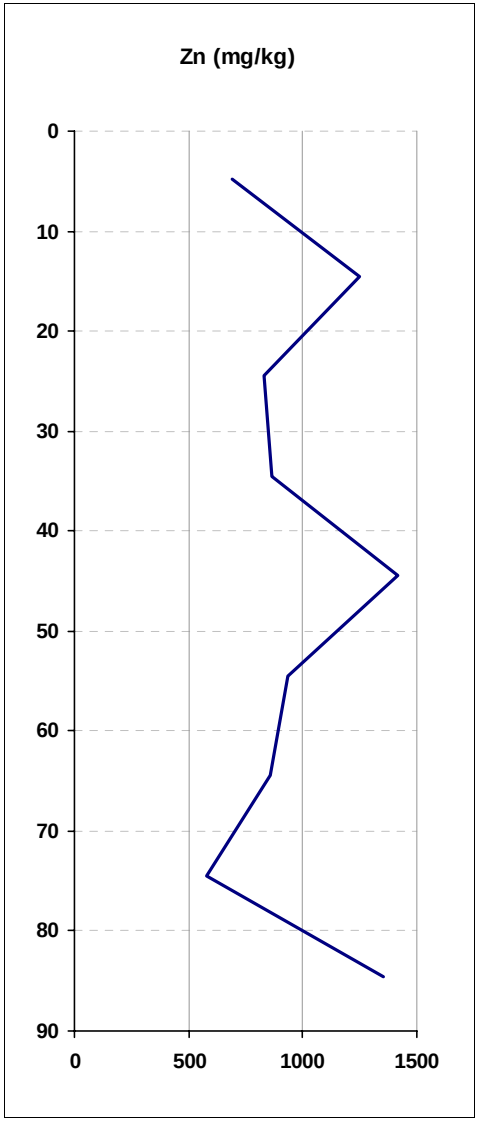
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-2

Test Type: WR







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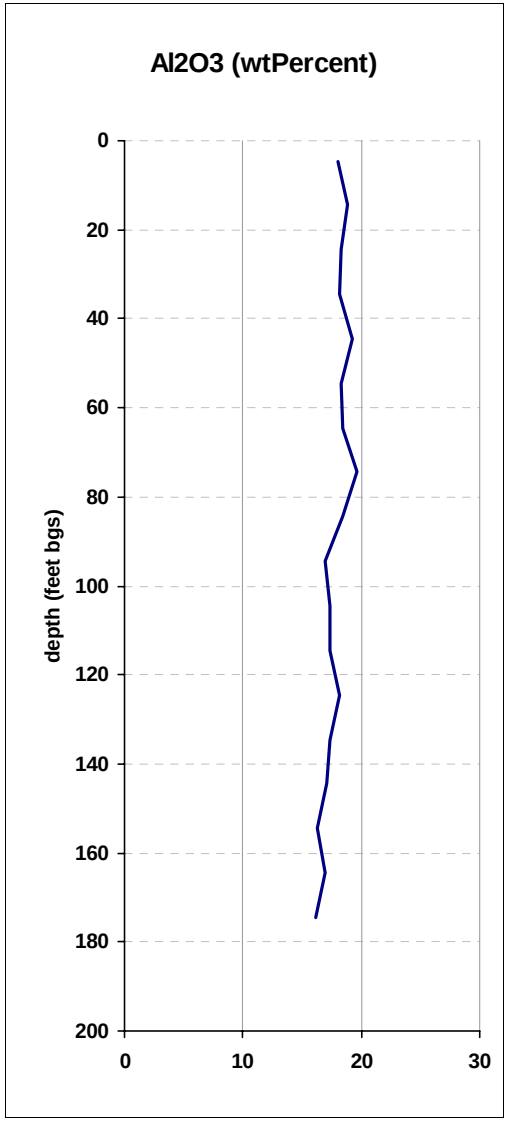
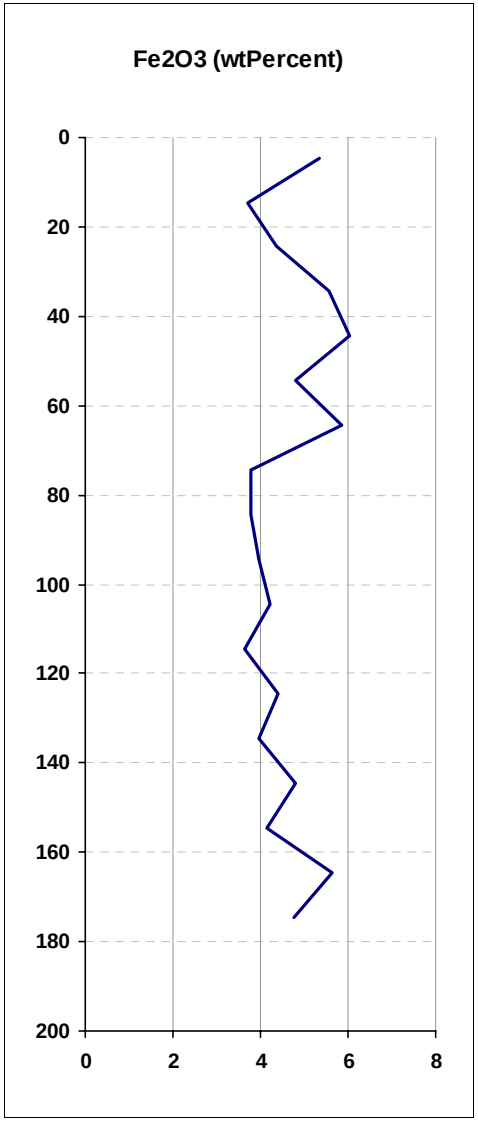
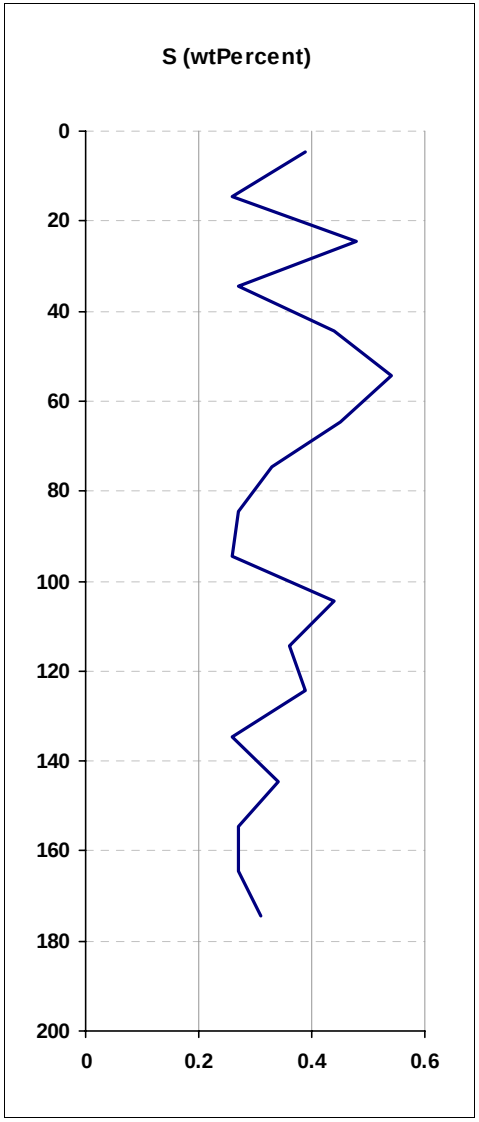
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-3

Test Type: WR







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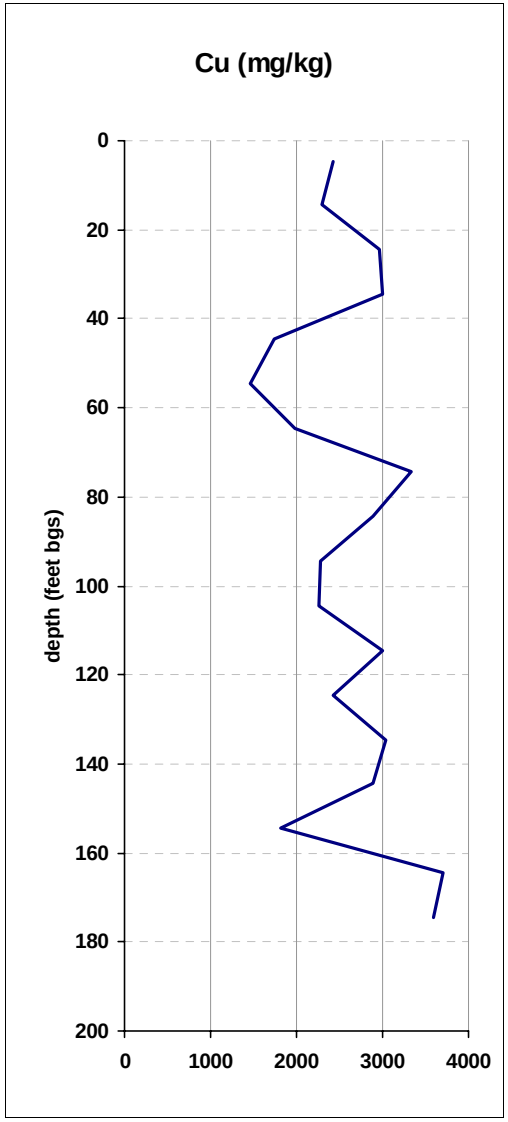
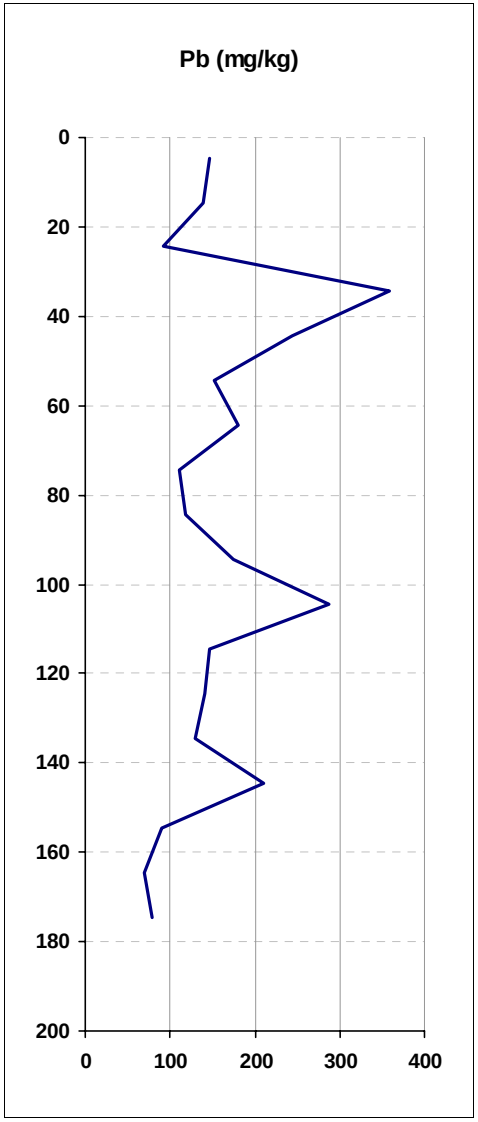
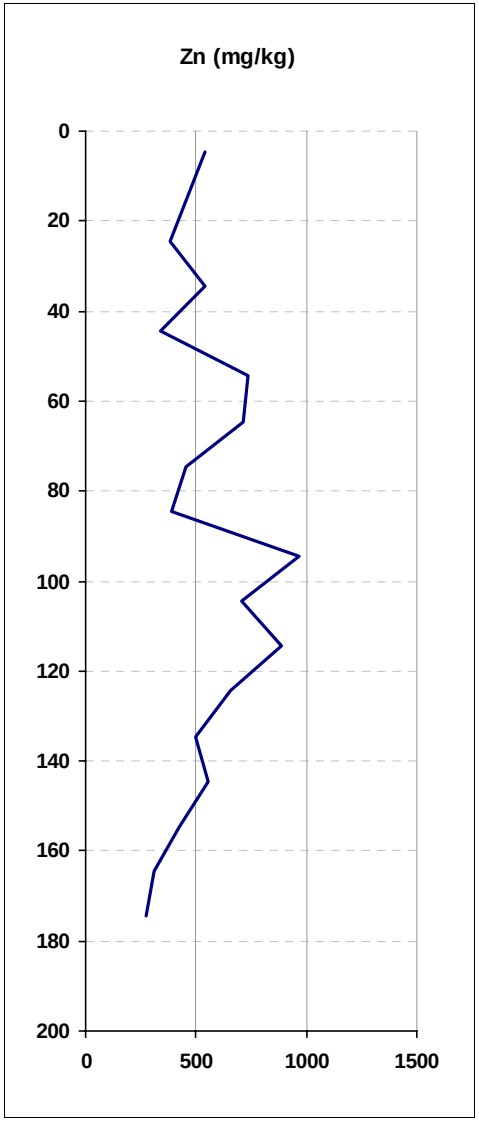
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-3

Test Type: WR







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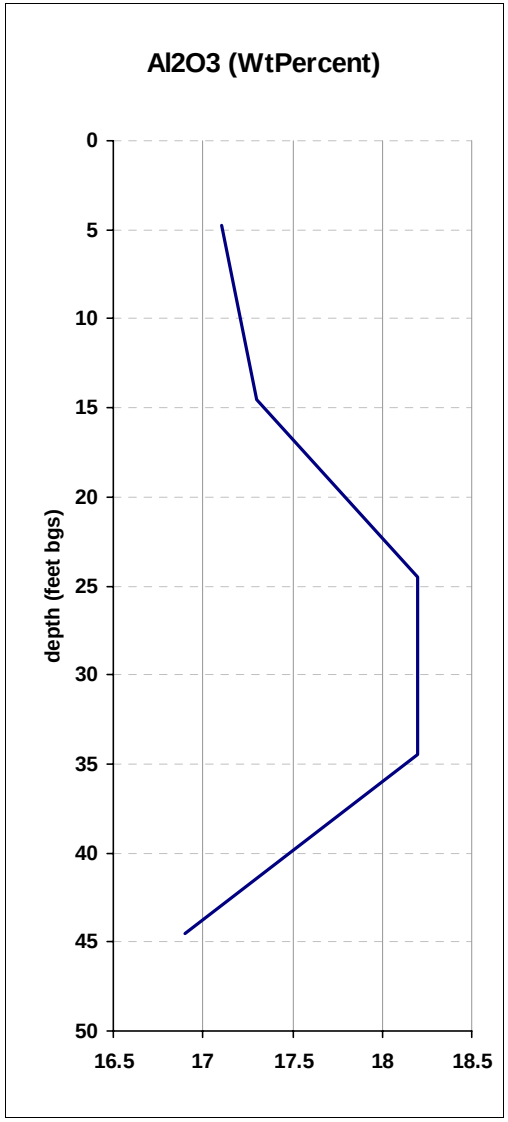
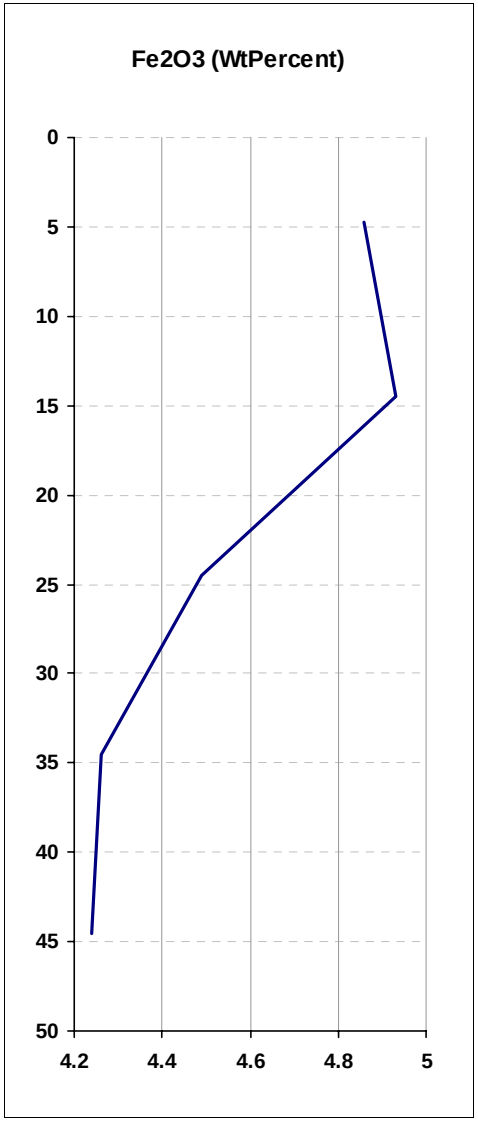
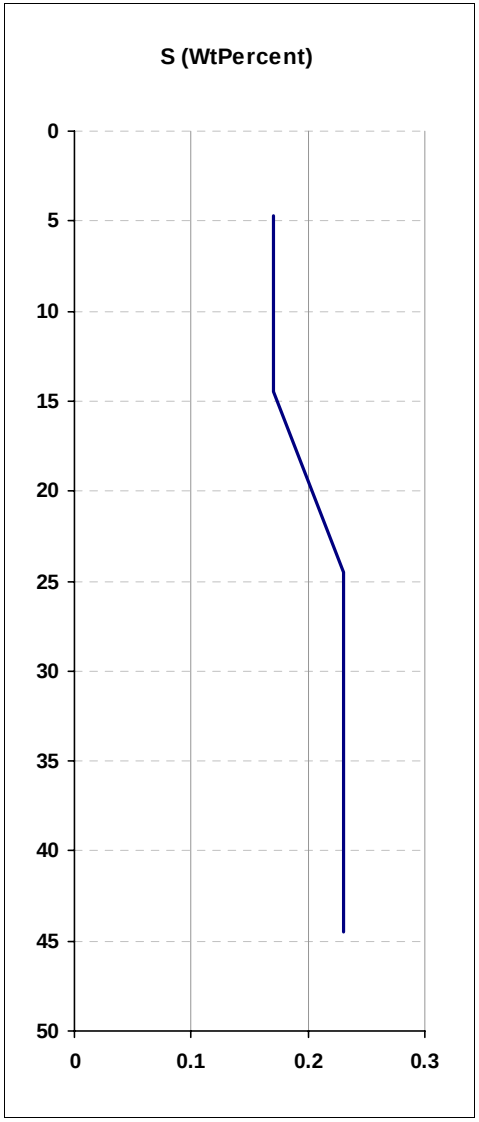
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-4

Test Type: WR







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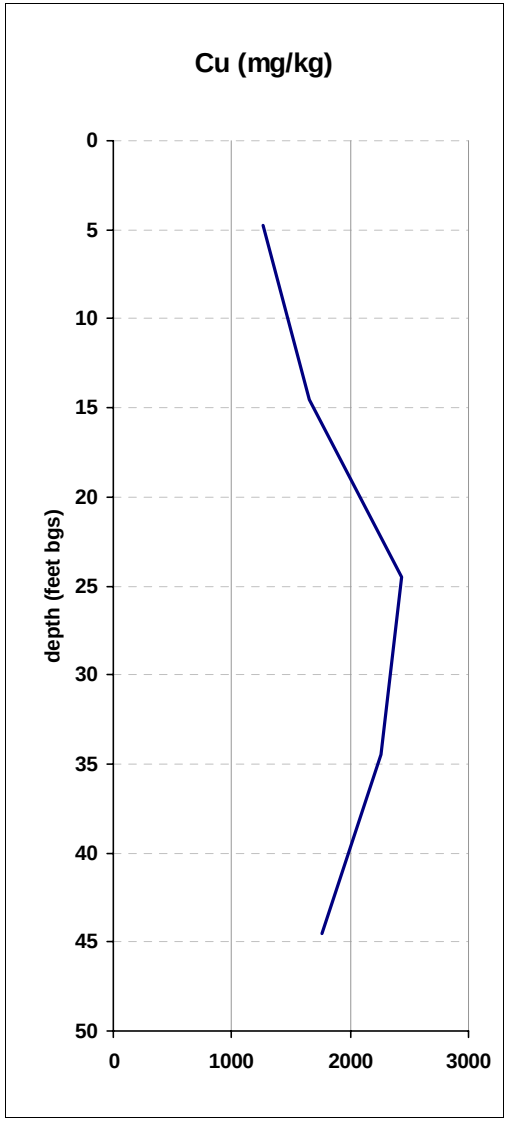
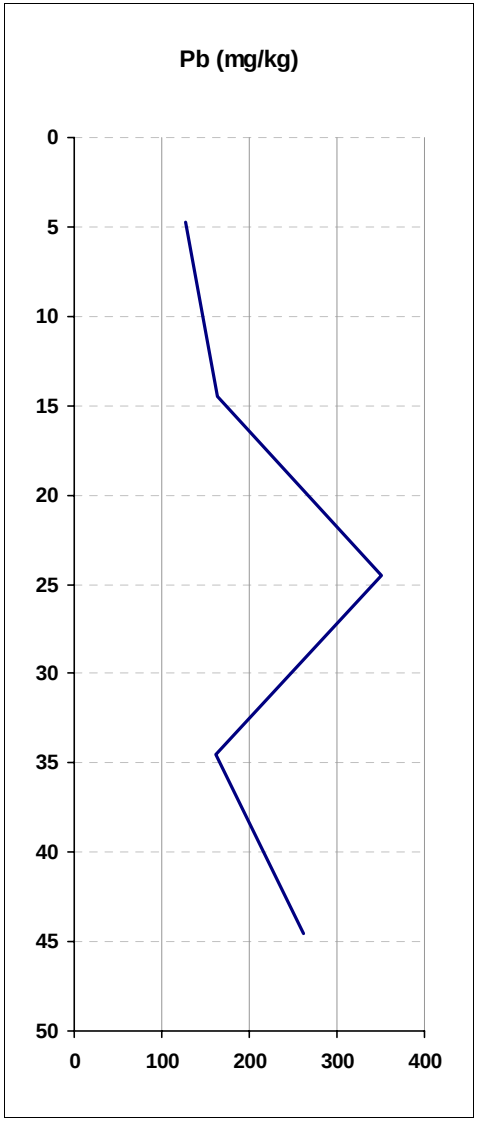
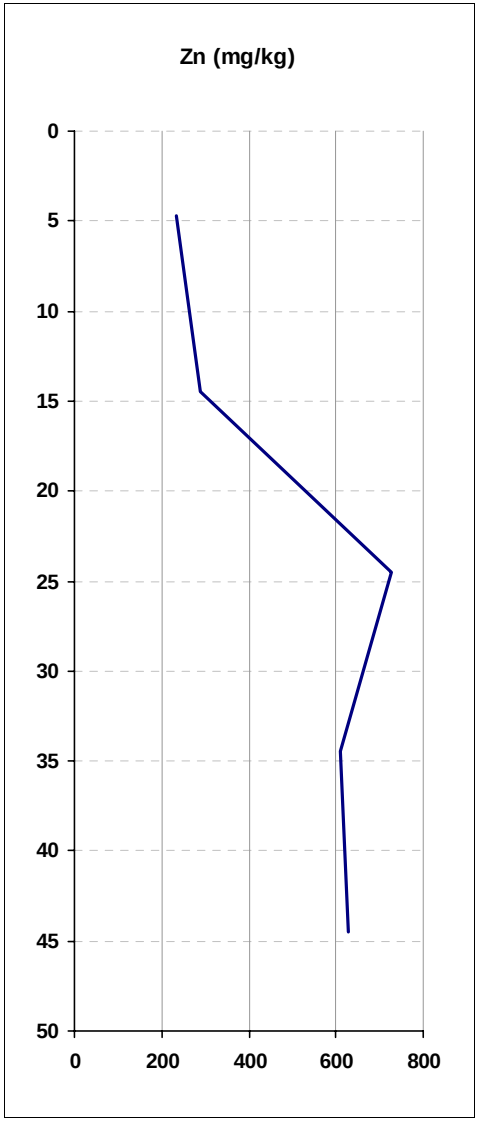
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-4

Test Type: WR







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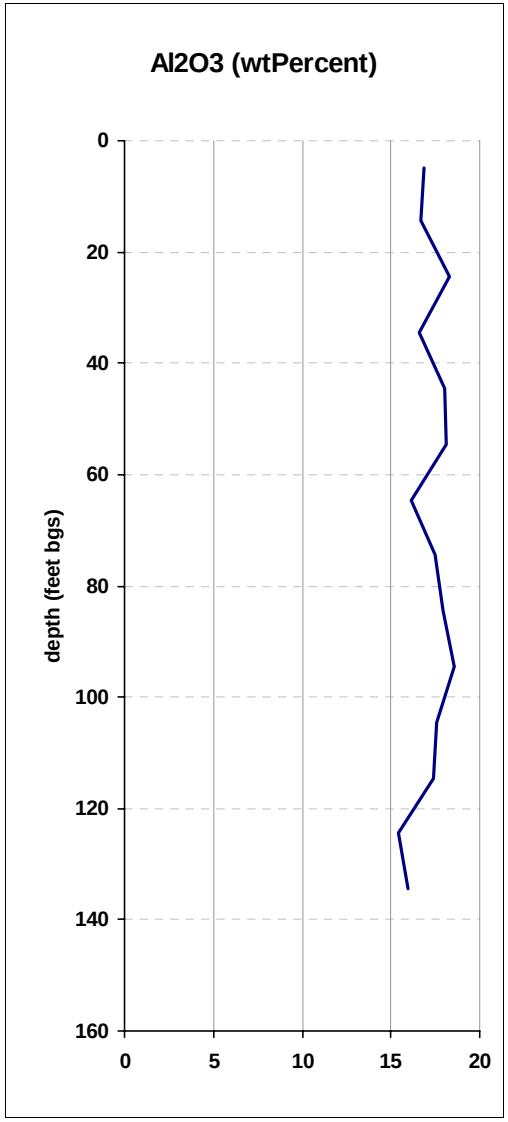
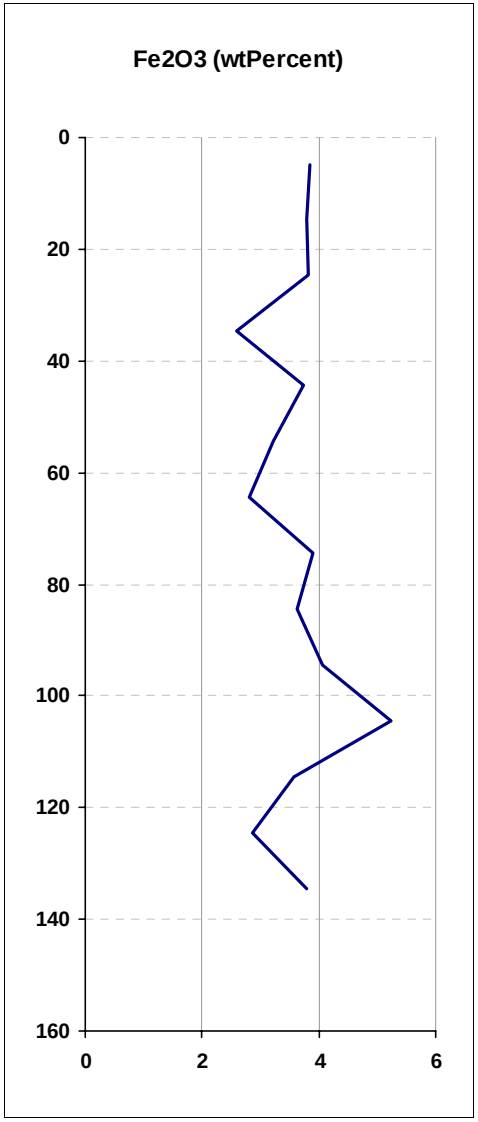
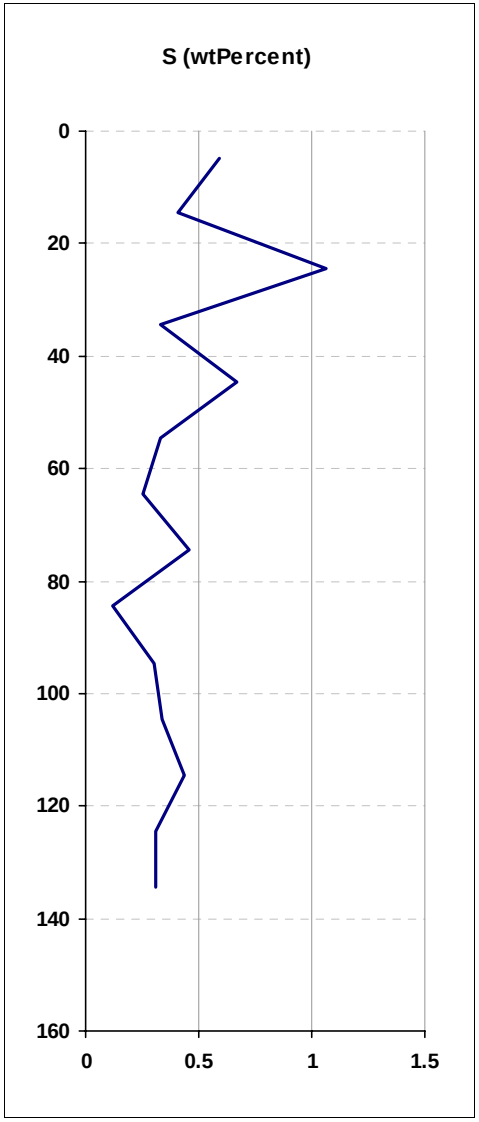
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-5

Test Type: WR







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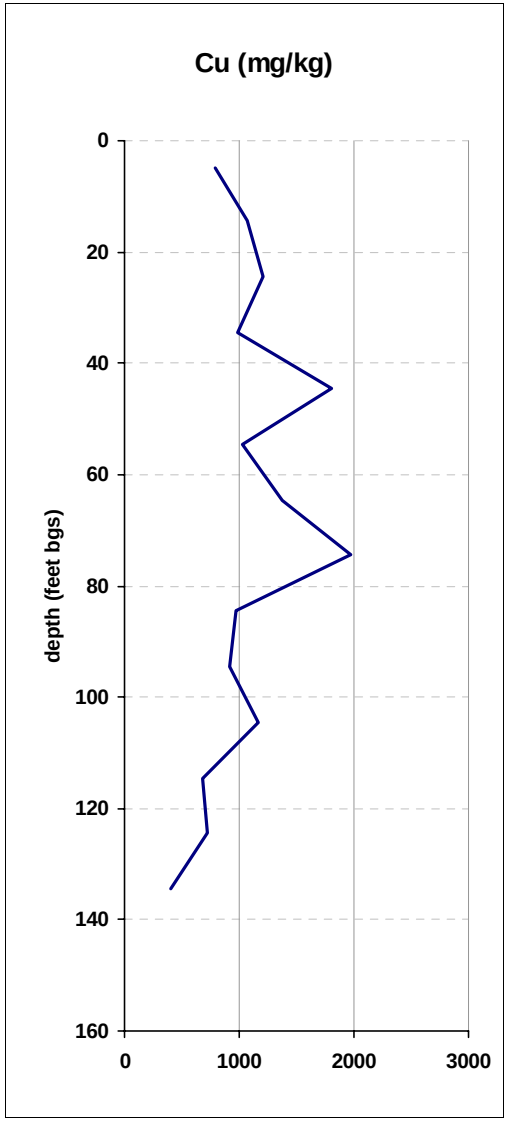
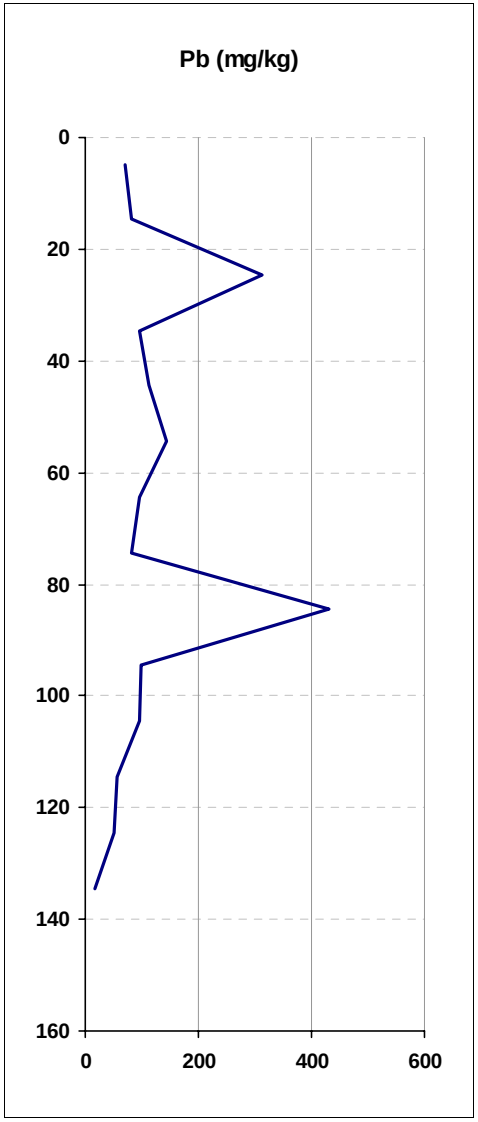
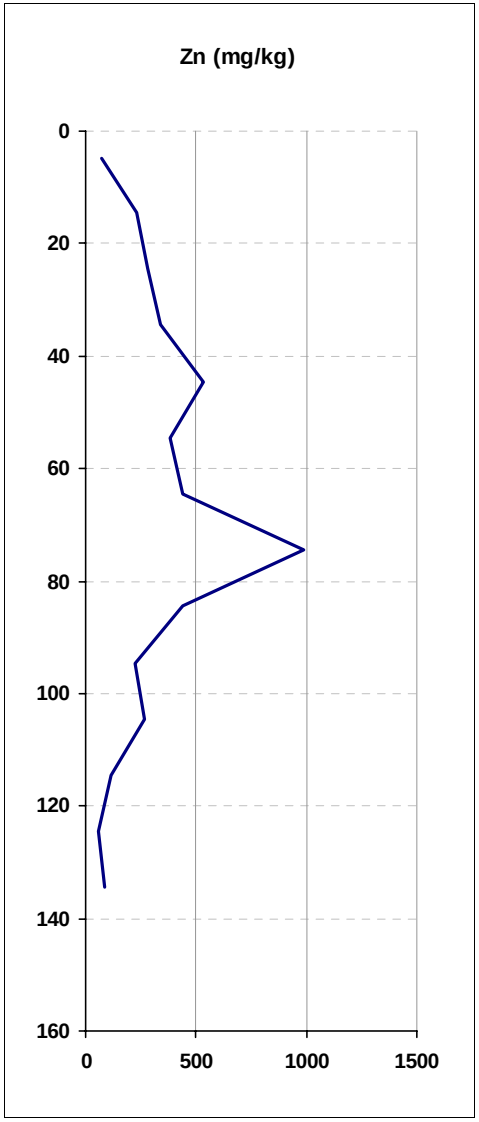
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-5

Test Type: WR







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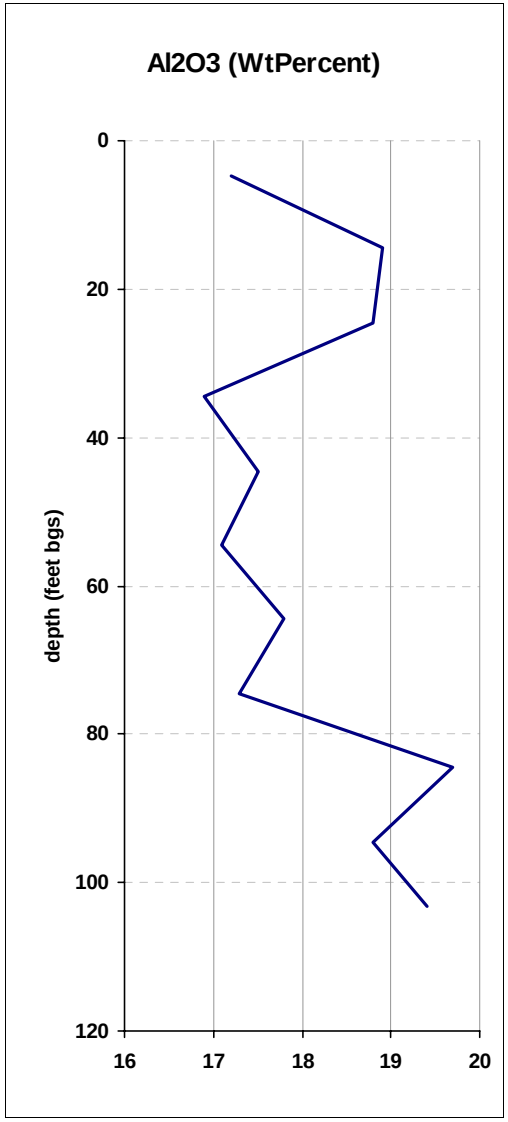
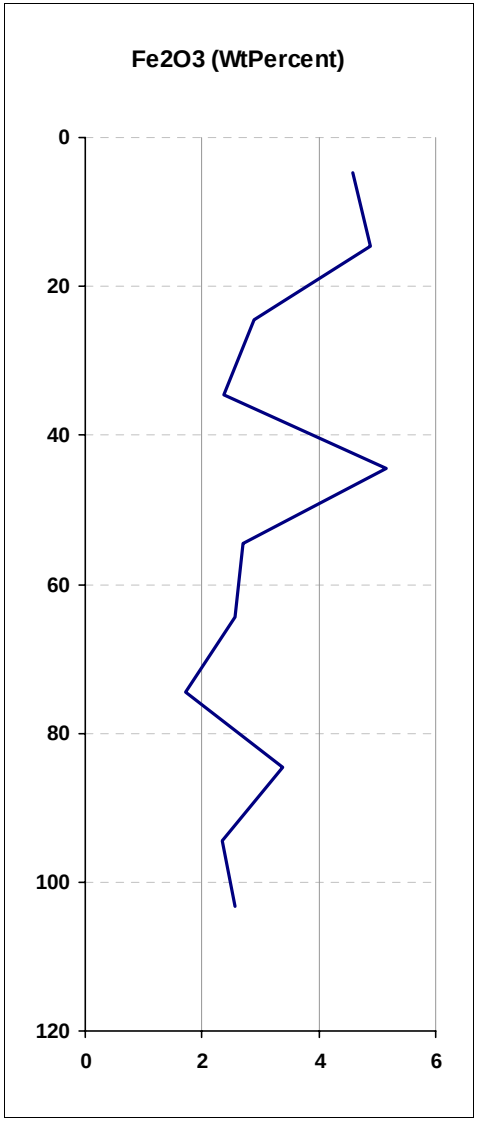
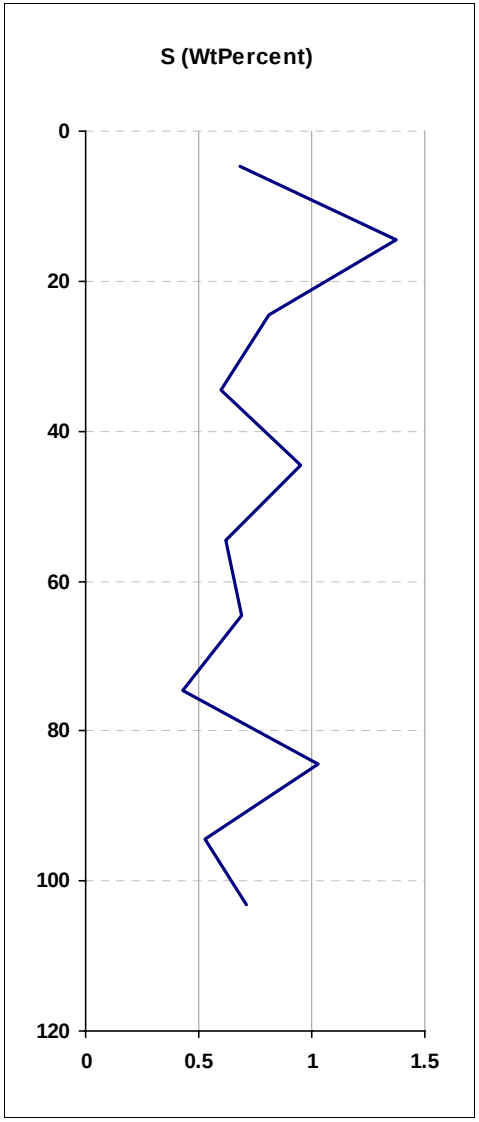
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-6

Test Type: WR







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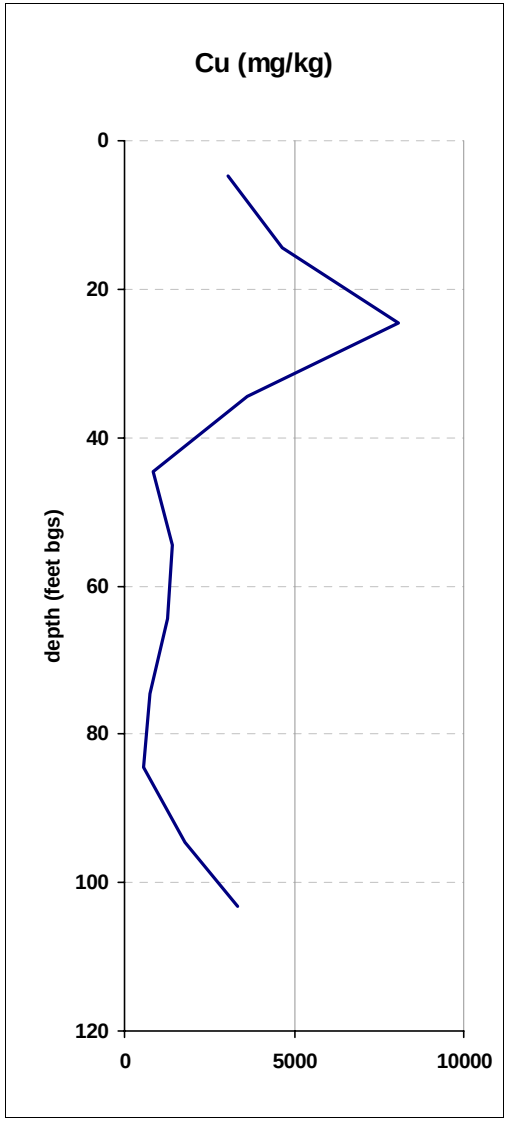
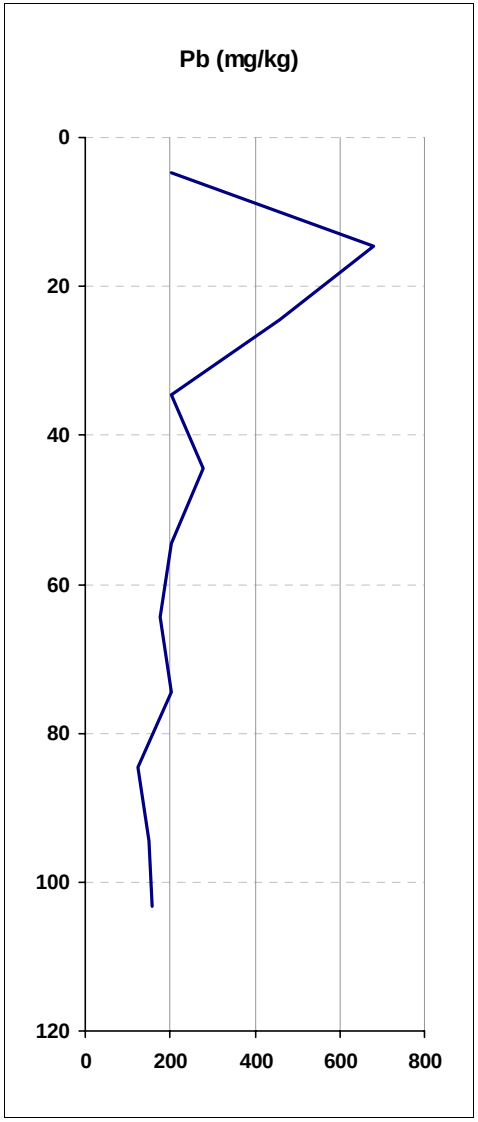
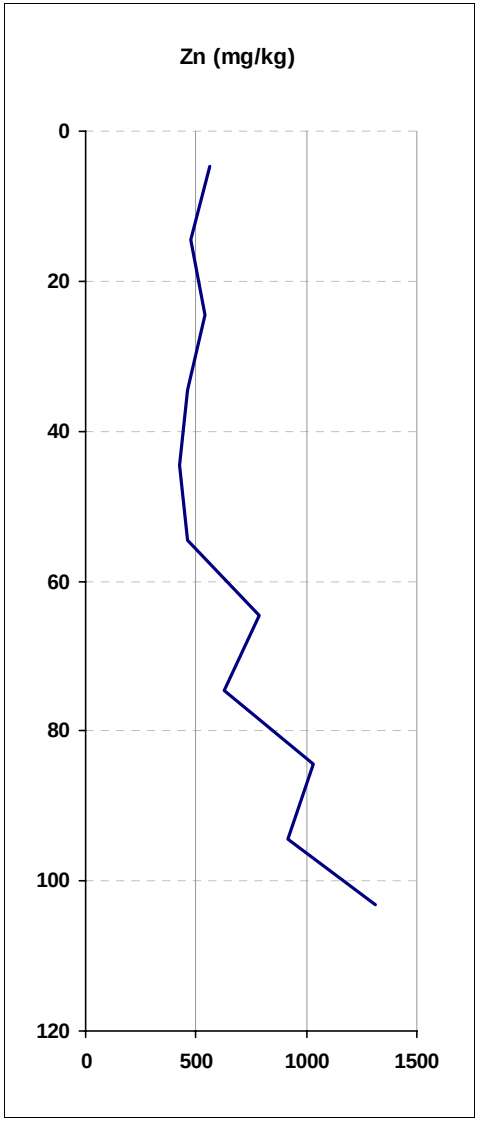
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-6

Test Type: WR





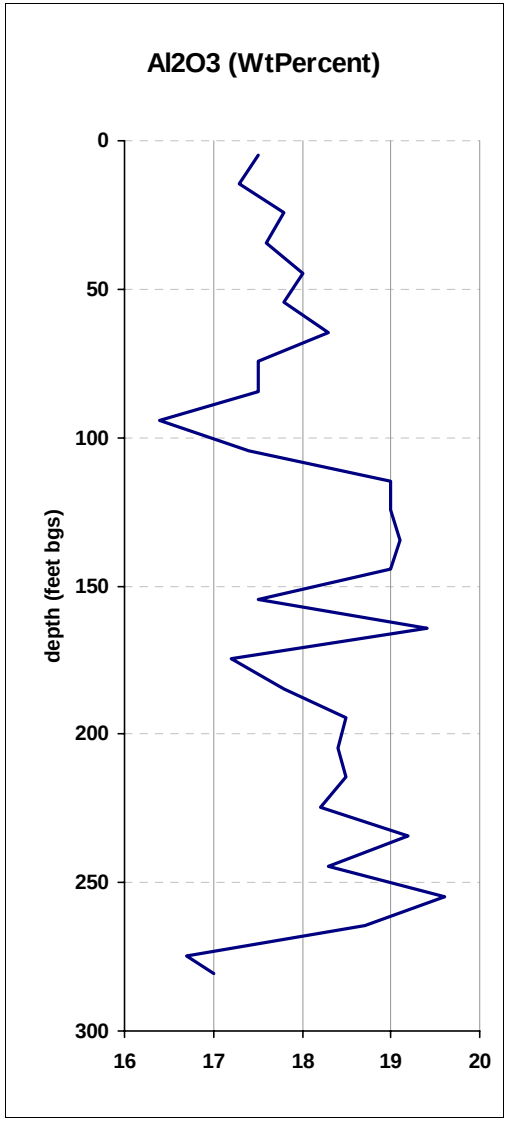


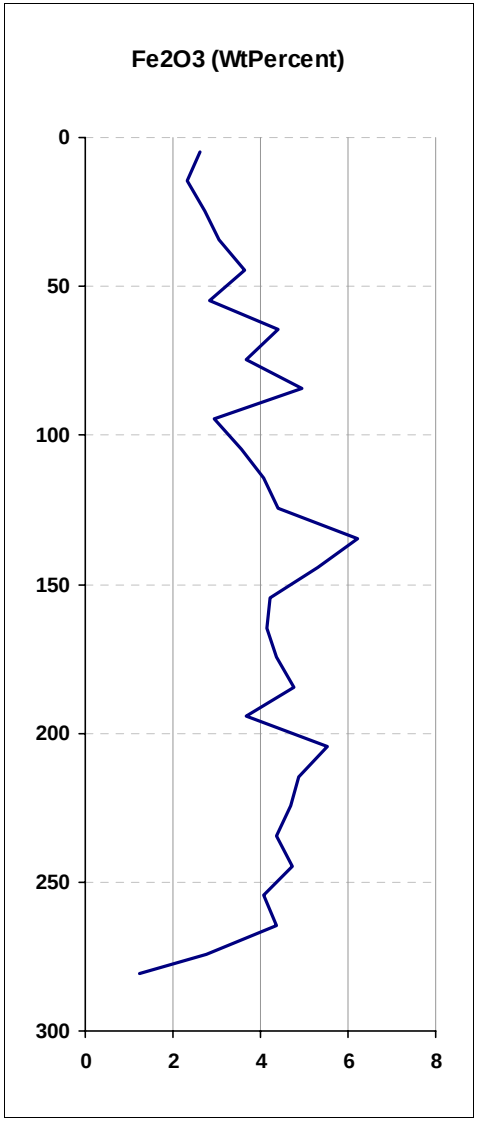
EnviroGroup Limited 2005

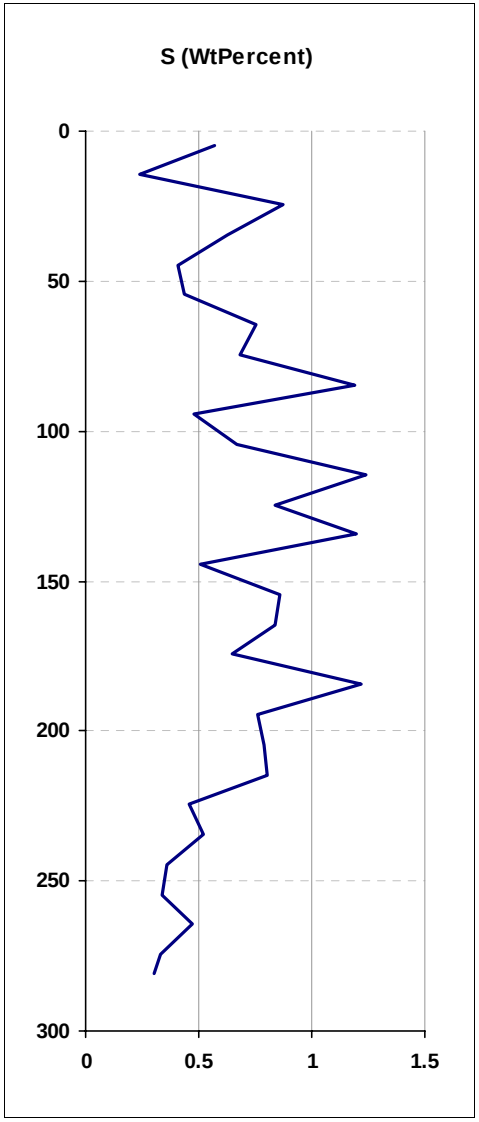
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7

Test Type: WR





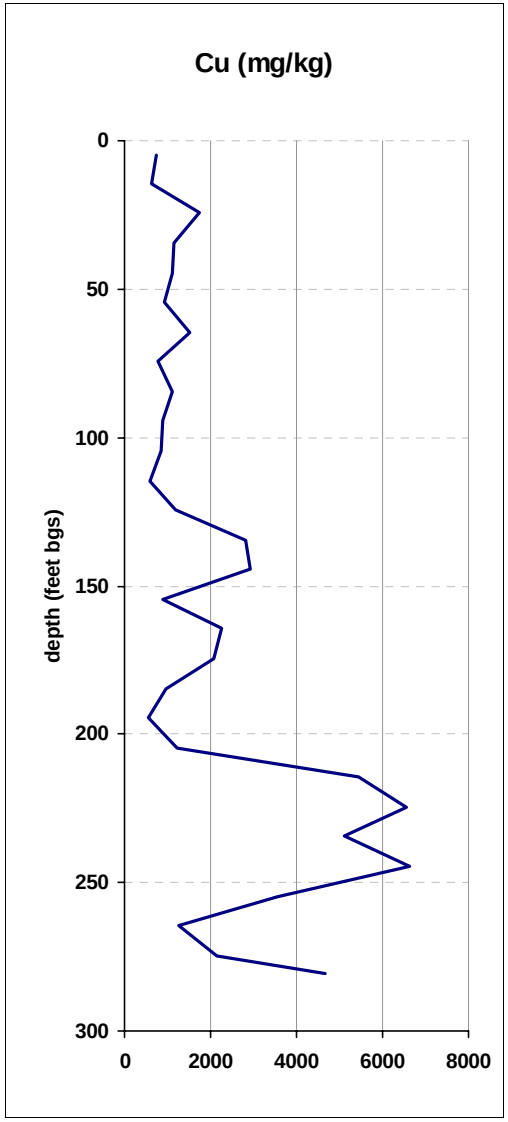


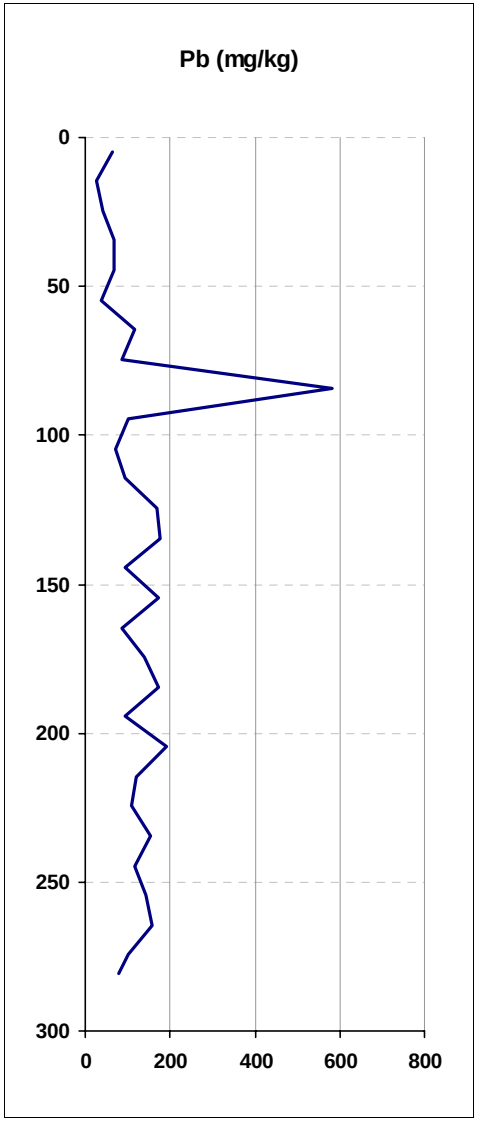
EnviroGroup Limited 2005

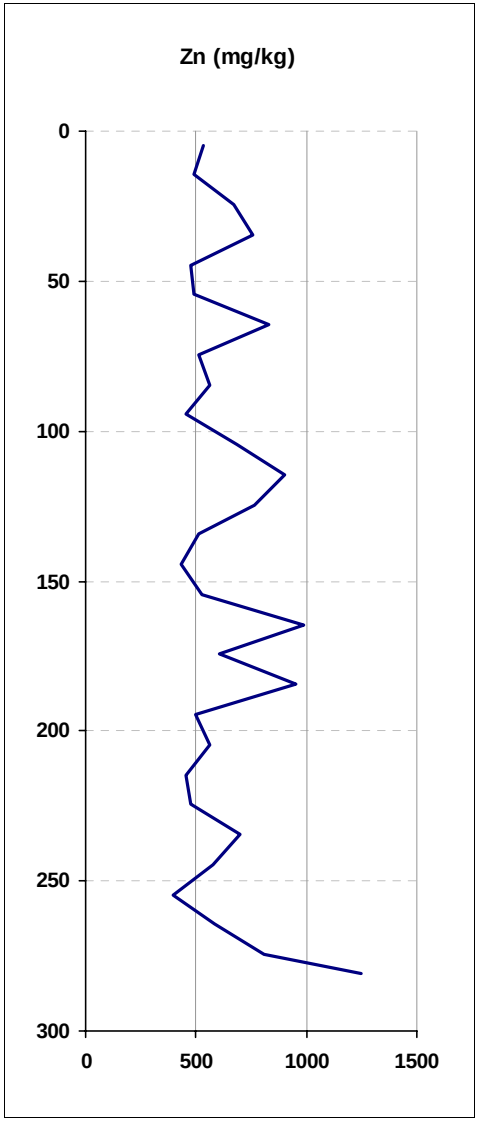
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7

Test Type: WR





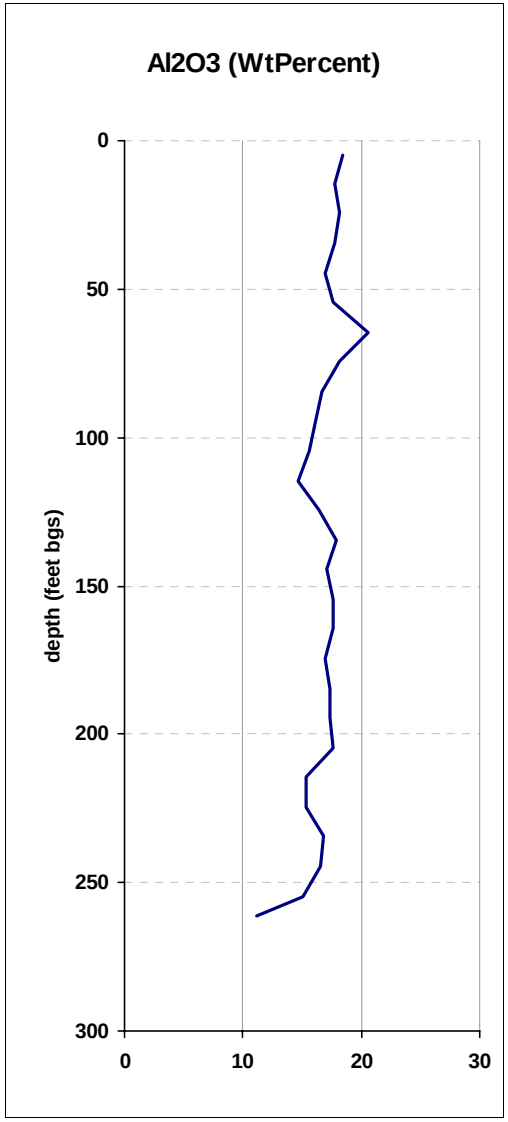


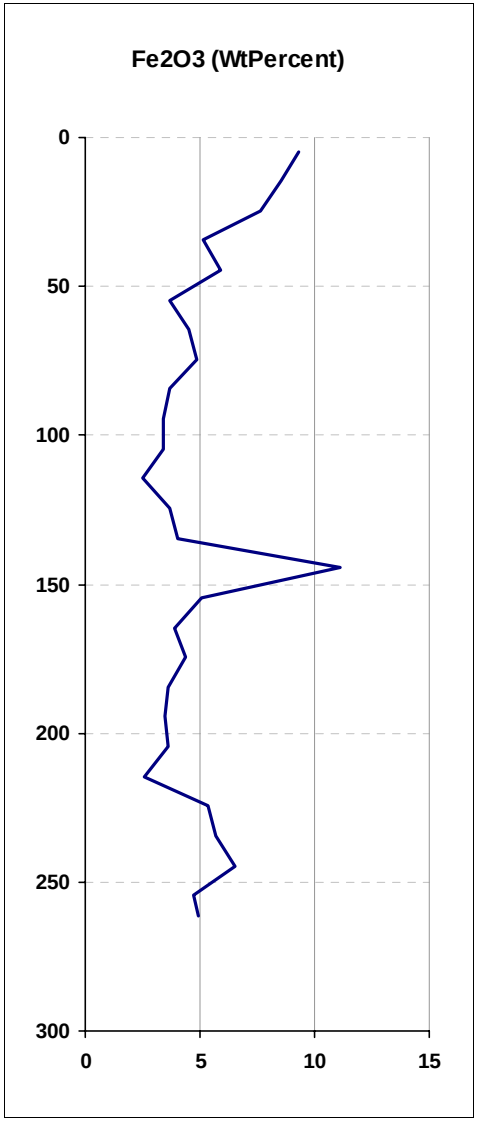
EnviroGroup Limited 2005

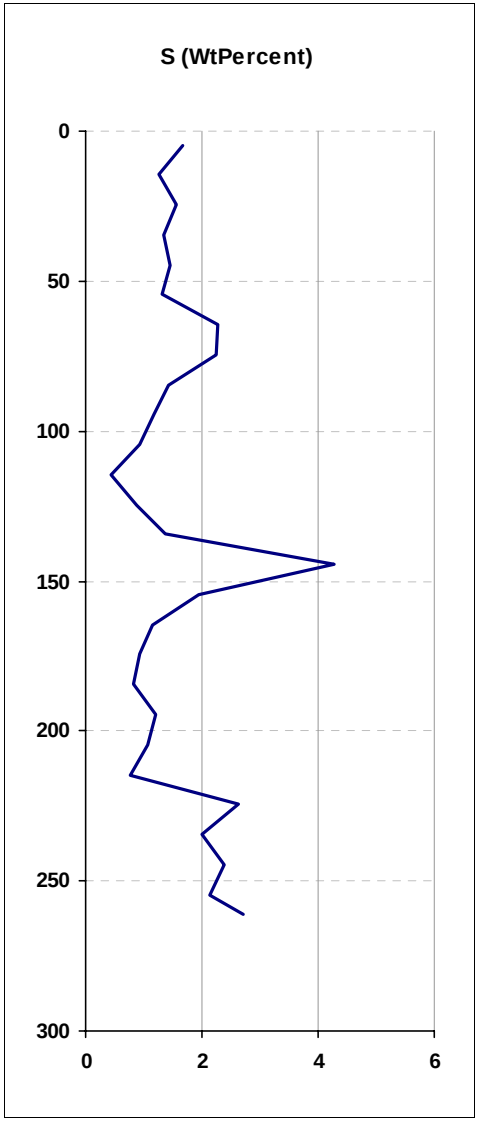
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7A

Test Type: WR





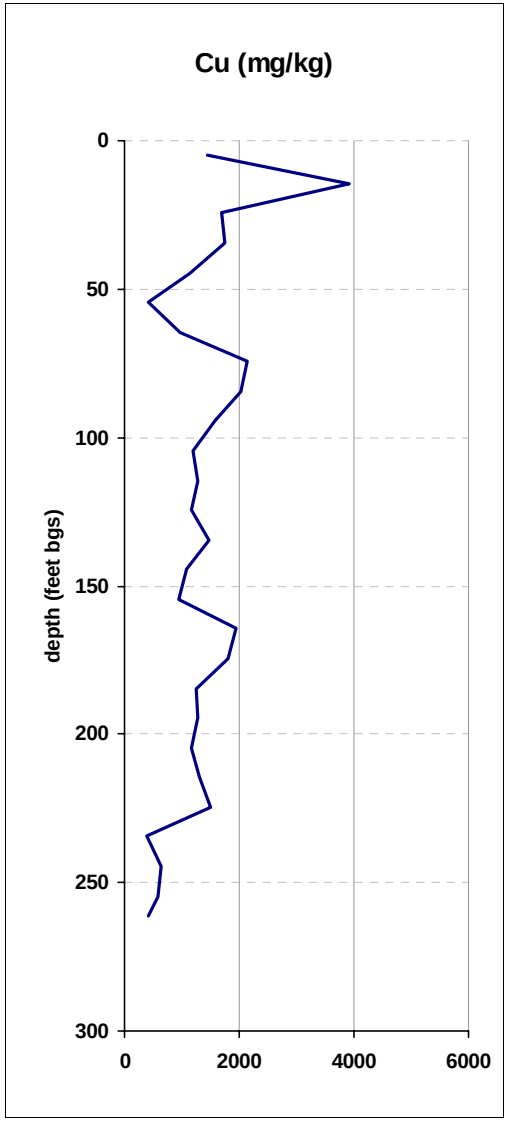


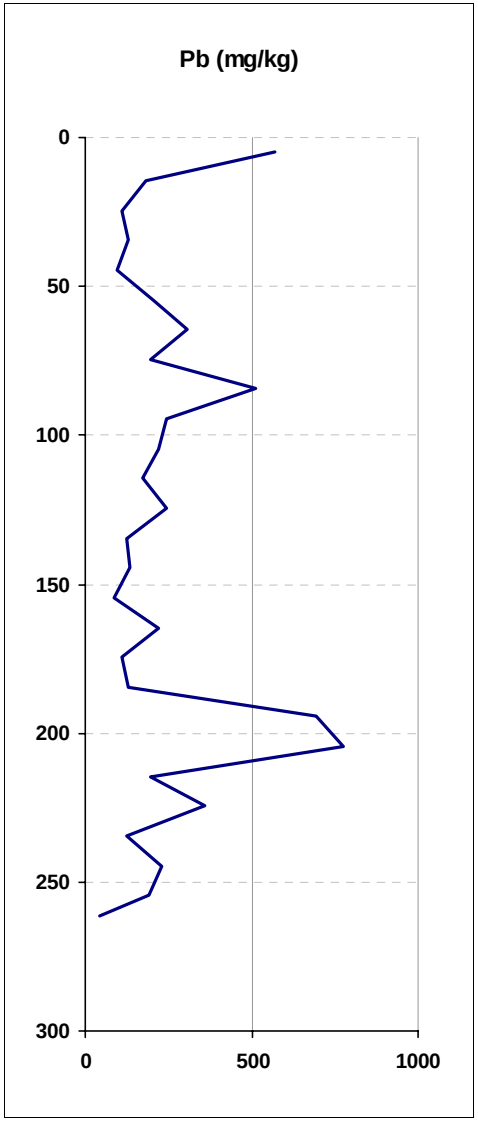
EnviroGroup Limited 2005

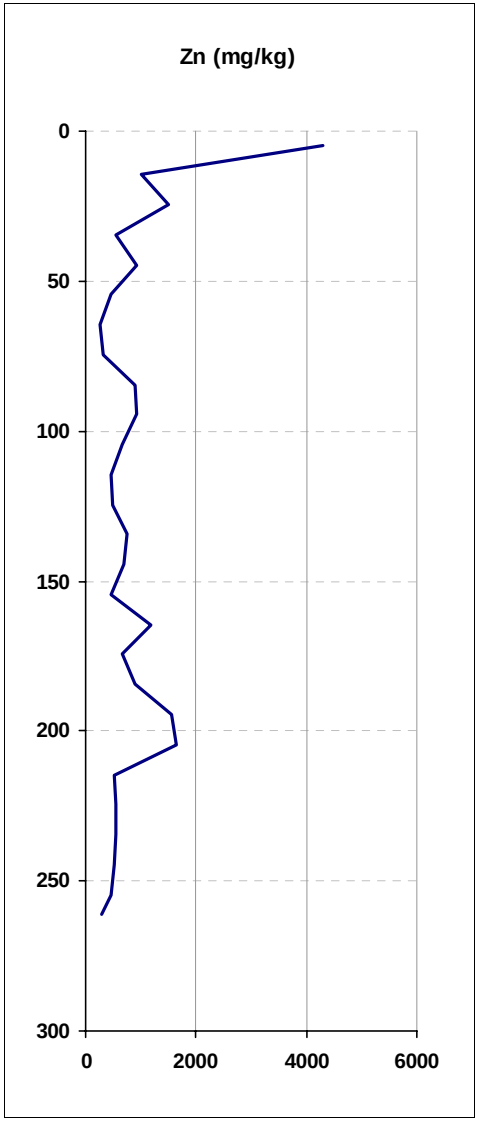
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7A

Test Type: WR







EnviroGroup Limited 2005

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	Al_2O_3 (wt%)	BaO (wt%)	CaO (wt%)	Cl (wt%)	Fe_2O_3 (wt%)	K_2O (wt%)	MgO (wt%)	MnO (wt%)	Na_2O (wt%)	P_2O_5 (wt%)
TBGC-1_0-9.5	18.9	0.07	0.1	<0.02	4.87	4.42	0.73	0.05	0.3	0.19
TBGC-1_9.5-19.5	18.3	0.07	0.14	<0.02	5.38	3.81	0.62	0.04	0.5	0.19
TBGC-1_19.5-29.5	19.2	0.08	0.09	<0.02	3.91	4.35	0.64	0.07	0.66	0.22
TBGC-1_29.5-39.5	18.7	0.07	0.13	<0.02	3.81	4.43	0.67	0.04	0.62	0.17
TBGC-1_39.5-49.5	18.4	0.1	0.14	<0.02	5.24	4.96	0.68	0.05	1.05	0.2
TBGC-1_49.5-59.5	19	0.08	0.1	<0.02	5.76	5.48	0.8	0.06	0.75	0.19
TBGC-1_59.5-69.5	17.5	0.09	0.42	<0.02	3.96	4.94	1.06	0.1	1.36	0.25
TBGC-1_69.5-79.5	16.3	0.07	0.53	<0.02	3.36	4.54	0.8	0.08	1.52	0.13
TBGC-1_79.5-89.5	17.1	0.08	0.41	<0.02	3.59	4.65	0.84	0.06	1.43	0.16
TBGC-1_89.5-99.5	15.8	0.07	0.76	<0.02	3.08	4.55	0.89	0.03	2.06	0.14
TBGC-1_99.5-109.5	15.8	0.08	0.65	<0.02	3.39	4.78	0.96	0.06	2.16	0.15
TBGC-1_109.5-119.5	16.6	0.07	0.06	<0.02	6.77	4.91	0.7	0.14	0.26	0.22
TBGC-1_119.5-129.5	17	0.06	0.06	<0.02	5.42	4.73	0.79	0.04	0.13	0.26
TBGC-1_129.5-139.5	15.4	0.04	0.03	<0.02	6.39	3.56	0.52	0.02	0.14	0.17
TBGC-1_139.5-149.5	12.8	0.05	0.04	<0.02	3.67	3.89	0.67	0.03	0.3	0.15
TBGC-1_149.5-159.5	16.7	0.05	0.02	<0.02	4.56	4.21	0.77	0.03	0.15	0.12
TBGC-1_159.5-169.5	17.3	0.05	0.03	<0.02	3.91	3.56	0.75	0.03	0.1	0.1
TBGC-1_169.5-179.5	16.6	0.09	0.32	<0.02	4.28	4.52	1.12	0.15	0.74	0.19
TBGC-1_179.5-189.5	17.8	0.04	0.03	<0.02	4.85	4.52	0.83	0.03	0.19	0.17
TBGC-1_189.5-199.5	17.2	0.04	0.04	<0.02	4.56	4.03	0.78	0.02	0.12	0.12
TBGC-1_199.5-209.5	14.9	0.04	0.05	<0.02	4.58	4.12	0.83	0.03	0.15	0.11
TBGC-1_209.5-219.5	13.7	0.06	0.03	<0.02	3.89	3.81	0.63	0.02	0.17	0.08
TBGC-1_219.5-222	15.9	0.05	0.13	<0.02	5.05	4.08	0.89	0.03	0.26	0.27
TBGC-2_0-9.5	17.3	0.1	0.28	<0.02	5.35	4.64	0.83	0.08	1.05	1.27
TBGC-2_9.5-19.5	17.8	0.09	0.29	<0.02	4.36	4.81	0.98	0.14	1.26	0.57
TBGC-2_19.5-29.5	16	0.1	0.15	<0.02	5.16	4.85	0.71	0.12	0.53	0.58
TBGC-2_29.5-39.5	17.2	0.1	0.21	<0.02	6.34	4.82	0.93	0.12	0.69	0.49
TBGC-2_39.5-49.5	19.7	0.1	0.17	<0.02	3.84	5.01	1.19	0.09	0.42	0.48
TBGC-2_49.5-59.5	18.9	0.1	0.13	<0.02	5.1	4.81	1	0.38	0.37	0.68
TBGC-2_59.5-69.5	18.5	0.08	0.14	<0.02	4.86	4.8	1.04	0.14	0.23	0.73
TBGC-2_69.5-79.5	19.3	0.1	0.28	<0.02	4.68	4.72	0.88	0.06	0.63	0.35
TBGC-2_79.5-89.5	15.5	0.11	0.16	<0.02	3.93	5.05	0.83	0.04	0.65	0.55
TBGC-3_0-9.5	18	0.1	0.17	<0.02	5.34	5.14	0.79	0.24	0.62	0.22
TBGC-3_9.5-19.5	18.8	0.1	0.22	<0.02	3.71	5.25	0.89	0.07	0.54	0.22
TBGC-3_19.5-29.5	18.3	0.11	0.26	<0.02	4.37	4.8	0.85	0.03	0.92	0.22

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	Al_2O_3 (wt%)	BaO (wt%)	CaO (wt%)	Cl (wt%)	Fe_2O_3 (wt%)	K_2O (wt%)	MgO (wt%)	MnO (wt%)	Na_2O (wt%)	P_2O_5 (wt%)
TBGC-3_29.5-39.5	18.2	0.11	0.17	<0.02	5.56	4.91	0.83	0.17	0.42	0.25
TBGC-3_39.5-49.5	19.2	0.1	0.12	<0.02	6.05	5.15	0.84	0.09	0.25	0.34
TBGC-3_49.5-59.5	18.3	0.12	0.24	<0.02	4.81	5.08	0.68	0.06	1.13	0.23
TBGC-3_59.5-69.5	18.4	0.1	0.22	<0.02	5.87	4.98	0.77	0.11	0.37	0.23
TBGC-3_69.5-79.5	19.7	0.1	0.29	<0.02	3.79	4.69	0.88	0.11	0.69	0.2
TBGC-3_79.5-89.5	18.4	0.14	0.19	<0.02	3.78	5.05	0.76	0.05	0.88	0.16
TBGC-3_89.5-99.5	17	0.11	0.15	<0.02	3.95	6.02	0.69	0.09	0.45	0.22
TBGC-3_99.5-109.5	17.3	0.11	0.25	<0.02	4.2	4.72	0.78	0.12	0.98	0.23
TBGC-3_109.5-119.5	17.4	0.11	0.26	<0.02	3.63	4.95	0.89	0.1	1.47	0.18
TBGC-3_119.5-129.5	18.1	0.1	0.21	<0.02	4.4	4.94	0.87	0.13	1.1	0.18
TBGC-3_129.5-139.5	17.4	0.1	0.17	<0.02	3.97	5.05	0.87	0.08	0.66	0.15
TBGC-3_13.95-149.5	17.1	0.11	0.2	<0.02	4.79	4.99	0.85	0.24	0.7	0.2
TBGC-3_149.5-159.5	16.3	0.1	0.15	<0.02	4.16	4.76	0.74	0.06	1.18	0.18
TBGC-3_159.5-169.5	17	0.09	0.13	<0.02	5.64	4.89	0.92	0.09	0.78	0.3
TBGC-3_169.5-179.5	16.2	0.08	0.14	<0.02	4.75	4.53	0.91	0.28	0.65	0.2
TBGC-4_0-9.5	17.1	0.07	0.1	<0.02	4.86	4.71	0.84	0.03	0.55	0.24
TBGC-4_9.5-19.5	17.3	0.06	0.08	<0.02	4.93	4.59	0.83	0.23	0.33	0.44
TBGC-4_19.5-29.5	18.2	0.11	0.24	<0.02	4.49	4.95	0.76	0.44	0.77	0.6
TBGC-4_29.5-39.5	18.2	0.09	0.33	<0.02	4.26	4.78	0.97	0.07	1.17	0.53
TBGC-4_39.5-49.5	16.9	0.09	0.33	<0.02	4.24	4.77	0.98	0.05	1.38	0.42
TBGC-5_0-9.5	16.9	0.07	0.38	<0.02	3.85	4.61	1.21	0.04	0.54	0.13
TBGC-5_9.5-19.5	16.7	0.08	0.73	<0.02	3.78	4.36	1.32	0.06	1.09	0.18
TBGC-5_19.5-29.5	18.3	0.08	0.26	<0.02	3.81	5.56	0.71	0.03	0.92	0.21
TBGC-5_29.5-39.5	16.6	0.1	0.23	<0.02	2.59	5.53	0.56	0.03	2.04	0.15
TBGC-5_39.5-49.5	18	0.1	0.22	<0.02	3.73	4.61	0.78	0.08	1.03	0.18
TBGC-5_49.5-59.5	18.1	0.1	0.42	<0.02	3.23	4.73	0.56	0.06	1.86	0.17
TBGC-5_59.5-69.5	16.1	0.09	0.56	<0.02	2.82	4.65	0.73	0.06	2.36	0.15
TBGC-5_69.5-79.5	17.5	0.09	0.43	<0.02	3.9	4.58	1.17	0.1	2.15	0.21
TBGC-5_79.5-89.5	17.9	0.09	0.73	<0.02	3.64	4.06	0.9	0.07	1.83	0.23
TBGC-5_89.5-99.5	18.6	0.09	0.23	<0.02	4.07	4.09	0.65	0.02	0.89	0.21
TBGC-5_99.5-109.5	17.6	0.09	0.82	<0.02	5.23	3.8	0.64	0.02	2.3	0.19
TBGC-5_109.5-119.5	17.4	0.1	0.71	<0.02	3.57	4.15	0.65	0.01	2.7	0.2
TBGC-5_119.5-129.5	15.4	0.11	0.4	<0.02	2.86	5.72	0.44	<0.01	2.17	0.15
TBGC-5_129.5-139.5	16	0.09	0.74	<0.02	3.79	3.96	0.55	<0.01	3.76	0.2
TBGC-6_0-9.5	17.2	0.06	0.11	<0.02	4.58	4.51	0.88	0.03	0.27	0.31

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	Al_2O_3 (wt%)	BaO (wt%)	CaO (wt%)	Cl (wt%)	Fe_2O_3 (wt%)	K_2O (wt%)	MgO (wt%)	MnO (wt%)	Na_2O (wt%)	P_2O_5 (wt%)
TBGC-6_9.5-19.5	18.9	0.08	0.19	<0.02	4.89	4.66	1.2	0.05	0.18	0.54
TBGC-6_19.5-29.5	18.8	0.07	0.1	<0.02	2.9	4.91	0.9	0.05	0.13	0.25
TBGC-6_29.5-39.5	16.9	0.08	0.02	<0.02	2.36	5.03	0.75	0.04	0.13	0.1
TBGC-6_39.5-49.5	17.5	0.07	0.06	<0.02	5.15	4.76	0.84	0.05	0.23	0.21
TBGC-6_49.5-59.5	17.1	0.13	0.34	<0.02	2.69	5.75	0.82	0.07	1.05	0.15
TBGC-6_59.5-69.5	17.8	0.11	0.25	<0.02	2.56	4.67	0.79	0.05	2.47	0.19
TBGC-6_69.5-79.5	17.3	0.12	0.14	<0.02	1.71	4.7	0.79	0.03	2.82	0.16
TBGC-6_79.5-89.5	19.7	0.07	0.05	<0.02	3.39	4.25	1.05	0.07	0.61	0.39
TBGC-6_89.5-99.5	18.8	0.11	0.12	<0.02	2.34	4.25	0.97	0.06	2.2	0.21
TBGC-6_99.5-107	19.4	0.11	0.1	<0.02	2.56	4.49	1.29	0.07	1.82	0.22
TBGC-7_0-9.5	17.5	0.08	1.02	<0.02	2.61	3.07	0.94	0.03	3.91	0.18
TBGC-7_9.5-19.5	17.3	0.1	2	<0.02	2.34	2.97	0.9	0.02	4.96	0.18
TBGC-7_19.5-29.5	17.8	0.09	1.36	<0.02	2.73	3.05	0.98	0.03	4.71	0.23
TBGC-7_29.5-39.5	17.6	0.09	0.9	<0.02	3.04	3.26	0.75	0.05	3.88	0.23
TBGC-7_39.5-49.5	18	0.1	0.64	<0.02	3.63	4.1	0.6	0.03	2.89	0.22
TBGC-7_49.5-59.5	17.8	0.09	0.49	<0.02	2.84	4.32	0.57	0.03	2.47	0.18
TBGC-7_59.5-69.5	18.3	0.09	0.73	<0.02	4.4	3.93	0.74	0.09	2.18	0.24
TBGC-7_69.5-79.5	17.5	0.1	0.46	<0.02	3.67	4.68	0.68	0.03	1.71	0.22
TBGC-7_79.5-89.5	17.5	0.09	0.53	<0.02	4.93	4.31	0.96	0.04	2.72	0.27
TBGC-7_89.5-99.5	16.4	0.09	0.7	<0.02	2.95	4.65	0.61	0.02	2.77	0.18
TBGC-7_99.5-109.5	17.4	0.09	0.65	<0.02	3.56	4.17	0.81	0.04	3	0.18
TBGC-7_109.5-119.5	19	0.1	0.42	<0.02	4.07	4.95	1.06	0.05	1.16	0.16
TBGC-7_119.5-129.5	19	0.11	0.36	<0.02	4.39	4.46	0.91	0.05	1.34	0.23
TBGC-7_129.5-139.5	19.1	0.08	0.22	<0.02	6.2	4.41	0.86	0.05	0.32	0.31
TBGC-7_139.5-149.5	19	0.08	0.19	<0.02	5.32	4.78	0.91	0.04	0.22	0.19
TBGC-7_149.5-159.5	17.5	0.1	0.16	<0.02	4.22	5.14	0.85	0.03	0.75	0.15
TBGC-7_159.5-169.5	19.4	0.11	0.16	<0.02	4.13	4.81	0.98	0.05	0.82	0.21
TBGC-7_169.5-179.5	17.2	0.12	0.21	<0.02	4.37	5.53	0.8	0.06	0.93	0.18
TBGC-7_179.5-189.5	17.8	0.11	0.38	<0.02	4.78	4.48	0.96	0.05	1.29	0.19
TBGC-7_189.5-199.5	18.5	0.09	0.16	<0.02	3.66	4.97	0.95	0.04	0.97	0.15
TBGC-7_199.5-209.5	18.4	0.1	0.12	<0.02	5.52	4.79	0.98	0.04	0.69	0.23
TBGC-7_209.5-219.5	18.5	0.09	0.09	<0.02	4.86	4.54	0.85	0.06	0.29	0.21
TBGC-7_219.5-229.5	18.2	0.07	0.24	<0.02	4.7	4.32	0.87	0.07	0.74	0.17
TBGC-7_229.5-239.5	19.2	0.09	0.31	<0.02	4.37	4.22	0.83	0.1	0.75	0.19
TBGC-7_239.5-249.5	18.3	0.09	0.23	<0.02	4.74	4.46	0.81	0.04	0.9	0.16

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	Al_2O_3 (wt%)	BaO (wt%)	CaO (wt%)	Cl (wt%)	Fe_2O_3 (wt%)	K_2O (wt%)	MgO (wt%)	MnO (wt%)	Na_2O (wt%)	P_2O_5 (wt%)
TBGC-7_249.5-259.5	19.6	0.08	0.16	<0.02	4.09	4.67	0.91	0.03	0.38	0.19
TBGC-7_259.5-269.5	18.7	0.1	0.15	<0.02	4.37	4.79	0.85	0.03	1.11	0.2
TBGC-7_269.5-279.5	16.7	0.1	0.25	<0.02	2.76	5.7	0.82	0.07	1.47	0.19
TBGC-7_279.5-289.5	17	0.07	0.48	<0.02	1.22	5.49	0.9	0.19	1.82	0.24
TBGC-7A_0-9.5	18.4	0.12	0.98	<0.02	9.34	4.61	4.2	0.3	0.08	0.86
TBGC-7A_9.5-19.5	17.7	0.09	0.43	<0.02	8.55	5.32	1.8	0.11	0.34	0.56
TBGC-7A_19.5-29.5	18.2	0.09	0.65	<0.02	7.61	4.99	3.44	0.19	0.06	0.73
TBGC-7A_29.5-39.5	17.7	0.08	0.16	<0.02	5.12	5.02	1.12	0.1	0.35	0.22
TBGC-7A_39.5-49.5	17	0.09	0.36	<0.02	5.89	4.72	1.4	0.09	0.58	0.24
TBGC-7A_49.5-59.5	17.6	0.07	0.16	<0.02	3.69	4.78	0.96	0.06	0.82	0.25
TBGC-7A_59.5-69.5	20.6	0.07	0.14	<0.02	4.48	5.09	0.91	0.04	0.3	0.31
TBGC-7A_69.5-79.5	18.2	0.07	0.16	<0.02	4.86	4.73	0.94	0.05	0.56	0.2
TBGC-7A_79.5-89.5	16.7	0.09	0.44	<0.02	3.68	5	0.87	0.08	1.65	0.16
TBGC-7A_89.5-99.5	16.2	0.1	0.55	<0.02	3.4	5.01	0.84	0.09	1.91	0.15
TBGC-7A_99.5-109.5	15.6	0.08	0.15	<0.02	3.42	4.89	0.68	0.07	0.29	0.18
TBGC-7A_109.5-119.5	14.7	0.11	0.1	<0.02	2.48	6.07	0.58	0.36	0.14	0.15
TBGC-7A_119.5-129.5	16.4	0.09	0.15	<0.02	3.67	5.52	0.81	0.22	0.33	0.17
TBGC-7A_129.5-139.5	17.9	0.09	0.41	<0.02	4.03	5.22	0.96	0.05	0.85	0.2
TBGC-7A_139.5-149.5	17.1	0.08	0.34	<0.02	11.1	4.34	0.85	0.04	0.82	0.13
TBGC-7A_149.5-159.5	17.6	0.07	0.29	<0.02	5.08	4.69	0.91	0.03	0.88	0.17
TBGC-7A_159.5-169.5	17.6	0.15	0.23	<0.02	3.92	6.13	1.01	0.07	1.02	0.13
TBGC-7A_169.5-179.5	17	0.08	0.23	<0.02	4.4	5.63	1.04	0.07	0.86	0.16
TBGC-7A_179.5-189.5	17.4	0.08	0.25	<0.02	3.6	5.7	1.04	0.06	0.84	0.19
TBGC-7A_189.5-199.5	17.3	0.08	0.08	<0.02	3.49	5.58	1.17	0.08	0.14	0.19
TBGC-7A_199.5-209.5	17.6	0.09	0.09	<0.02	3.58	5.62	1.04	0.07	0.1	0.14
TBGC-7A_209.5-219.5	15.4	0.08	0.08	<0.02	2.56	5.61	0.87	0.04	0.15	0.11
TBGC-7A_219.5-229.5	15.3	0.05	0.1	<0.02	5.32	4.03	1.01	0.05	0.05	0.17
TBGC-7A_229.5-239.5	16.8	0.06	0.16	<0.02	5.69	4.47	1.01	0.05	0.21	0.17
TBGC-7A_239.5-249.5	16.6	0.07	0.14	<0.02	6.54	3.83	0.71	0.06	0.32	0.35
TBGC-7A_249.5-259.5	15	0.05	0.1	<0.02	4.69	3.34	0.54	0.05	0.25	0.29
TBGC-7A_259.5-263	11.1	0.03	0.11	<0.02	4.96	2.58	0.25	0.02	0.25	0.36

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	S (wt%)	SiO_2 (wt%)	TiO_2 (wt%)	As (mg/kg)	Co (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Mo (mg/kg)	Nb (mg/kg)	Ni (mg/kg)
TBGC-1_0-9.5	0.84	67.9	0.29	<20	<10	19	592	85	<10	<10
TBGC-1_9.5-19.5	1.12	67.4	0.32	<20	<10	18	848	59	<10	<10
TBGC-1_19.5-29.5	0.72	69.2	0.31	<20	<10	19	349	57	<10	<10
TBGC-1_29.5-39.5	0.74	67.7	0.32	<20	<10	16	428	50	<10	<10
TBGC-1_39.5-49.5	1.41	65.8	0.34	<20	<10	19	630	30	<10	<10
TBGC-1_49.5-59.5	0.77	65.3	0.33	<20	<10	14	595	41	<10	<10
TBGC-1_59.5-69.5	0.36	66	0.43	<20	<10	14	802	32	11	<10
TBGC-1_69.5-79.5	0.27	68.9	0.32	<20	<10	29	282	40	12	<10
TBGC-1_79.5-89.5	0.39	68.7	0.29	<20	<10	23	297	63	<10	<10
TBGC-1_89.5-99.5	0.36	69.2	0.33	<20	<10	26	395	45	<10	<10
TBGC-1_99.5-109.5	0.63	68.1	0.32	<20	11	36	1,301	27	<10	<10
TBGC-1_109.5-119.5	0.7	67.3	0.42	<20	13	21	816	318	21	<10
TBGC-1_119.5-129.5	0.99	66.2	0.47	<20	<10	23	338	104	16	<10
TBGC-1_129.5-139.5	1.16	69.9	0.26	<20	<10	30	566	145	15	<10
TBGC-1_139.5-149.5	1.4	73.5	0.42	<20	15	38	1,568	54	14	<10
TBGC-1_149.5-159.5	1.32	67.3	0.35	<20	<10	23	2,184	82	19	<10
TBGC-1_159.5-169.5	0.87	68.8	0.28	<20	<10	34	469	136	18	<10
TBGC-1_169.5-179.5	1.1	64.7	0.38	<20	<10	15	1,130	35	11	<10
TBGC-1_179.5-189.5	1.5	67.8	0.32	<20	<10	20	228	15	14	<10
TBGC-1_189.5-199.5	0.95	70.1	0.27	<20	<10	32	181	36	16	<10
TBGC-1_199.5-209.5	0.55	74.5	0.29	<20	<10	47	773	68	15	<10
TBGC-1_209.5-219.5	0.19	74.2	0.26	<20	<10	47	778	56	13	<10
TBGC-1_219.5-222	0.69	72.5	0.38	<20	12	43	3,652	35	13	<10
TBGC-2_0-9.5	0.34	60.3	0.51	<20	14	37	1,194	48	<10	<10
TBGC-2_9.5-19.5	0.18	62.8	0.39	<20	<10	20	1,229	50	<10	<10
TBGC-2_19.5-29.5	0.18	65.1	0.32	<20	14	29	2,511	116	<10	<10
TBGC-2_29.5-39.5	0.21	63.3	0.37	<20	10	11	3,841	82	<10	<10
TBGC-2_39.5-49.5	0.17	60.4	0.38	<20	<10	14	2,825	29	<10	<10
TBGC-2_49.5-59.5	0.26	63.3	0.38	<20	<10	16	1,850	84	<10	<10
TBGC-2_59.5-69.5	0.22	62.1	0.39	<20	<10	12	1,117	97	<10	<10
TBGC-2_69.5-79.5	0.19	57.7	0.38	<20	<10	10	1,931	145	<10	<10
TBGC-2_79.5-89.5	0.18	65.3	0.36	<20	<10	19	1,202	102	<10	<10
TBGC-3_0-9.5	0.39	60.9	0.35	<20	12	33	2,430	122	<10	<10
TBGC-3_9.5-19.5	0.26	62.4	0.33	<20	<10	18	2,292	110	<10	<10
TBGC-3_19.5-29.5	0.48	64.2	0.4	<20	<10	43	2,966	105	<10	<10

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	S (wt%)	SiO_2 (wt%)	TiO_2 (wt%)	As (mg/kg)	Co (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Mo (mg/kg)	Nb (mg/kg)	Ni (mg/kg)
TBGC-3_29.5-39.5	0.27	61.5	0.36	<20	14	18	3,000	212	<10	<10
TBGC-3_39.5-49.5	0.44	62.9	0.35	<20	10	14	1,734	289	<10	<10
TBGC-3_49.5-59.5	0.54	58.9	0.41	<20	<10	27	1,456	116	<10	<10
TBGC-3_59.5-69.5	0.45	59.8	0.36	<20	12	47	1,977	171	<10	<10
TBGC-3_69.5-79.5	0.33	60	0.36	<20	11	34	3,332	111	<10	<10
TBGC-3_79.5-89.5	0.27	64	0.41	<20	<10	33	2,889	77	<10	<10
TBGC-3_89.5-99.5	0.26	61.9	0.38	<20	11	16	2,286	103	<10	<10
TBGC-3_99.5-109.5	0.44	61.6	0.37	<20	11	19	2,259	84	<10	<10
TBGC-3_109.5-119.5	0.36	65.1	0.4	<20	13	30	3,006	22	<10	<10
TBGC-3_119.5-129.5	0.39	63.2	0.34	<20	12	23	2,430	87	<10	<10
TBGC-3_129.5-139.5	0.26	64.9	0.36	<20	<10	23	3,046	81	<10	<10
TBGC-3_13.95-149.5	0.34	63.5	0.33	<20	16	19	2,883	137	<10	<10
TBGC-3_149.5-159.5	0.27	68.2	0.35	<20	<10	24	1,806	133	<10	<10
TBGC-3_159.5-169.5	0.27	66.2	0.36	<20	12	20	3,708	188	<10	<10
TBGC-3_169.5-179.5	0.31	68.8	0.37	<20	52	25	3,600	284	<10	<10
TBGC-4_0-9.5	0.17	64.2	0.33	<20	<10	21	1,260	161	<10	<10
TBGC-4_9.5-19.5	0.17	64.4	0.34	<20	10	27	1,658	234	10	<10
TBGC-4_19.5-29.5	0.23	60.2	0.39	<20	19	12	2,439	172	<10	<10
TBGC-4_29.5-39.5	0.23	60.9	0.4	<20	<10	16	2,266	103	<10	<10
TBGC-4_39.5-49.5	0.23	63.7	0.38	<20	11	20	1,761	111	<10	<10
TBGC-5_0-9.5	0.59	65.3	0.38	<20	<10	31	794	132	<10	<10
TBGC-5_9.5-19.5	0.41	62.8	0.38	<20	11	31	1,068	121	<10	<10
TBGC-5_19.5-29.5	1.06	64	0.29	<20	<10	28	1,212	100	<10	<10
TBGC-5_29.5-39.5	0.33	69.1	0.31	<20	<10	24	980	62	<10	<10
TBGC-5_39.5-49.5	0.67	65.5	0.41	<20	14	25	1,799	115	<10	<10
TBGC-5_49.5-59.5	0.33	65.7	0.35	<20	12	20	1,032	72	<10	<10
TBGC-5_59.5-69.5	0.25	67.4	0.29	<20	13	29	1,379	86	<10	<10
TBGC-5_69.5-79.5	0.46	65.6	0.46	<20	16	25	1,979	64	<10	<10
TBGC-5_79.5-89.5	0.12	66.5	0.33	<20	12	26	975	111	<10	<10
TBGC-5_89.5-99.5	0.3	65.7	0.38	<20	<10	20	916	122	<10	<10
TBGC-5_99.5-109.5	0.34	66.1	0.36	<20	15	29	1,172	158	<10	<10
TBGC-5_109.5-119.5	0.44	66.6	0.38	<20	<10	27	676	76	<10	<10
TBGC-5_119.5-129.5	0.31	69.3	0.37	<20	<10	39	718	146	<10	<10
TBGC-5_129.5-139.5	0.31	67.5	0.32	<20	<10	31	401	33	<10	<10
TBGC-6_0-9.5	0.68	70.5	0.41	<20	11	44	3,032	26	11	<10

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	S (wt%)	SiO_2 (wt%)	TiO_2 (wt%)	As (mg/kg)	Co (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Mo (mg/kg)	Nb (mg/kg)	Ni (mg/kg)
TBGC-6_9.5-19.5	1.37	67.1	0.6	22	19	43	4,625	28	12	<10
TBGC-6_19.5-29.5	0.81	69.2	0.47	<20	<10	32	8,054	15	16	<10
TBGC-6_29.5-39.5	0.6	73.9	0.3	<20	<10	19	3,600	<10	11	<10
TBGC-6_39.5-49.5	0.95	67.2	0.28	<20	<10	25	865	43	12	<10
TBGC-6_49.5-59.5	0.62	68.4	0.31	<20	<10	27	1,431	15	11	<10
TBGC-6_59.5-69.5	0.69	66.4	0.37	<20	10	28	1,254	47	<10	<10
TBGC-6_69.5-79.5	0.43	66.5	0.33	<20	<10	20	735	61	<10	<10
TBGC-6_79.5-89.5	1.03	60.5	0.44	<20	<10	14	548	<10	<10	<10
TBGC-6_89.5-99.5	0.53	61.9	0.46	<20	<10	15	1,771	<10	<10	<10
TBGC-6_99.5-107	0.71	62.6	0.42	<20	<10	10	3,351	<10	<10	<10
TBGC-7_0-9.5	0.57	69.2	0.39	<20	13	34	729	45	<10	246
TBGC-7_9.5-19.5	0.24	71.6	0.3	<20	14	39	630	<10	<10	342
TBGC-7_19.5-29.5	0.87	70.6	0.43	<20	16	36	1,737	38	<10	223
TBGC-7_29.5-39.5	0.63	68.5	0.45	<20	13	37	1,160	66	<10	95
TBGC-7_39.5-49.5	0.41	67.1	0.44	<20	11	34	1,097	75	<10	56
TBGC-7_49.5-59.5	0.44	66.6	0.44	<20	10	16	919	61	<10	<10
TBGC-7_59.5-69.5	0.75	62.5	0.49	<20	14	26	1,510	129	<10	20
TBGC-7_69.5-79.5	0.68	71.1	0.51	<20	19	32	784	76	<10	20
TBGC-7_79.5-89.5	1.19	67.3	0.41	<20	25	40	1,110	133	<10	41
TBGC-7_89.5-99.5	0.48	70	0.36	<20	18	43	901	84	<10	22
TBGC-7_99.5-109.5	0.67	66.9	0.41	<20	17	27	861	68	<10	13
TBGC-7_109.5-119.5	1.24	66.4	0.41	<20	17	23	587	37	<10	<10
TBGC-7_119.5-129.5	0.84	64.1	0.4	<20	16	18	1,192	46	<10	<10
TBGC-7_129.5-139.5	1.2	63.4	0.37	<20	15	24	2,818	136	<10	<10
TBGC-7_139.5-149.5	0.51	63.5	0.36	<20	12	20	2,932	50	<10	<10
TBGC-7_149.5-159.5	0.86	66	0.34	<20	11	25	875	91	<10	<10
TBGC-7_159.5-169.5	0.84	62.4	0.47	<20	13	20	2,244	98	<10	<10
TBGC-7_169.5-179.5	0.65	67	0.41	<20	14	29	2,091	94	<10	<10
TBGC-7_179.5-189.5	1.22	64.9	0.44	<20	13	21	954	40	<10	<10
TBGC-7_189.5-199.5	0.76	63.6	0.38	<20	<10	23	556	42	<10	<10
TBGC-7_199.5-209.5	0.79	62.7	0.4	<20	<10	25	1,223	149	<10	<10
TBGC-7_209.5-219.5	0.8	63.1	0.37	<20	14	28	5,435	149	<10	<10
TBGC-7_219.5-229.5	0.46	64.2	0.3	<20	21	17	6,556	197	<10	<10
TBGC-7_229.5-239.5	0.52	58.2	0.33	<20	14	<10	5,118	130	<10	<10
TBGC-7_239.5-249.5	0.36	62.4	0.35	<20	<10	14	6,628	126	<10	<10

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	S (wt%)	SiO_2 (wt%)	TiO_2 (wt%)	As (mg/kg)	Co (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Mo (mg/kg)	Nb (mg/kg)	Ni (mg/kg)
TBGC-7_249.5-259.5	0.34	60.7	0.4	<20	<10	11	3,565	96	<10	<10
TBGC-7_259.5-269.5	0.47	62.3	0.36	<20	<10	19	1,244	149	<10	<10
TBGC-7_269.5-279.5	0.33	64.5	0.35	<20	17	17	2,164	60	<10	<10
TBGC-7_279.5-289.5	0.3	62.9	0.34	<20	57	20	4,668	<10	<10	14
TBGC-7A_0-9.5	1.68	57.7	1.05	<20	28	39	1,449	90	<10	17
TBGC-7A_9.5-19.5	1.26	64	0.66	<20	26	23	3,914	596	<10	11
TBGC-7A_19.5-29.5	1.55	59.7	0.96	<20	24	39	1,683	53	<10	16
TBGC-7A_29.5-39.5	1.33	66	0.5	<20	14	22	1,744	15	<10	<10
TBGC-7A_39.5-49.5	1.46	62.8	0.56	<20	22	23	1,152	42	<10	<10
TBGC-7A_49.5-59.5	1.32	66.7	0.55	<20	13	31	418	<10	<10	<10
TBGC-7A_59.5-69.5	2.27	63.1	0.71	<20	15	11	976	<10	<10	<10
TBGC-7A_69.5-79.5	2.25	66.2	0.55	<20	15	21	2,150	<10	<10	<10
TBGC-7A_79.5-89.5	1.42	64.5	0.33	<20	13	53	2,029	31	<10	12
TBGC-7A_89.5-99.5	1.17	66.8	0.31	<20	10	28	1,571	70	<10	<10
TBGC-7A_99.5-109.5	0.92	71.3	0.3	<20	<10	39	1,201	231	15	<10
TBGC-7A_109.5-119.5	0.45	72	0.32	<20	21	44	1,270	406	16	<10
TBGC-7A_119.5-129.5	0.87	68.3	0.31	<20	17	32	1,179	319	11	<10
TBGC-7A_129.5-139.5	1.38	61.8	0.36	<20	13	19	1,481	107	<10	<10
TBGC-7A_139.5-149.5	4.28	66	0.32	21	25	47	1,080	100	11	<10
TBGC-7A_149.5-159.5	1.95	65.7	0.35	<20	11	31	952	68	10	<10
TBGC-7A_159.5-169.5	1.14	69.9	0.34	<20	13	28	1,958	22	<10	<10
TBGC-7A_169.5-179.5	0.92	71	0.4	<20	15	43	1,809	24	13	<10
TBGC-7A_179.5-189.5	0.81	67.1	0.54	<20	11	32	1,256	48	16	<10
TBGC-7A_189.5-199.5	1.21	70.1	0.44	<20	11	38	1,286	48	17	<10
TBGC-7A_199.5-209.5	1.08	69.4	0.37	<20	12	43	1,157	43	14	<10
TBGC-7A_209.5-219.5	0.76	73.2	0.29	<20	<10	43	1,314	51	13	<10
TBGC-7A_219.5-229.5	2.64	75.8	0.31	<20	15	51	1,504	23	14	<10
TBGC-7A_229.5-239.5	1.99	66.9	0.5	<20	11	41	385	10	14	<10
TBGC-7A_239.5-249.5	2.39	62.7	0.39	<20	<10	27	651	21	14	<10
TBGC-7A_249.5-259.5	2.14	68	0.3	<20	<10	42	578	15	11	<10
TBGC-7A_259.5-263	2.72	71.7	0.21	<20	<10	47	403	11	<10	<10

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	Pb (mg/kg)	Rb (mg/kg)	Sn (mg/kg)	Sr (mg/kg)	U (mg/kg)	V (mg/kg)	W (mg/kg)	Y (mg/kg)	Zn (mg/kg)	Zr (mg/kg)
TBGC-1_0-9.5	123	174	61	516	<10	27	<10	<10	152	116
TBGC-1_9.5-19.5	87	154	79	515	<10	25	<10	12	166	133
TBGC-1_19.5-29.5	166	173	<50	717	<10	24	<10	<10	217	117
TBGC-1_29.5-39.5	100	169	<50	537	<10	28	<10	<10	140	111
TBGC-1_39.5-49.5	77	190	73	320	<10	34	<10	10	207	130
TBGC-1_49.5-59.5	77	209	86	224	<10	31	<10	<10	227	114
TBGC-1_59.5-69.5	107	185	53	327	<10	56	<10	16	606	131
TBGC-1_69.5-79.5	150	146	<50	314	<10	31	<10	30	207	132
TBGC-1_79.5-89.5	206	165	<50	407	<10	34	<10	19	231	124
TBGC-1_89.5-99.5	115	142	<50	376	<10	36	<10	30	139	142
TBGC-1_99.5-109.5	55	143	<50	379	<10	35	<10	19	347	123
TBGC-1_109.5-119.5	304	156	100	382	<10	40	14	58	262	247
TBGC-1_119.5-129.5	390	175	87	297	<10	38	11	59	109	217
TBGC-1_129.5-139.5	179	125	99	205	<10	24	11	42	260	152
TBGC-1_139.5-149.5	346	123	53	154	<10	28	16	62	378	189
TBGC-1_149.5-159.5	228	134	64	102	<10	27	<10	75	87	224
TBGC-1_159.5-169.5	205	135	<50	168	<10	25	<10	62	79	219
TBGC-1_169.5-179.5	419	171	61	174	<10	36	<10	33	2,109	147
TBGC-1_179.5-189.5	511	170	66	160	<10	36	<10	46	287	165
TBGC-1_189.5-199.5	150	158	58	115	<10	29	<10	49	106	180
TBGC-1_199.5-209.5	364	165	52	118	21	24	<10	80	114	246
TBGC-1_209.5-219.5	185	138	<50	80	19	21	<10	65	131	211
TBGC-1_219.5-222	212	144	76	128	26	52	10	60	946	189
TBGC-2_0-9.5	160	143	101	310	<10	100	<10	56	691	129
TBGC-2_9.5-19.5	122	152	74	312	<10	38	<10	26	1,250	115
TBGC-2_19.5-29.5	202	142	87	270	12	40	<10	14	833	98
TBGC-2_29.5-39.5	581	140	111	295	<10	37	<10	14	864	106
TBGC-2_39.5-49.5	224	189	67	149	<10	40	<10	15	1,416	112
TBGC-2_49.5-59.5	1,523	194	91	227	<10	43	<10	20	932	111
TBGC-2_59.5-69.5	1,003	191	83	224	<10	37	<10	16	859	105
TBGC-2_69.5-79.5	96	147	85	368	<10	35	<10	20	576	112
TBGC-2_79.5-89.5	121	141	68	276	<10	43	<10	10	1,354	102
TBGC-3_0-9.5	146	154	93	295	<10	39	<10	17	539	106
TBGC-3_9.5-19.5	139	147	59	292	<10	30	<10	12	460	106
TBGC-3_19.5-29.5	92	135	65	391	<10	37	<10	19	382	116

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	Pb (mg/kg)	Rb (mg/kg)	Sn (mg/kg)	Sr (mg/kg)	U (mg/kg)	V (mg/kg)	W (mg/kg)	Y (mg/kg)	Zn (mg/kg)	Zr (mg/kg)
TBGC-3_29.5-39.5	359	151	93	287	<10	40	<10	16	538	107
TBGC-3_39.5-49.5	245	155	88	398	10	43	<10	16	337	101
TBGC-3_49.5-59.5	153	164	81	416	<10	38	<10	17	734	118
TBGC-3_59.5-69.5	181	148	95	329	<10	41	<10	13	712	102
TBGC-3_69.5-79.5	110	121	66	342	<10	36	<10	17	453	102
TBGC-3_79.5-89.5	118	136	62	321	<10	34	<10	34	389	109
TBGC-3_89.5-99.5	175	171	64	370	<10	39	<10	14	964	105
TBGC-3_99.5-109.5	287	129	69	335	<10	35	<10	14	710	109
TBGC-3_109.5-119.5	147	127	54	342	<10	37	<10	21	884	117
TBGC-3_119.5-129.5	140	159	68	300	<10	36	<10	16	654	110
TBGC-3_129.5-139.5	130	164	62	255	<10	36	<10	11	499	105
TBGC-3_13.95-149.5	210	151	80	292	<10	36	<10	19	554	101
TBGC-3_149.5-159.5	91	154	58	339	<10	33	<10	14	428	116
TBGC-3_159.5-169.5	70	147	92	263	<10	33	<10	10	309	117
TBGC-3_169.5-179.5	78	125	73	233	<10	37	<10	13	271	100
TBGC-4_0-9.5	127	166	78	293	<10	38	<10	<10	234	116
TBGC-4_9.5-19.5	164	165	77	273	<10	37	<10	17	289	129
TBGC-4_19.5-29.5	351	161	79	402	<10	36	<10	25	726	114
TBGC-4_29.5-39.5	162	141	66	333	<10	38	<10	22	610	122
TBGC-4_39.5-49.5	261	127	60	364	<10	36	<10	19	628	106
TBGC-5_0-9.5	70	147	54	189	<10	44	<10	13	75	121
TBGC-5_9.5-19.5	82	134	53	329	<10	48	<10	28	234	129
TBGC-5_19.5-29.5	313	153	51	409	<10	58	<10	13	284	112
TBGC-5_29.5-39.5	95	139	<50	454	<10	28	<10	14	341	111
TBGC-5_39.5-49.5	113	140	<50	383	<10	39	<10	21	532	129
TBGC-5_49.5-59.5	145	123	<50	480	<10	38	<10	37	384	106
TBGC-5_59.5-69.5	96	110	<50	427	<10	34	<10	21	441	108
TBGC-5_69.5-79.5	82	141	54	390	<10	41	<10	12	987	118
TBGC-5_79.5-89.5	431	127	<50	513	<10	43	<10	12	438	96
TBGC-5_89.5-99.5	98	119	53	422	<10	38	<10	12	224	114
TBGC-5_99.5-109.5	97	103	70	544	<10	40	<10	11	264	126
TBGC-5_109.5-119.5	56	114	<50	539	<10	37	<10	10	112	121
TBGC-5_119.5-129.5	50	120	<50	517	<10	40	<10	23	58	134
TBGC-5_129.5-139.5	18	100	<50	509	<10	32	<10	<10	84	109
TBGC-6_0-9.5	203	165	62	140	20	63	<10	62	566	177

XRF Results for Geochemical Boreholes

Borehole ID and Sample Interval	Pb (mg/kg)	Rb (mg/kg)	Sn (mg/kg)	Sr (mg/kg)	U (mg/kg)	V (mg/kg)	W (mg/kg)	Y (mg/kg)	Zn (mg/kg)	Zr (mg/kg)
TBGC-6_9.5-19.5	678	180	79	231	23	112	<10	61	475	169
TBGC-6_19.5-29.5	458	207	<50	162	14	52	<10	64	538	206
TBGC-6_29.5-39.5	203	198	<50	98	17	21	<10	82	459	182
TBGC-6_39.5-49.5	277	192	68	255	20	27	<10	63	425	175
TBGC-6_49.5-59.5	202	204	<50	273	14	25	<10	48	461	158
TBGC-6_59.5-69.5	175	146	<50	413	15	32	<10	20	783	109
TBGC-6_69.5-79.5	204	126	<50	373	<10	28	<10	<10	631	97
TBGC-6_79.5-89.5	124	166	<50	95	<10	38	<10	11	1,033	121
TBGC-6_89.5-99.5	151	140	<50	295	<10	39	<10	<10	913	115
TBGC-6_99.5-107	156	161	<50	248	14	41	<10	15	1,310	111
TBGC-7_0-9.5	62	85	<50	614	25	34	<10	19	534	109
TBGC-7_9.5-19.5	26	58	<50	768	18	31	<10	16	493	98
TBGC-7_19.5-29.5	42	71	<50	689	33	41	<10	24	669	109
TBGC-7_29.5-39.5	69	96	<50	668	31	37	<10	28	755	117
TBGC-7_39.5-49.5	69	114	<50	779	32	41	<10	14	474	121
TBGC-7_49.5-59.5	38	125	<50	620	31	49	<10	24	492	117
TBGC-7_59.5-69.5	117	121	65	710	39	47	<10	20	827	133
TBGC-7_69.5-79.5	87	132	<50	415	38	45	<10	33	515	128
TBGC-7_79.5-89.5	583	148	60	497	31	41	<10	30	564	105
TBGC-7_89.5-99.5	103	120	<50	544	32	35	<10	22	455	114
TBGC-7_99.5-109.5	70	123	<50	534	26	35	<10	15	685	102
TBGC-7_109.5-119.5	94	153	52	297	23	40	<10	20	899	123
TBGC-7_119.5-129.5	168	142	57	578	30	39	<10	27	767	106
TBGC-7_129.5-139.5	176	158	91	554	42	37	<10	19	513	100
TBGC-7_139.5-149.5	94	168	78	345	21	39	<10	10	430	94
TBGC-7_149.5-159.5	174	168	57	295	22	32	<10	18	528	116
TBGC-7_159.5-169.5	88	161	62	316	24	34	<10	17	987	112
TBGC-7_169.5-179.5	139	175	54	373	26	41	<10	20	607	106
TBGC-7_179.5-189.5	174	149	66	264	26	37	<10	18	949	113
TBGC-7_189.5-199.5	94	150	<50	225	10	34	<10	13	496	102
TBGC-7_199.5-209.5	191	172	73	312	25	33	<10	14	564	121
TBGC-7_209.5-219.5	121	140	68	321	22	35	<10	18	451	106
TBGC-7_219.5-229.5	110	141	66	360	20	31	<10	33	475	97
TBGC-7_229.5-239.5	154	134	69	500	22	27	<10	35	698	100
TBGC-7_239.5-249.5	118	146	73	352	22	32	<10	54	580	106

XRF Results for Geochemical Boreholes

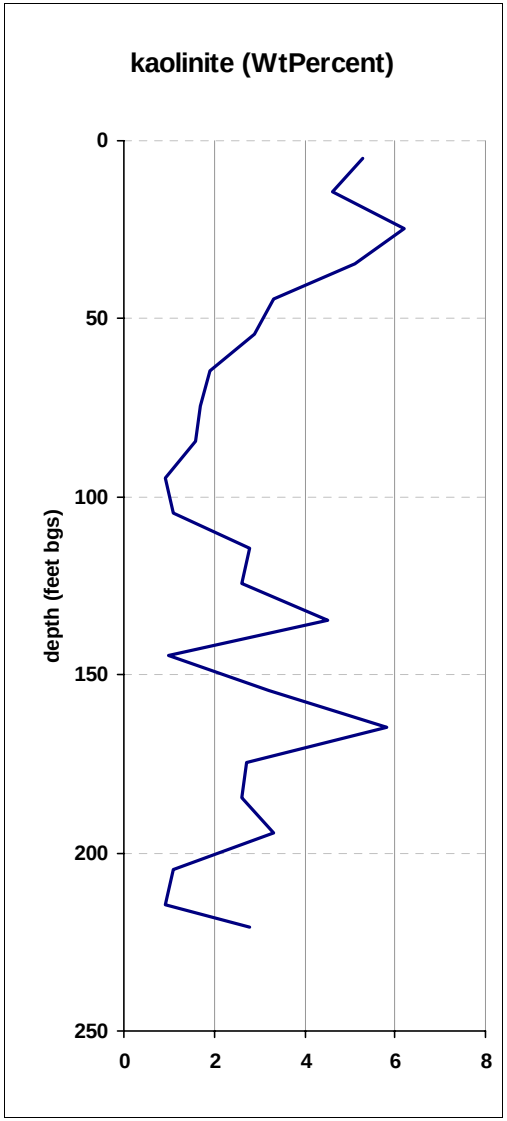
Borehole ID and Sample Interval	Pb (mg/kg)	Rb (mg/kg)	Sn (mg/kg)	Sr (mg/kg)	U (mg/kg)	V (mg/kg)	W (mg/kg)	Y (mg/kg)	Zn (mg/kg)	Zr (mg/kg)
TBGC-7_249.5-259.5	143	154	56	334	11	34	<10	23	395	110
TBGC-7_259.5-269.5	156	153	<50	364	12	36	<10	14	583	102
TBGC-7_269.5-279.5	102	142	<50	321	12	36	<10	11	811	95
TBGC-7_279.5-289.5	80	127	<50	505	<10	40	<10	12	1,247	90
TBGC-7A_0-9.5	569	174	102	168	22	239	<10	52	4,293	144
TBGC-7A_9.5-19.5	182	186	91	248	30	144	<10	58	998	169
TBGC-7A_19.5-29.5	109	187	106	150	24	202	<10	60	1,498	165
TBGC-7A_29.5-39.5	127	222	66	211	14	31	<10	42	544	180
TBGC-7A_39.5-49.5	98	212	80	132	18	32	<10	67	918	248
TBGC-7A_49.5-59.5	204	204	<50	99	15	60	<10	49	452	161
TBGC-7A_59.5-69.5	305	187	61	135	12	85	<10	41	266	129
TBGC-7A_69.5-79.5	195	184	62	168	15	72	<10	33	320	130
TBGC-7A_79.5-89.5	511	175	<50	293	20	28	<10	37	884	126
TBGC-7A_89.5-99.5	245	157	<50	381	<10	29	<10	34	918	138
TBGC-7A_99.5-109.5	219	146	<50	274	<10	36	<10	59	654	229
TBGC-7A_109.5-119.5	174	152	<50	285	<10	41	<10	54	453	220
TBGC-7A_119.5-129.5	244	149	<50	330	<10	40	<10	38	482	153
TBGC-7A_129.5-139.5	123	165	55	306	<10	38	<10	15	749	103
TBGC-7A_139.5-149.5	132	128	107	144	18	26	15	15	682	91
TBGC-7A_149.5-159.5	88	145	79	151	<10	29	<10	11	458	111
TBGC-7A_159.5-169.5	218	220	<50	207	<10	20	<10	14	1,183	120
TBGC-7A_169.5-179.5	109	227	53	150	<10	29	<10	33	671	181
TBGC-7A_179.5-189.5	128	199	50	108	<10	32	<10	56	897	233
TBGC-7A_189.5-199.5	692	195	<50	157	15	33	<10	81	1,560	232
TBGC-7A_199.5-209.5	773	208	<50	141	<10	30	<10	55	1,646	195
TBGC-7A_209.5-219.5	195	182	<50	109	<10	23	10	36	532	161
TBGC-7A_219.5-229.5	358	143	67	133	11	25	17	40	540	176
TBGC-7A_229.5-239.5	124	175	94	152	15	39	11	45	548	233
TBGC-7A_239.5-249.5	229	153	104	272	<10	70	<10	35	522	148
TBGC-7A_249.5-259.5	189	133	65	410	<10	33	<10	39	449	164
TBGC-7A_259.5-263	41	90	74	608	<10	30	<10	24	302	108

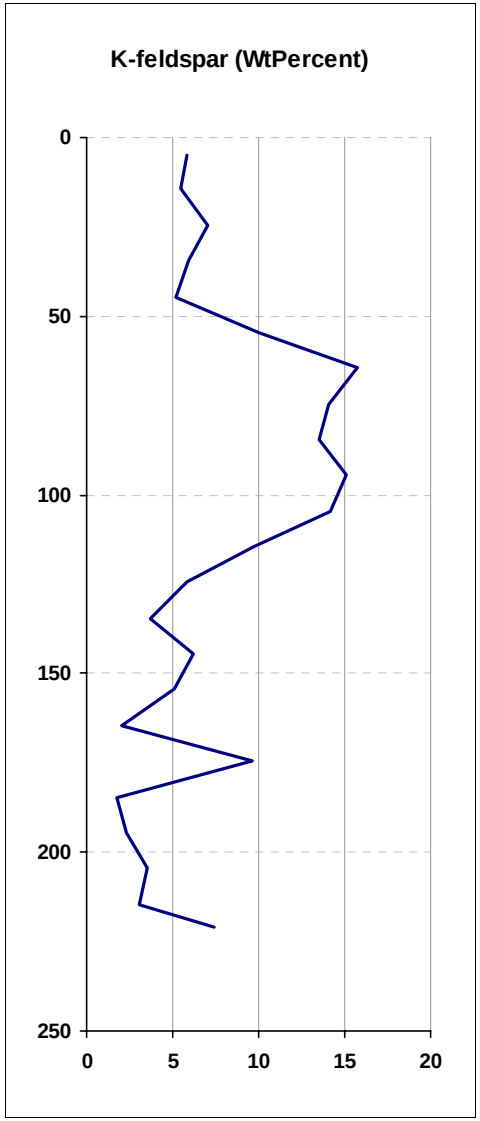
APPENDIX C

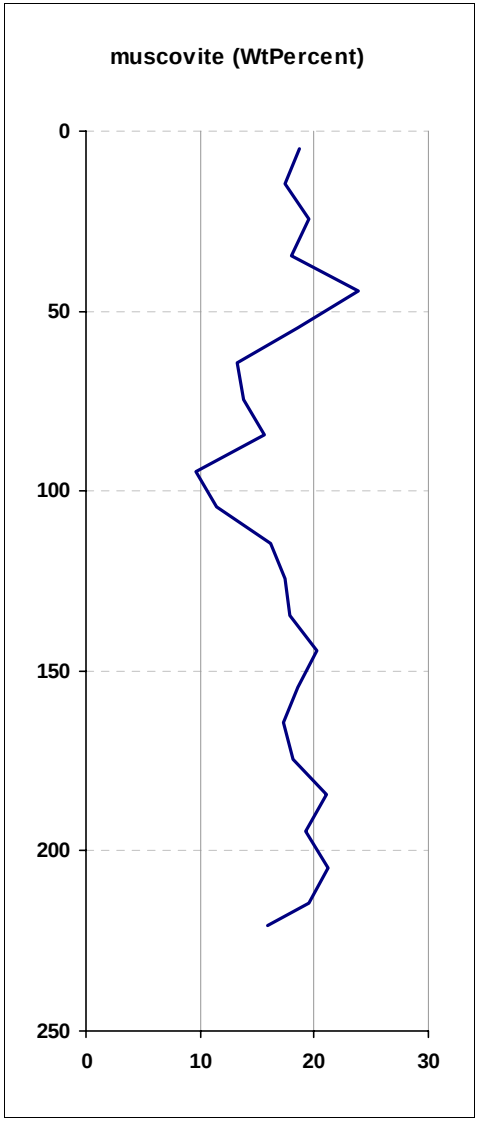
Tyrone Mine Sample Test Results by Location, Test Type

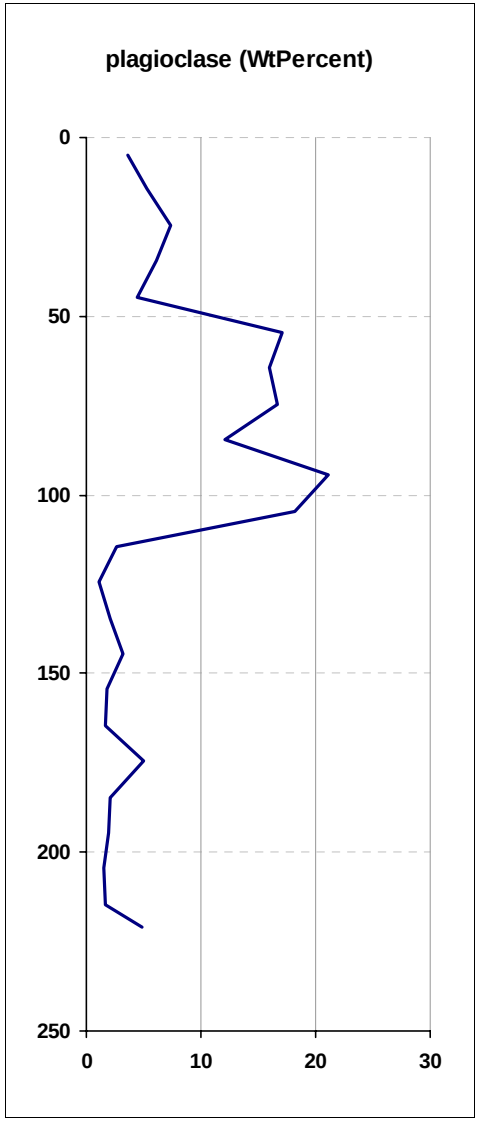
Location: TBGC-1

Test Type: Mineralogy









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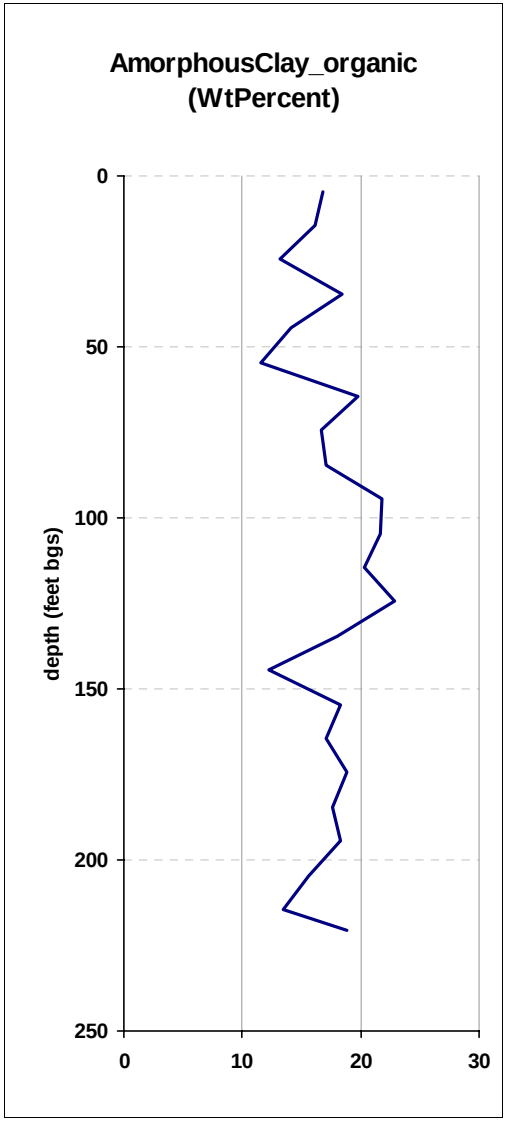
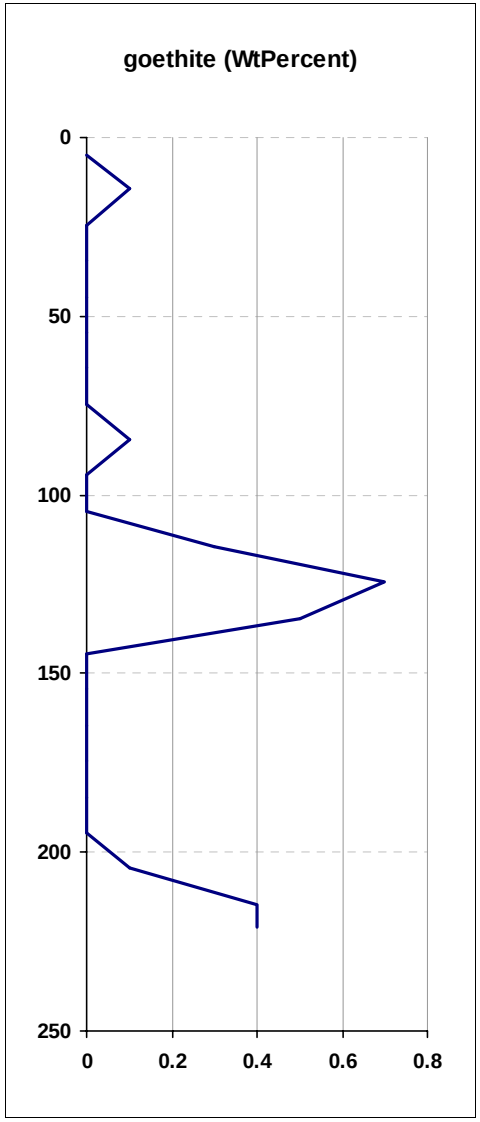
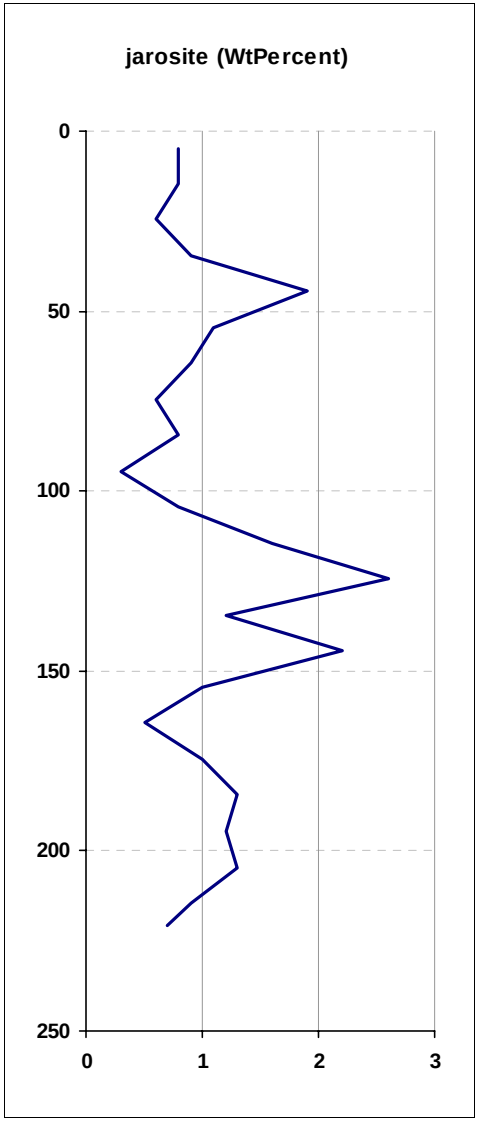
Tyrone Mine Sample Test Results by Location, Test Type

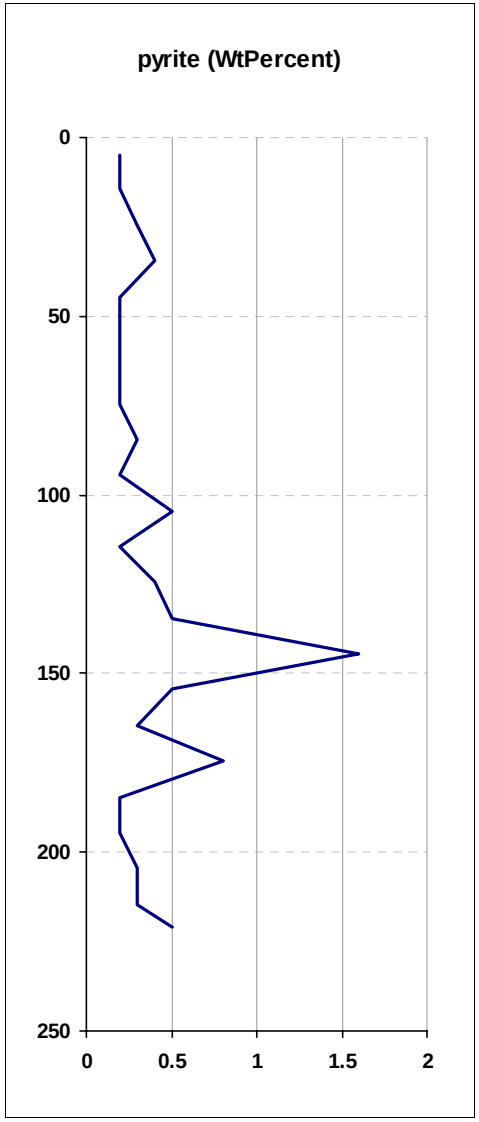
Location: TBGC-1

Test Type: Mineralogy









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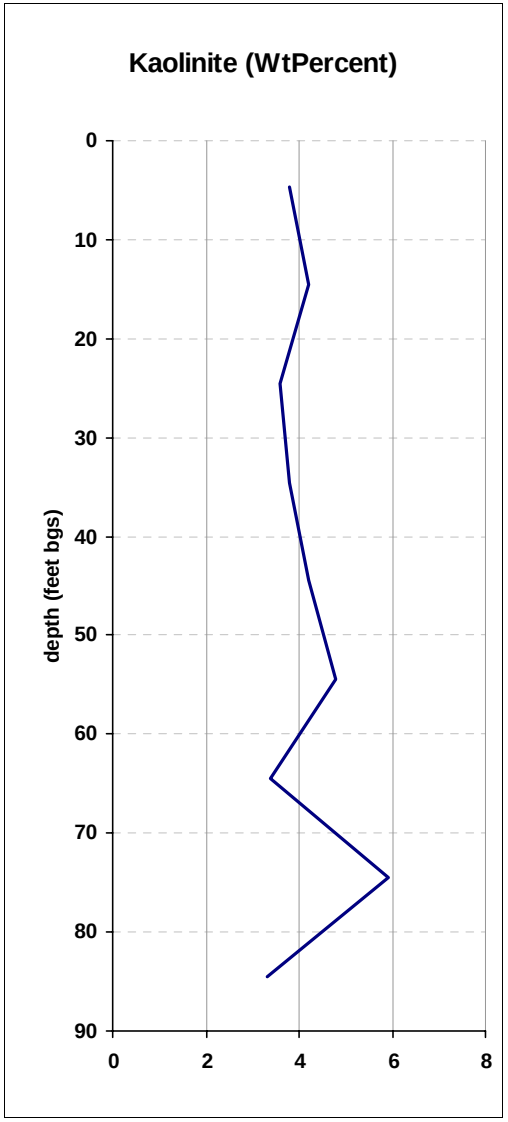
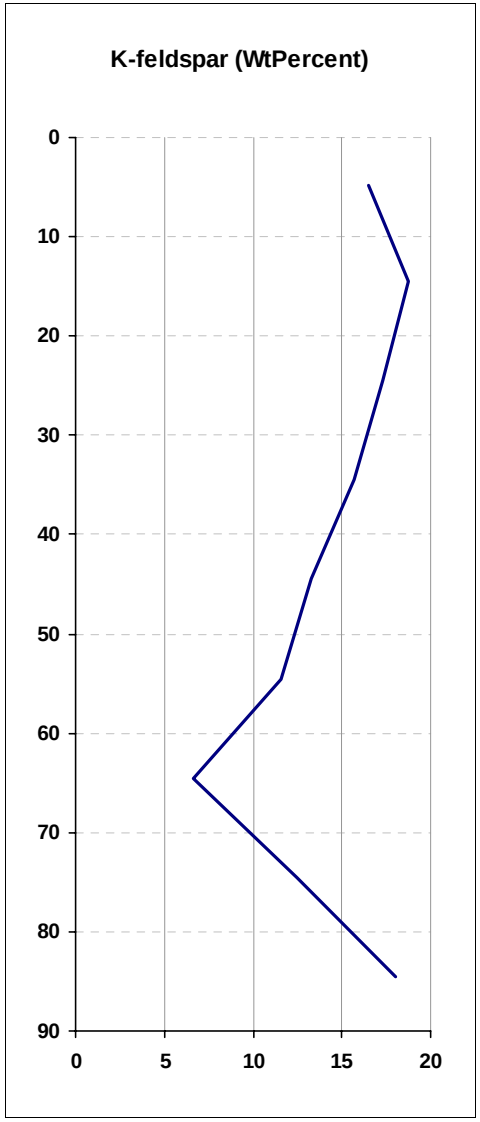
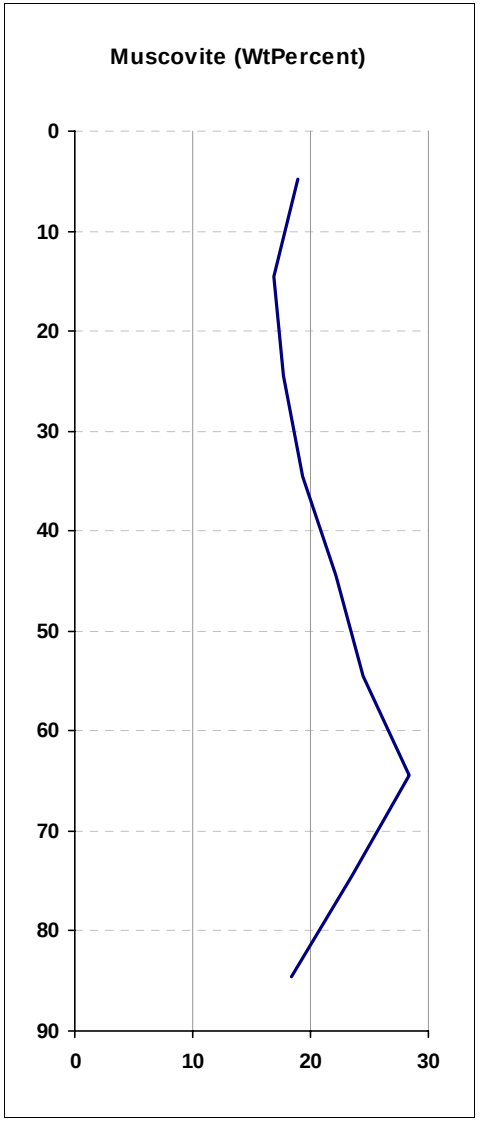
Tyrone Mine Sample Test Results by Location, Test Type

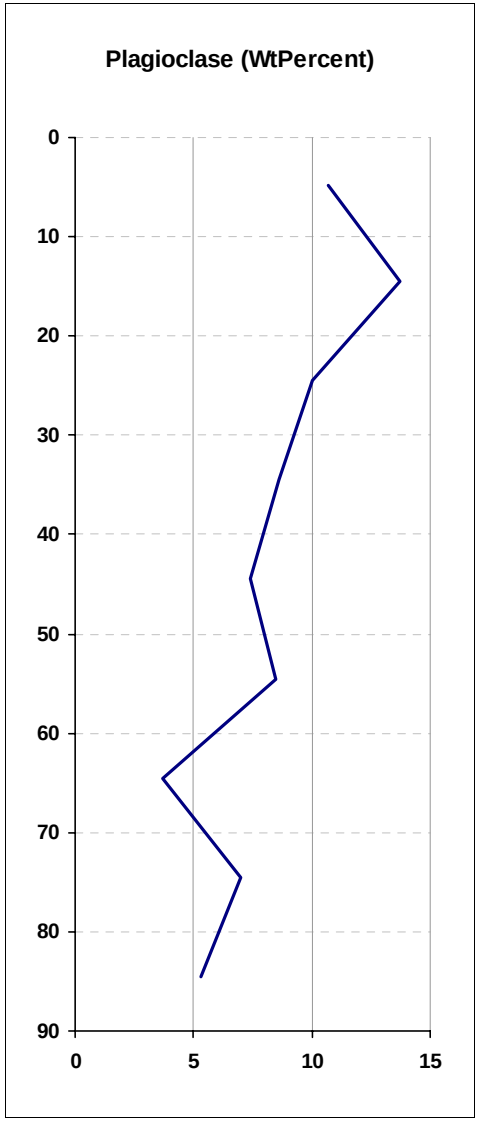
Location: TBGC-2

Test Type: Mineralogy









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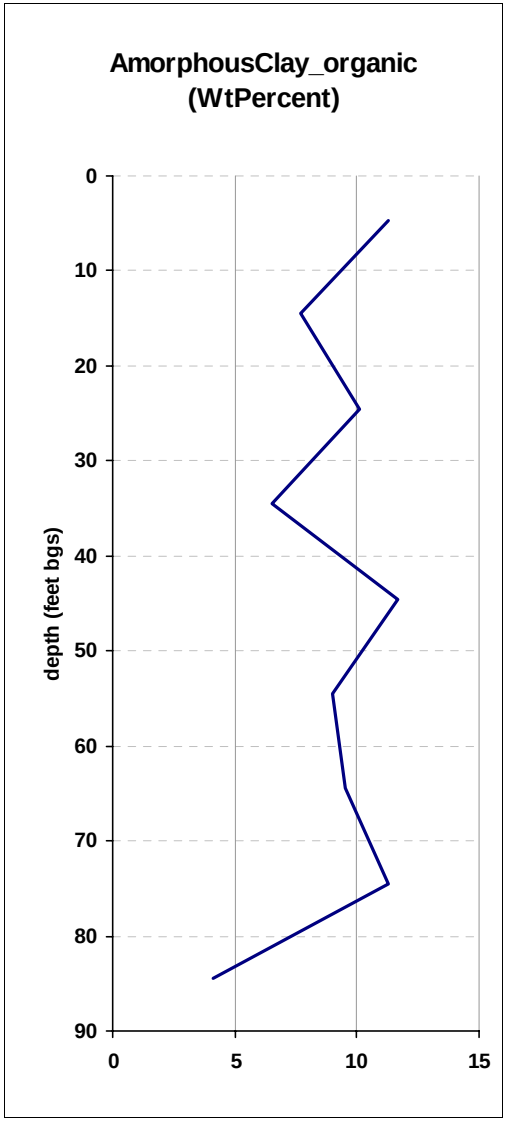
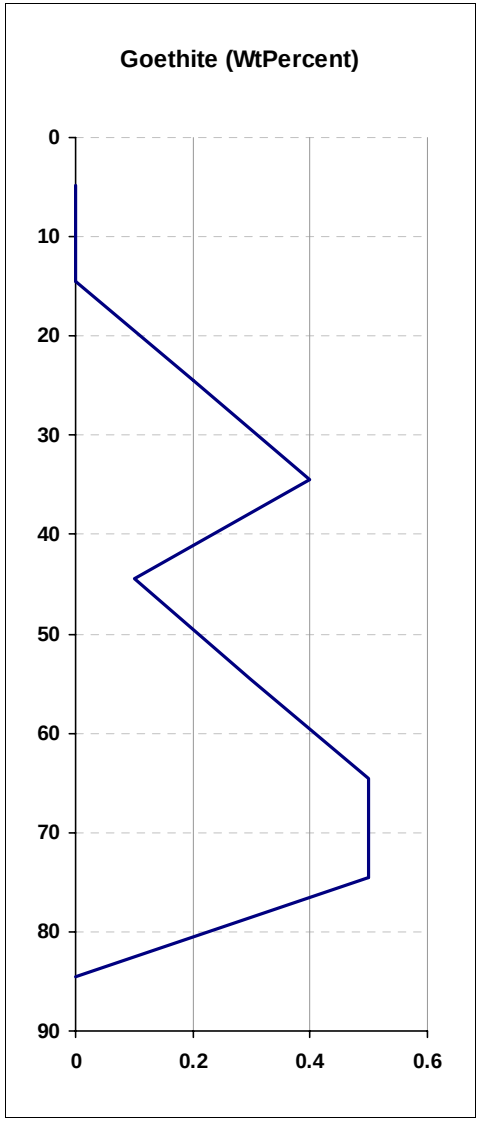
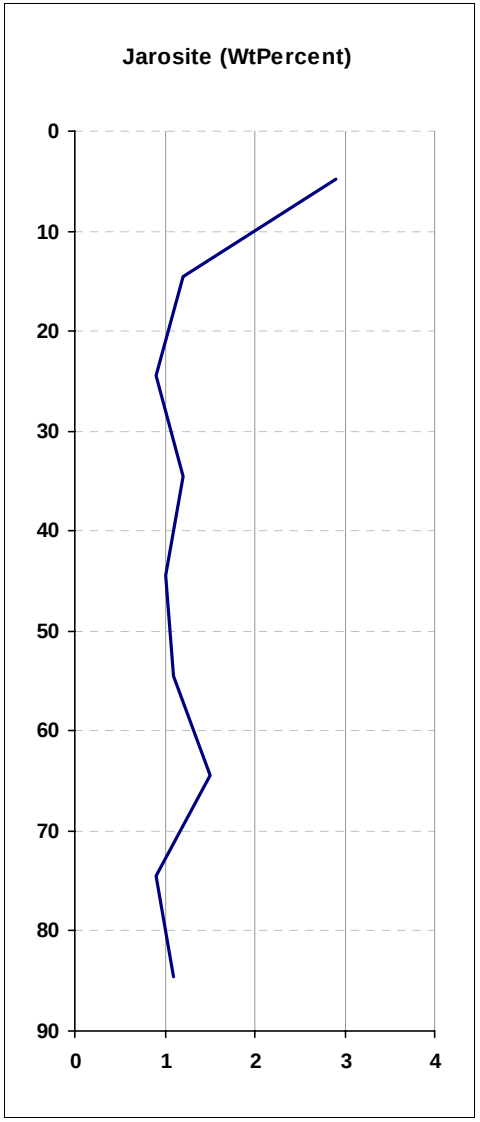
Tyrone Mine Sample Test Results by Location, Test Type

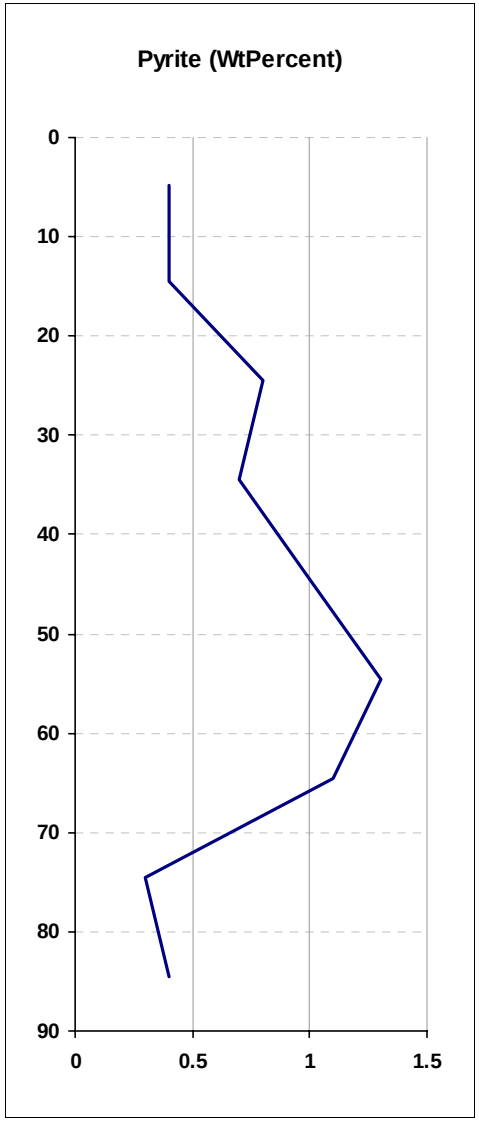
Location: TBGC-2

Test Type: Mineralogy









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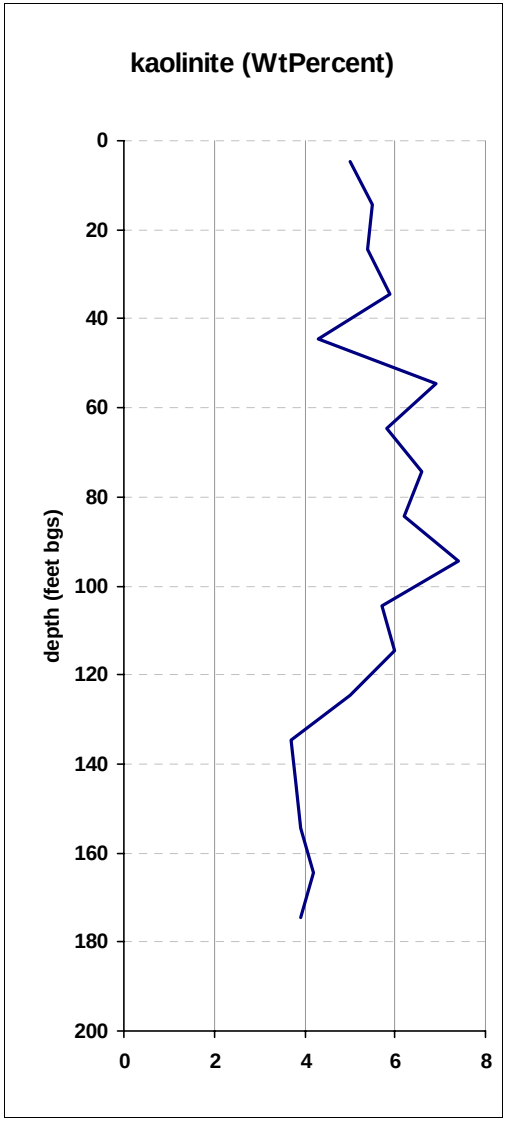
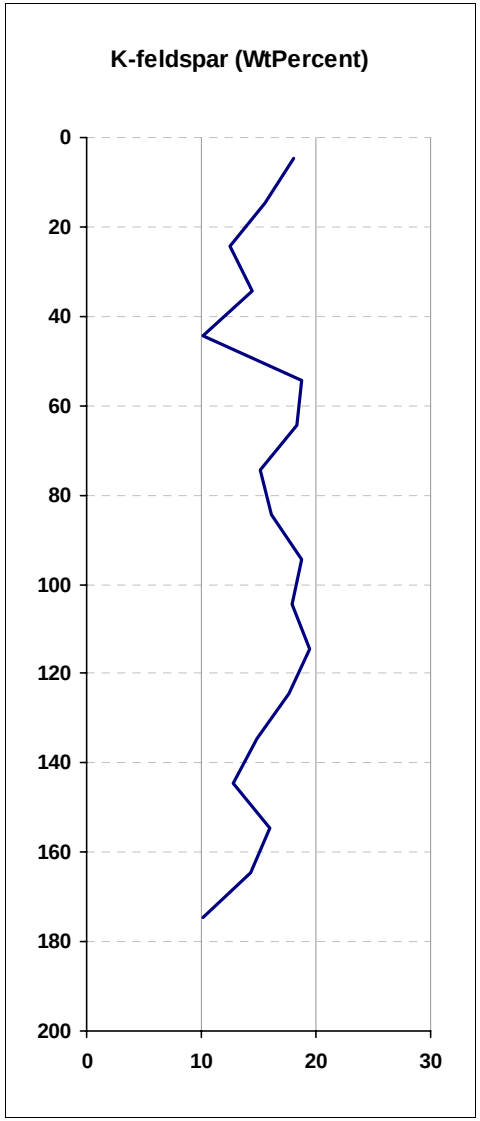
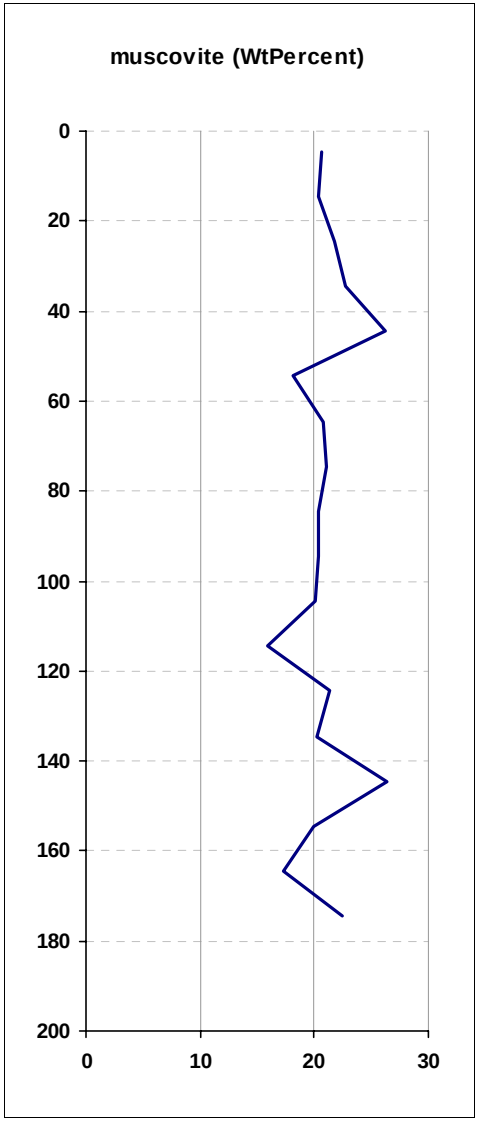
Tyrone Mine Sample Test Results by Location, Test Type

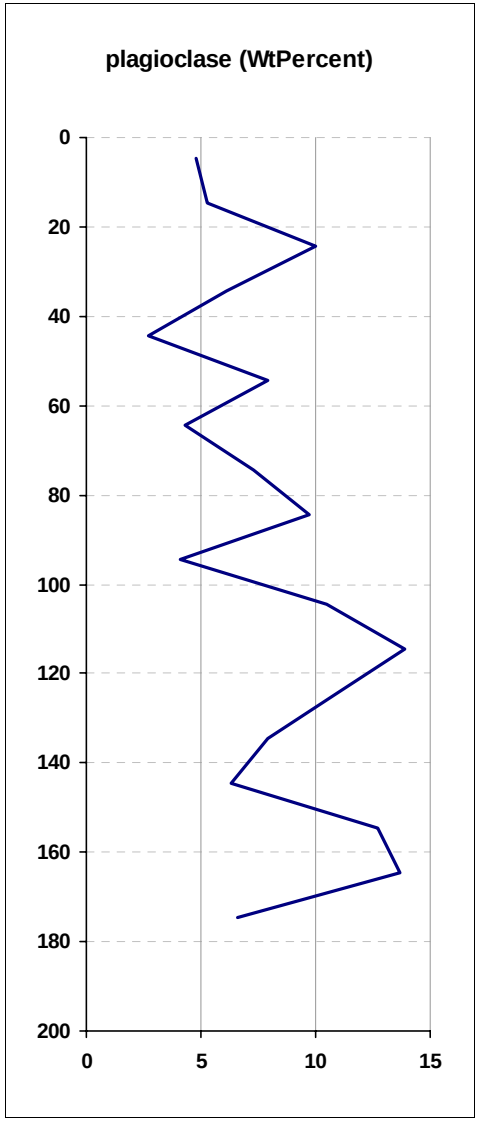
Location: TBGC-3

Test Type: Mineralogy







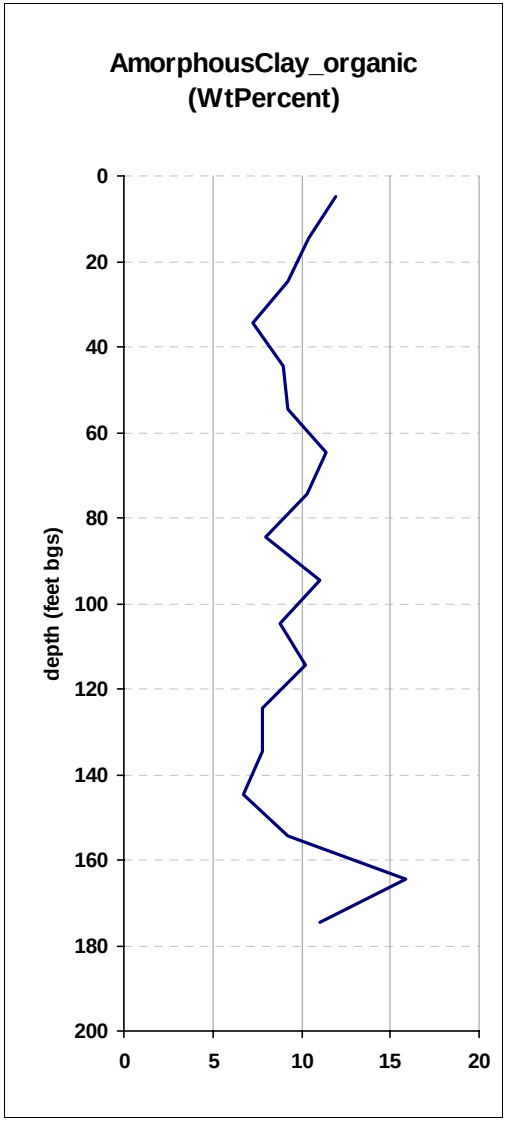


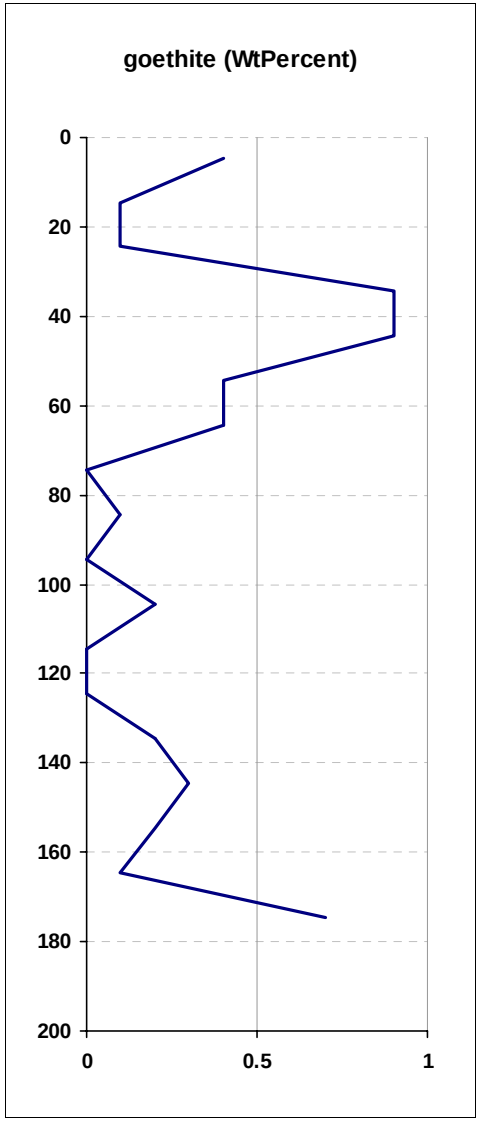
EnviroGroup Limited 2005

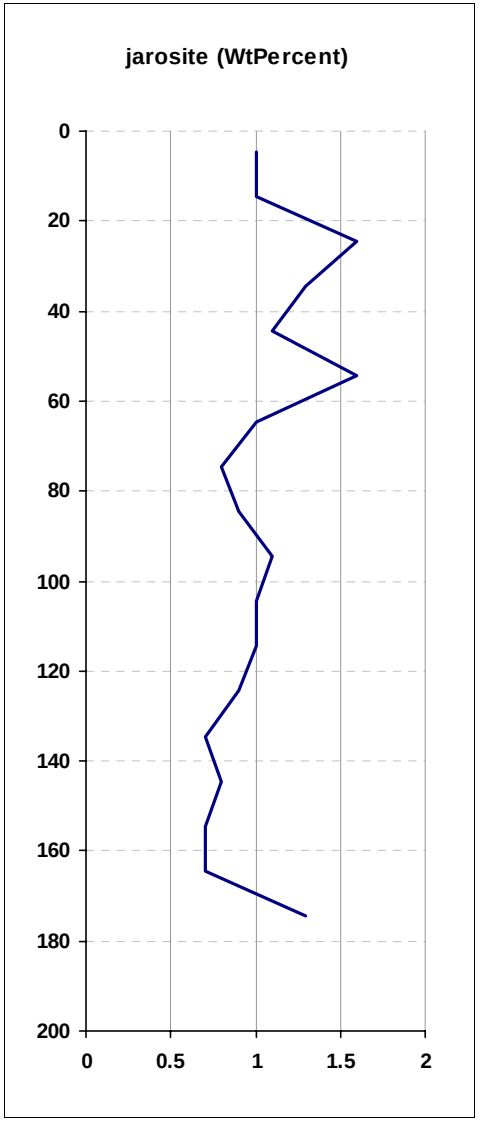
Tyrone Mine Sample Test Results by Location, Test Type

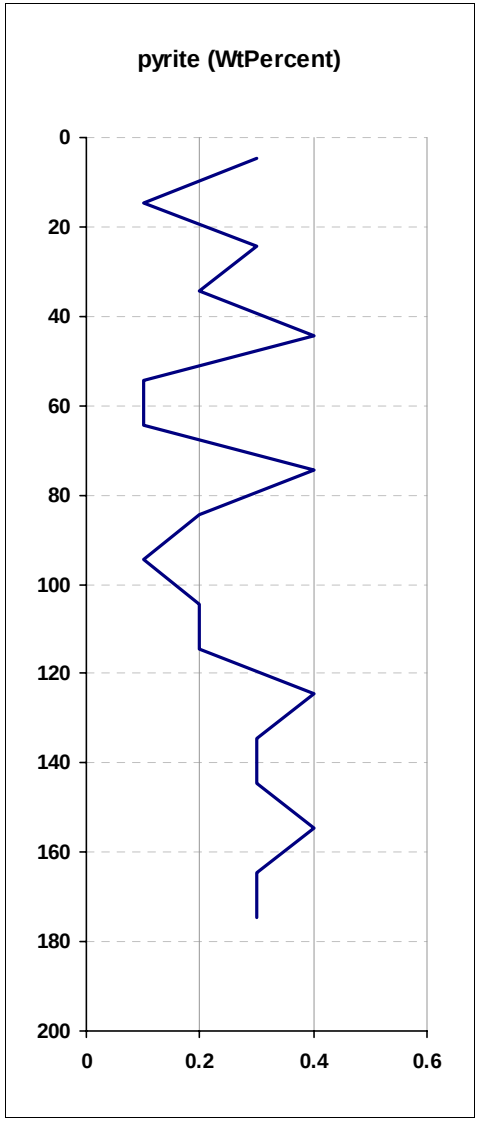
Location: TBGC-3

Test Type: Mineralogy









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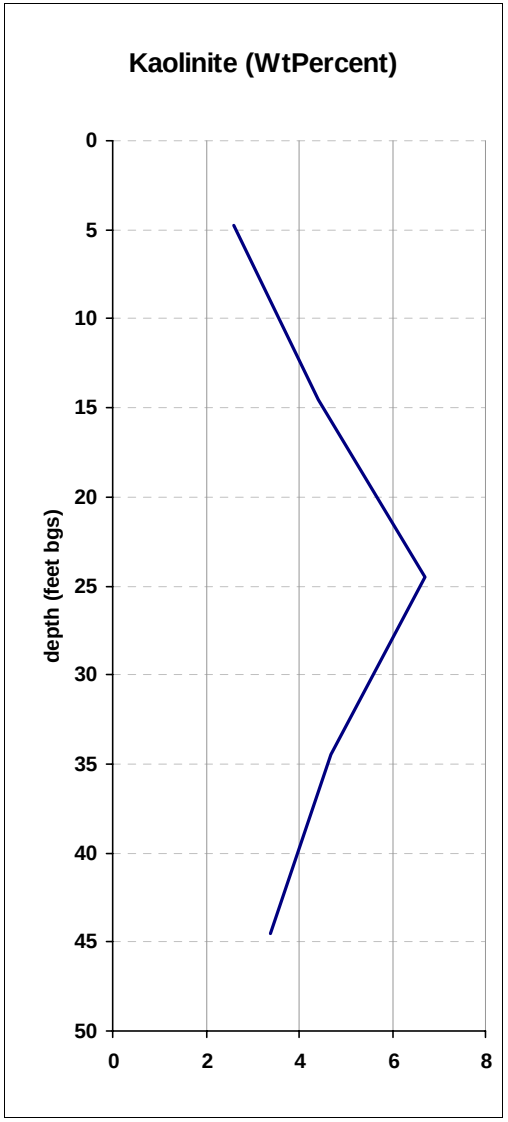
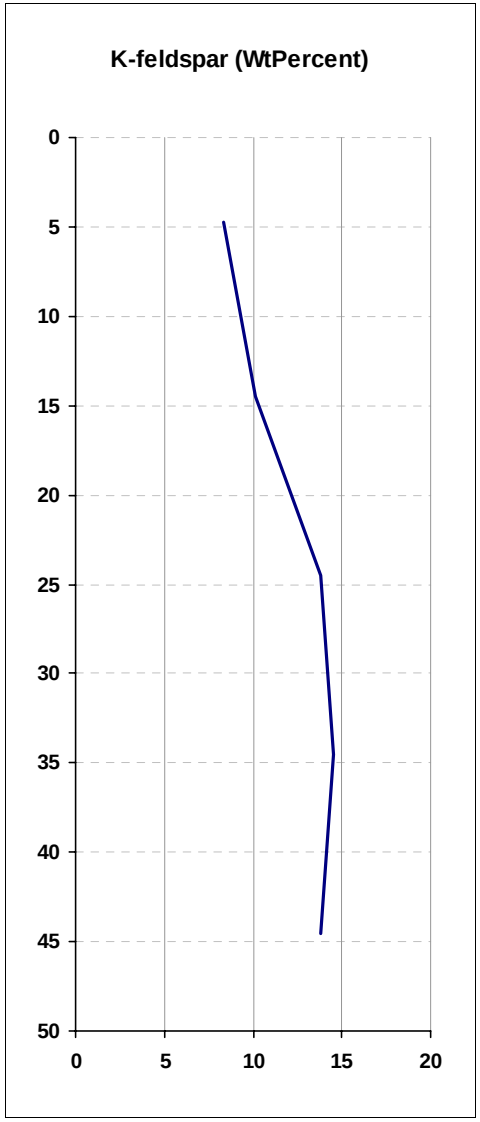
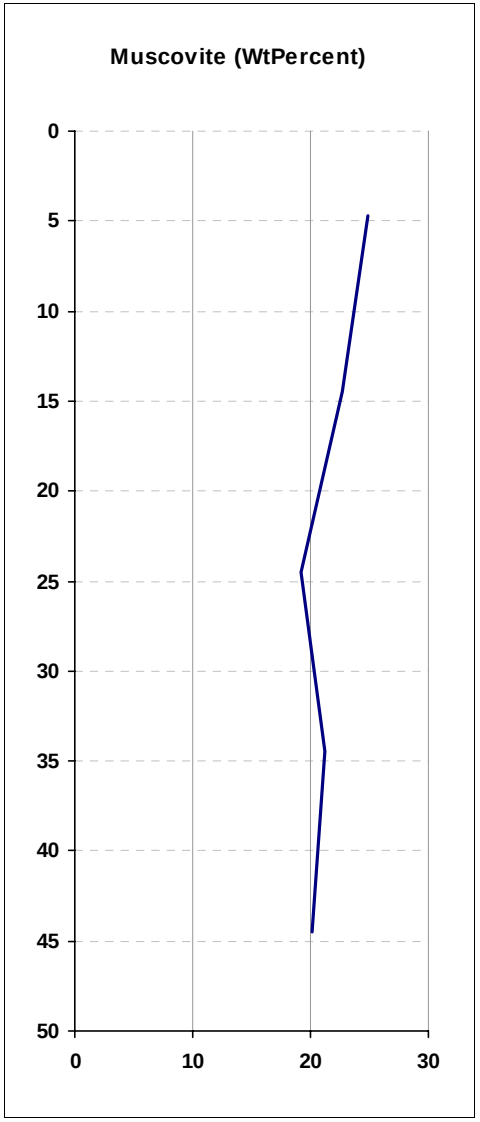
Tyrone Mine Sample Test Results by Location, Test Type

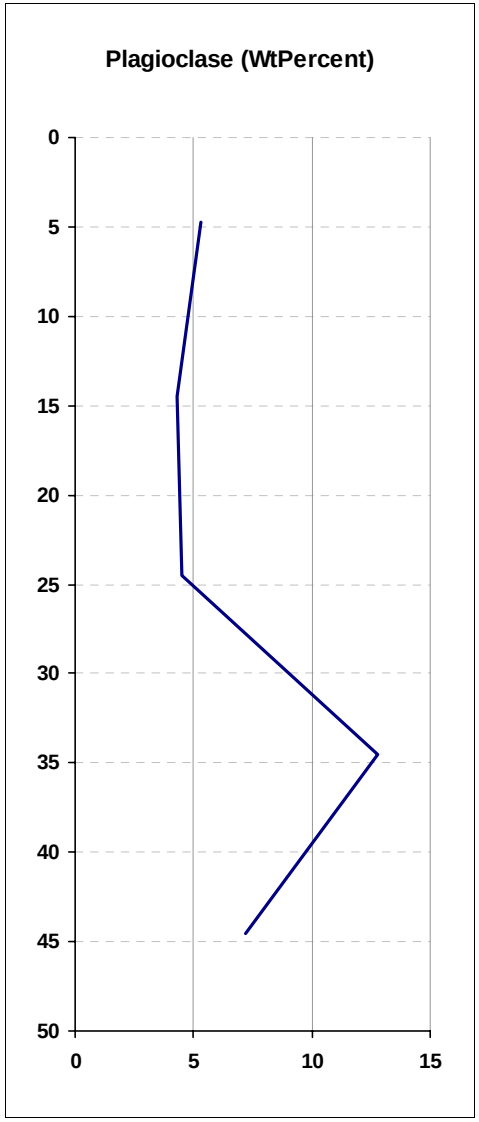
Location: TBGC-4

Test Type: Mineralogy









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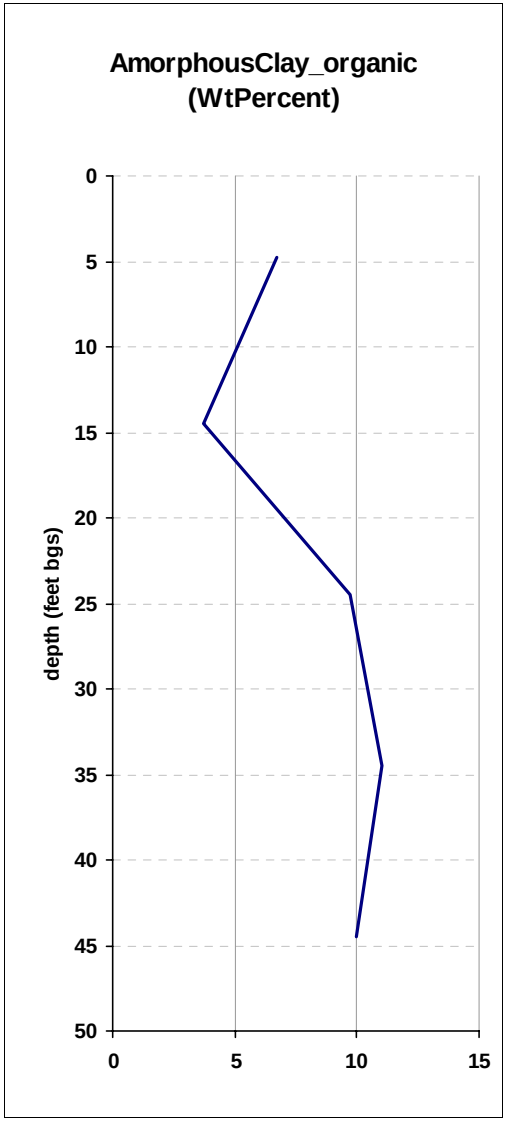
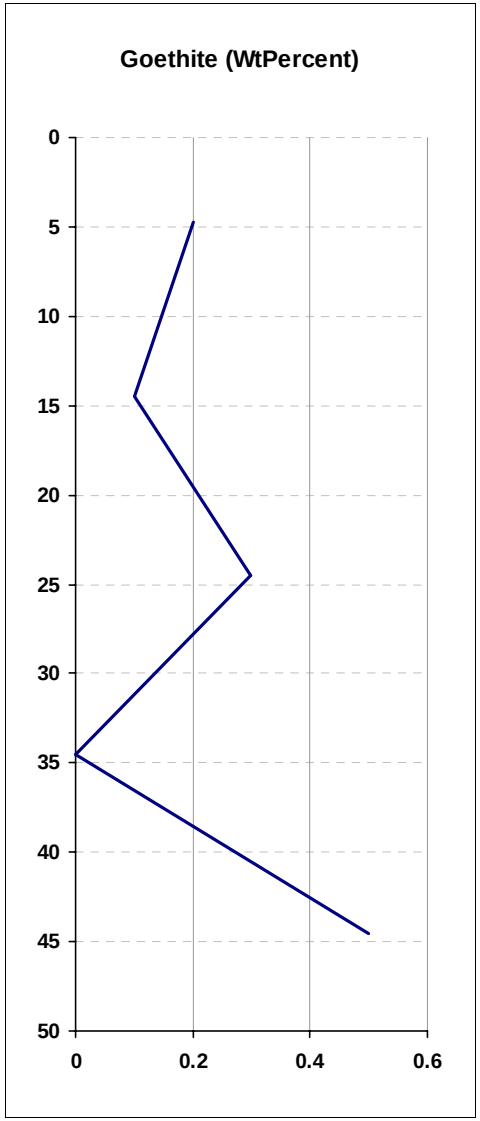
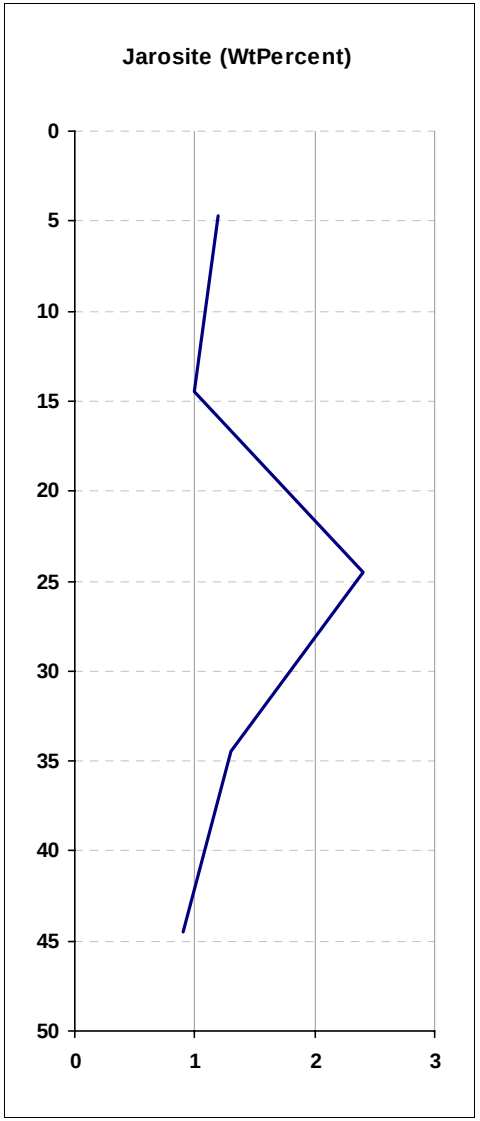
Tyrone Mine Sample Test Results by Location, Test Type

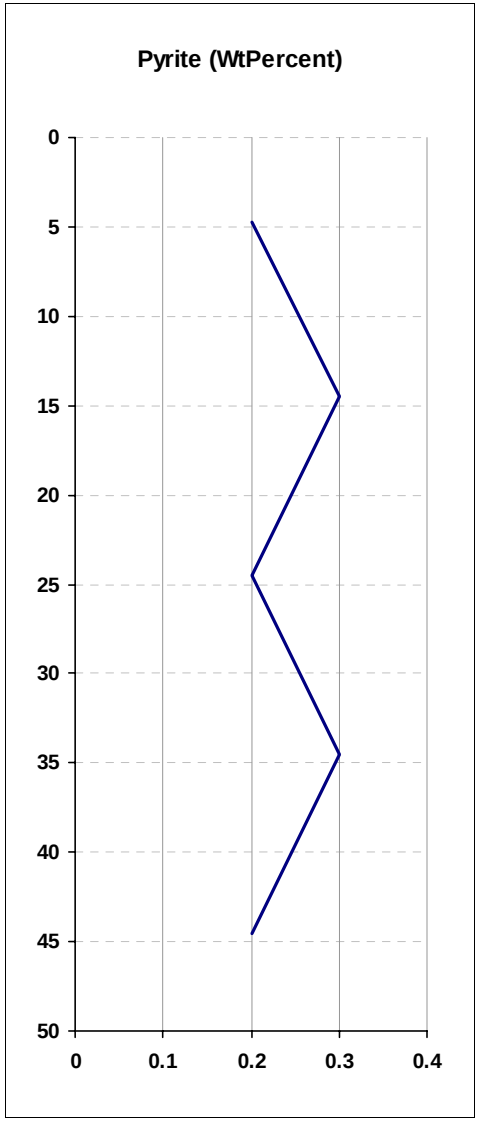
Location: TBGC-4

Test Type: Mineralogy









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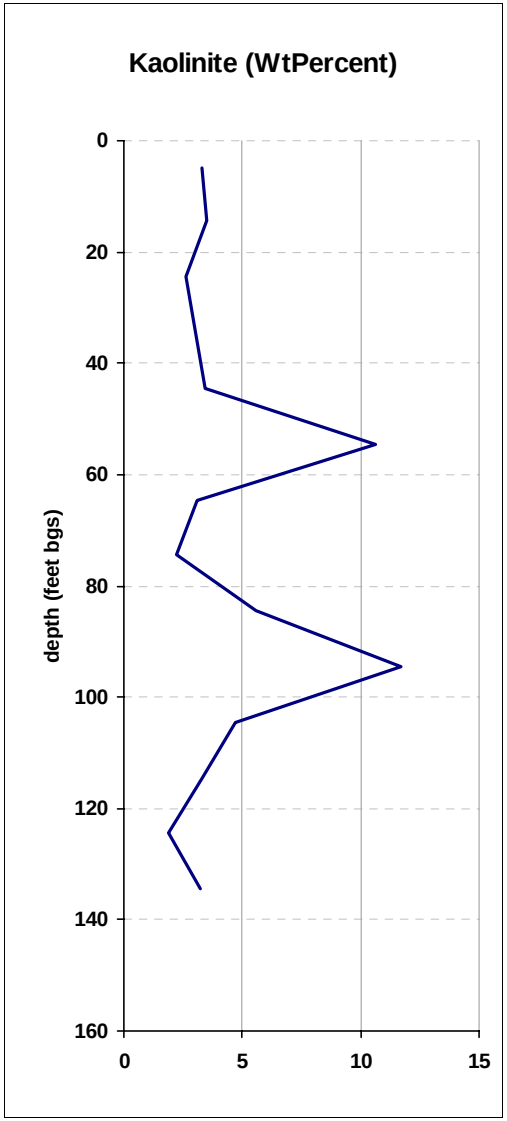
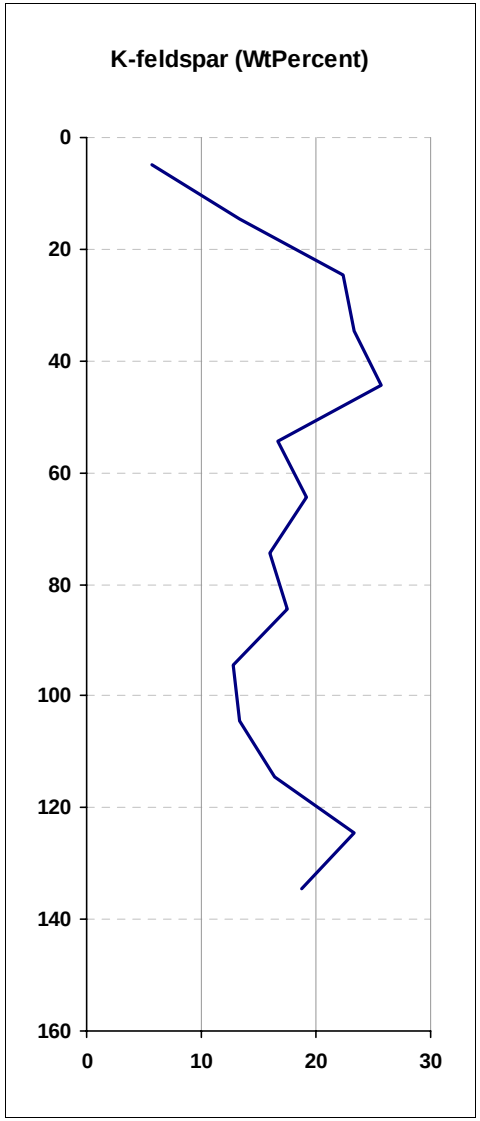
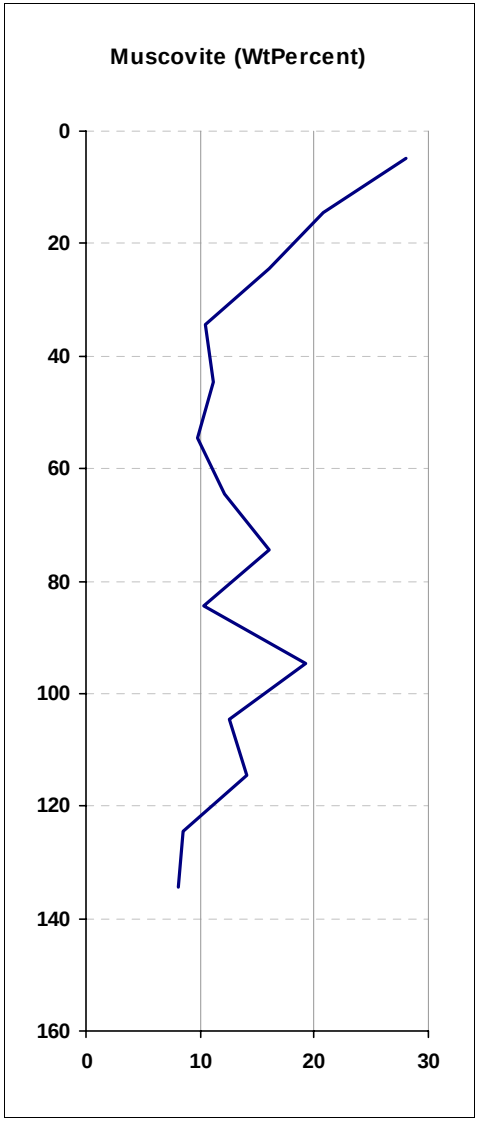
Tyrone Mine Sample Test Results by Location, Test Type

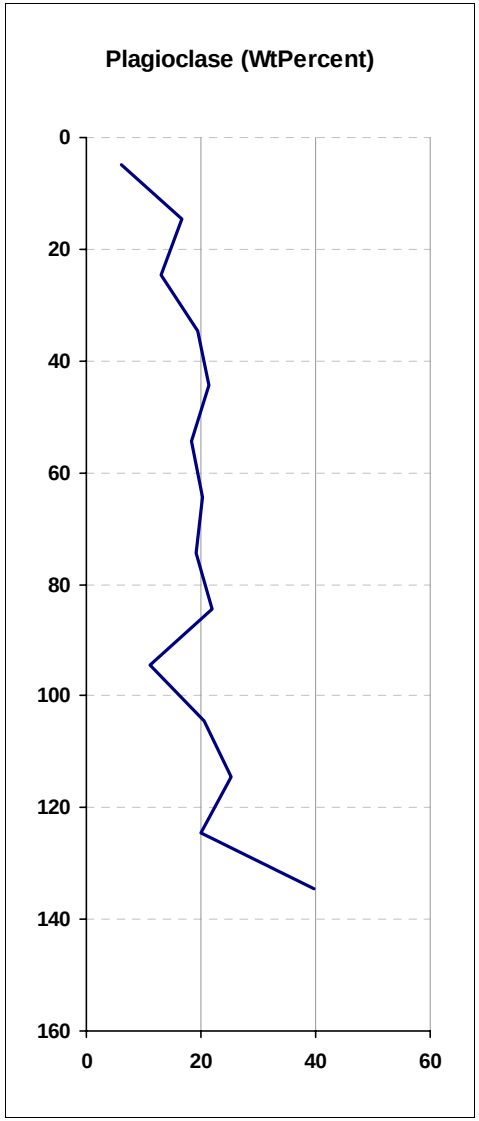
Location: TBGC-5

Test Type: Mineralogy









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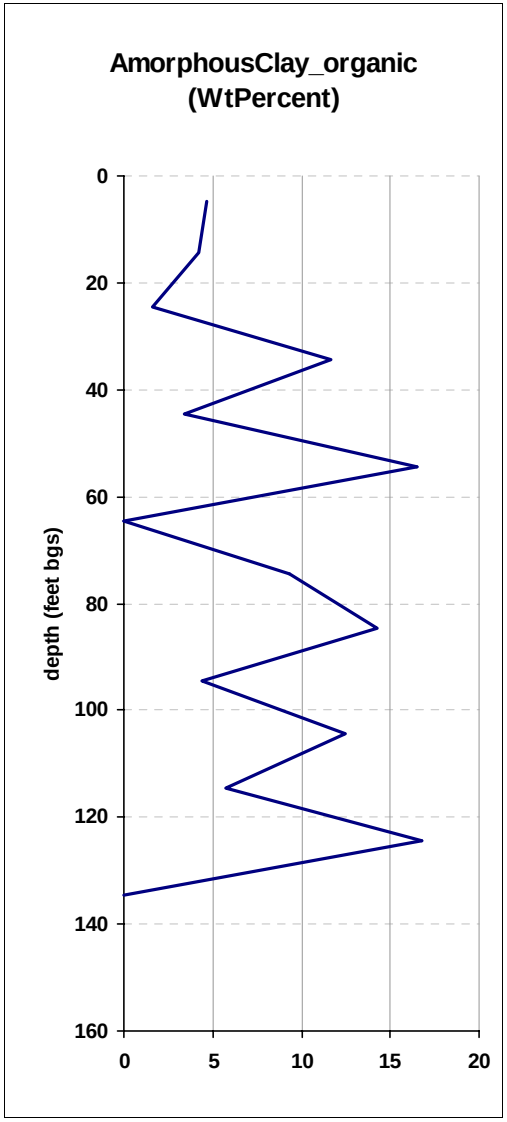
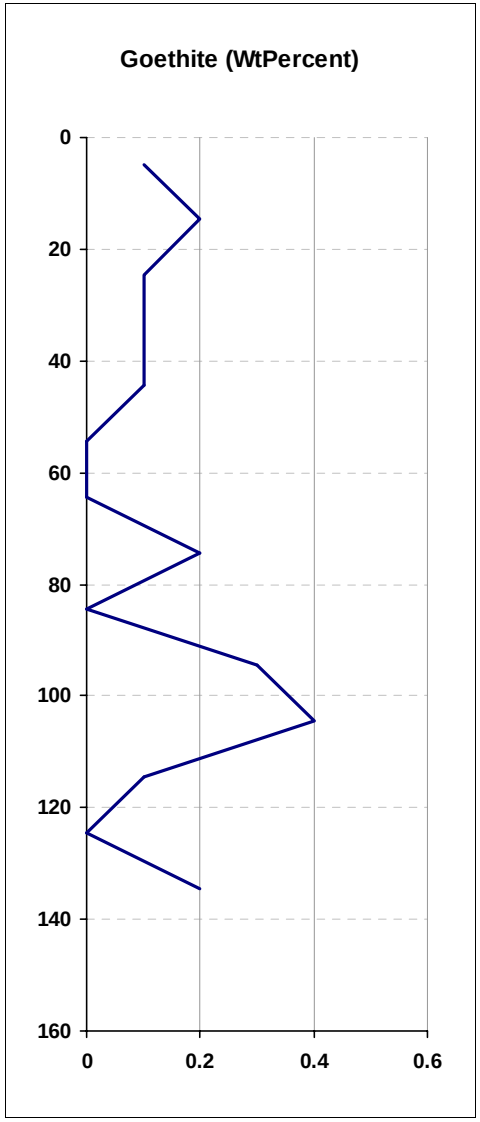
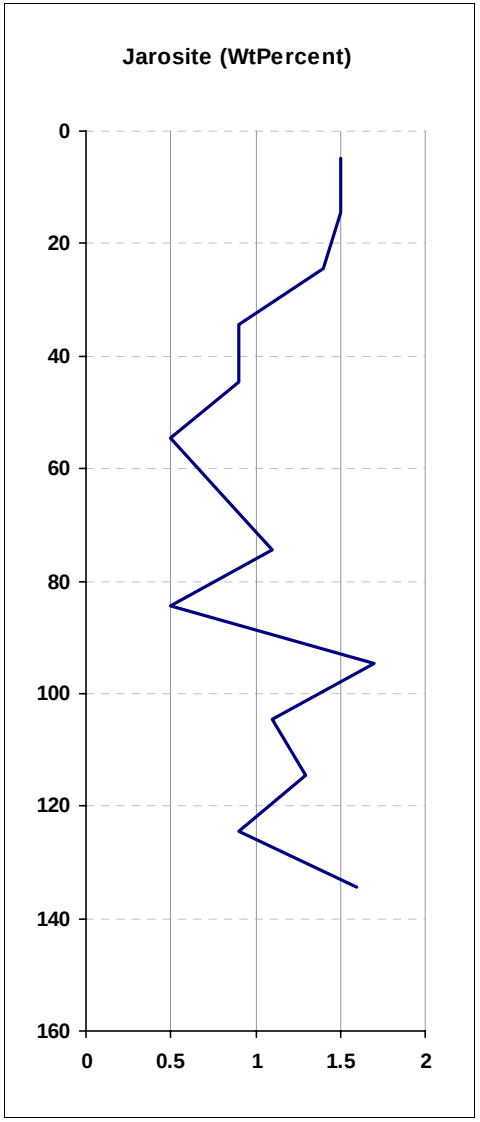
Tyrone Mine Sample Test Results by Location, Test Type

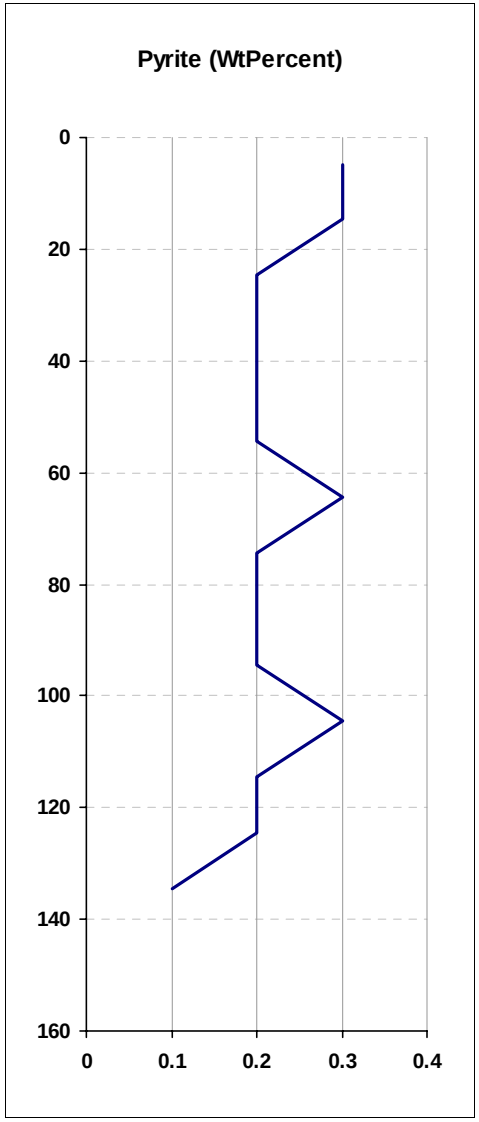
Location: TBGC-5

Test Type: Mineralogy









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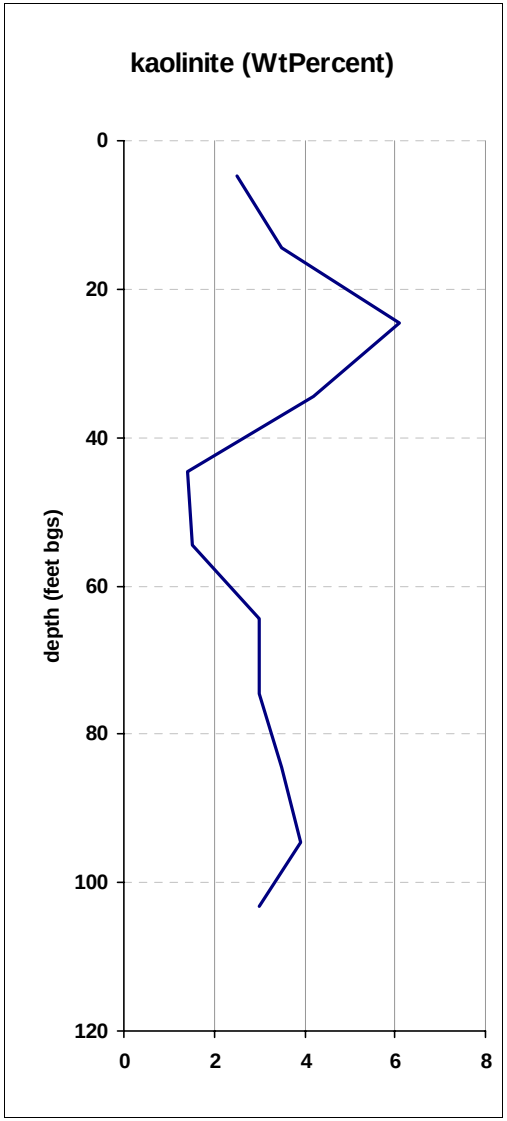
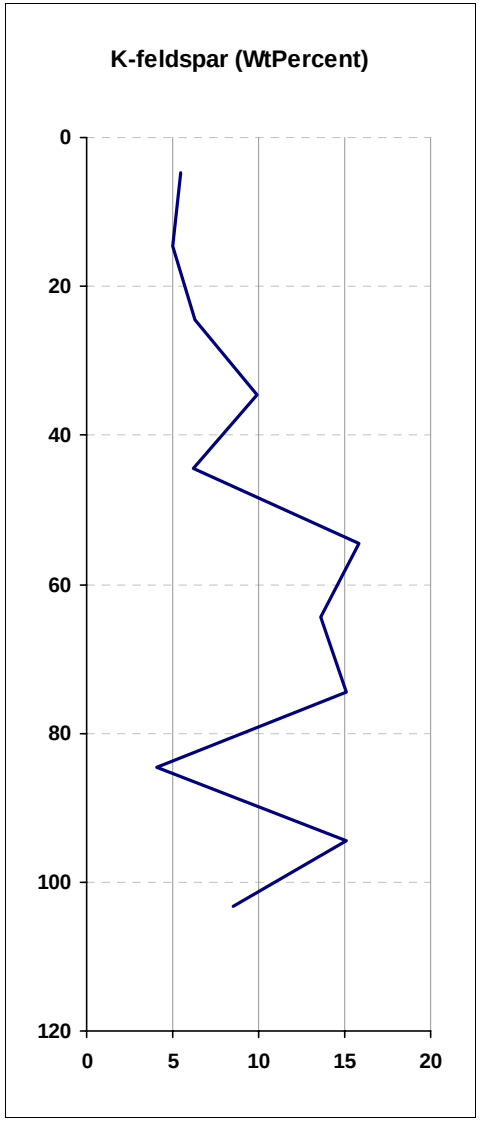
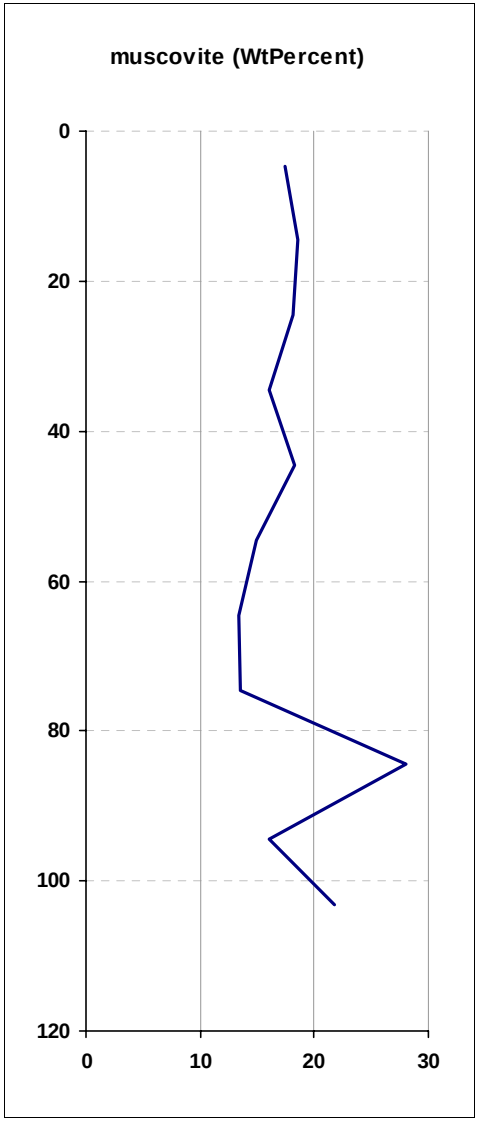
Tyrone Mine Sample Test Results by Location, Test Type

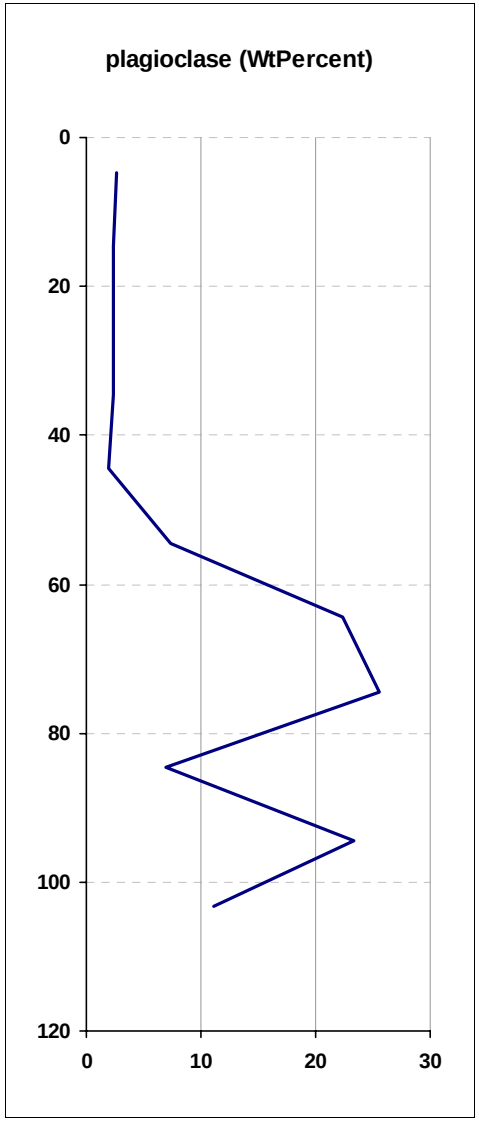
Location: TBGC-6

Test Type: Mineralogy









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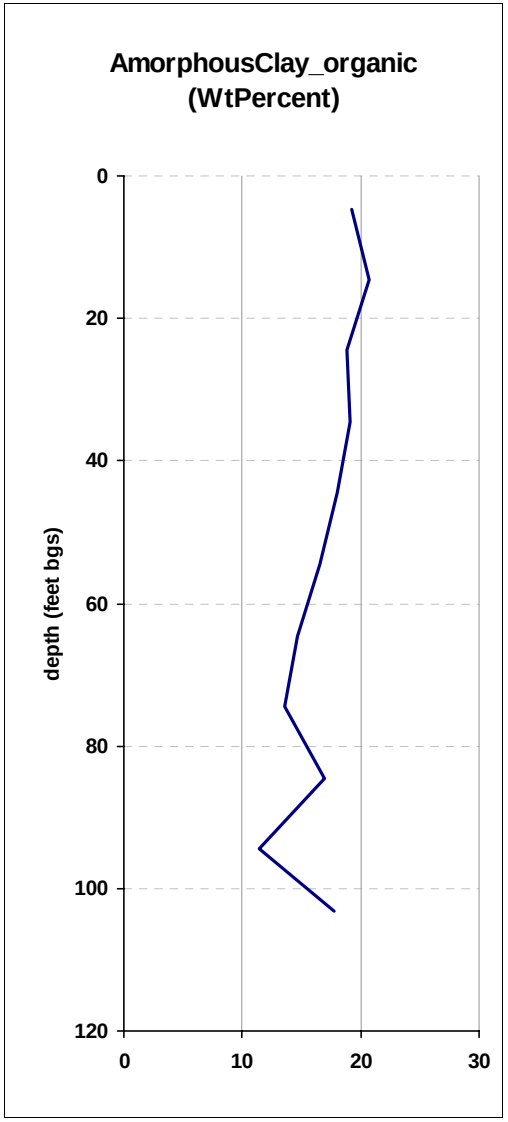
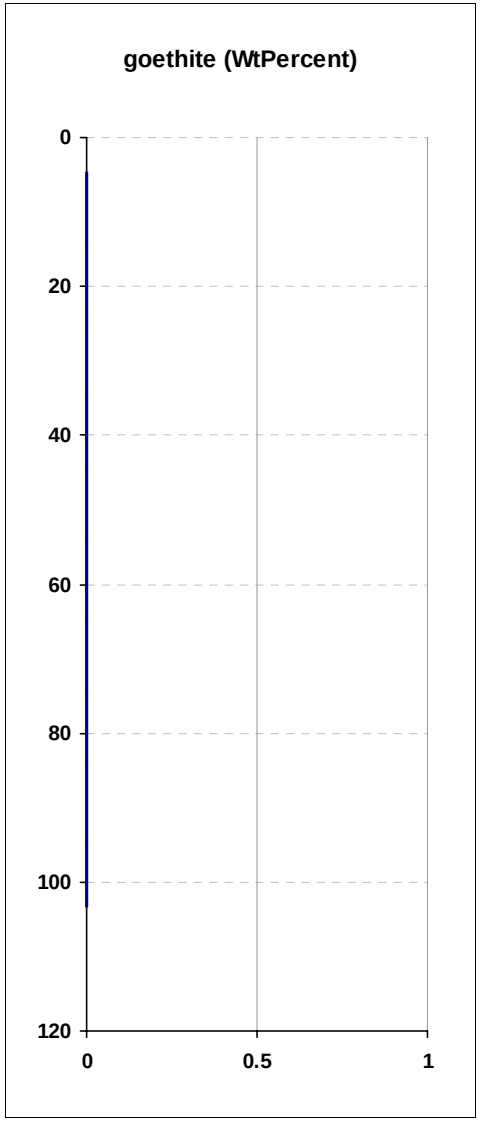
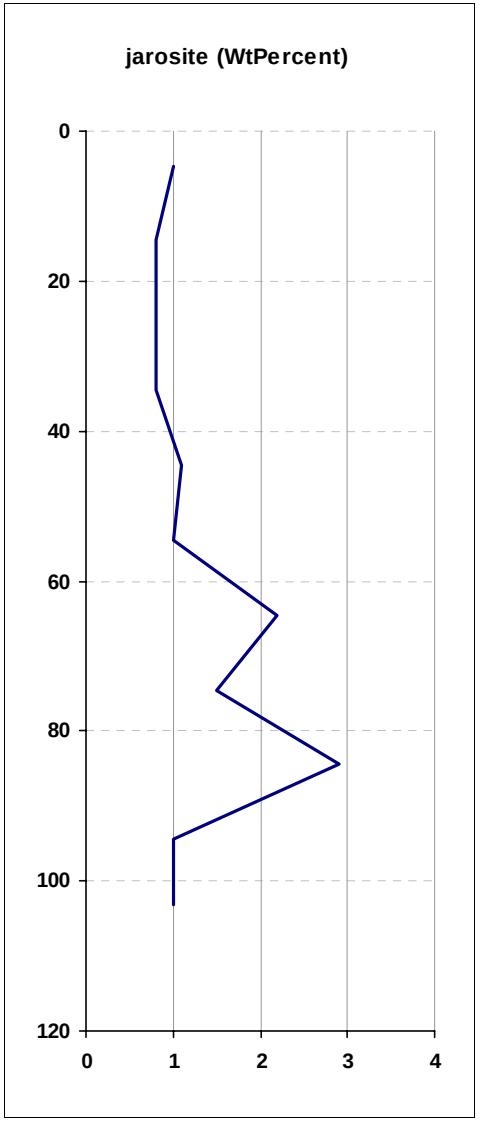
Tyrone Mine Sample Test Results by Location, Test Type

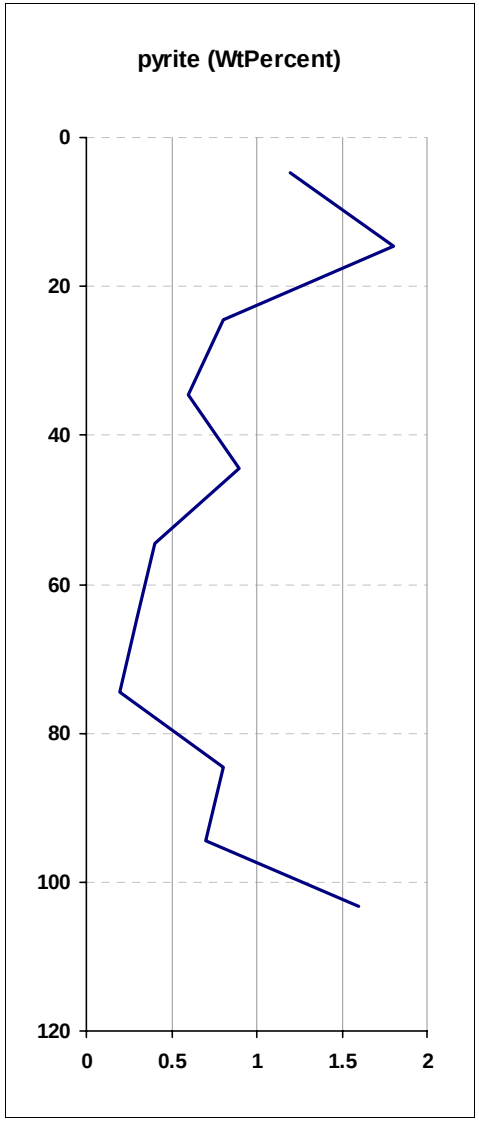
Location: TBGC-6

Test Type: Mineralogy









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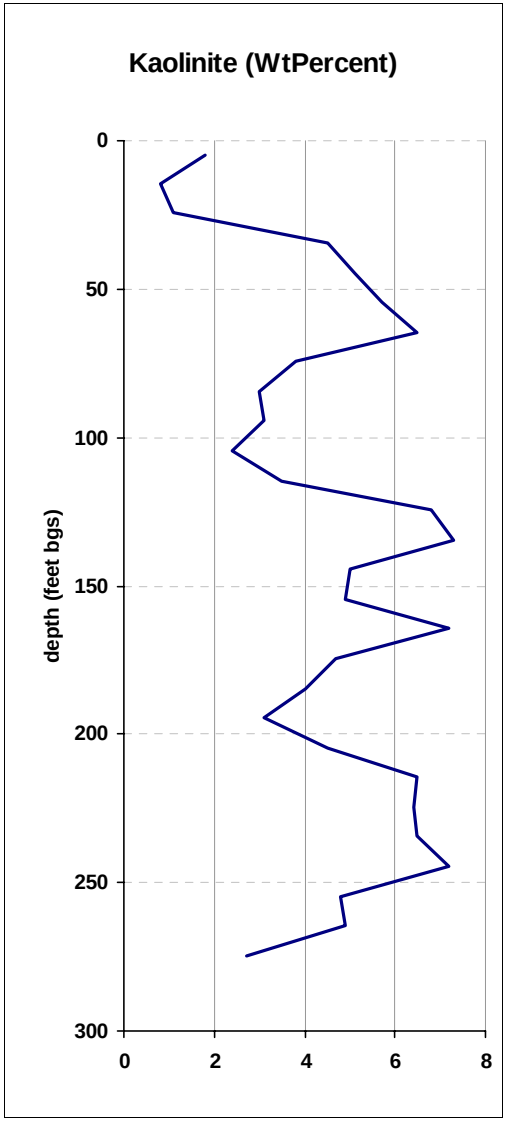
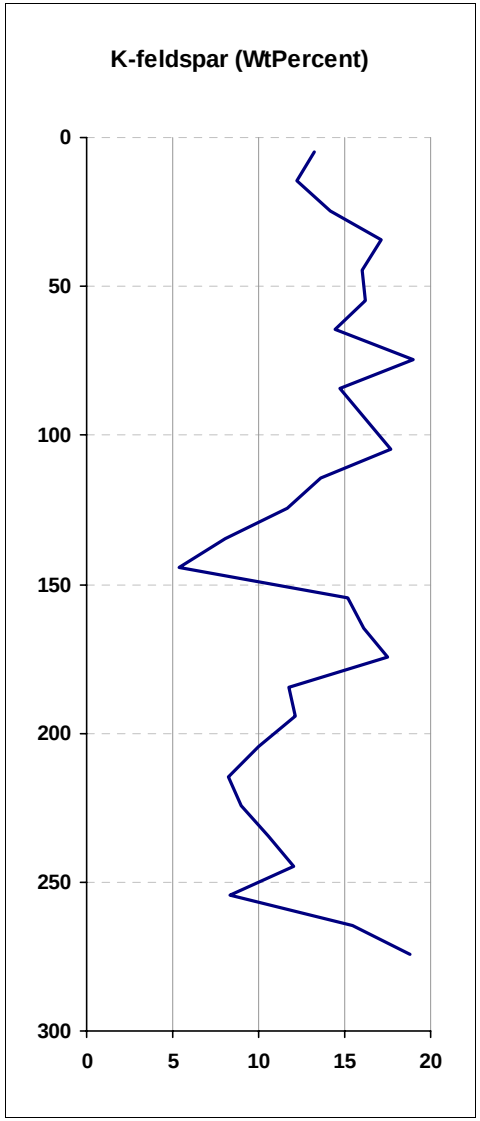
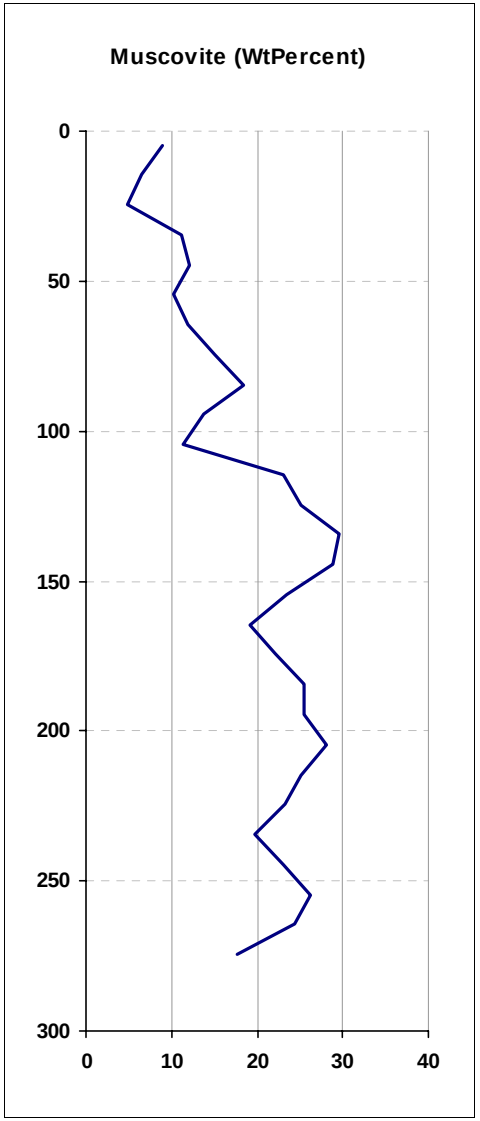
Tyrone Mine Sample Test Results by Location, Test Type

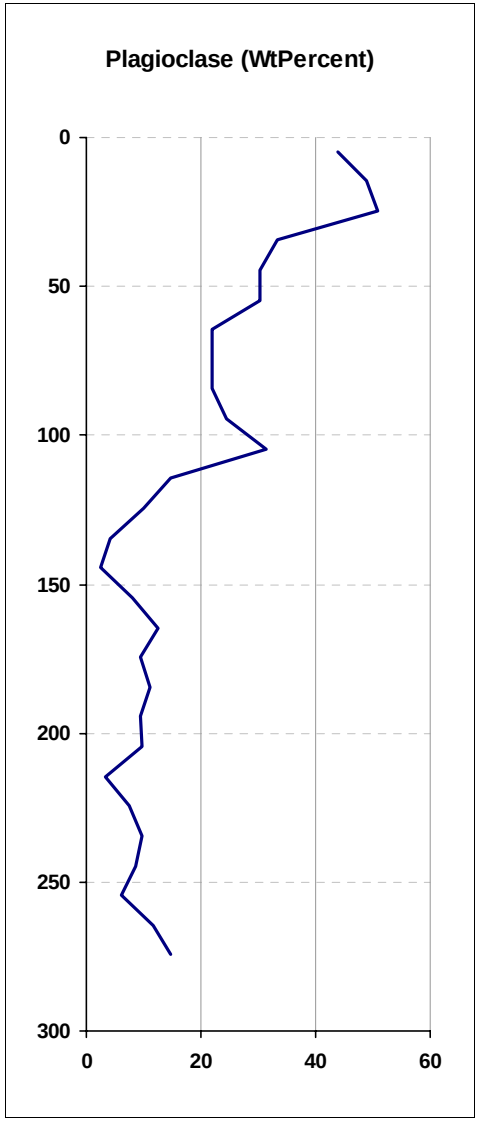
Location: TBGC-7

Test Type: Mineralogy









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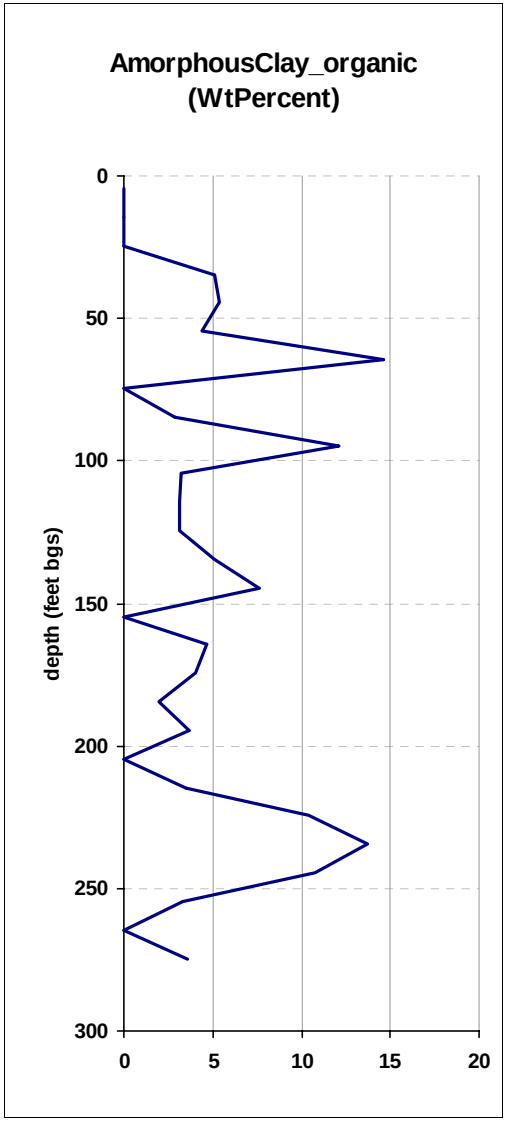
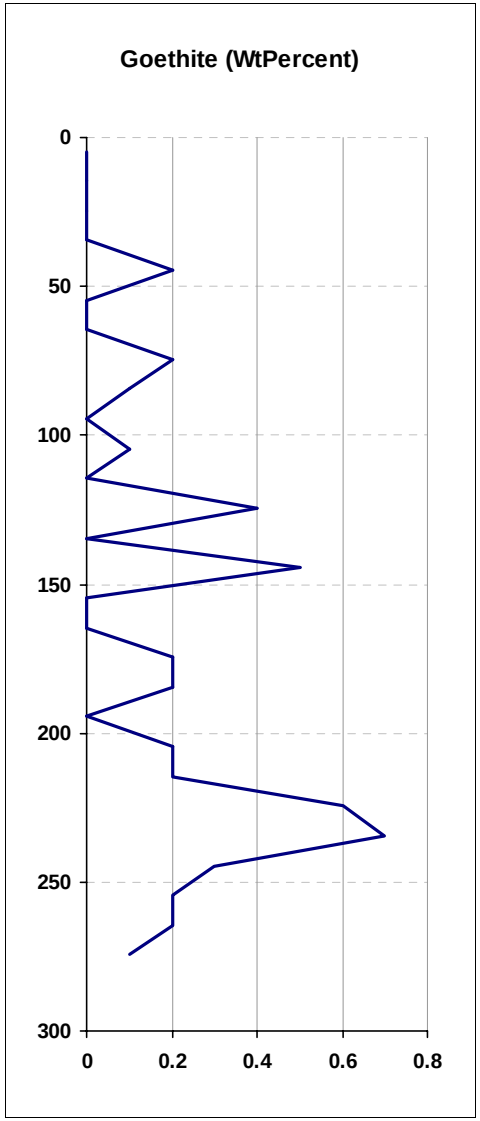
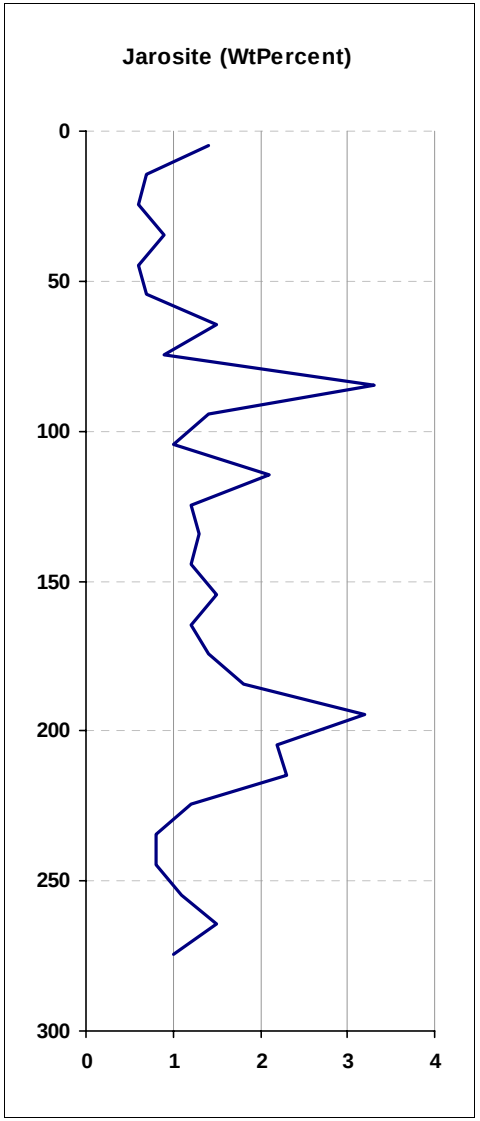
Tyrone Mine Sample Test Results by Location, Test Type

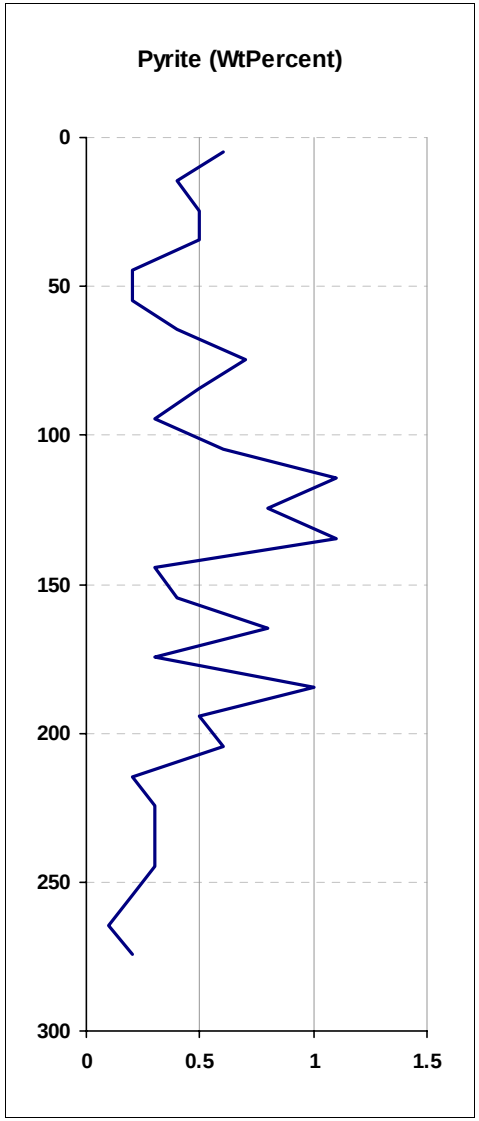
Location: TBGC-7

Test Type: Mineralogy









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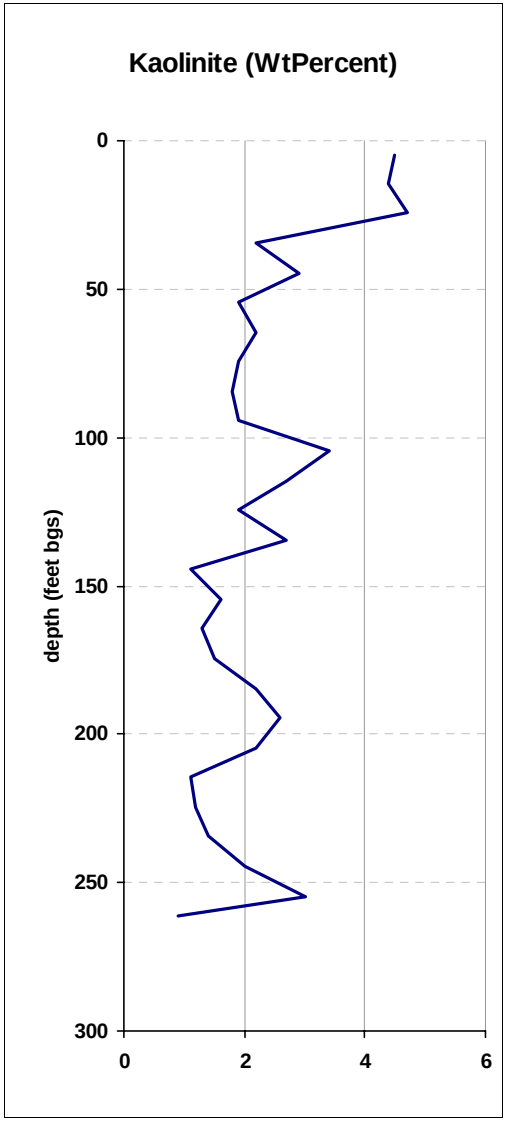
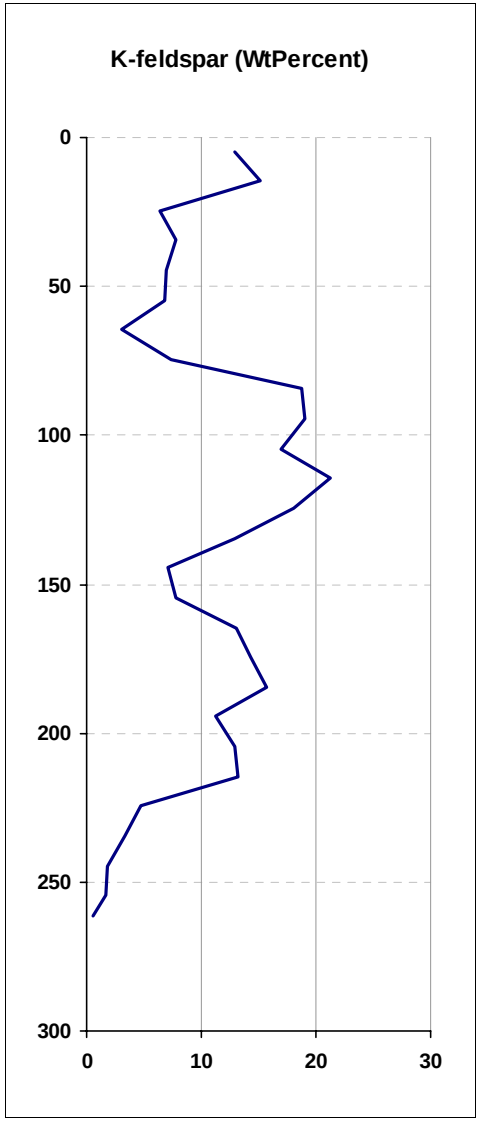
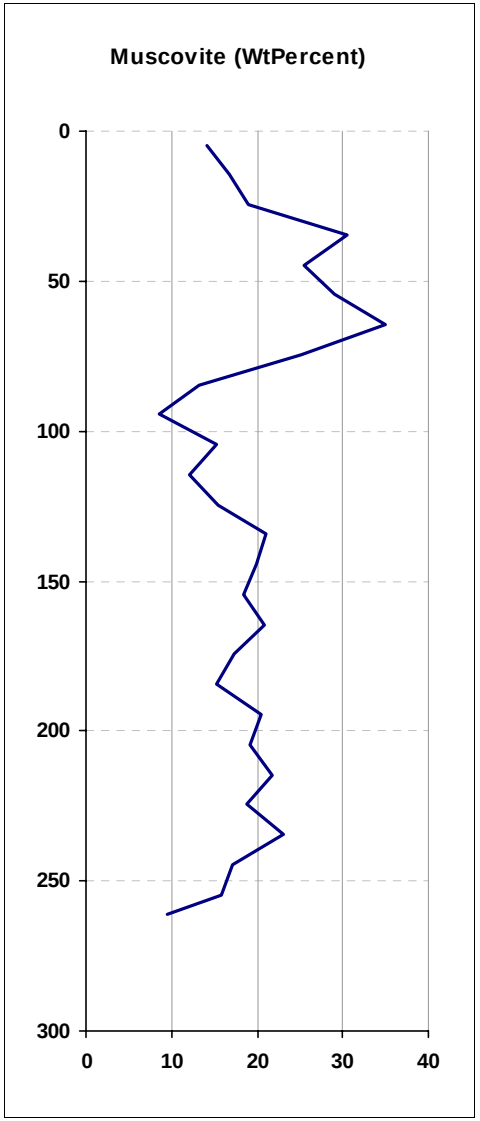
Tyrone Mine Sample Test Results by Location, Test Type

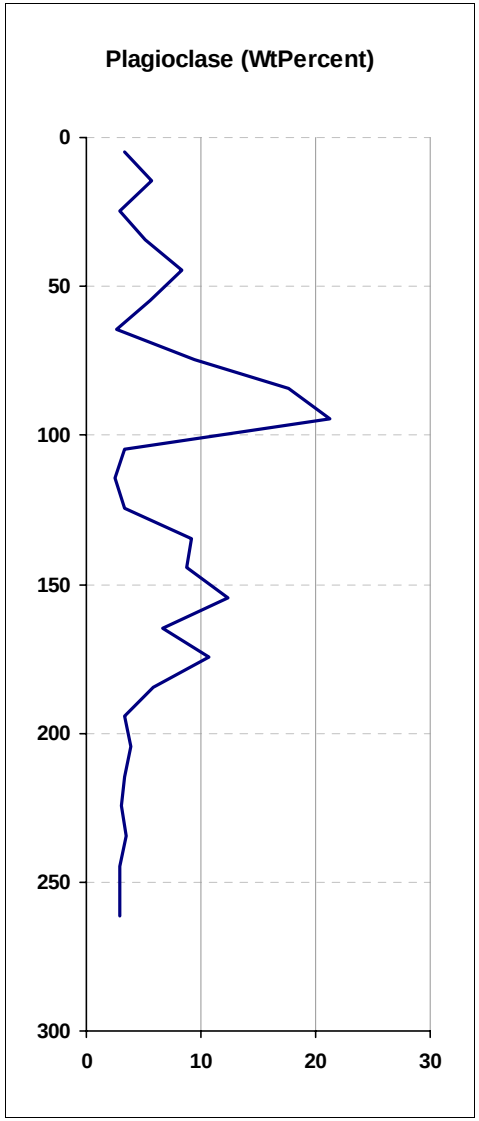
Location: TBGC-7A

Test Type: Mineralogy









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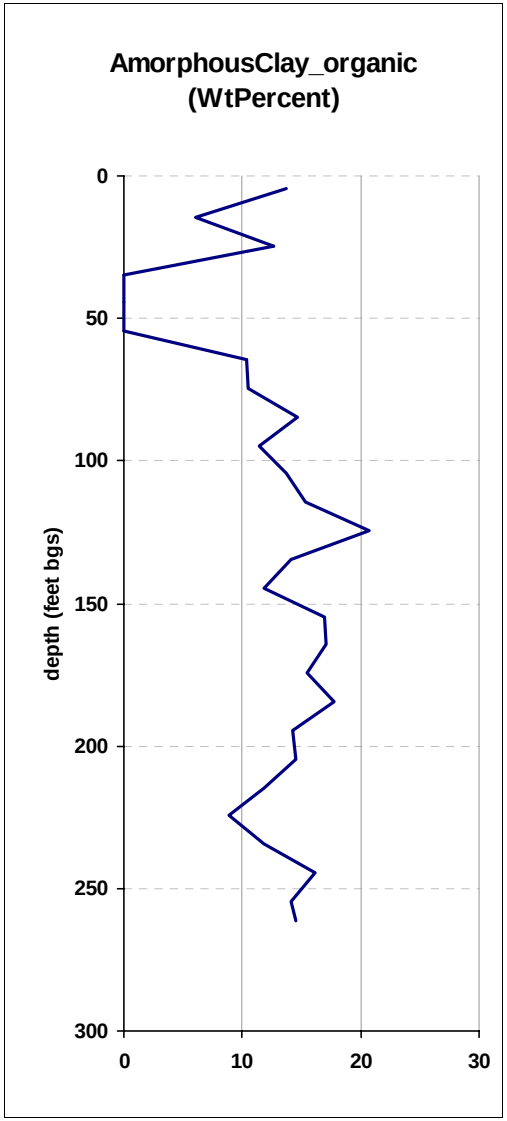
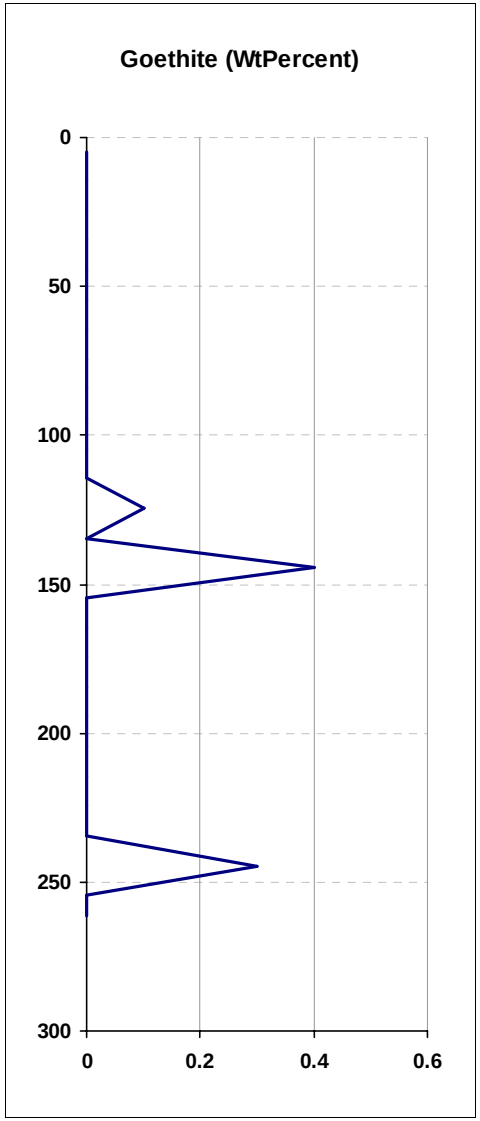
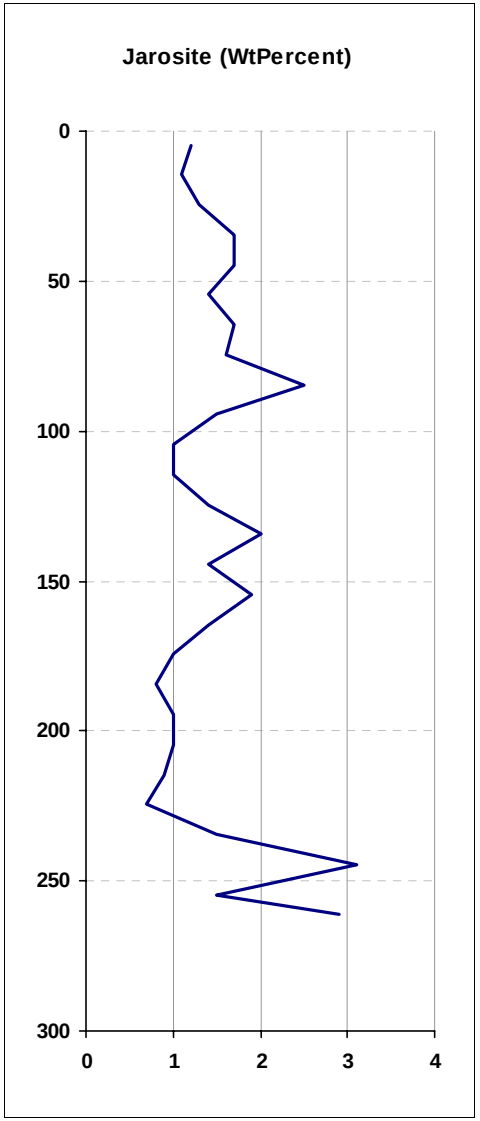
Tyrone Mine Sample Test Results by Location, Test Type

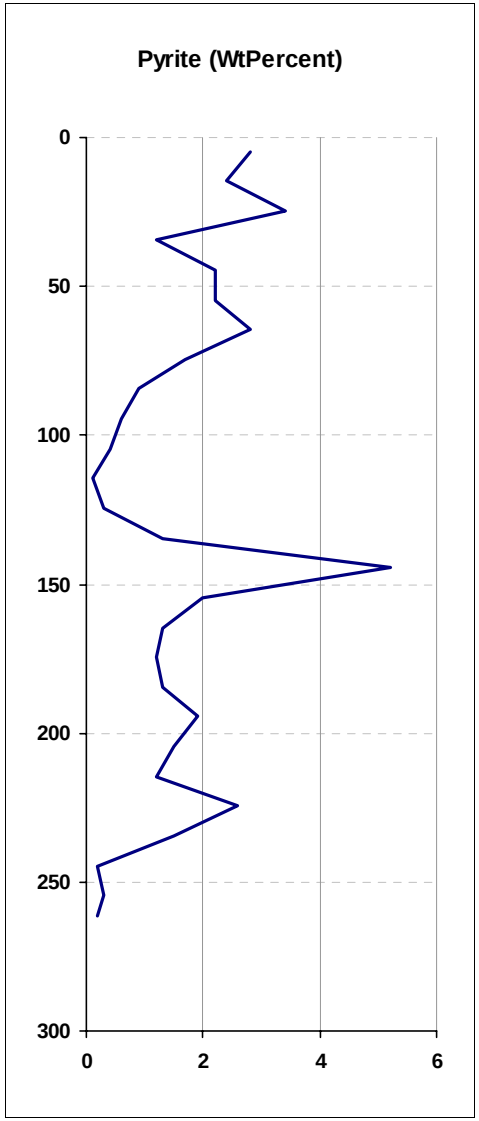
Location: TBGC-7A

Test Type: Mineralogy









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XRD Results for Geochemical Boreholes

Borehole ID and Sample Interval	Alunite	Amorphous	Chalcopyrite	Chlorite	Epidote	Goethite	Gypsum	Hematite	Jarosite
TBGC-1_0-9.5	3.0	16.8	0.2	0.2	1.3	0.0	0.0	0.5	0.8
TBGC-1_9.5-19.5	3.5	16.2	0.2	0.1	0.6	0.1	0.0	0.5	0.8
TBGC-1_19.5-29.5	3.6	13.2	0.2	0.3	1.1	0.0	0.0	0.5	0.6
TBGC-1_29.5-39.5	2.8	18.4	0.2	0.3	1.0	0.0	0.0	0.2	0.9
TBGC-1_39.5-49.5	5.5	14.1	0.2	0.6	1.2	0.0	0.0	0.4	1.9
TBGC-1_49.5-59.5	2.8	11.6	0.3	0.2	1.1	0.0	0.0	0.1	1.1
TBGC-1_59.5-69.5	0.7	19.8	0.2	1.1	1.1	0.0	0.0	0.2	0.9
TBGC-1_69.5-79.5	1.0	16.7	0.2	0.3	1.2	0.0	0.0	0.1	0.6
TBGC-1_79.5-89.5	1.2	17.1	0.2	0.4	0.5	0.1	0.0	0.3	0.8
TBGC-1_89.5-99.5	0.6	21.8	0.2	0.2	0.9	0.0	0.0	0.1	0.3
TBGC-1_99.5-109.5	0.5	21.6	0.2	0.8	1.3	0.0	0.0	0.1	0.8
TBGC-1_109.5-119.5	1.9	20.3	0.1	0.5	1.0	0.3	0.0	0.2	1.6
TBGC-1_119.5-129.5	2.3	22.9	0.1	0.6	0.9	0.7	0.0	0.3	2.6
TBGC-1_129.5-139.5	2.5	18.0	0.1	0.2	0.8	0.5	0.0	0.2	1.2
TBGC-1_139.5-149.5	1.2	12.2	0.2	0.4	1.7	0.0	0.0	0.0	2.2
TBGC-1_149.5-159.5	2.8	18.3	0.2	0.6	1.7	0.0	0.0	0.2	1.0
TBGC-1_159.5-169.5	3.7	17.1	0.1	0.5	0.6	0.0	0.0	0.2	0.5
TBGC-1_169.5-179.5	2.1	18.8	0.1	1.9	1.8	0.0	0.0	0.1	1.0
TBGC-1_179.5-189.5	4.2	17.6	0.1	0.3	0.9	0.0	0.0	0.3	1.3
TBGC-1_189.5-199.5	3.6	18.3	0.1	0.3	1.1	0.0	0.0	0.3	1.2
TBGC-1_199.5-209.5	1.6	15.6	0.2	0.2	1.7	0.1	0.0	0.3	1.3
TBGC-1_209.5-219.5	1.4	13.4	0.1	0.1	1.4	0.4	0.0	0.1	0.9
TBGC-1_219.5-222	1.1	18.8	0.2	0.7	1.9	0.4	0.0	0.0	0.7
TBGC-2_0-9.5	0.2	11.3	0.0	1.0	0.9	0.0	0.0	0.2	2.9
TBGC-2_9.5-19.5	0.2	7.7	0.1	1.7	1.1	0.0	0.0	0.0	1.2
TBGC-2_19.5-29.5	0.2	10.1	0.1	1.6	0.8	0.2	0.0	0.2	0.9
TBGC-2_29.5-39.5	0.2	6.5	0.2	1.0	0.8	0.4	0.0	0.1	1.2
TBGC-2_39.5-49.5	0.3	11.7	0.1	1.3	0.8	0.1	0.0	0.1	1.0
TBGC-2_49.5-59.5	0.2	9.0	0.2	0.8	0.8	0.3	0.0	0.0	1.1
TBGC-2_59.5-69.5	0.5	9.5	0.2	1.3	1.0	0.5	0.0	0.0	1.5
TBGC-2_69.5-79.5	0.3	11.3	0.1	0.7	0.8	0.5	0.0	0.2	0.9
TBGC-2_79.5-89.5	0.2	4.1	0.1	0.2	0.6	0.0	0.0	0.0	1.1
TBGC-3_0-9.5	0.3	11.9	0.1	0.7	0.7	0.4	0.0	0.0	1.0
TBGC-3_9.5-19.5	0.2	10.4	0.1	0.7	0.9	0.1	0.0	0.0	1.0
TBGC-3_19.5-29.5	0.3	9.2	0.1	0.7	0.9	0.1	0.0	0.2	1.6

Note: All units in weight percent (wt%)

XRD Results for Geochemical Boreholes

Borehole ID and Sample Interval	Alunite	Amorphous	Chalcopyrite	Chlorite	Epidote	Goethite	Gypsum	Hematite	Jarosite
TBGC-3_29.5-39.5	0.2	7.3	0.1	0.8	0.6	0.9	0.0	0.1	1.3
TBGC-3_39.5-49.5	0.7	9.0	0.1	0.7	1.2	0.9	0.0	0.0	1.1
TBGC-3_49.5-59.5	0.4	9.2	0.1	1.0	0.8	0.4	0.0	0.0	1.6
TBGC-3_59.5-69.5	0.3	11.4	0.1	0.8	0.7	0.4	0.0	0.0	1.0
TBGC-3_69.5-79.5	0.3	10.3	0.1	0.9	0.8	0.0	0.0	0.0	0.8
TBGC-3_79.5-89.5	0.2	8.0	0.1	0.9	0.5	0.1	0.0	0.0	0.9
TBGC-3_89.5-99.5	0.5	11.0	0.1	1.4	0.9	0.0	0.0	0.0	1.1
TBGC-3_99.5-109.5	0.2	8.8	0.1	0.9	1.0	0.2	0.0	0.0	1.0
TBGC-3_109.5-119.5	0.3	10.2	0.1	1.7	0.9	0.0	0.0	0.0	1.0
TBGC-3_119.5-129.5	0.2	7.8	0.1	0.5	0.9	0.0	0.0	0.1	0.9
TBGC-3_129.5-139.5	0.4	7.8	0.1	0.9	0.8	0.2	0.0	0.1	0.7
TBGC-3_13.95-149.5	0.0	6.7	0.1	0.5	1.2	0.3	0.0	0.1	0.8
TBGC-3_149.5-159.5	0.4	9.2	0.1	0.6	1.1	0.2	0.0	0.0	0.7
TBGC-3_159.5-169.5	0.3	15.9	0.1	0.9	1.2	0.1	0.0	0.0	0.7
TBGC-3_169.5-179.5	0.3	11.0	0.1	1.0	0.6	0.7	0.0	0.1	1.3
TBGC-4_0-9.5	0.4	6.7	0.1	0.8	1.1	0.2	0.0	0.0	1.2
TBGC-4_9.5-19.5	0.6	3.7	0.1	0.4	1.1	0.1	0.0	0.0	1.0
TBGC-4_19.5-29.5	0.9	9.7	0.1	1.0	1.1	0.3	0.0	0.0	2.4
TBGC-4_29.5-39.5	0.2	11.0	0.0	0.9	0.6	0.0	0.0	0.0	1.3
TBGC-4_39.5-49.5	0.4	10.0	0.1	0.9	0.6	0.5	0.0	0.1	0.9
TBGC-5_0-9.5	1.3	4.7	0.2	0.6	2.4	0.1	0.0	0.0	1.5
TBGC-5_9.5-19.5	0.9	4.2	0.1	0.4	1.0	0.2	0.0	0.1	1.5
TBGC-5_19.5-29.5	0.6	1.6	0.1	0.3	1.1	0.1	0.0	0.1	1.4
TBGC-5_29.5-39.5	0.4	11.7	0.2	0.5	1.3	0.1	0.0	0.0	0.9
TBGC-5_39.5-49.5	0.4	3.4	0.2	0.6	1.6	0.1	0.0	0.0	0.9
TBGC-5_49.5-59.5	0.4	16.5	0.1	0.8	0.7	0.0	0.0	0.3	0.5
TBGC-5_59.5-69.5	0.5	0.0	0.2	1.6	0.7	0.0	0.0	0.2	0.8
TBGC-5_69.5-79.5	0.3	9.3	0.2	1.2	0.9	0.2	0.0	0.2	1.1
TBGC-5_79.5-89.5	0.2	14.3	0.1	0.8	0.7	0.0	0.0	0.3	0.5
TBGC-5_89.5-99.5	1.1	4.4	0.1	1.8	0.7	0.3	0.0	0.3	1.7
TBGC-5_99.5-109.5	0.4	12.5	0.2	1.0	1.7	0.4	0.0	0.3	1.1
TBGC-5_109.5-119.5	0.5	5.7	0.1	0.6	0.7	0.1	0.0	0.4	1.3
TBGC-5_119.5-129.5	0.4	16.8	0.1	0.6	0.8	0.0	0.0	0.1	0.9
TBGC-5_129.5-139.5	0.2	0.0	0.2	0.8	0.5	0.2	0.0	0.4	1.6
TBGC-6_0-9.5	1.3	19.3	0.2	1.4	1.6	0.0	0.0	0.0	1.0

Note: All units in weight percent (wt%)

XRD Results for Geochemical Boreholes

Borehole ID and Sample Interval	Alunite	Amorphous	Chalcopyrite	Chlorite	Epidote	Goethite	Gypsum	Hematite	Jarosite
TBGC-6_9.5-19.5	2.0	20.7	0.2	2.0	2.1	0.0	0.0	0.0	0.8
TBGC-6_19.5-29.5	1.8	18.8	0.2	1.2	1.8	0.0	0.0	0.0	0.8
TBGC-6_29.5-39.5	1.1	19.1	0.2	0.4	2.0	0.0	0.0	0.0	0.8
TBGC-6_39.5-49.5	1.2	18.0	0.2	0.3	1.8	0.0	0.0	0.0	1.1
TBGC-6_49.5-59.5	0.7	16.5	0.2	0.6	2.5	0.0	0.0	0.0	1.0
TBGC-6_59.5-69.5	0.3	14.6	0.2	0.2	1.7	0.0	0.0	0.0	2.2
TBGC-6_69.5-79.5	0.3	13.6	0.2	0.2	1.6	0.0	0.0	0.0	1.5
TBGC-6_79.5-89.5	0.2	17.0	0.1	0.3	1.5	0.0	0.0	0.0	2.9
TBGC-6_89.5-99.5	0.3	11.4	0.2	0.6	1.2	0.0	0.0	0.0	1.0
TBGC-6_99.5-107	0.4	17.8	0.2	0.3	1.5	0.0	0.0	0.0	1.0
TBGC-7_0-9.5	0.2	0.0	0.2	1.6	1.3	0.0	0.0	0.7	1.4
TBGC-7_9.5-19.5	0.1	0.0	0.1	2.2	1.8	0.0	0.0	0.1	0.7
TBGC-7_19.5-29.5	0.0	0.0	0.1	2.7	1.5	0.0	0.0	0.2	0.6
TBGC-7_29.5-39.5	0.2	5.1	0.2	0.5	1.1	0.0	0.0	0.0	0.9
TBGC-7_39.5-49.5	0.2	5.4	0.2	0.5	1.3	0.2	0.0	0.1	0.6
TBGC-7_49.5-59.5	0.3	4.4	0.1	0.6	1.6	0.0	0.0	0.0	0.7
TBGC-7_59.5-69.5	0.3	14.6	0.2	0.9	1.1	0.0	0.4	0.1	1.5
TBGC-7_69.5-79.5	0.5	0.0	0.2	0.1	1.4	0.2	0.0	0.1	0.9
TBGC-7_79.5-89.5	0.7	2.9	0.2	1.0	1.0	0.1	0.0	0.0	3.3
TBGC-7_89.5-99.5	0.4	12.1	0.1	0.6	0.9	0.0	0.0	0.1	1.4
TBGC-7_99.5-109.5	0.1	3.2	0.2	0.5	1.3	0.1	0.0	0.0	1.0
TBGC-7_109.5-119.5	0.4	3.1	0.2	0.8	1.9	0.0	0.0	0.0	2.1
TBGC-7_119.5-129.5	0.6	3.1	0.2	1.2	1.9	0.4	0.2	0.1	1.2
TBGC-7_129.5-139.5	0.6	5.1	0.1	0.9	1.9	0.0	0.3	0.1	1.3
TBGC-7_139.5-149.5	0.8	7.6	0.1	0.7	1.9	0.5	0.2	0.1	1.2
TBGC-7_149.5-159.5	0.9	0.0	0.2	0.8	1.7	0.0	0.2	0.2	1.5
TBGC-7_159.5-169.5	0.9	4.7	0.2	0.8	1.4	0.0	0.3	0.0	1.2
TBGC-7_169.5-179.5	1.3	4.0	0.1	0.9	1.8	0.2	0.1	0.0	1.4
TBGC-7_179.5-189.5	0.3	2.0	0.1	0.5	2.1	0.2	0.1	0.0	1.8
TBGC-7_189.5-199.5	0.6	3.7	0.1	0.5	1.4	0.0	0.1	0.0	3.2
TBGC-7_199.5-209.5	1.5	0.0	0.2	0.7	1.3	0.2	0.2	0.2	2.2
TBGC-7_209.5-219.5	1.9	3.5	0.2	1.6	1.4	0.2	0.0	0.3	2.3
TBGC-7_219.5-229.5	1.4	10.4	0.1	0.9	1.4	0.6	0.1	0.1	1.2
TBGC-7_229.5-239.5	0.7	13.7	0.1	0.6	1.7	0.7	0.0	0.0	0.8
TBGC-7_239.5-249.5	0.5	10.8	0.1	0.7	1.2	0.3	0.0	0.0	0.8

Note: All units in weight percent (wt%)

XRD Results for Geochemical Boreholes

Borehole ID and Sample Interval	Alunite	Amorphous	Chalcopyrite	Chlorite	Epidote	Goethite	Gypsum	Hematite	Jarosite
TBGC-7_249.5-259.5	0.9	3.3	0.2	0.8	1.7	0.2	0.0	0.0	1.1
TBGC-7_259.5-269.5	0.7	0.0	0.1	0.8	1.2	0.2	0.0	0.0	1.5
TBGC-7_269.5-279.5	0.3	3.6	0.2	0.5	2.0	0.1	0.0	0.0	1.0
TBGC-7_279.5-289.5	0.1	0.0	0.3	0.4	1.3	0.0	0.0	0.0	0.4
TBGC-7A_0-9.5	0.0	13.7	0.3	12.4	2.5	0.0	0.0	0.2	1.2
TBGC-7A_9.5-19.5	1.0	6.0	0.3	5.5	2.4	0.0	0.0	0.2	1.1
TBGC-7A_19.5-29.5	1.2	12.6	0.2	6.6	3.0	0.0	0.0	0.0	1.3
TBGC-7A_29.5-39.5	1.1	0.0	0.2	0.6	2.2	0.0	0.0	0.5	1.7
TBGC-7A_39.5-49.5	1.1	0.0	0.2	1.3	1.3	0.0	0.0	0.3	1.7
TBGC-7A_49.5-59.5	1.2	0.0	0.2	1.5	1.4	0.0	0.0	0.1	1.4
TBGC-7A_59.5-69.5	1.5	10.3	0.2	0.7	2.2	0.0	0.0	0.0	1.7
TBGC-7A_69.5-79.5	1.0	10.5	0.2	0.7	1.7	0.0	0.0	0.0	1.6
TBGC-7A_79.5-89.5	0.4	14.7	0.2	0.4	2.0	0.0	0.0	0.0	2.5
TBGC-7A_89.5-99.5	0.5	11.5	0.2	1.3	2.7	0.0	0.3	0.0	1.5
TBGC-7A_99.5-109.5	1.4	13.7	0.2	0.6	1.6	0.0	0.3	0.1	1.0
TBGC-7A_109.5-119.5	0.7	15.4	0.2	0.4	1.5	0.0	0.2	0.0	1.0
TBGC-7A_119.5-129.5	1.1	20.7	0.2	0.8	1.6	0.1	0.1	0.0	1.4
TBGC-7A_129.5-139.5	0.7	14.1	0.3	0.3	1.8	0.0	0.2	0.1	2.0
TBGC-7A_139.5-149.5	0.7	11.9	0.3	0.6	2.3	0.4	0.0	0.2	1.4
TBGC-7A_149.5-159.5	0.9	16.9	0.2	0.6	2.5	0.0	0.1	0.0	1.9
TBGC-7A_159.5-169.5	0.6	17.1	0.3	1.1	2.0	0.0	0.1	0.0	1.4
TBGC-7A_169.5-179.5	0.4	15.5	0.3	1.5	1.6	0.0	0.1	0.1	1.0
TBGC-7A_179.5-189.5	0.6	17.8	0.3	1.4	1.4	0.0	0.0	0.0	0.8
TBGC-7A_189.5-199.5	1.2	14.2	0.2	0.9	2.1	0.0	0.3	0.0	1.0
TBGC-7A_199.5-209.5	1.4	14.5	0.2	0.8	2.2	0.0	0.3	0.0	1.0
TBGC-7A_209.5-219.5	1.1	11.8	0.2	1.1	2.2	0.0	0.0	0.0	0.9
TBGC-7A_219.5-229.5	1.9	8.9	0.2	0.6	2.3	0.0	0.1	0.0	0.7
TBGC-7A_229.5-239.5	3.1	11.8	0.2	0.9	1.3	0.0	0.2	0.3	1.5
TBGC-7A_239.5-249.5	7.1	16.2	0.3	0.5	1.1	0.3	0.4	0.3	3.1
TBGC-7A_249.5-259.5	7.6	14.1	0.2	0.3	1.2	0.0	0.1	0.4	1.5
TBGC-7A_259.5-263	8.8	14.5	0.1	0.4	0.4	0.0	0.2	0.4	2.9

Note: All units in weight percent (wt%)

XRD Results for Geochemical Boreholes

Borehole ID and Sample Interval	Kaolinite	K-Feldspar	Magnetite	Muscovite	Plagioclase	Pyrite	Pyrophyllite	Quartz	Talc
TBGC-1_0-9.5	5.3	5.8	0.5	18.7	3.6	0.2	0.0	43.2	0.0
TBGC-1_9.5-19.5	4.6	5.5	0.6	17.5	5.3	0.2	0.0	44.4	0.0
TBGC-1_19.5-29.5	6.2	7.0	0.4	19.5	7.3	0.3	0.0	40.0	0.0
TBGC-1_29.5-39.5	5.1	5.9	0.5	18.0	6.1	0.4	0.0	40.3	0.0
TBGC-1_39.5-49.5	3.3	5.2	0.5	23.8	4.5	0.2	0.0	38.7	0.0
TBGC-1_49.5-59.5	2.9	10.0	0.3	18.6	17.1	0.2	0.0	33.6	0.0
TBGC-1_59.5-69.5	1.9	15.7	0.3	13.3	16.0	0.2	0.0	28.7	0.0
TBGC-1_69.5-79.5	1.7	14.1	0.5	13.8	16.7	0.2	0.0	33.0	0.0
TBGC-1_79.5-89.5	1.6	13.5	0.5	15.6	12.1	0.3	0.0	35.7	0.0
TBGC-1_89.5-99.5	0.9	15.1	0.4	9.6	21.1	0.2	0.0	28.5	0.0
TBGC-1_99.5-109.5	1.1	14.2	0.3	11.5	18.2	0.5	0.0	28.8	0.0
TBGC-1_109.5-119.5	2.8	9.7	0.4	16.2	2.6	0.2	0.0	42.3	0.0
TBGC-1_119.5-129.5	2.6	5.8	0.6	17.4	1.1	0.4	0.0	41.6	0.0
TBGC-1_129.5-139.5	4.5	3.7	0.5	17.8	2.1	0.5	0.0	47.3	0.0
TBGC-1_139.5-149.5	1.0	6.2	0.1	20.3	3.2	1.6	0.0	49.8	0.0
TBGC-1_149.5-159.5	3.2	5.1	0.2	18.5	1.8	0.5	0.0	46.0	0.0
TBGC-1_159.5-169.5	5.8	2.0	0.3	17.3	1.7	0.3	0.0	49.8	0.0
TBGC-1_169.5-179.5	2.7	9.6	0.1	18.1	5.0	0.8	0.0	37.8	0.0
TBGC-1_179.5-189.5	2.6	1.8	0.5	21.1	2.1	0.2	0.0	47.2	0.0
TBGC-1_189.5-199.5	3.3	2.3	0.4	19.2	1.9	0.2	0.0	47.9	0.0
TBGC-1_199.5-209.5	1.1	3.5	0.5	21.2	1.5	0.3	0.0	51.0	0.0
TBGC-1_209.5-219.5	0.9	3.1	0.4	19.5	1.6	0.3	0.0	56.5	0.0
TBGC-1_219.5-222	2.8	7.4	0.2	15.9	4.9	0.5	0.0	44.5	0.0
TBGC-2_0-9.5	3.8	16.5	0.4	18.9	10.7	0.4	0.7	32.2	0.0
TBGC-2_9.5-19.5	4.2	18.7	0.2	16.9	13.7	0.4	0.0	33.9	0.0
TBGC-2_19.5-29.5	3.6	17.3	0.3	17.7	10.0	0.8	0.0	36.5	0.0
TBGC-2_29.5-39.5	3.8	15.7	0.4	19.3	8.6	0.7	0.0	41.1	0.0
TBGC-2_39.5-49.5	4.2	13.3	0.2	22.2	7.4	1.0	0.0	36.2	0.0
TBGC-2_49.5-59.5	4.8	11.6	0.2	24.4	8.5	1.3	0.0	36.8	0.0
TBGC-2_59.5-69.5	3.4	6.6	0.2	28.4	3.7	1.1	0.0	42.4	0.0
TBGC-2_69.5-79.5	5.9	12.5	0.5	23.5	7.0	0.3	0.0	35.7	0.0
TBGC-2_79.5-89.5	3.3	18.0	0.3	18.4	5.3	0.4	0.0	48.1	0.0
TBGC-3_0-9.5	5.0	18.0	0.3	20.6	4.8	0.3	0.0	35.9	0.0
TBGC-3_9.5-19.5	5.5	15.5	0.2	20.4	5.3	0.1	0.0	39.6	0.0
TBGC-3_19.5-29.5	5.4	12.5	0.4	21.7	10.0	0.3	0.0	36.6	0.0

Note: All units in weight percent (wt%)

XRD Results for Geochemical Boreholes

Borehole ID and Sample Interval	Kaolinite	K-Feldspar	Magnetite	Muscovite	Plagioclase	Pyrite	Pyrophyllite	Quartz	Talc
TBGC-3_29.5-39.5	5.9	14.5	0.3	22.7	6.1	0.2	0.9	37.9	0.0
TBGC-3_39.5-49.5	4.3	10.1	0.4	26.3	2.7	0.4	0.0	42.1	0.0
TBGC-3_49.5-59.5	6.9	18.8	0.4	18.1	7.9	0.1	0.0	34.5	0.0
TBGC-3_59.5-69.5	5.8	18.3	0.3	20.8	4.3	0.1	0.0	35.6	0.0
TBGC-3_69.5-79.5	6.6	15.1	0.4	21.1	7.3	0.4	0.0	35.9	0.0
TBGC-3_79.5-89.5	6.2	16.1	0.3	20.4	9.7	0.2	0.0	36.4	0.0
TBGC-3_89.5-99.5	7.4	18.7	0.3	20.4	4.1	0.1	0.0	34.0	0.0
TBGC-3_99.5-109.5	5.7	17.9	0.4	20.1	10.5	0.2	0.0	32.9	0.0
TBGC-3_109.5-119.5	6.0	19.4	0.3	15.9	13.9	0.2	0.0	30.0	0.0
TBGC-3_119.5-129.5	5.0	17.6	0.2	21.4	10.9	0.4	0.0	33.9	0.0
TBGC-3_129.5-139.5	3.7	14.9	0.2	20.2	7.9	0.3	0.0	41.9	0.0
TBGC-3_13.95-149.5	3.8	12.8	0.3	26.4	6.3	0.3	0.0	40.3	0.0
TBGC-3_149.5-159.5	3.9	16.0	0.2	20.0	12.7	0.4	0.0	34.5	0.0
TBGC-3_159.5-169.5	4.2	14.3	0.2	17.3	13.7	0.3	0.0	30.8	0.0
TBGC-3_169.5-179.5	3.9	10.2	0.3	22.4	6.6	0.3	0.0	41.3	0.0
TBGC-4_0-9.5	2.6	8.3	0.1	24.8	5.3	0.2	0.0	48.3	0.0
TBGC-4_9.5-19.5	4.4	10.1	0.2	22.7	4.3	0.3	0.0	50.9	0.0
TBGC-4_19.5-29.5	6.7	13.8	0.4	19.2	4.5	0.2	0.9	38.9	0.0
TBGC-4_29.5-39.5	4.7	14.5	0.2	21.2	12.8	0.3	0.0	32.3	0.0
TBGC-4_39.5-49.5	3.4	13.8	0.4	20.2	7.2	0.2	0.0	41.4	0.0
TBGC-5_0-9.5	3.3	5.7	0.5	28.0	6.0	0.3	0.0	45.5	0.0
TBGC-5_9.5-19.5	3.5	13.4	0.4	20.8	16.6	0.3	0.0	36.4	0.0
TBGC-5_19.5-29.5	2.6	22.4	0.5	16.1	13.1	0.2	0.0	39.7	0.0
TBGC-5_29.5-39.5	3.0	23.4	0.3	10.5	19.4	0.2	0.0	28.2	0.0
TBGC-5_39.5-49.5	3.4	25.7	0.4	11.1	21.3	0.2	0.0	30.8	0.0
TBGC-5_49.5-59.5	10.6	16.7	0.2	9.7	18.4	0.2	0.0	24.8	0.1
TBGC-5_59.5-69.5	3.1	19.1	0.4	12.1	20.2	0.3	0.0	40.8	0.0
TBGC-5_69.5-79.5	2.2	16.0	0.4	16.1	19.2	0.2	0.0	32.5	0.0
TBGC-5_79.5-89.5	5.6	17.5	0.3	10.3	21.9	0.2	0.0	27.2	0.0
TBGC-5_89.5-99.5	11.7	12.8	0.3	19.2	11.1	0.2	0.0	34.0	0.3
TBGC-5_99.5-109.5	4.7	13.4	0.4	12.6	20.6	0.3	0.0	30.4	0.0
TBGC-5_109.5-119.5	3.3	16.4	0.4	14.1	25.4	0.2	0.0	30.9	0.0
TBGC-5_119.5-129.5	1.9	23.4	0.3	8.5	20.1	0.2	0.0	25.9	0.0
TBGC-5_129.5-139.5	3.2	18.8	0.6	8.1	39.8	0.1	0.0	25.3	0.4
TBGC-6_0-9.5	2.5	5.5	0.3	17.5	2.6	1.2	0.0	45.9	0.0

Note: All units in weight percent (wt%)

XRD Results for Geochemical Boreholes

Borehole ID and Sample Interval	Kaolinite	K-Feldspar	Magnetite	Muscovite	Plagioclase	Pyrite	Pyrophyllite	Quartz	Talc
TBGC-6_9.5-19.5	3.5	5.0	0.2	18.5	2.4	1.8	0.0	40.9	0.0
TBGC-6_19.5-29.5	6.1	6.3	0.1	18.1	2.3	0.8	0.0	41.8	0.0
TBGC-6_29.5-39.5	4.2	9.9	0.3	16.1	2.3	0.6	0.0	42.9	0.0
TBGC-6_39.5-49.5	1.4	6.2	0.4	18.3	1.9	0.9	0.0	48.5	0.0
TBGC-6_49.5-59.5	1.5	15.8	0.3	14.9	7.4	0.4	0.0	38.1	0.0
TBGC-6_59.5-69.5	3.0	13.6	0.2	13.4	22.3	0.3	0.0	27.9	0.0
TBGC-6_69.5-79.5	3.0	15.1	0.1	13.6	25.5	0.2	0.0	25.1	0.0
TBGC-6_79.5-89.5	3.5	4.1	0.0	28.1	6.9	0.8	0.0	34.6	0.0
TBGC-6_89.5-99.5	3.9	15.1	0.2	16.0	23.4	0.7	0.0	25.9	0.0
TBGC-6_99.5-107	3.0	8.5	0.1	21.8	11.1	1.6	0.0	32.8	0.0
TBGC-7_0-9.5	1.8	13.2	0.2	8.9	43.9	0.6	0.0	26.0	0.0
TBGC-7_9.5-19.5	0.8	12.2	0.4	6.6	49.0	0.4	0.0	25.6	0.0
TBGC-7_19.5-29.5	1.1	14.2	0.5	4.8	50.8	0.5	0.0	22.9	0.0
TBGC-7_29.5-39.5	4.5	17.1	0.5	11.1	33.2	0.5	0.0	25.2	0.0
TBGC-7_39.5-49.5	5.1	16.0	0.5	12.0	30.4	0.2	0.0	27.3	0.0
TBGC-7_49.5-59.5	5.7	16.2	0.5	10.2	30.2	0.2	0.0	29.2	0.0
TBGC-7_59.5-69.5	6.5	14.4	0.4	11.9	22.0	0.4	0.0	25.2	0.0
TBGC-7_69.5-79.5	3.8	19.0	0.5	15.0	22.0	0.7	0.0	35.8	0.0
TBGC-7_79.5-89.5	3.0	14.7	0.5	18.5	21.9	0.5	0.0	31.8	0.0
TBGC-7_89.5-99.5	3.1	16.2	0.5	13.7	24.5	0.3	0.0	26.3	0.0
TBGC-7_99.5-109.5	2.4	17.7	0.4	11.3	31.4	0.6	0.0	29.8	0.0
TBGC-7_109.5-119.5	3.5	13.6	0.3	23.1	14.6	1.1	0.0	35.3	0.0
TBGC-7_119.5-129.5	6.8	11.7	0.4	25.1	9.9	0.8	0.0	36.5	0.0
TBGC-7_129.5-139.5	7.3	8.1	0.3	29.6	4.2	1.1	0.0	39.0	0.0
TBGC-7_139.5-149.5	5.0	5.4	0.5	28.9	2.4	0.3	0.0	44.4	0.0
TBGC-7_149.5-159.5	4.9	15.2	0.4	23.4	8.0	0.4	0.0	42.3	0.0
TBGC-7_159.5-169.5	7.2	16.1	0.4	19.2	12.6	0.8	0.0	34.2	0.0
TBGC-7_169.5-179.5	4.7	17.5	0.4	22.2	9.5	0.3	0.0	35.6	0.0
TBGC-7_179.5-189.5	4.0	11.8	0.3	25.5	11.0	1.0	0.0	39.3	0.0
TBGC-7_189.5-199.5	3.1	12.1	0.3	25.4	9.5	0.5	0.0	39.5	0.0
TBGC-7_199.5-209.5	4.5	10.0	0.5	28.0	9.8	0.6	0.0	40.2	0.0
TBGC-7_209.5-219.5	6.5	8.2	0.4	25.1	3.4	0.2	0.0	44.8	0.0
TBGC-7_219.5-229.5	6.4	9.0	0.5	23.3	7.4	0.3	0.0	36.9	0.0
TBGC-7_229.5-239.5	6.5	10.6	0.5	19.8	9.8	0.3	0.0	34.3	0.0
TBGC-7_239.5-249.5	7.2	12.0	0.4	23.0	8.6	0.3	0.0	34.0	0.0

Note: All units in weight percent (wt%)

XRD Results for Geochemical Boreholes

Borehole ID and Sample Interval	Kaolinite	K-Feldspar	Magnetite	Muscovite	Plagioclase	Pyrite	Pyrophyllite	Quartz	Talc
TBGC-7_249.5-259.5	4.8	8.3	0.5	26.3	6.0	0.2	0.0	45.7	0.0
TBGC-7_259.5-269.5	4.9	15.5	0.4	24.3	11.6	0.1	0.0	38.7	0.1
TBGC-7_269.5-279.5	2.7	18.8	0.5	17.6	14.6	0.2	0.0	38.1	0.0
TBGC-7_279.5-289.5	3.7	32.7	0.6	12.3	19.4	0.1	0.0	28.7	0.0
TBGC-7A_0-9.5	4.5	12.9	1.0	14.2	3.4	2.8	0.0	31.1	0.0
TBGC-7A_9.5-19.5	4.4	15.2	0.5	16.7	5.7	2.4	0.0	38.6	0.0
TBGC-7A_19.5-29.5	4.7	6.4	0.4	19.0	2.9	3.4	0.0	38.3	0.0
TBGC-7A_29.5-39.5	2.2	7.8	0.5	30.6	5.2	1.2	0.0	46.2	0.0
TBGC-7A_39.5-49.5	2.9	7.0	0.4	25.4	8.3	2.2	0.0	47.9	0.0
TBGC-7A_49.5-59.5	1.9	6.8	0.1	29.0	5.5	2.2	0.0	48.8	0.0
TBGC-7A_59.5-69.5	2.2	3.1	0.0	34.9	2.7	2.8	0.0	37.6	0.0
TBGC-7A_69.5-79.5	1.9	7.4	0.2	25.2	9.5	1.7	0.0	38.4	0.0
TBGC-7A_79.5-89.5	1.8	18.7	0.3	13.3	17.7	0.9	0.0	27.2	0.0
TBGC-7A_89.5-99.5	1.9	19.0	0.3	8.5	21.2	0.6	0.0	30.5	0.0
TBGC-7A_99.5-109.5	3.4	17.0	0.3	15.3	3.4	0.4	0.0	41.2	0.0
TBGC-7A_109.5-119.5	2.7	21.2	0.4	12.1	2.5	0.1	0.0	41.5	0.0
TBGC-7A_119.5-129.5	1.9	18.1	0.2	15.4	3.3	0.3	0.0	35.0	0.0
TBGC-7A_129.5-139.5	2.7	12.9	0.3	21.1	9.1	1.3	0.0	33.2	0.0
TBGC-7A_139.5-149.5	1.1	7.1	0.4	19.9	8.7	5.2	0.0	39.9	0.0
TBGC-7A_149.5-159.5	1.6	7.8	0.3	18.5	12.4	2.0	0.0	34.3	0.0
TBGC-7A_159.5-169.5	1.3	13.0	0.2	20.9	6.6	1.3	0.0	34.2	0.1
TBGC-7A_169.5-179.5	1.5	14.3	0.1	17.3	10.7	1.2	0.0	34.4	0.0
TBGC-7A_179.5-189.5	2.2	15.7	0.4	15.2	5.8	1.3	0.0	37.2	0.0
TBGC-7A_189.5-199.5	2.6	11.2	0.1	20.4	3.3	1.9	0.0	40.5	0.0
TBGC-7A_199.5-209.5	2.2	12.9	0.1	19.2	3.9	1.5	0.0	39.8	0.0
TBGC-7A_209.5-219.5	1.1	13.2	0.1	21.7	3.4	1.2	0.0	42.0	0.0
TBGC-7A_219.5-229.5	1.2	4.7	0.0	18.7	3.0	2.6	0.0	55.0	0.0
TBGC-7A_229.5-239.5	1.4	3.3	0.2	23.0	3.5	1.5	0.0	47.6	0.0
TBGC-7A_239.5-249.5	2.0	1.8	0.5	17.1	2.9	0.2	0.0	46.3	0.0
TBGC-7A_249.5-259.5	3.0	1.7	0.4	15.9	2.9	0.3	0.0	50.5	0.0
TBGC-7A_259.5-263	0.9	0.5	0.5	9.5	2.9	0.2	0.0	57.9	0.0

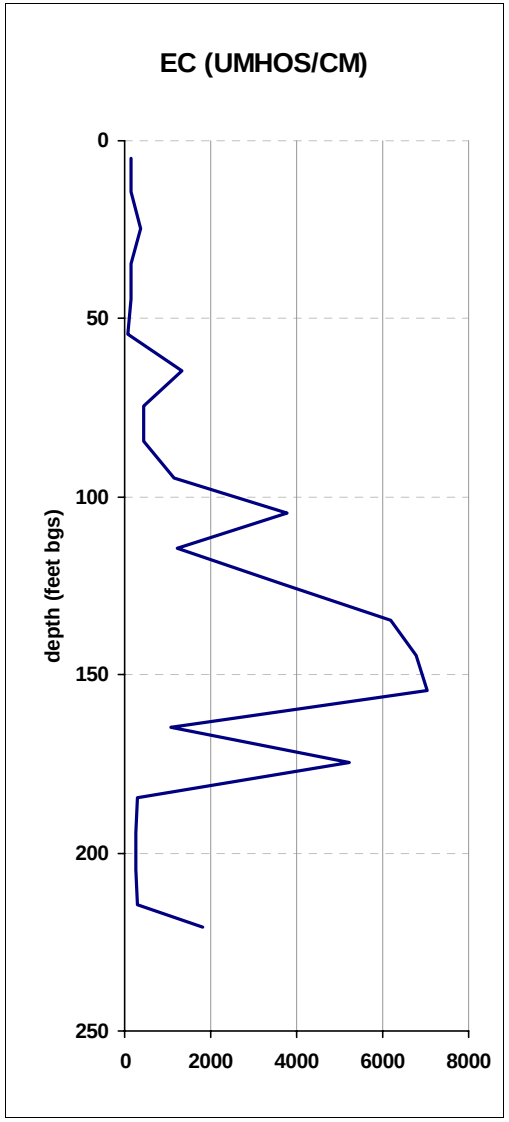
Note: All units in weight percent (wt%)

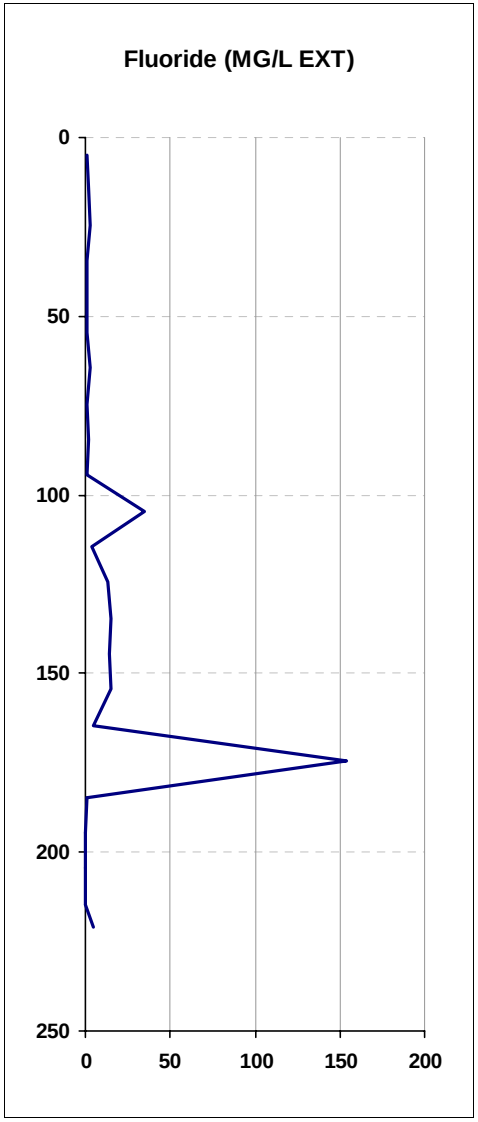
APPENDIX B

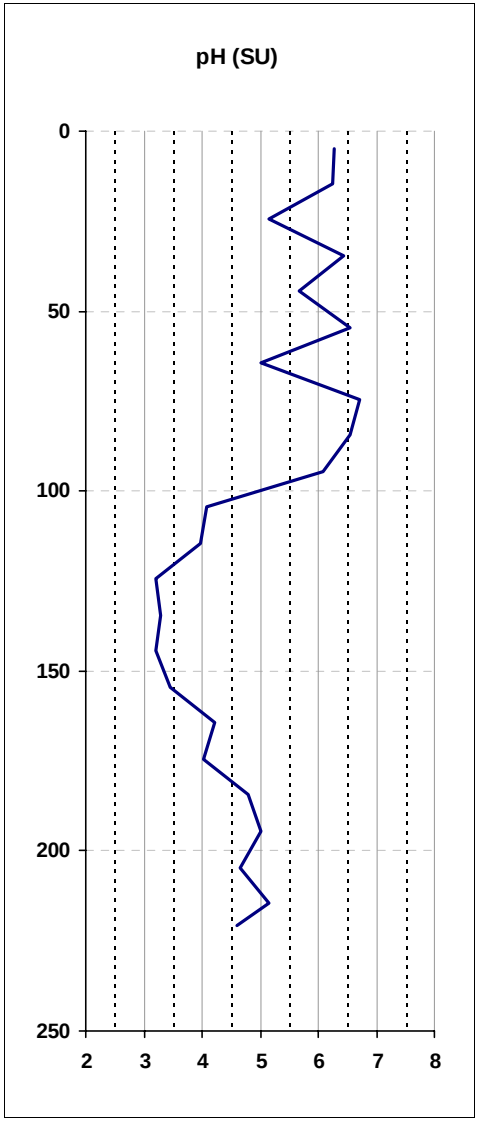
Tyrone Mine Sample Test Results by Location, Test Type

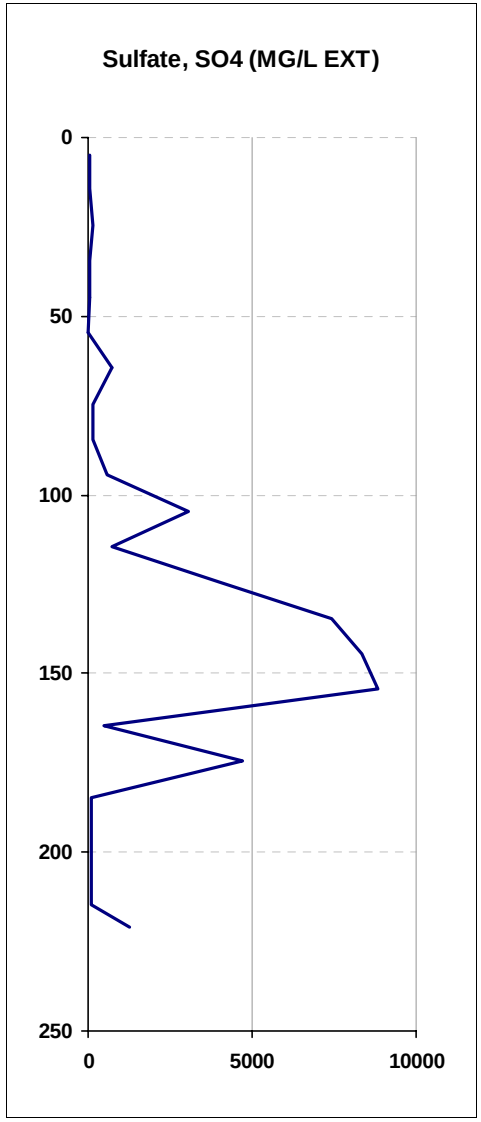
Location: TBGC-1

Test Type: MWMP









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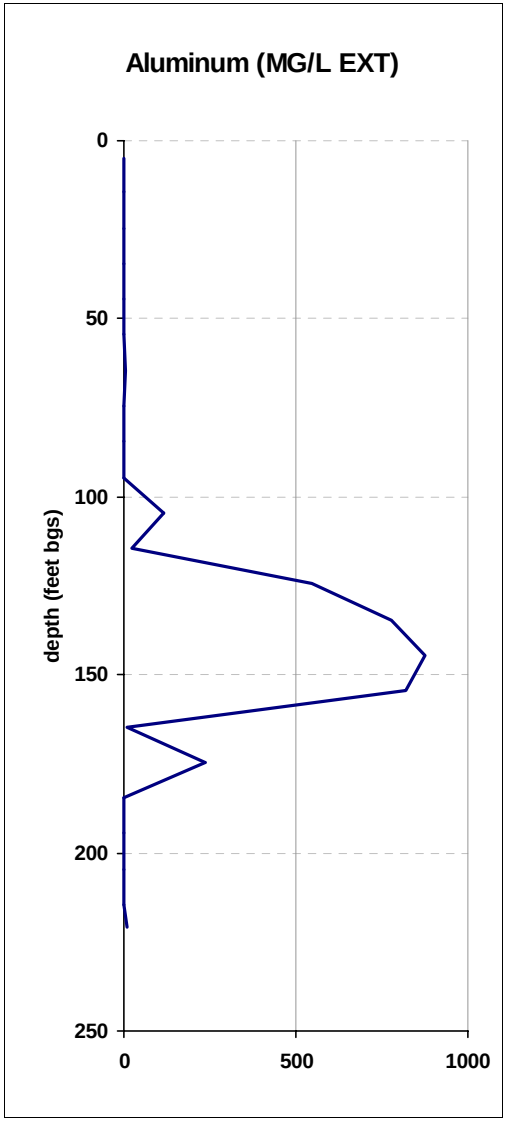
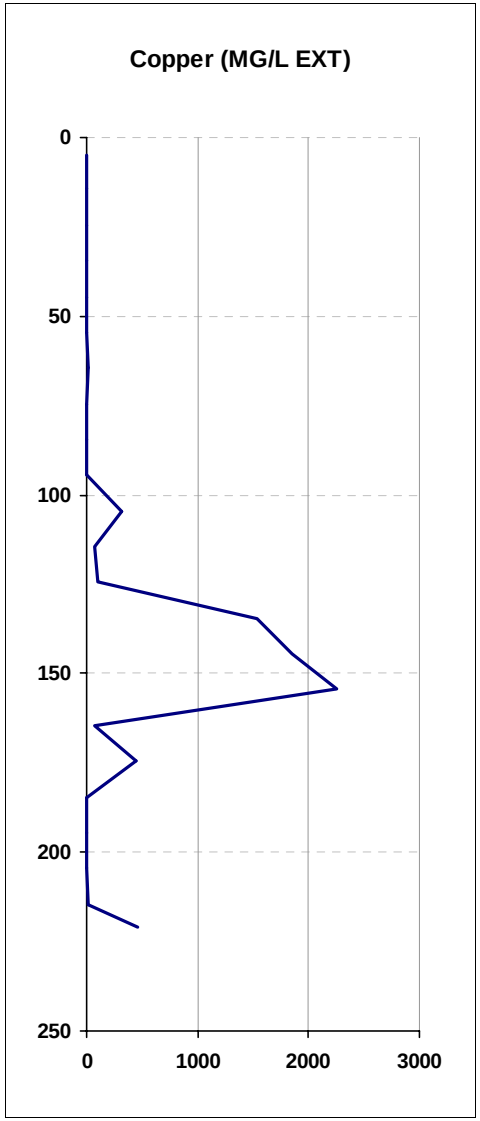
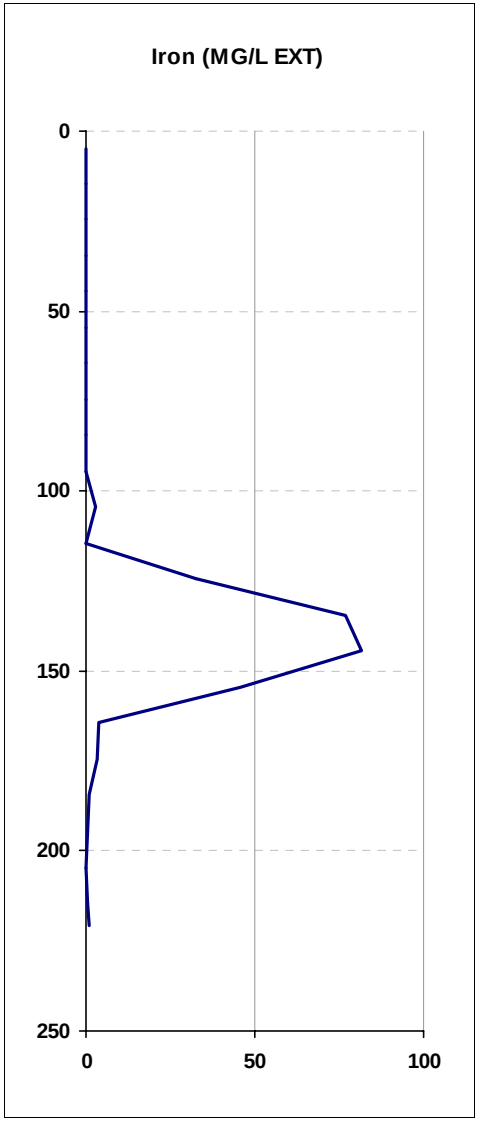
Tyrone Mine Sample Test Results by Location, Test Type

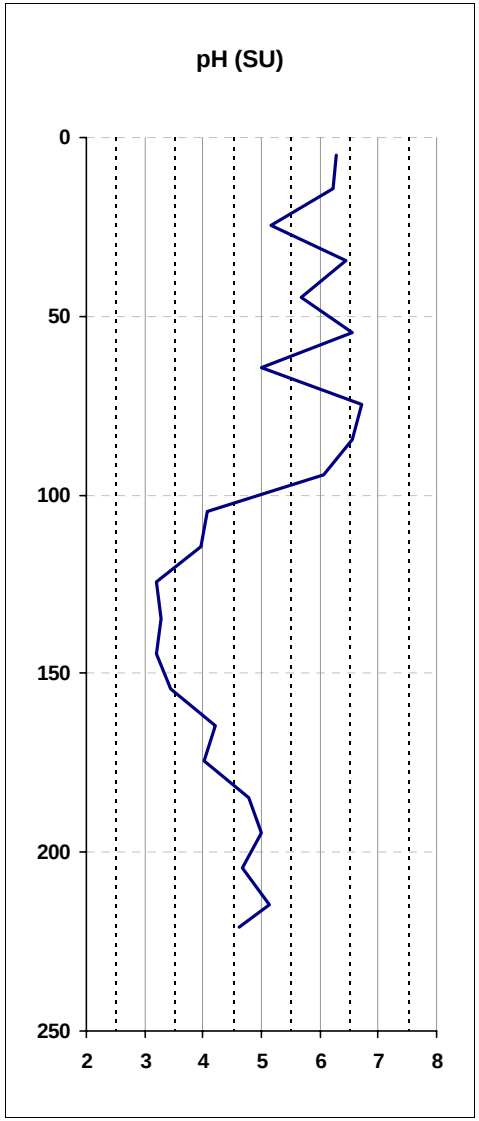
Location: TBGC-1

Test Type: MWMP









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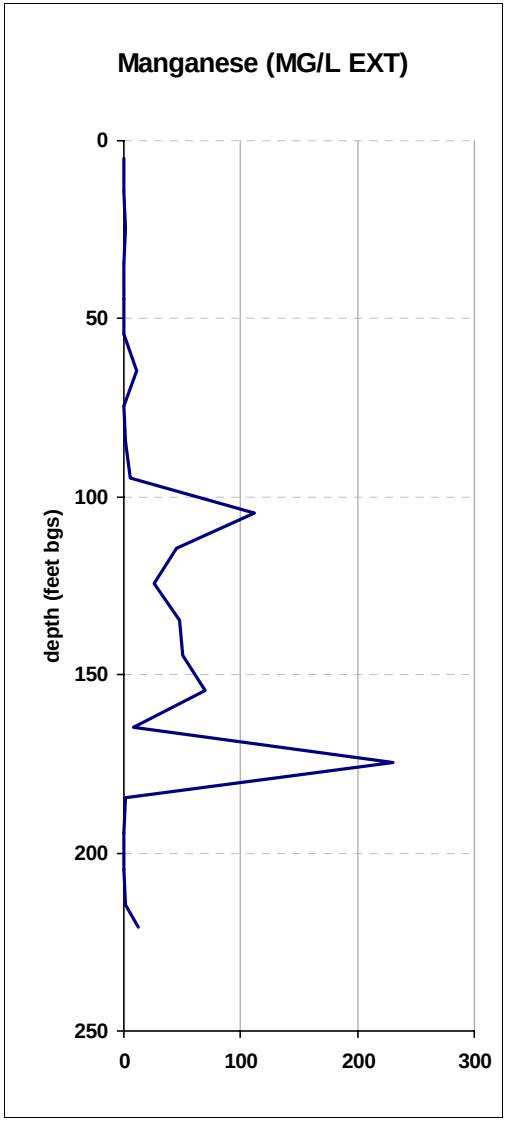
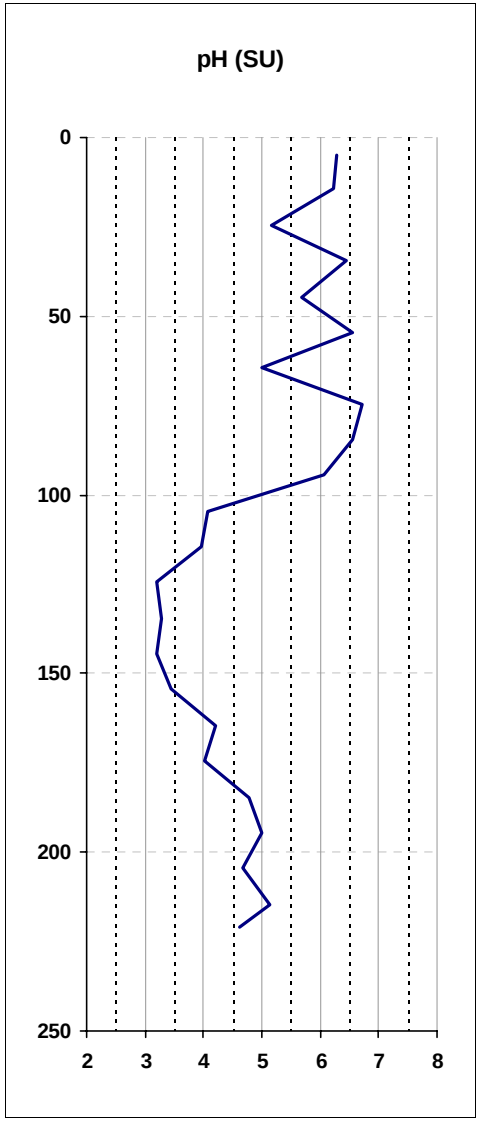
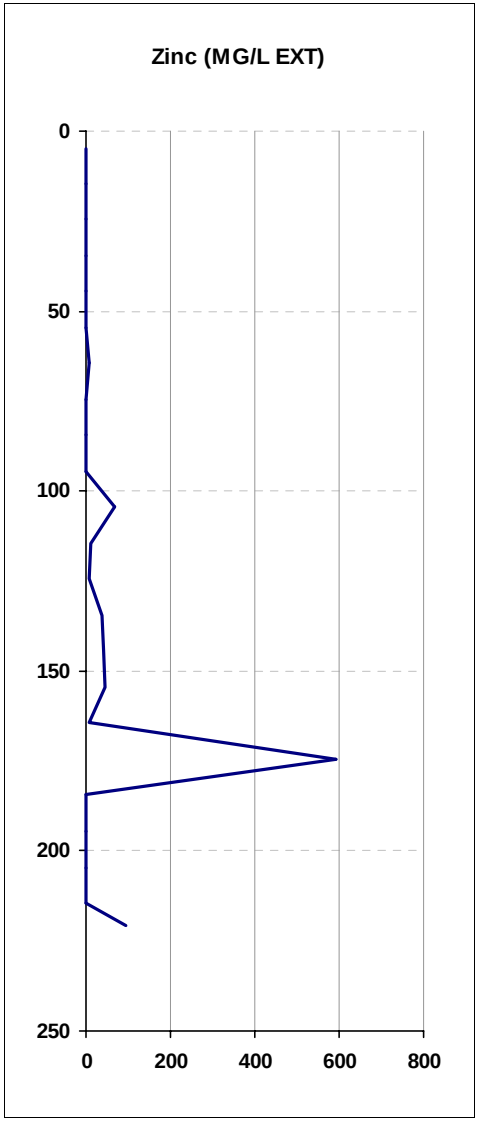
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-1

Test Type: MWMP







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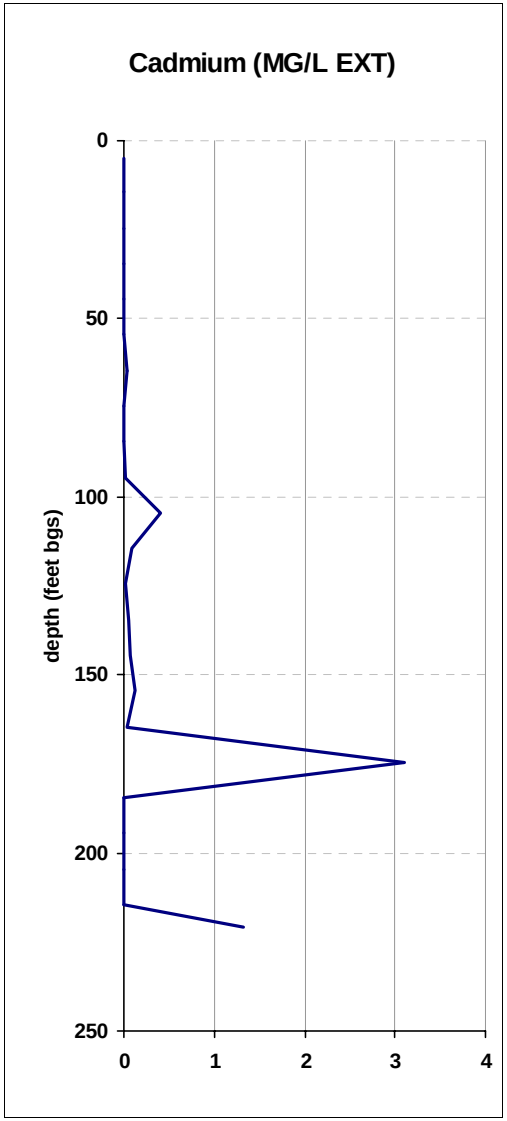
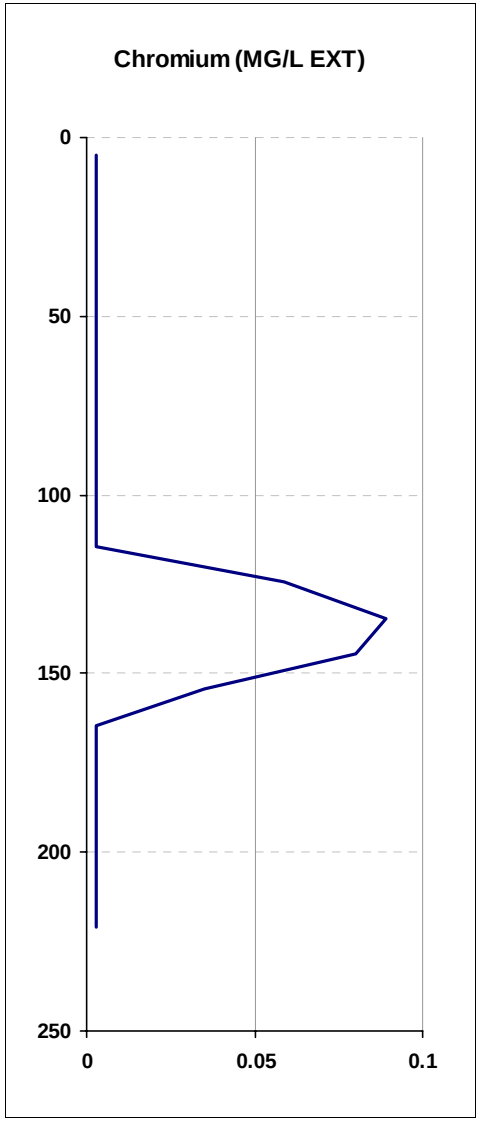
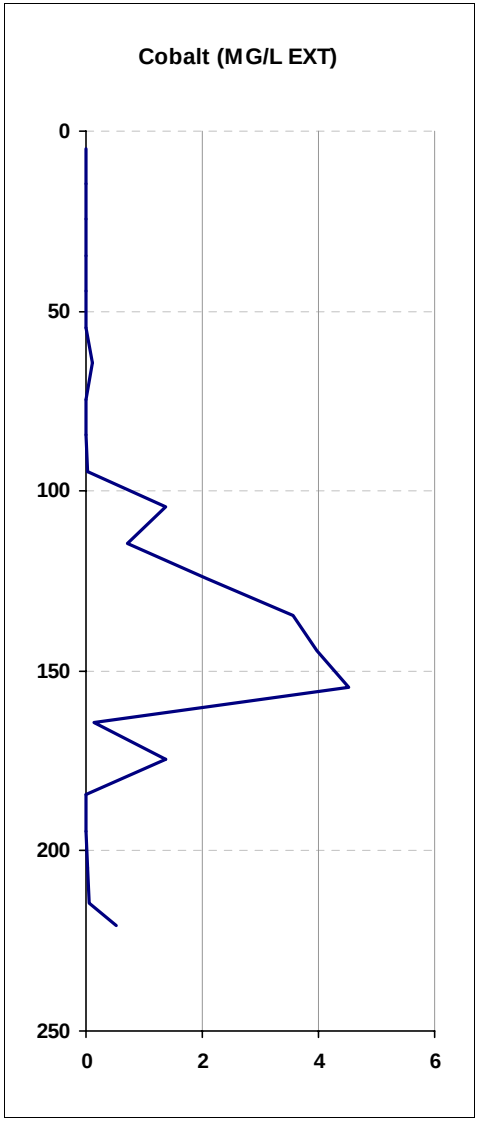
Tyrone Mine Sample Test Results by Location, Test Type

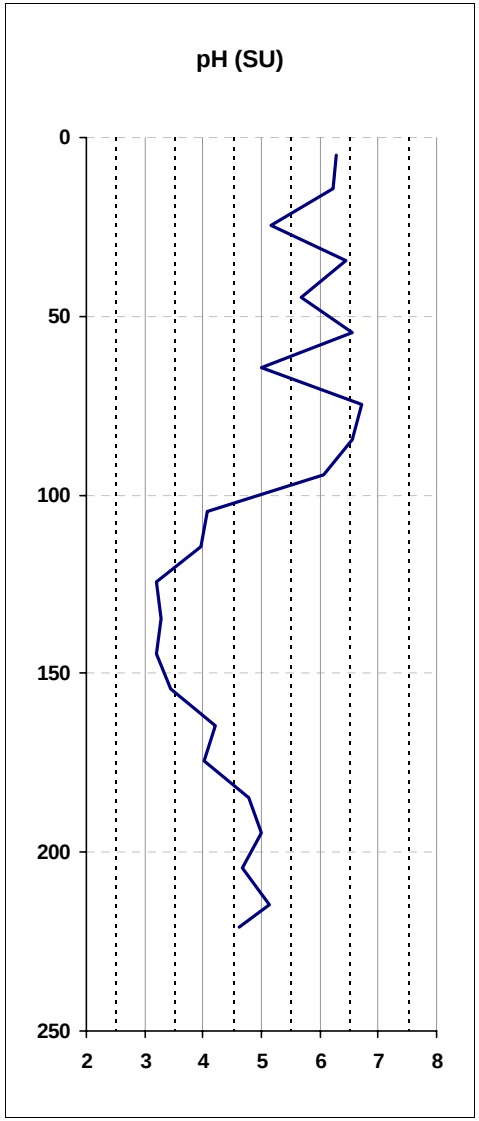
Location: TBGC-1

Test Type: MWMP









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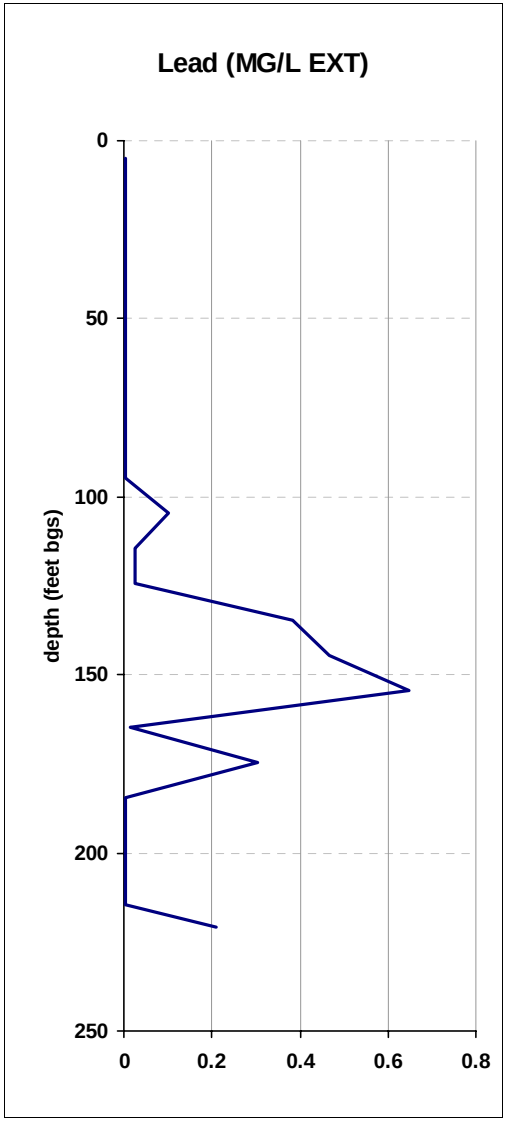
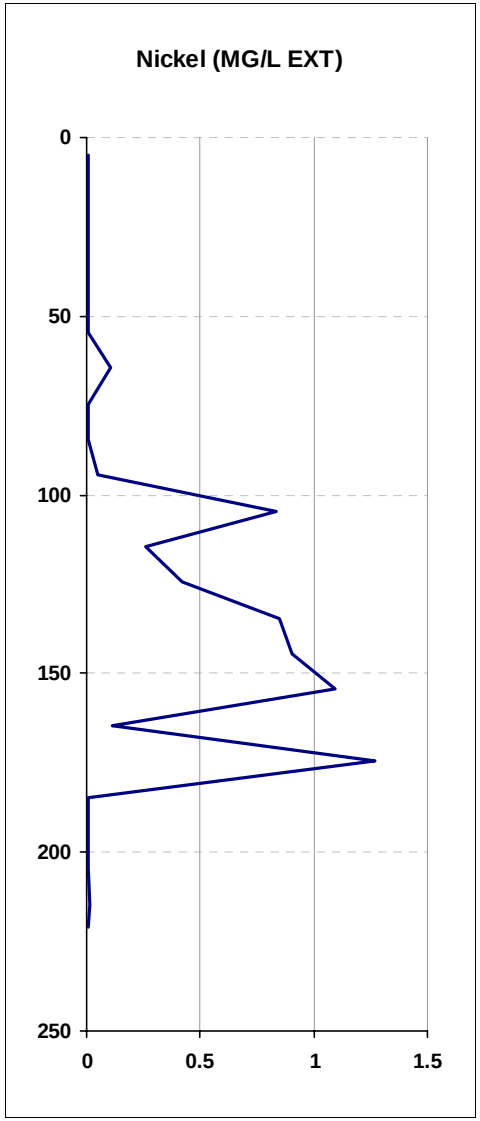
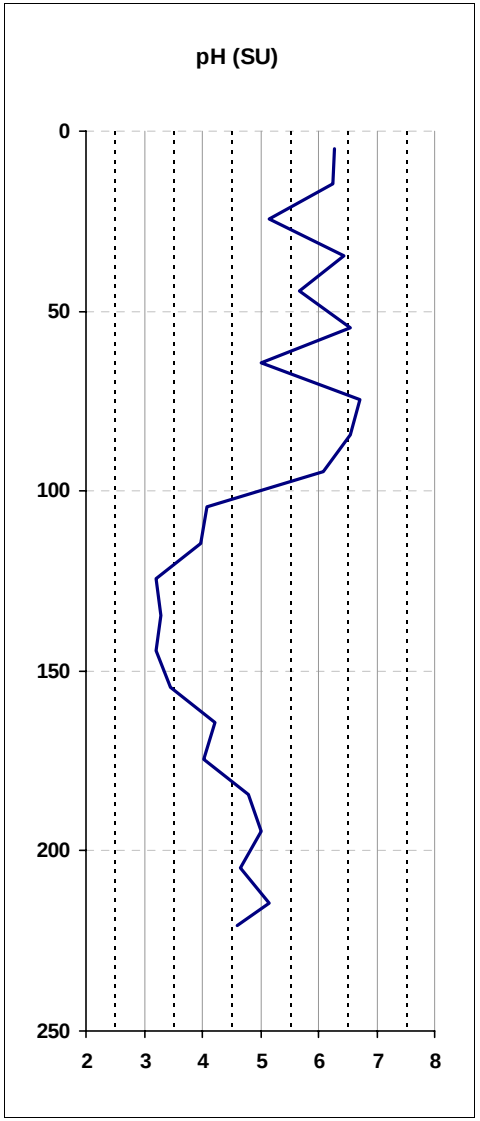
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-1

Test Type: MWMP







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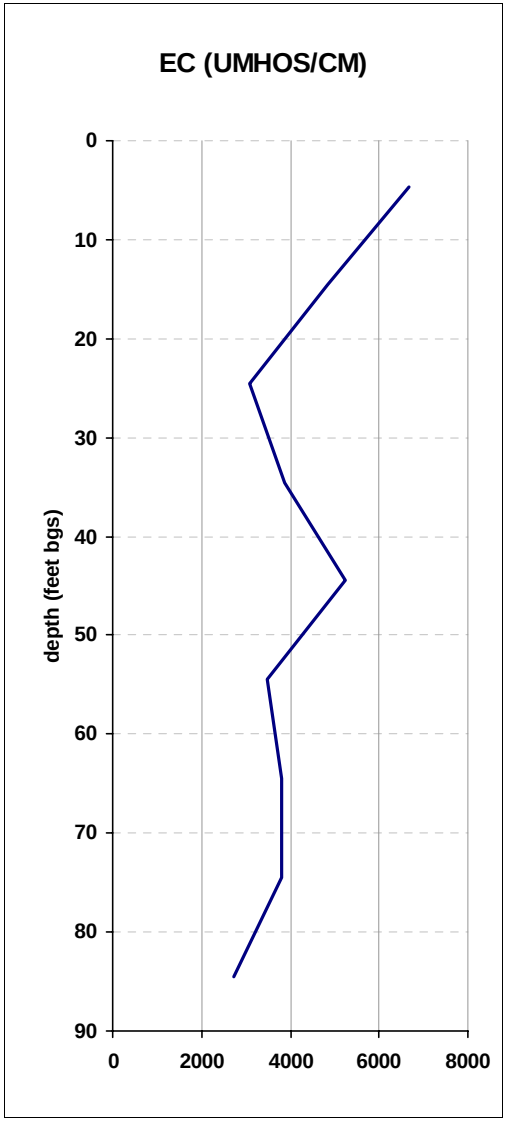
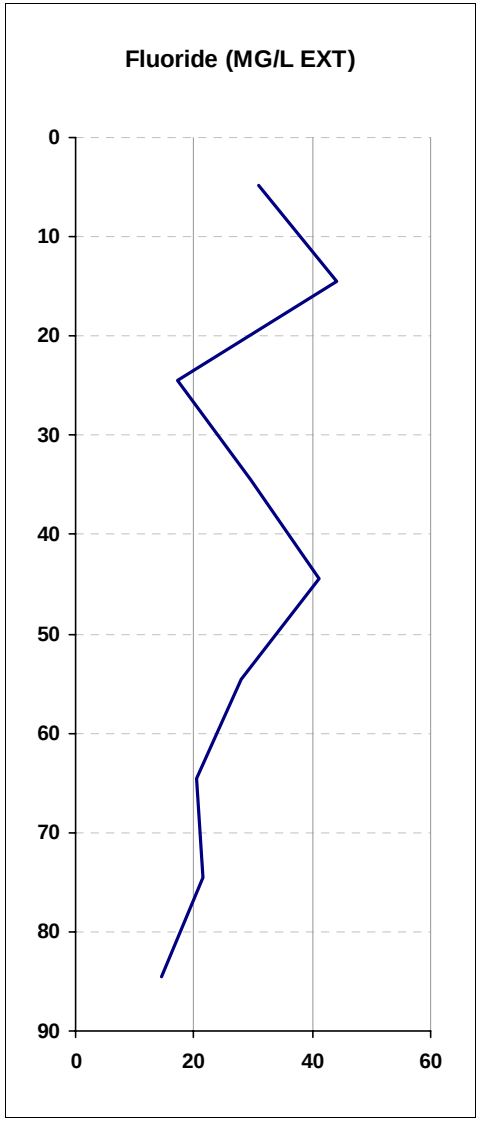
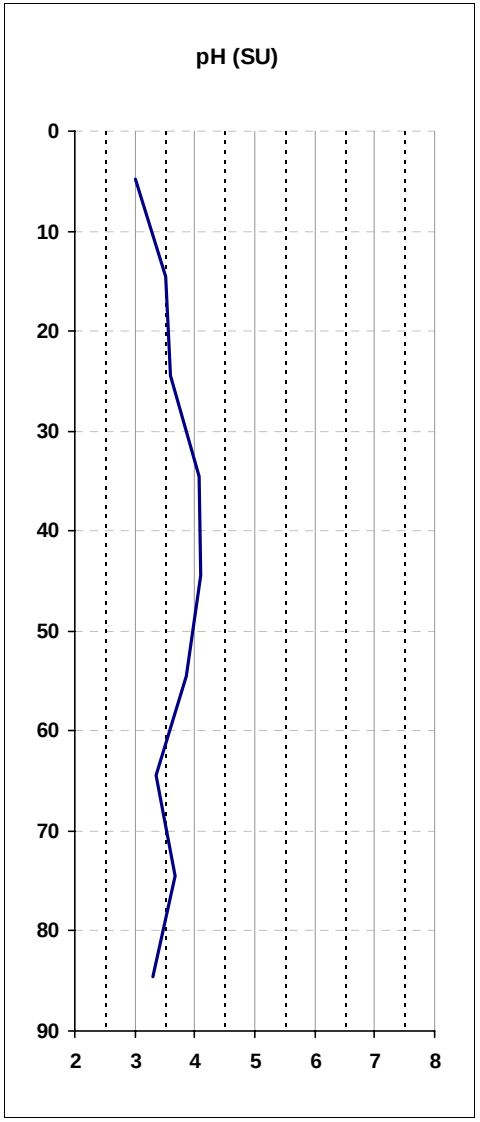
Tyrone Mine Sample Test Results by Location, Test Type

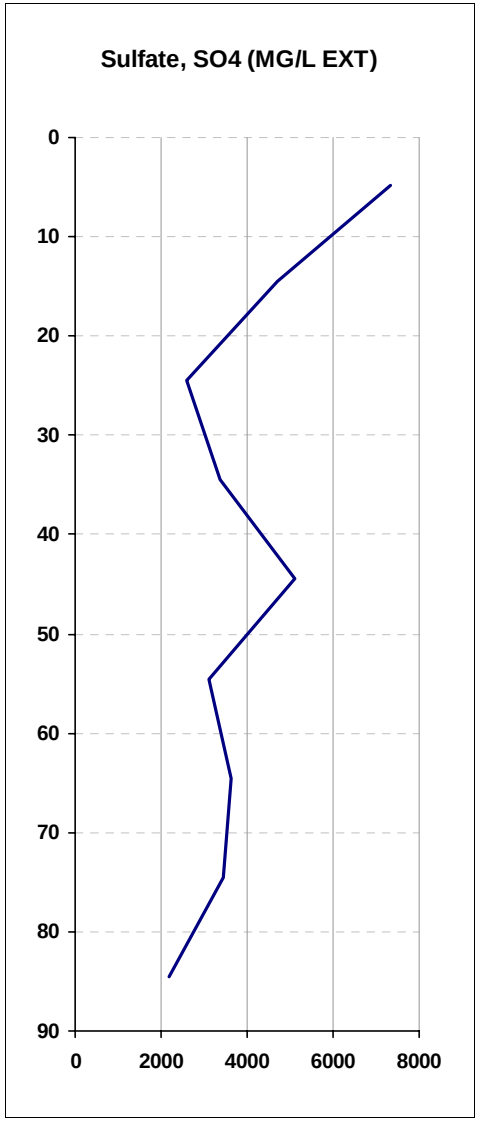
Location: TBGC-2

Test Type: MWMP







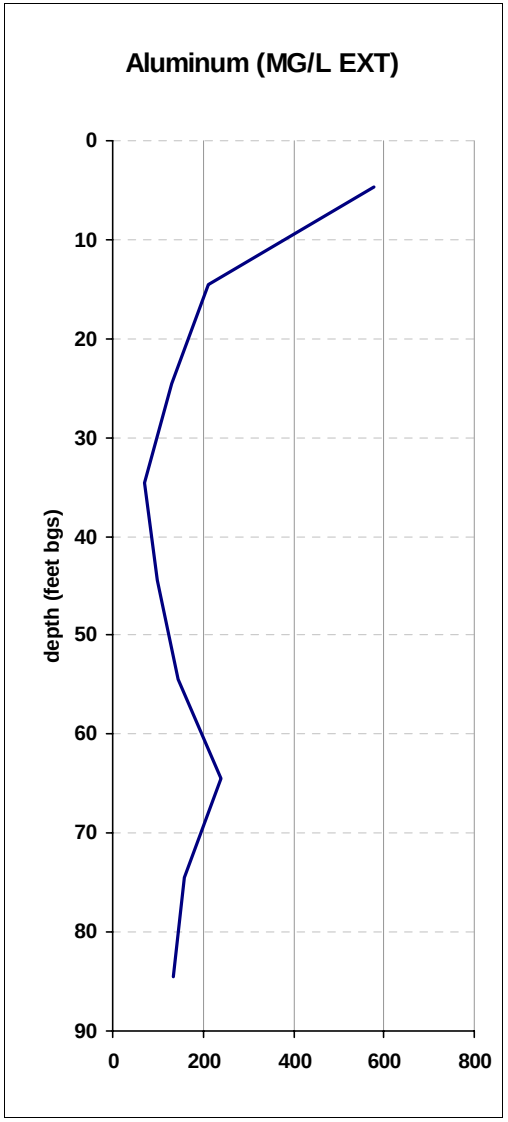


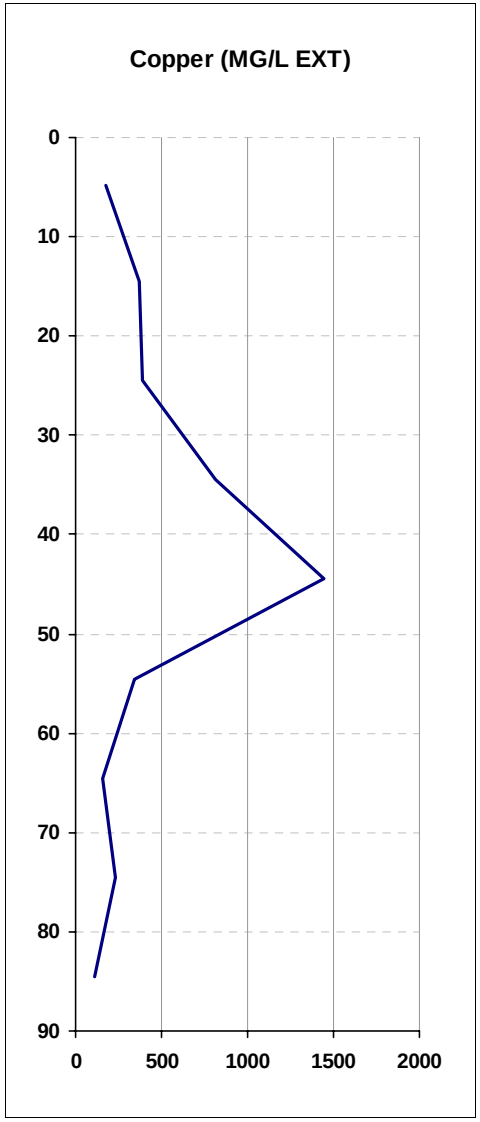
EnviroGroup Limited 2005

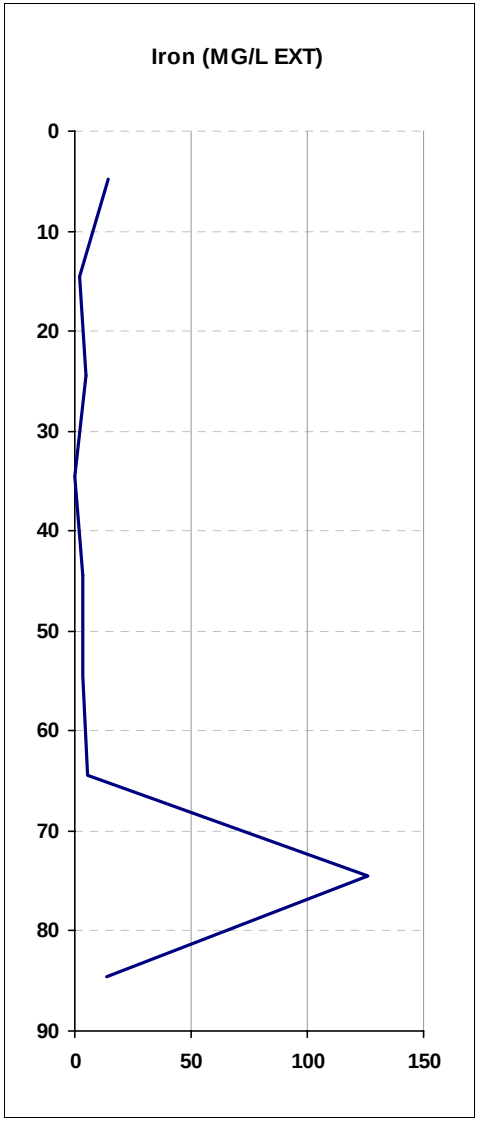
Tyrone Mine Sample Test Results by Location, Test Type

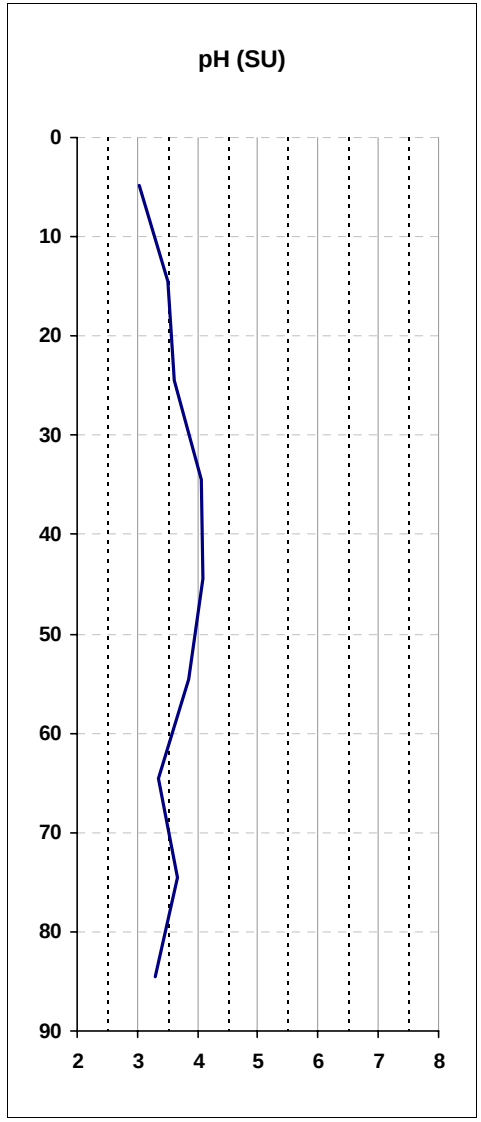
Location: TBGC-2

Test Type: MWMP







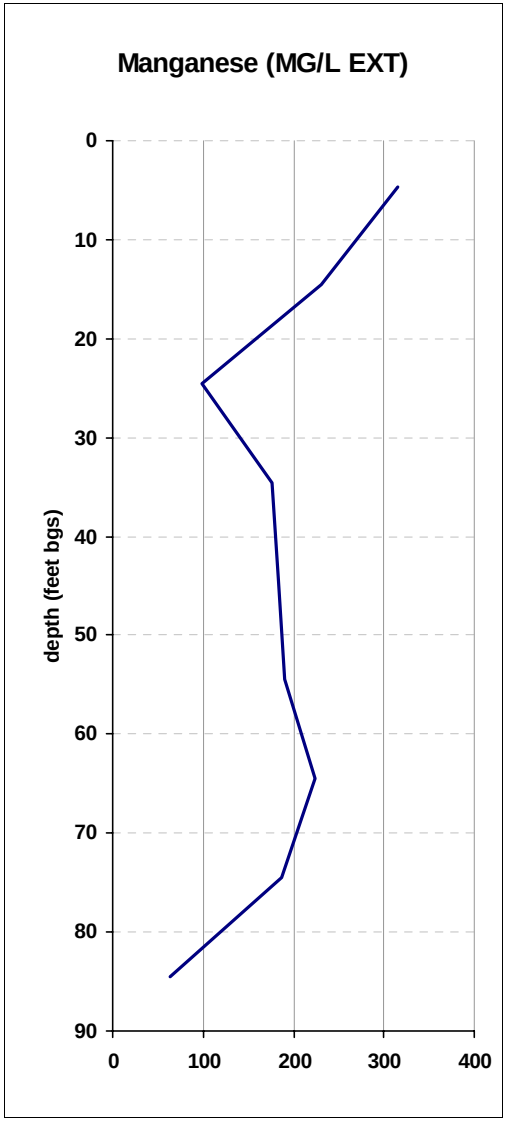


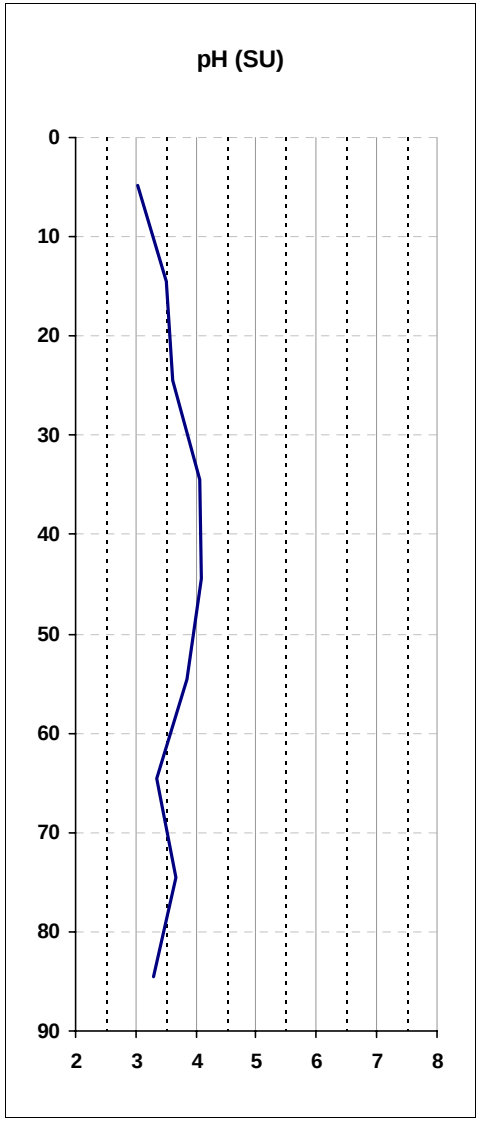
EnviroGroup Limited 2005

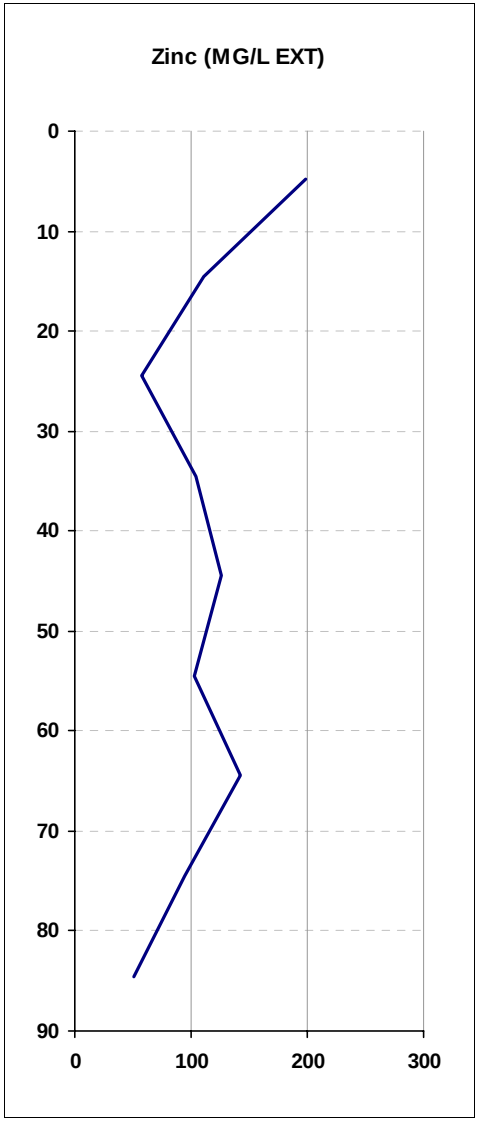
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-2

Test Type: MWMP





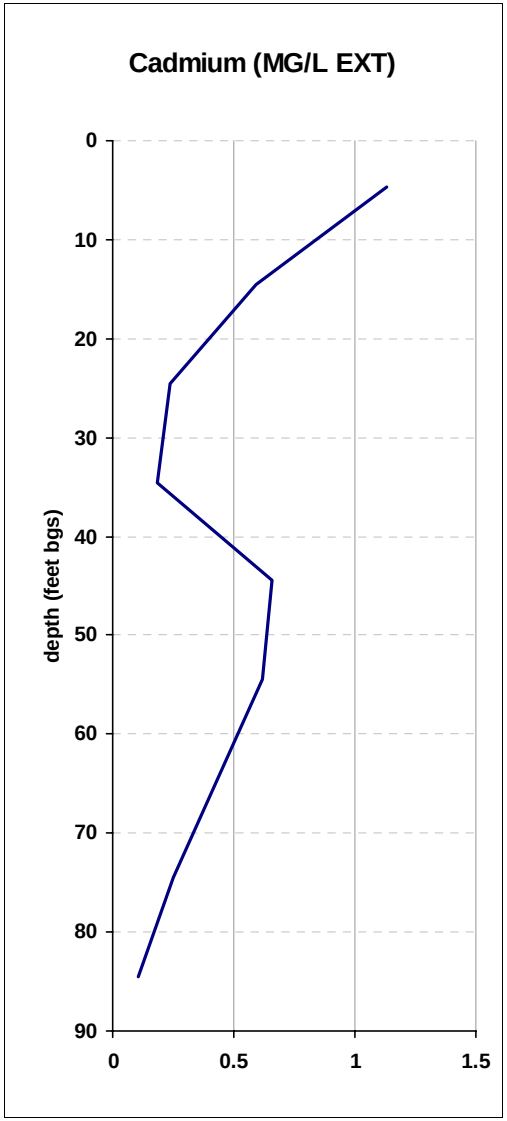


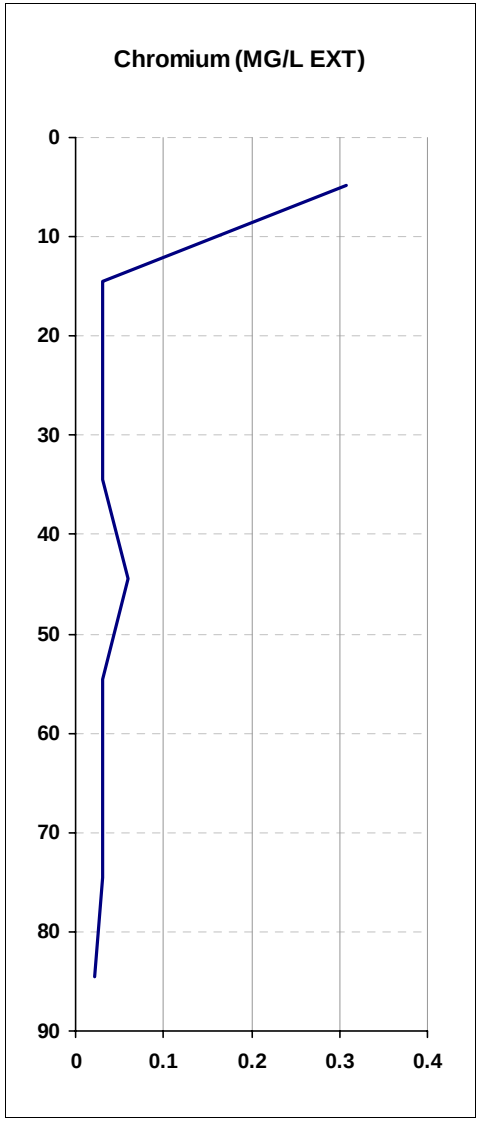
EnviroGroup Limited 2005

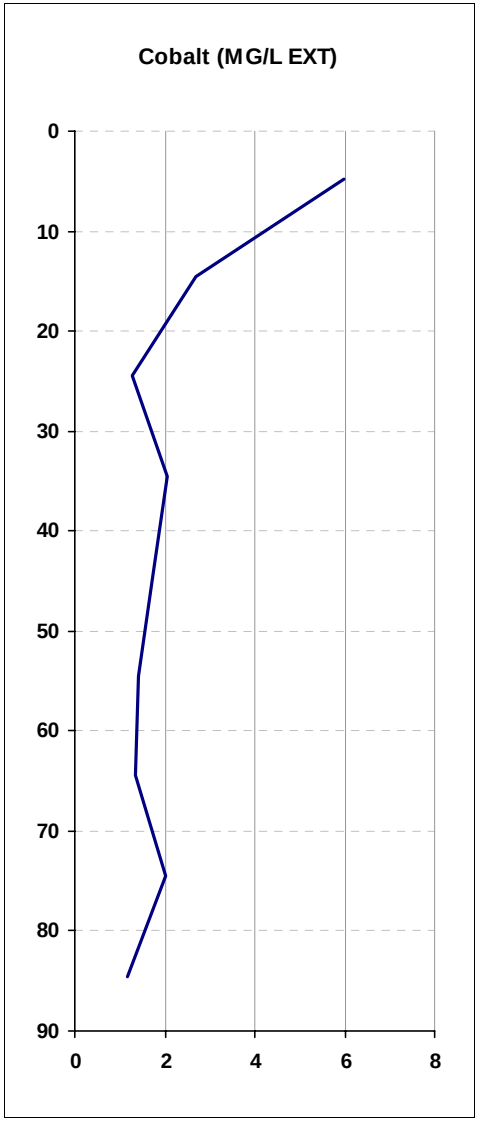
Tyrone Mine Sample Test Results by Location, Test Type

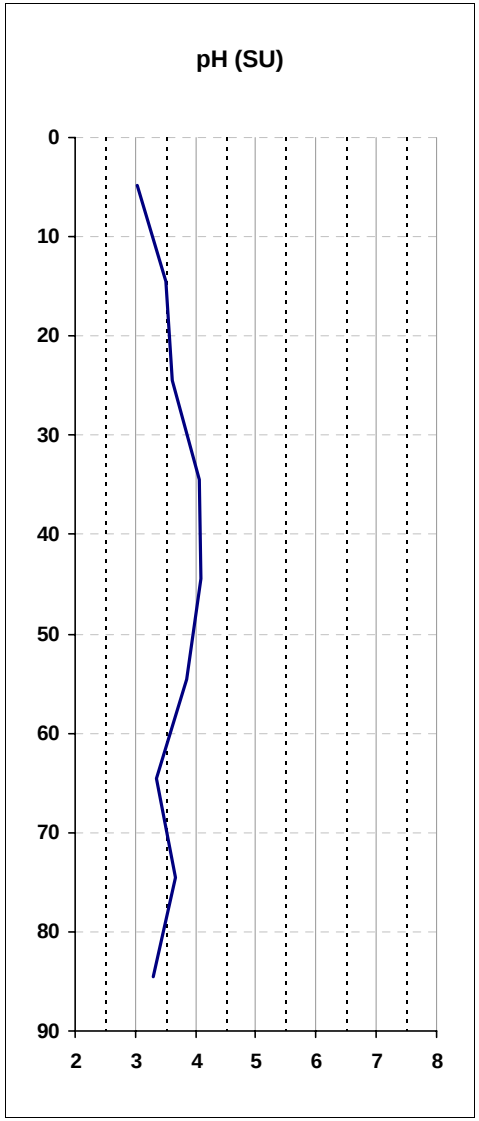
Location: TBGC-2

Test Type: MWMP







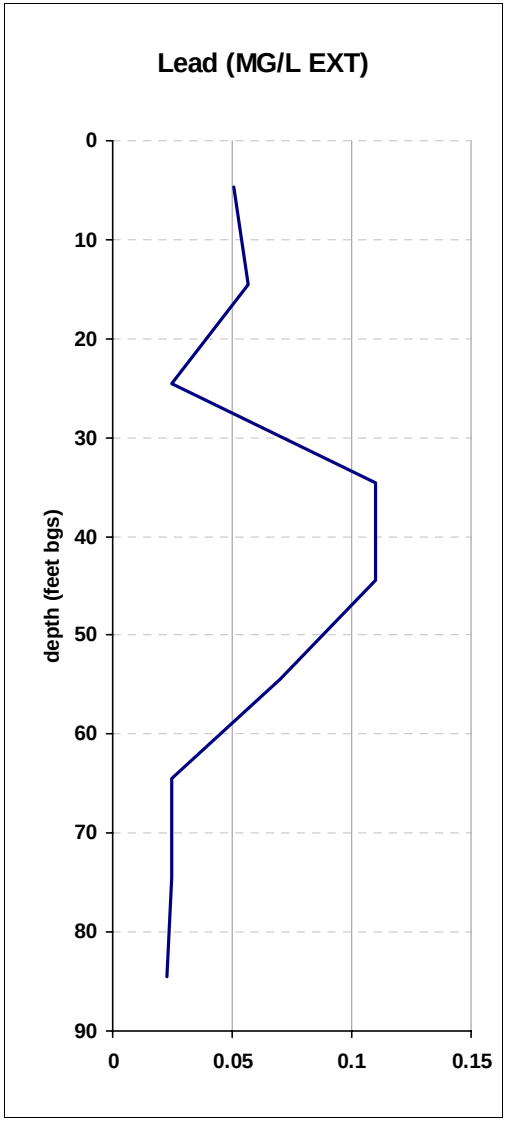


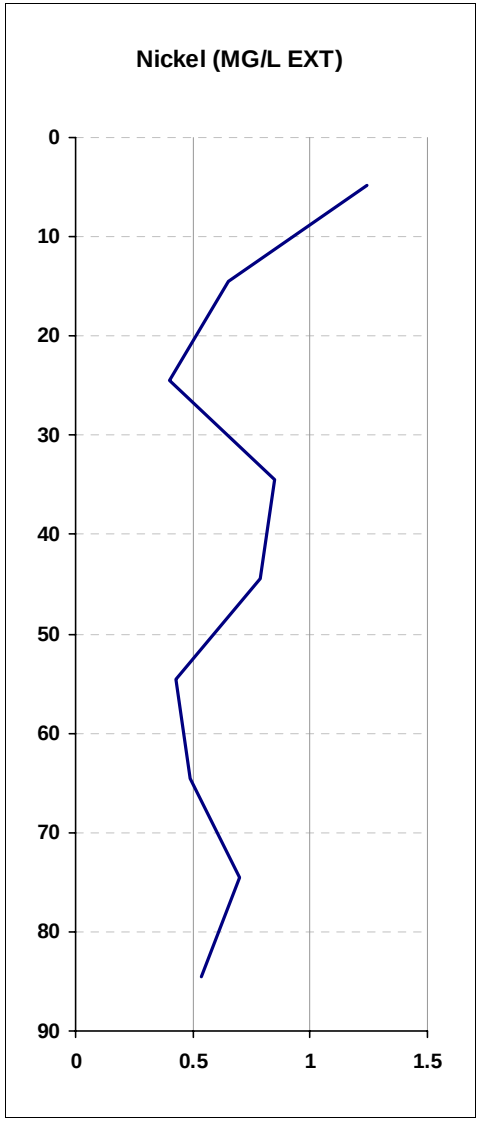
EnviroGroup Limited 2005

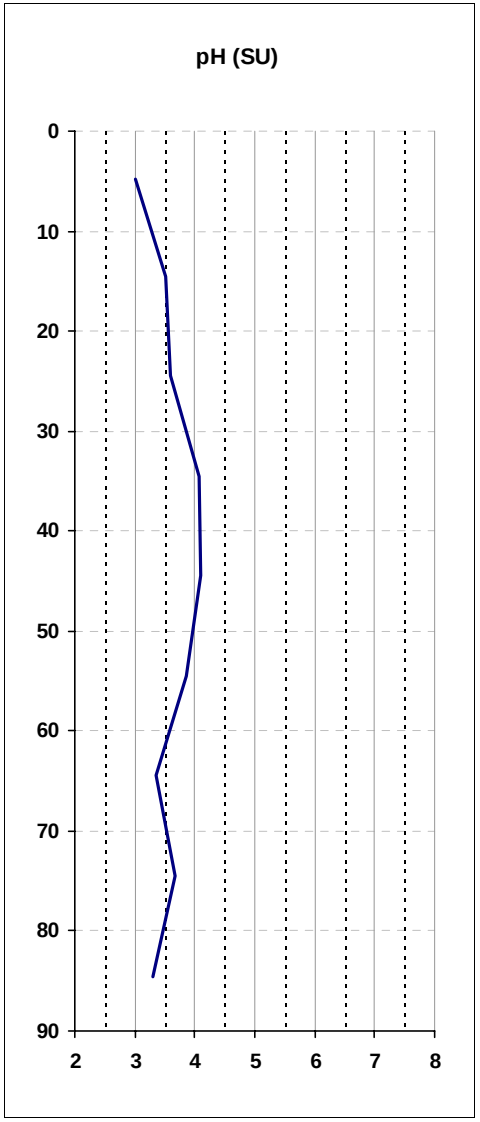
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-2

Test Type: MWMP





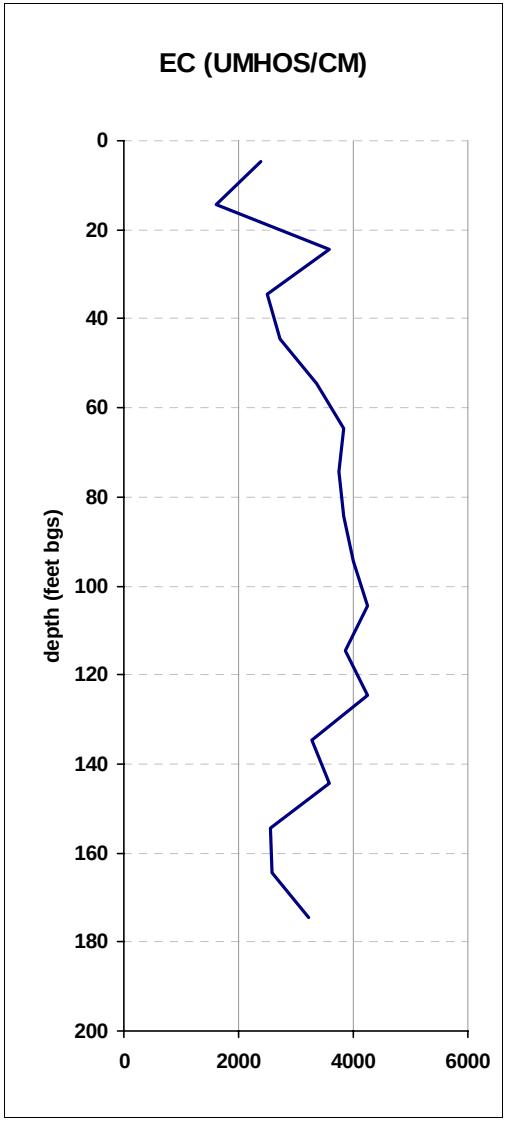


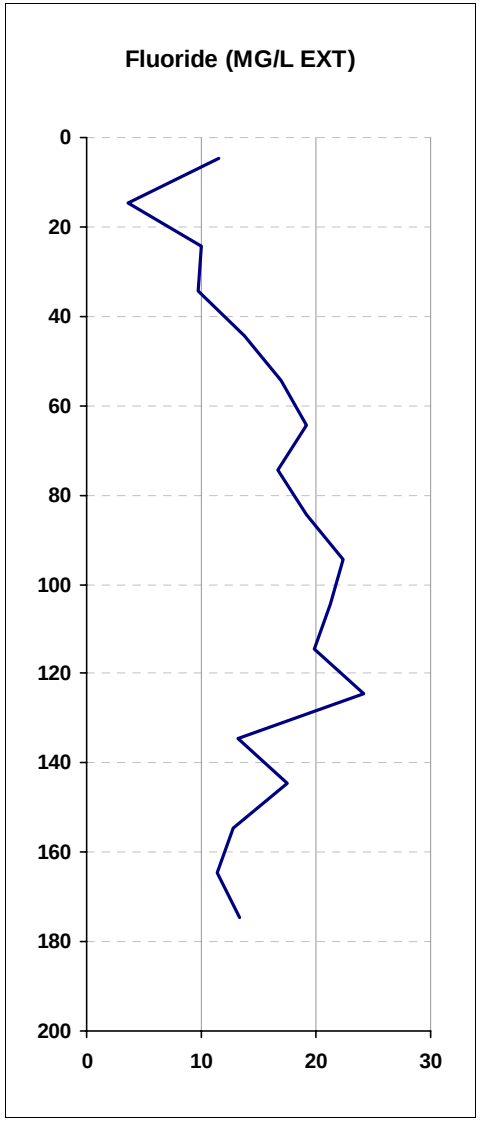
EnviroGroup Limited 2005

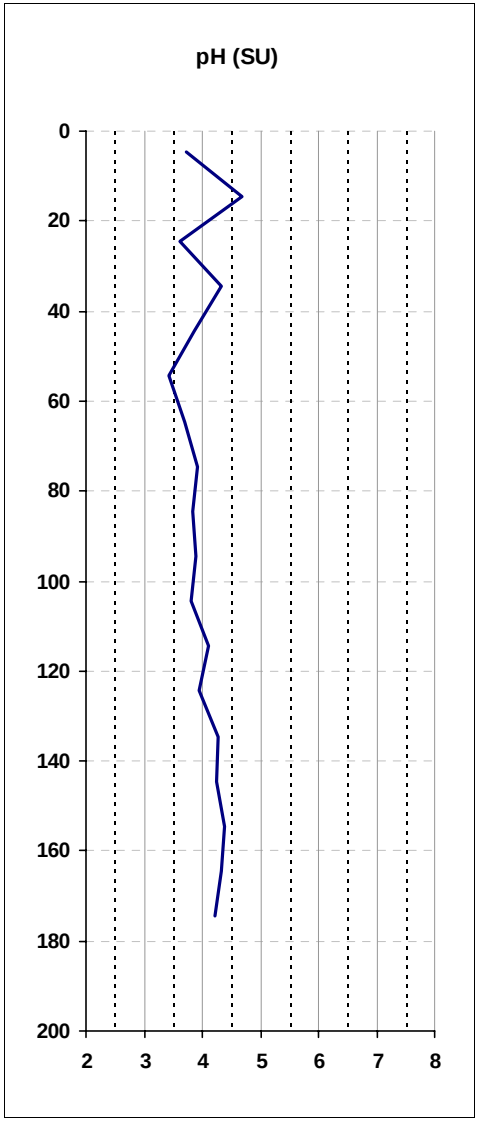
Tyrone Mine Sample Test Results by Location, Test Type

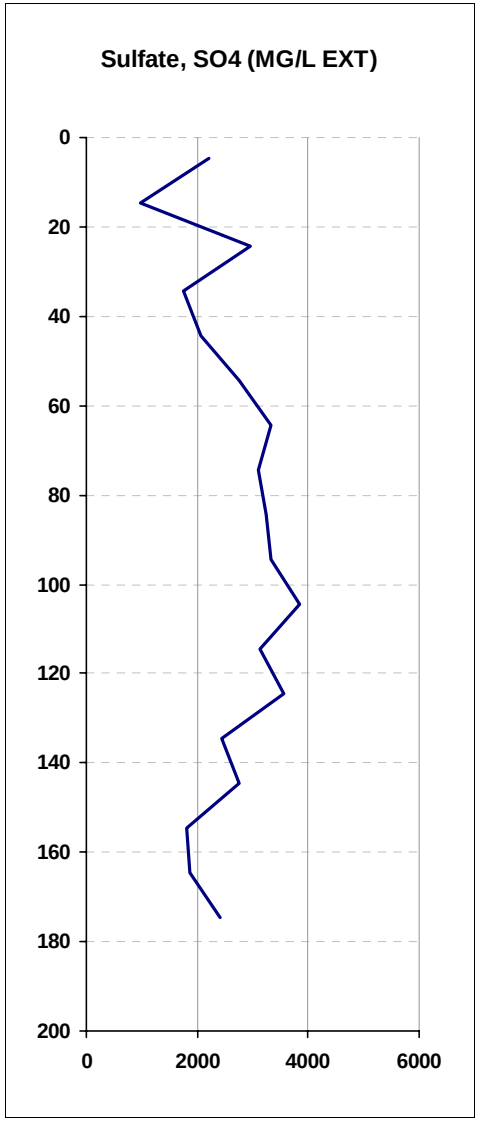
Location: TBGC-3

Test Type: MWMP







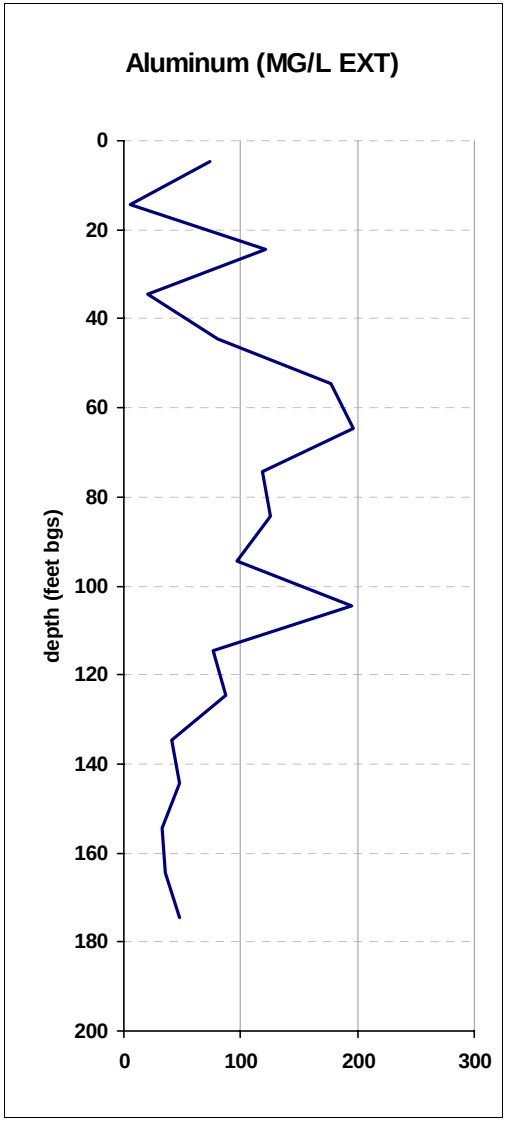


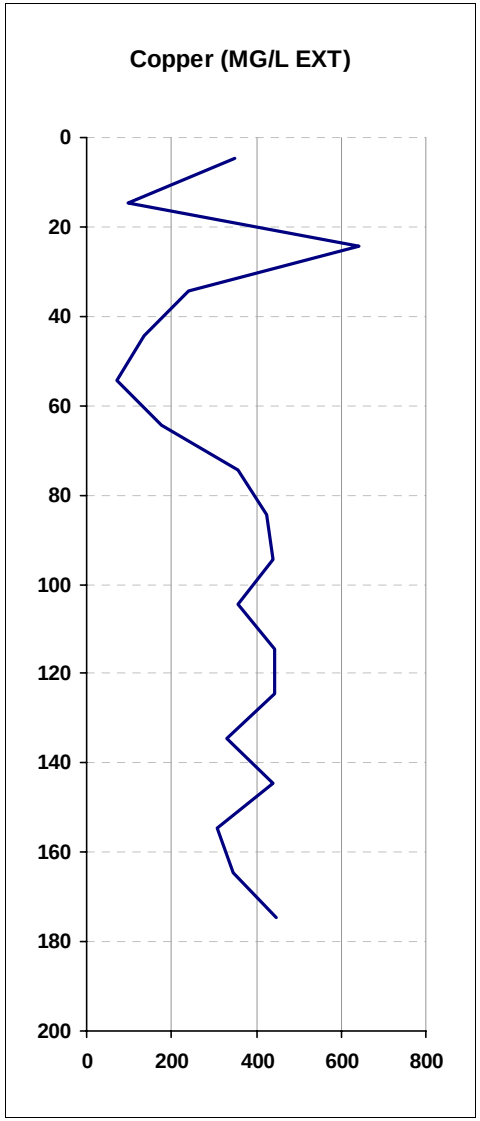
EnviroGroup Limited 2005

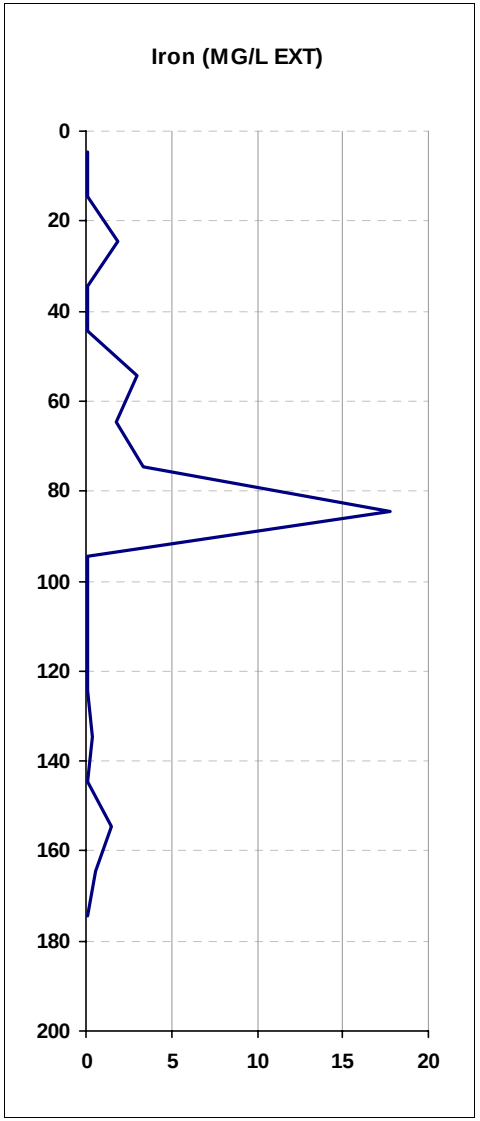
Tyrone Mine Sample Test Results by Location, Test Type

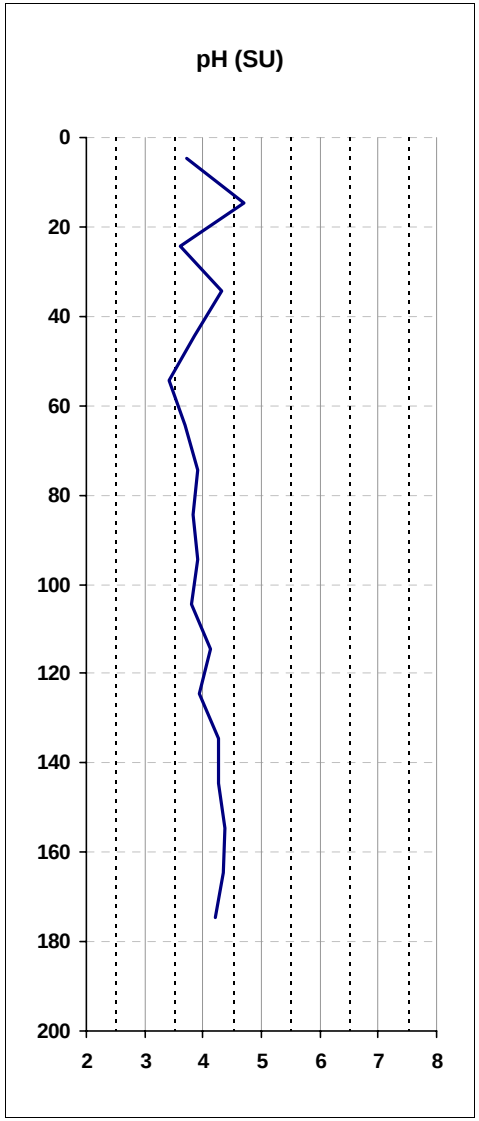
Location: TBGC-3

Test Type: MWMP







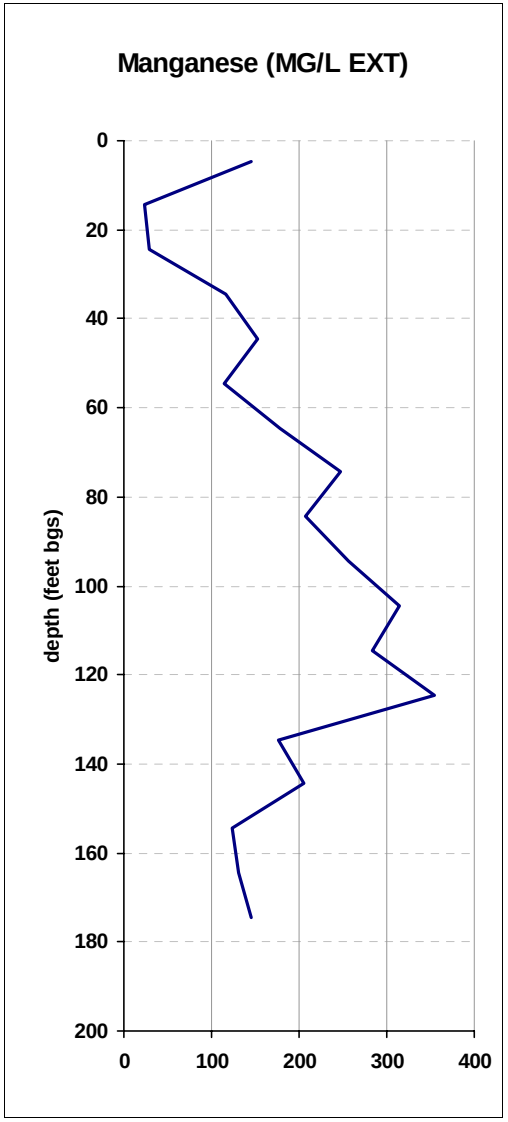


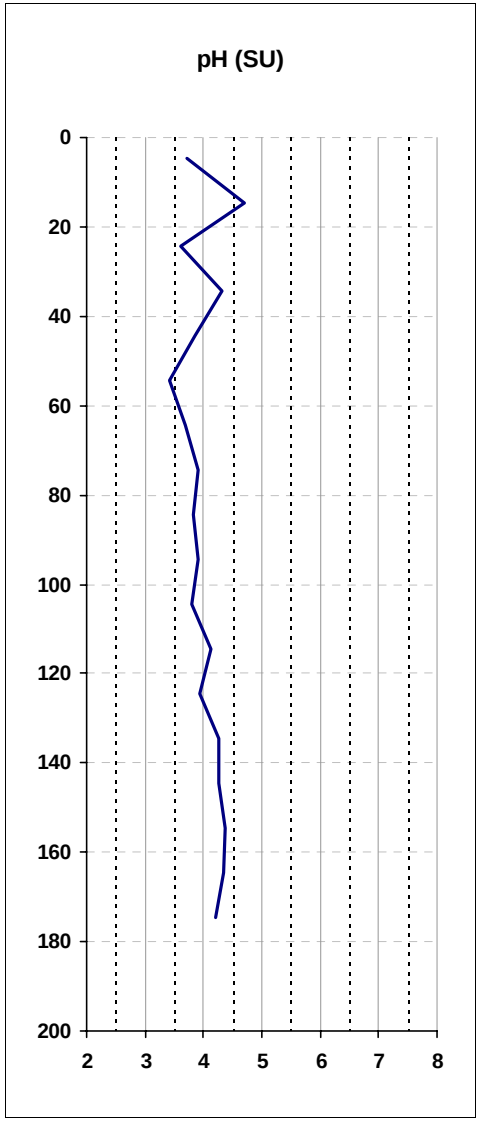
EnviroGroup Limited 2005

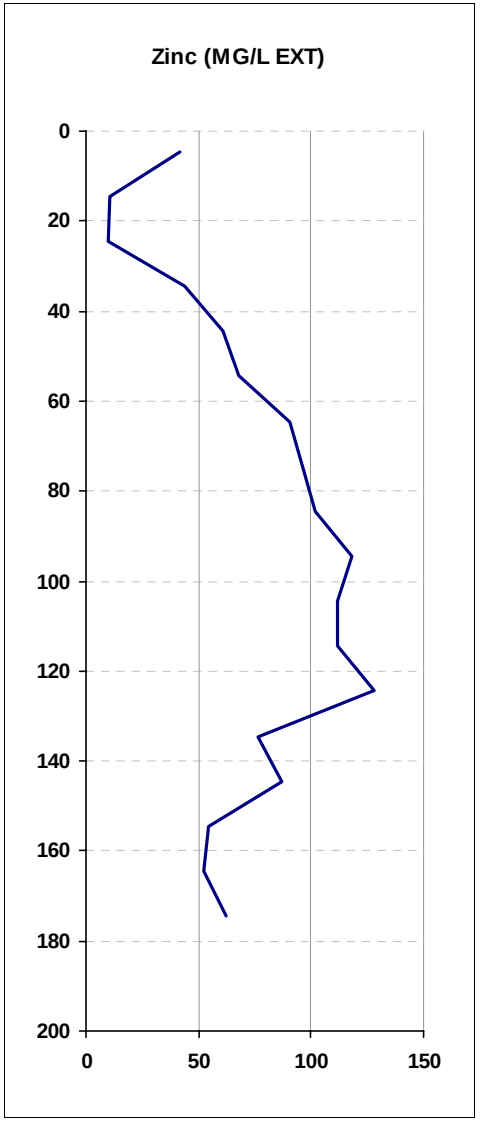
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-3

Test Type: MWMP





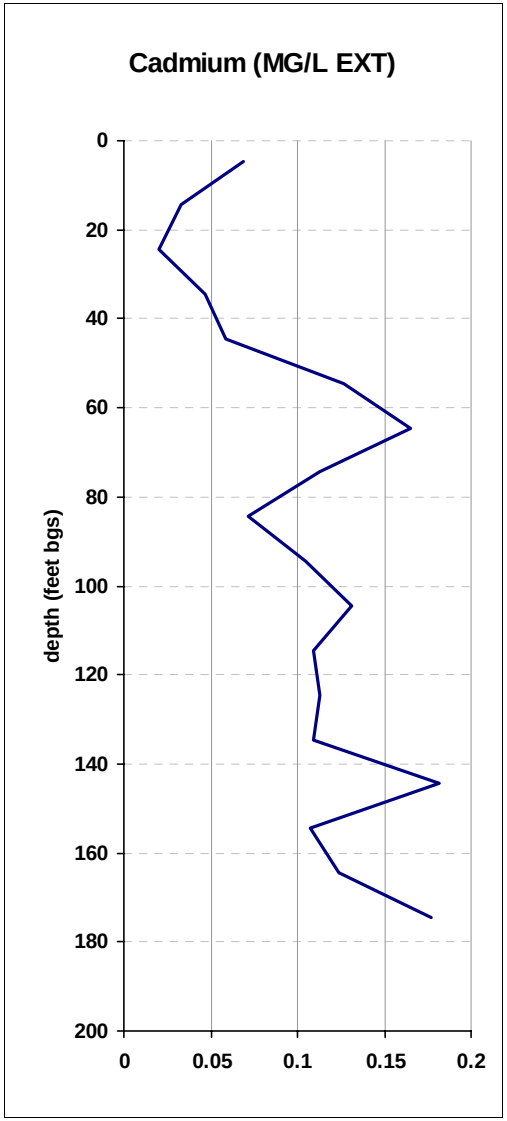


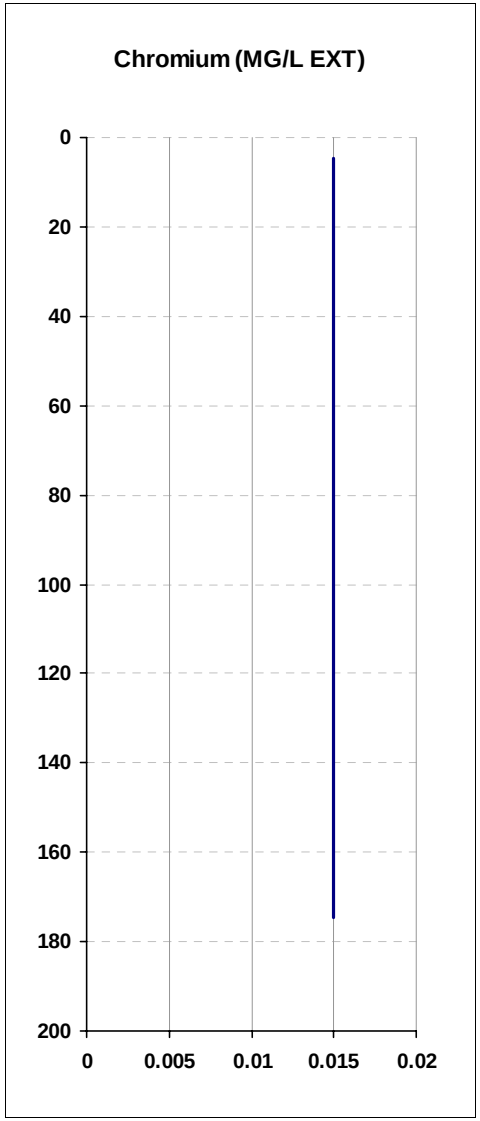
EnviroGroup Limited 2005

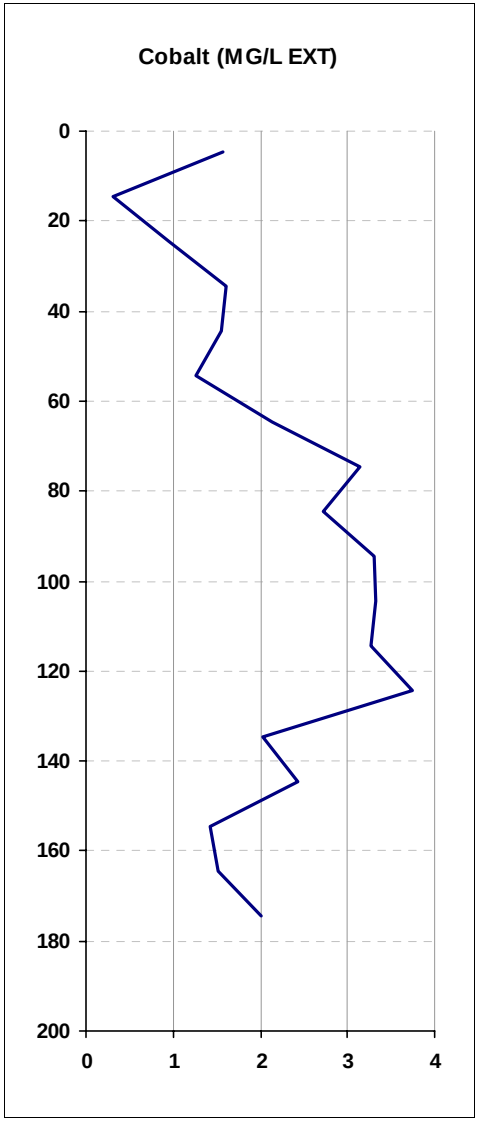
Tyrone Mine Sample Test Results by Location, Test Type

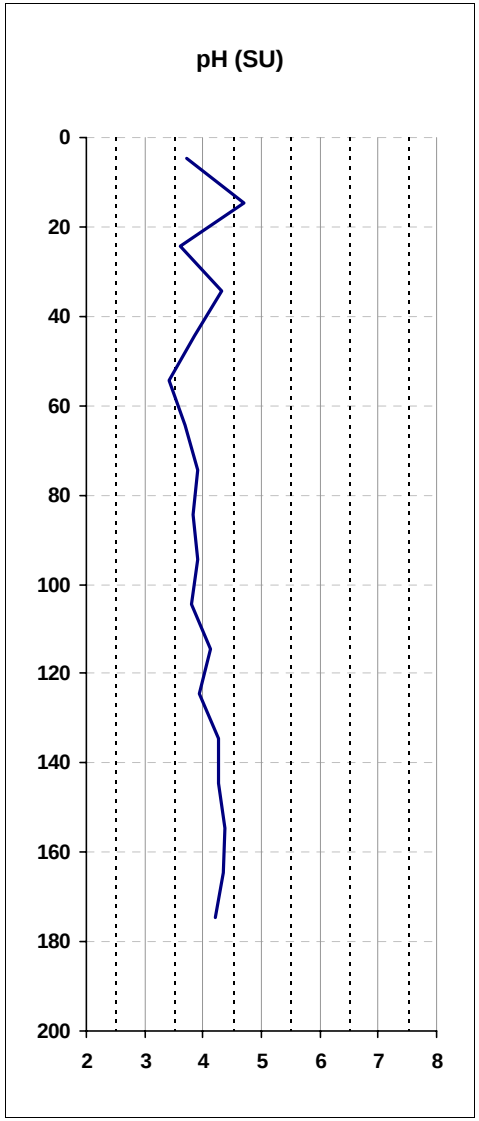
Location: TBGC-3

Test Type: MWMP







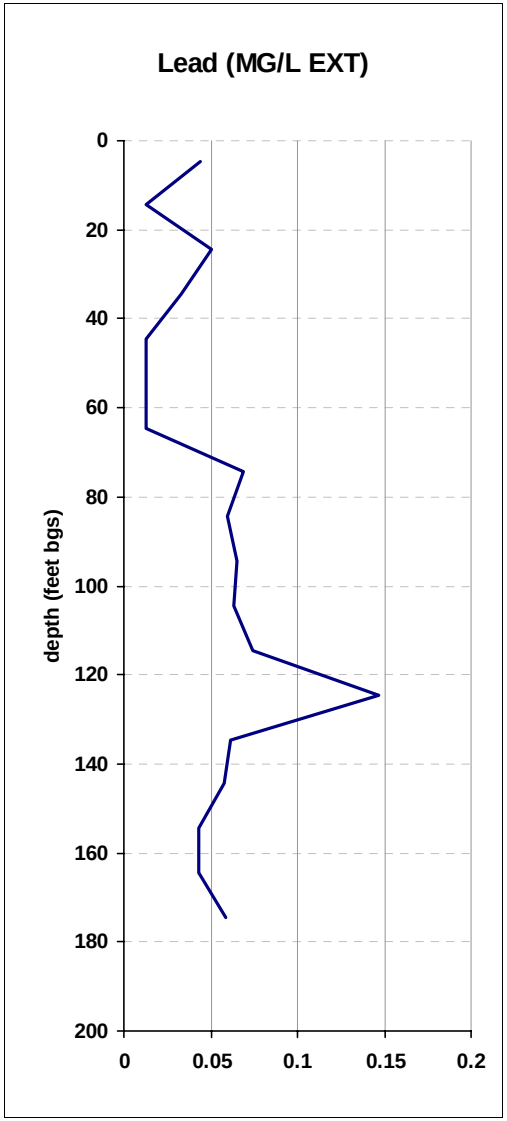


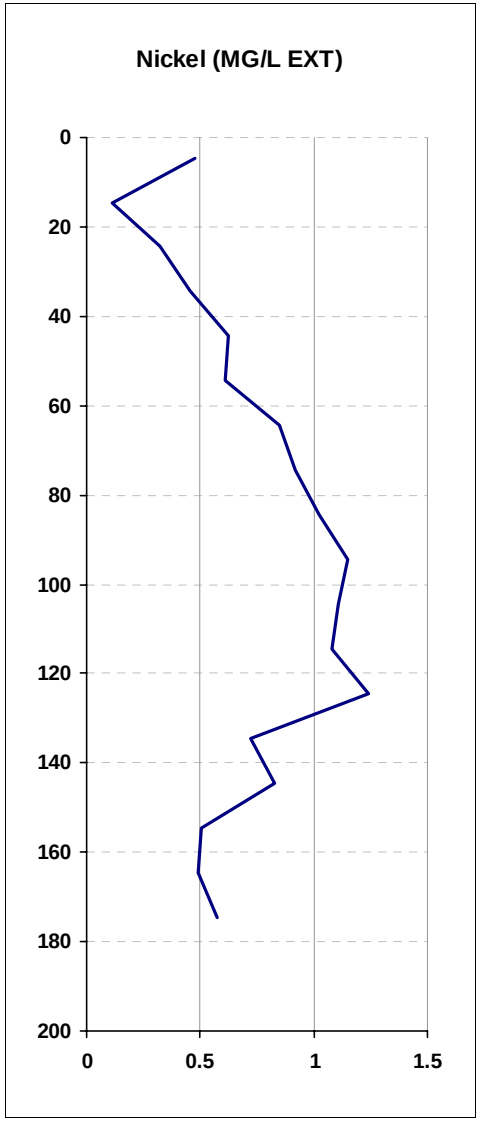
EnviroGroup Limited 2005

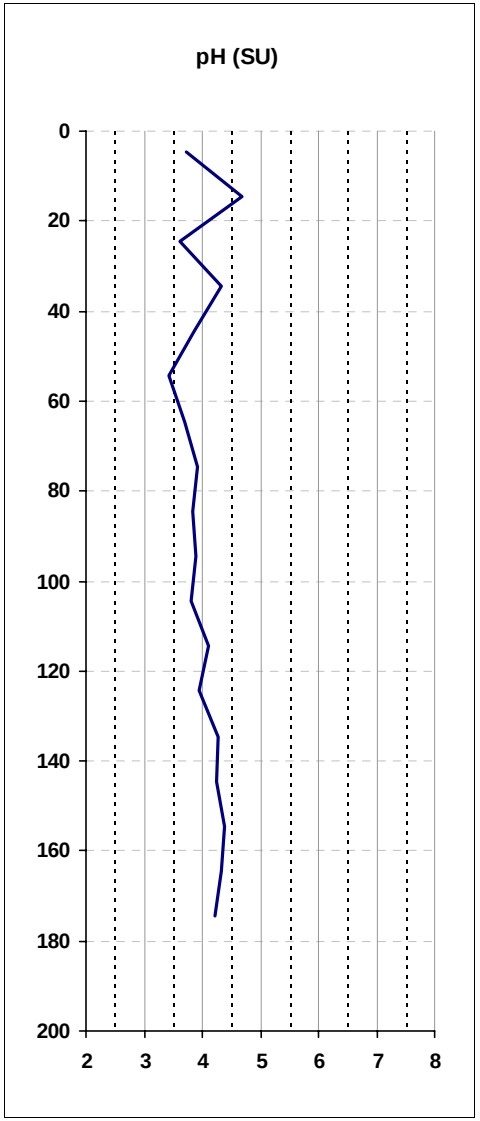
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-3

Test Type: MWMP





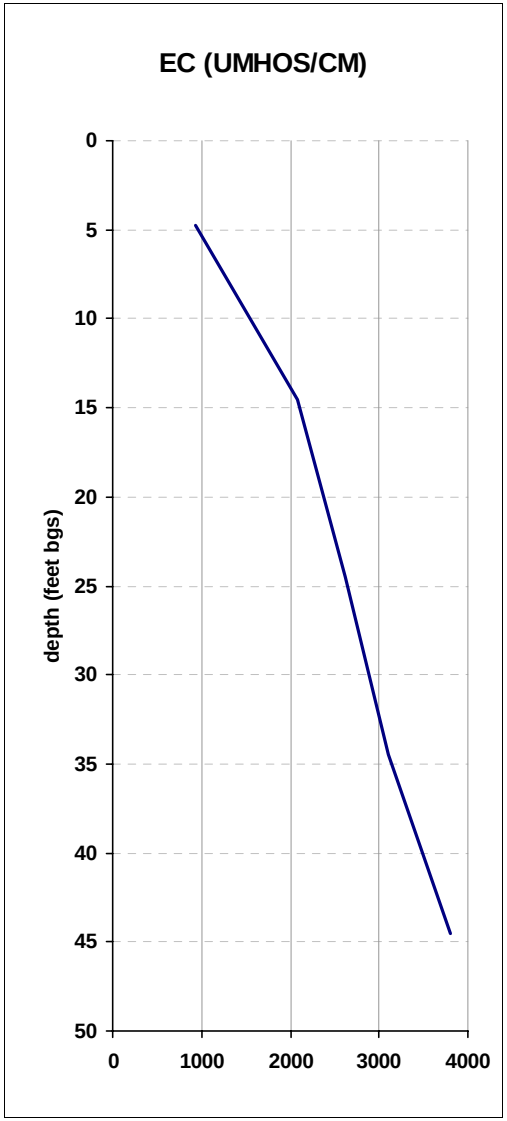


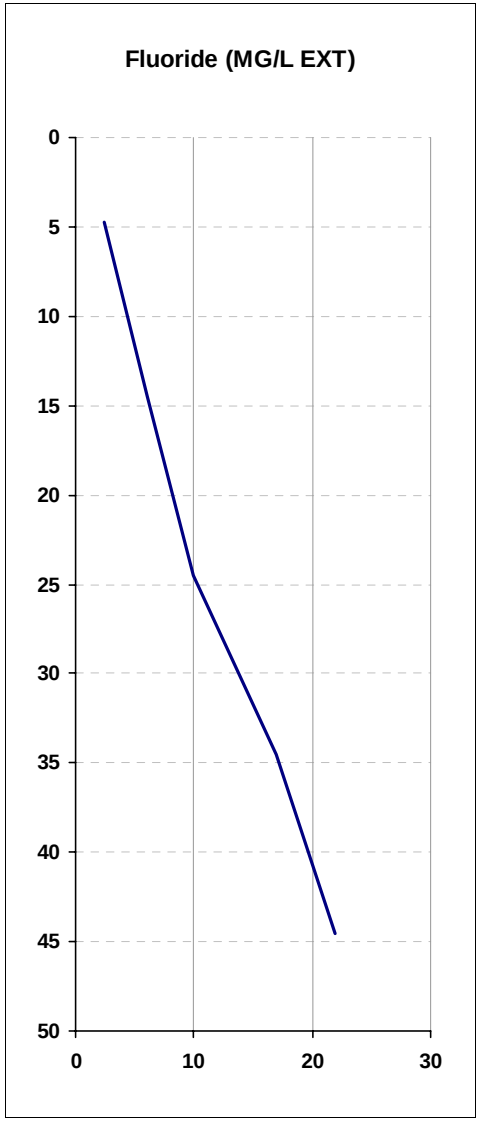
EnviroGroup Limited 2005

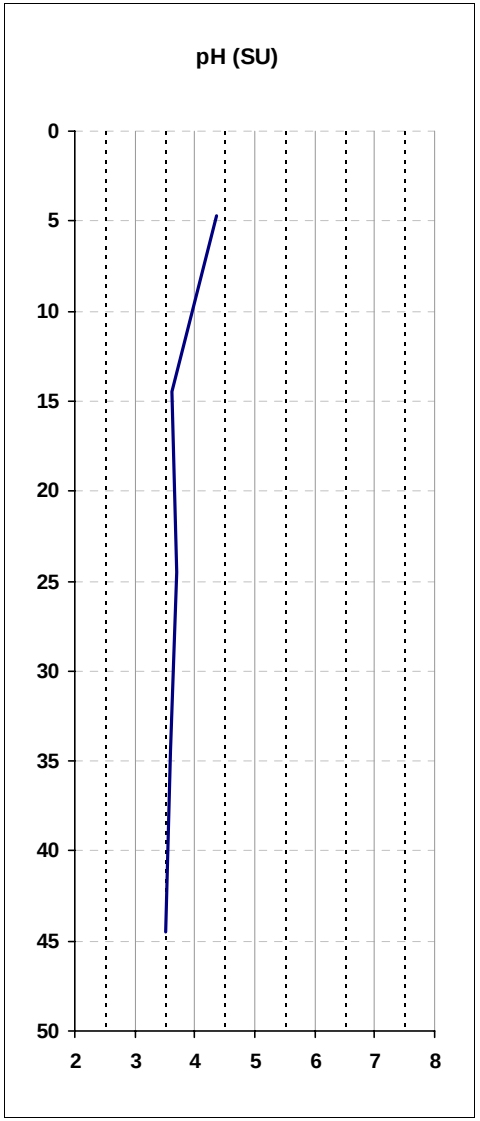
Tyrone Mine Sample Test Results by Location, Test Type

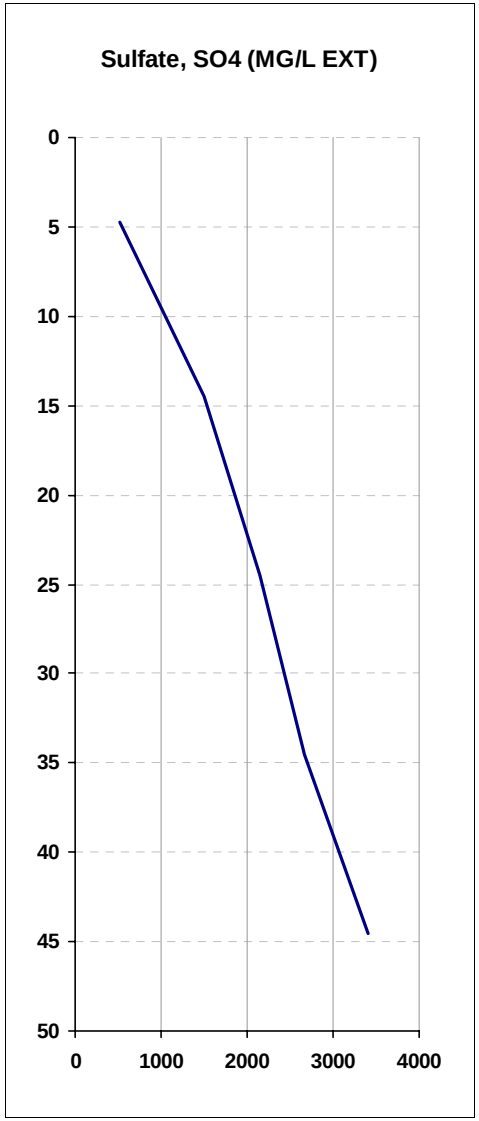
Location: TBGC-4

Test Type: MWMP









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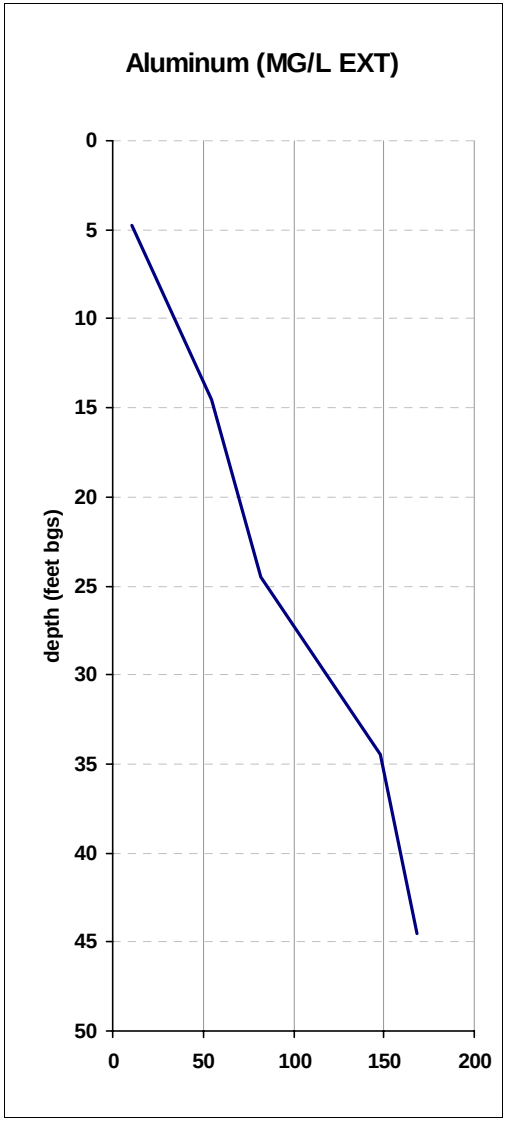
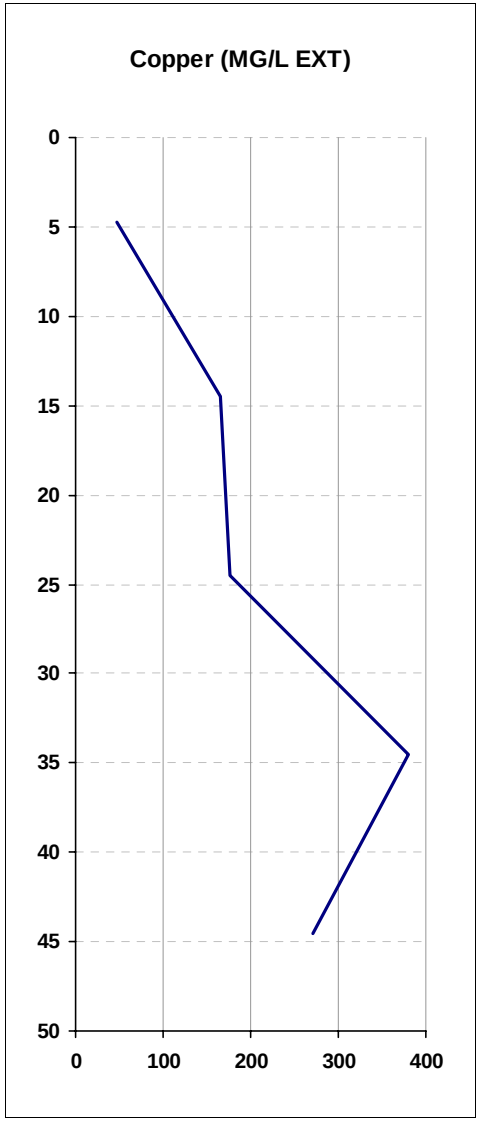
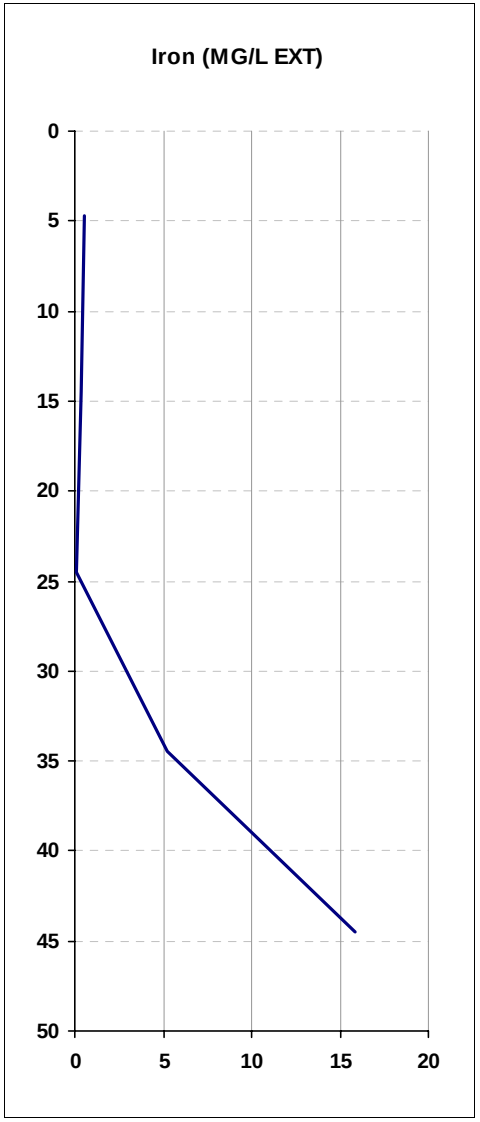
Tyrone Mine Sample Test Results by Location, Test Type

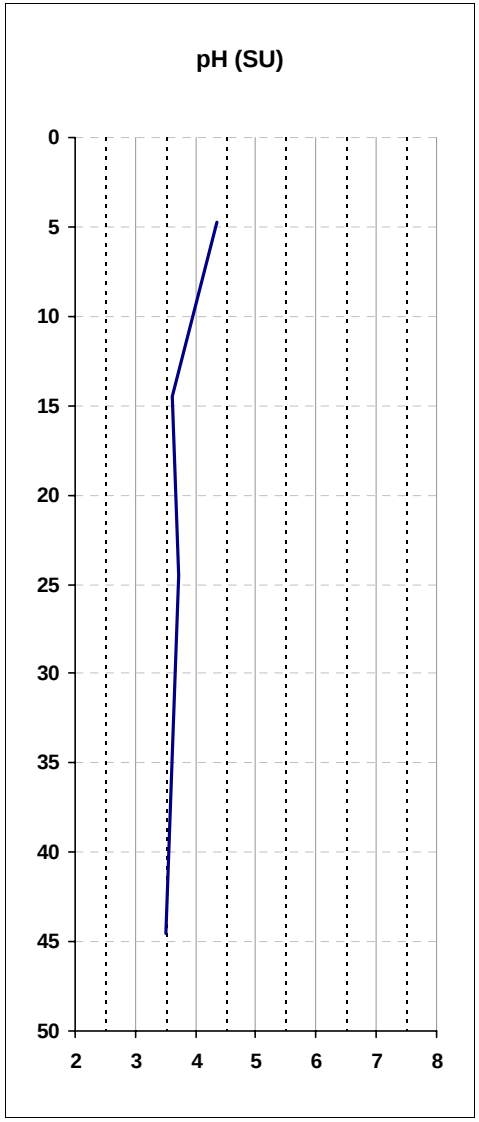
Location: TBGC-4

Test Type: MWMP







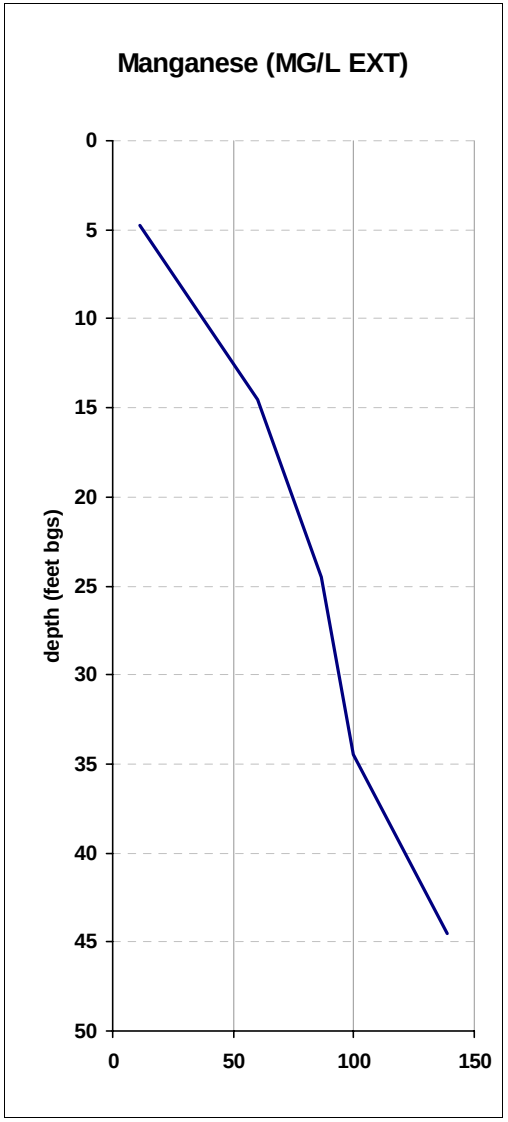


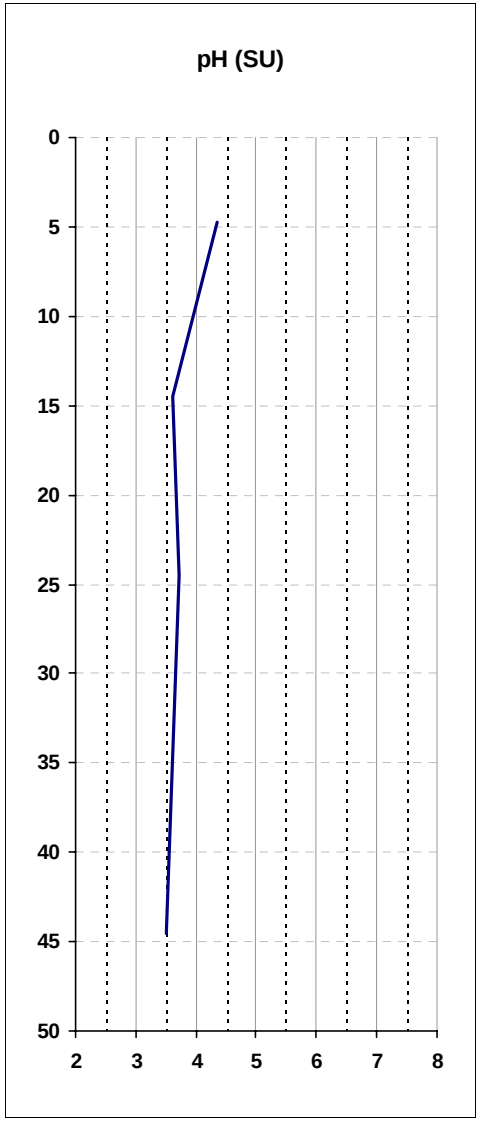
EnviroGroup Limited 2005

Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-4

Test Type: MWMP



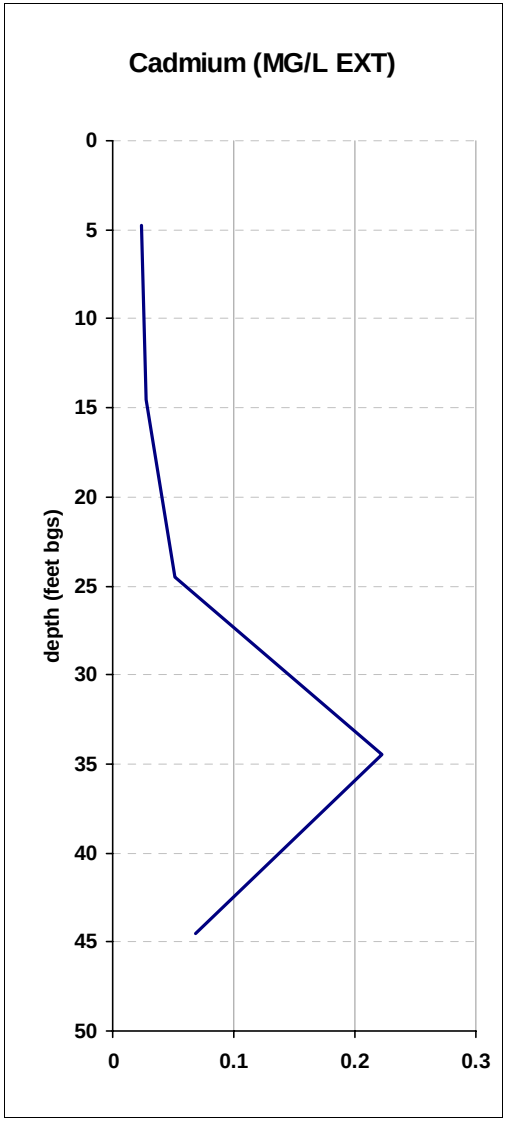


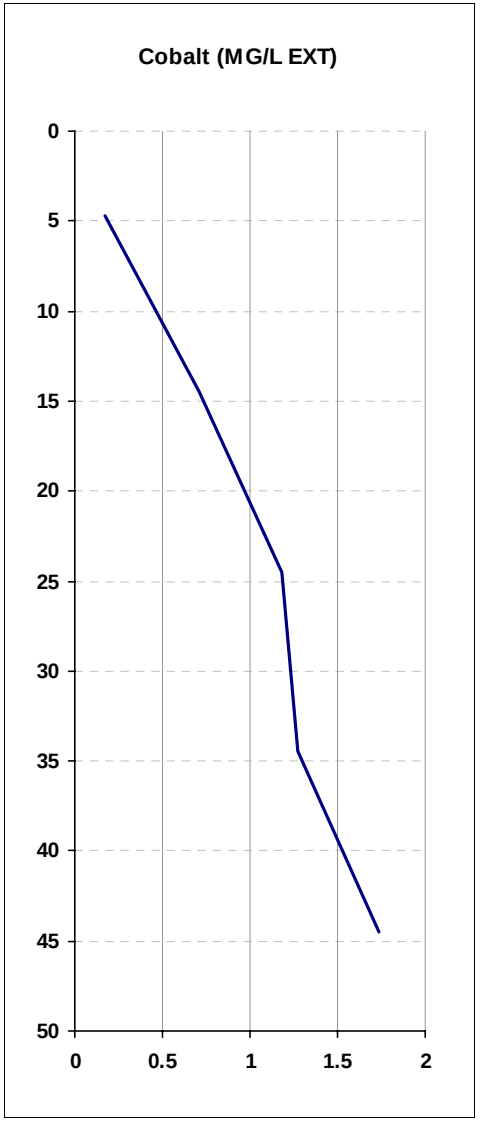
EnviroGroup Limited 2005

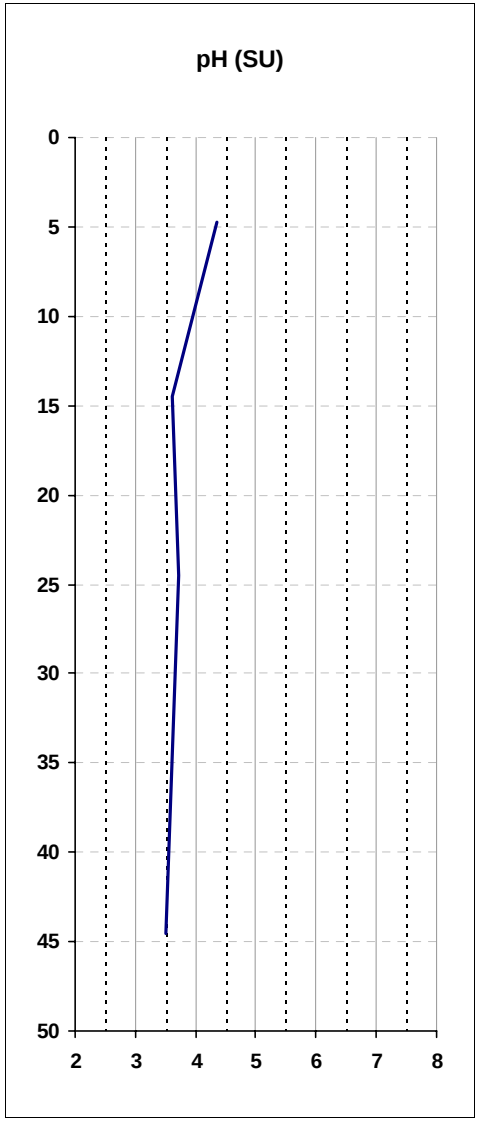
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-4

Test Type: MWMP





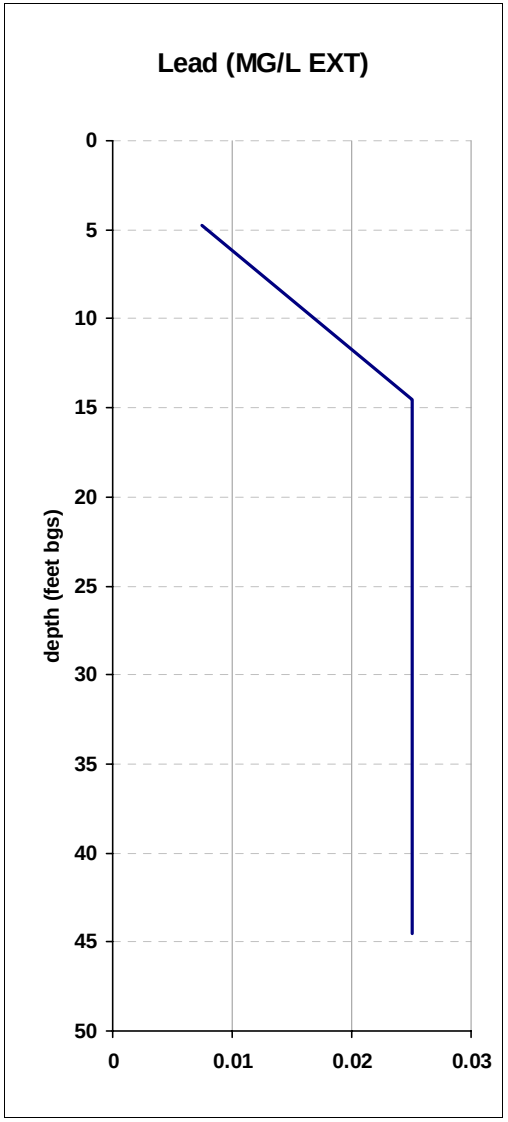


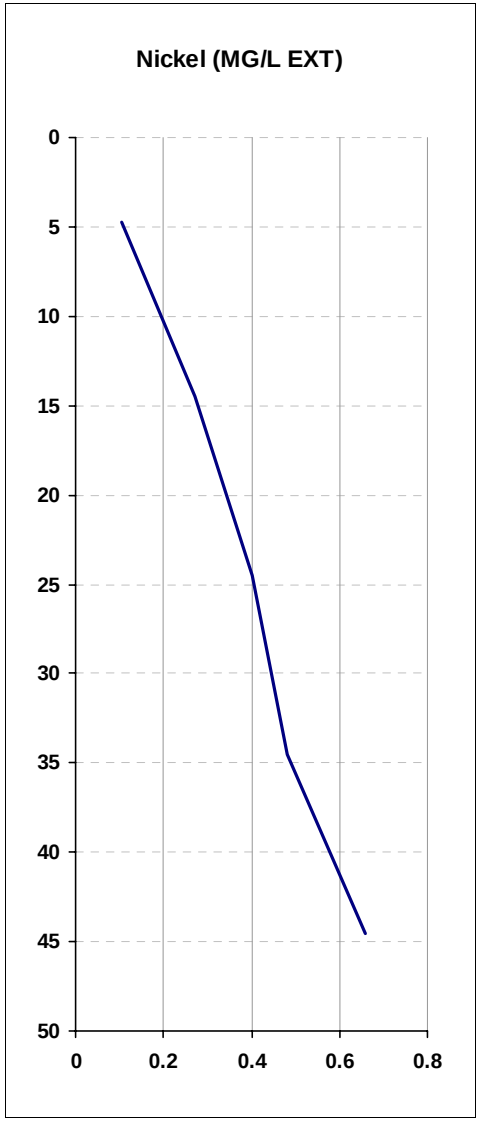
EnviroGroup Limited 2005

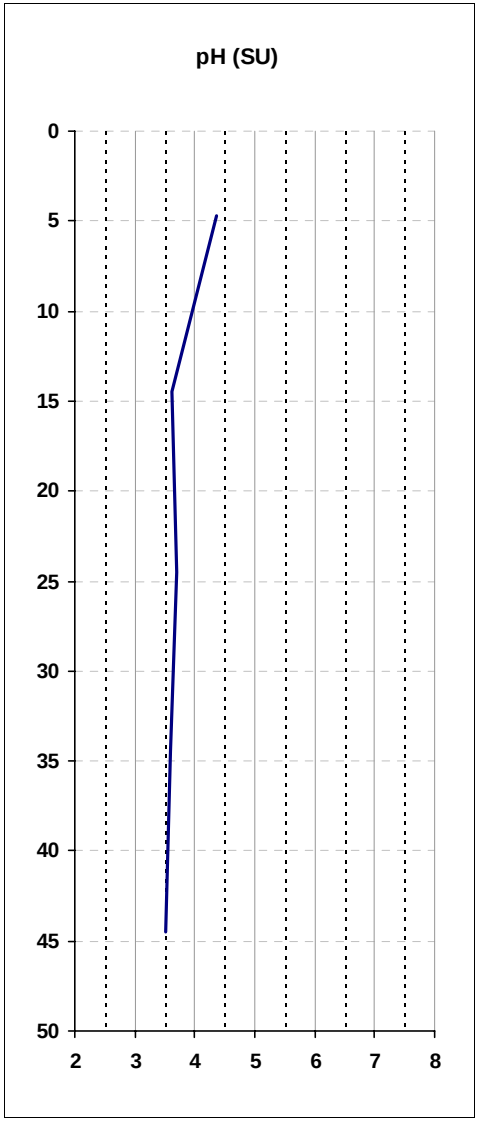
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-4

Test Type: MWMP







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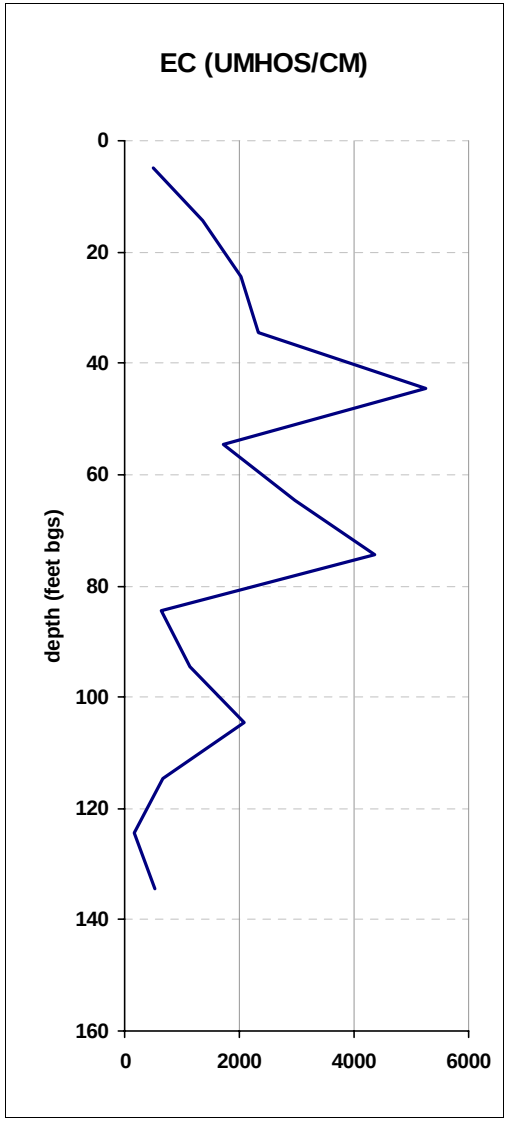
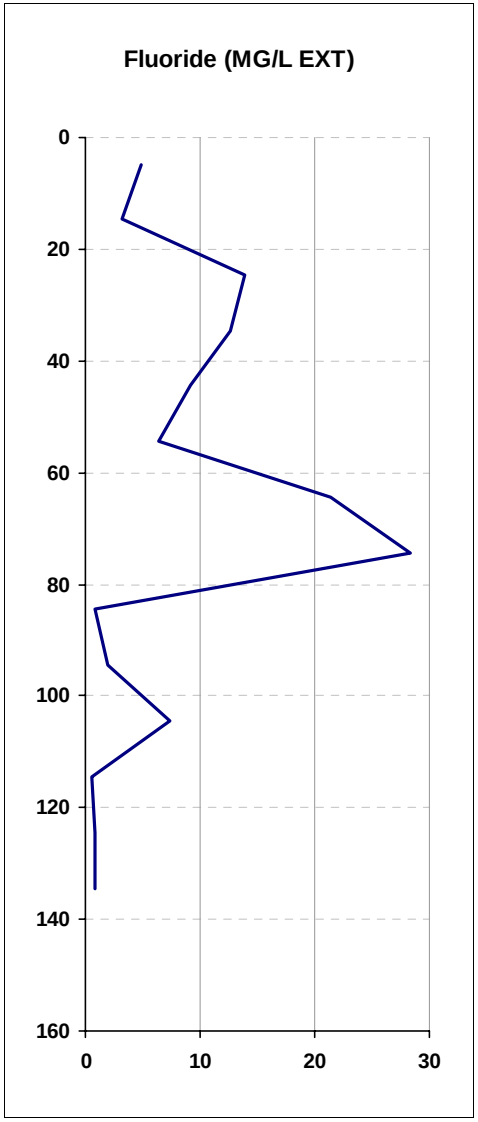
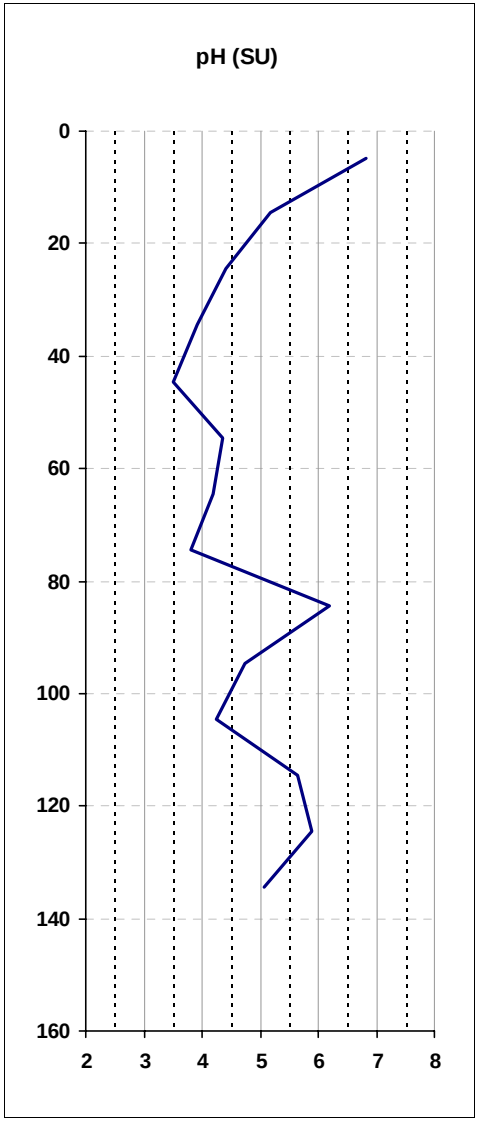
Tyrone Mine Sample Test Results by Location, Test Type

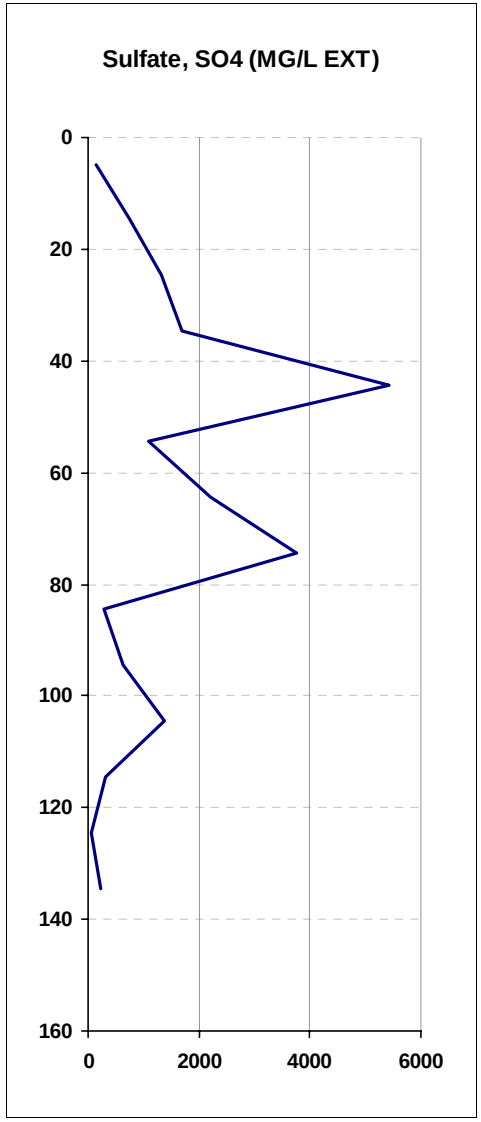
Location: TBGC-5

Test Type: MWMP







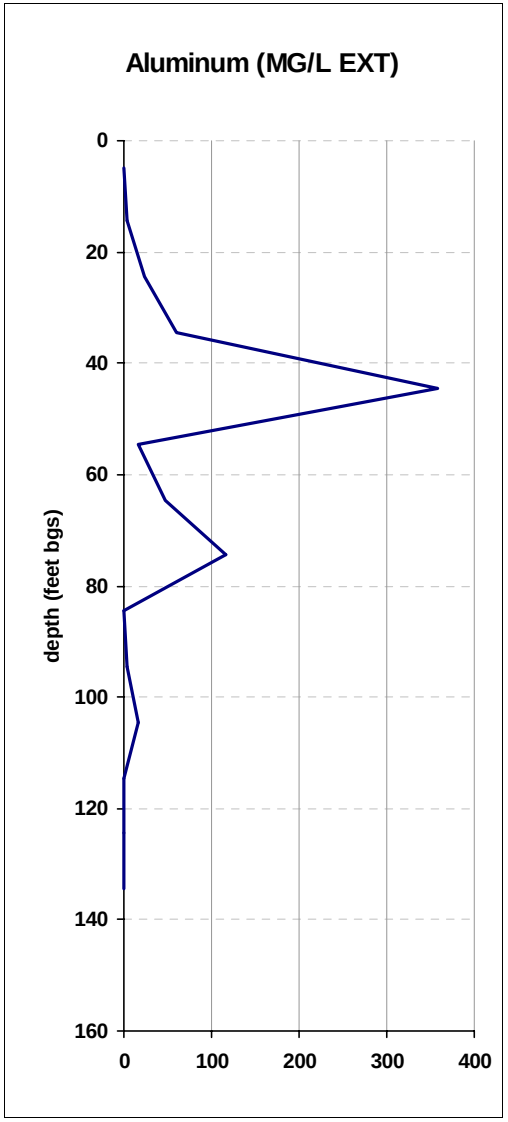


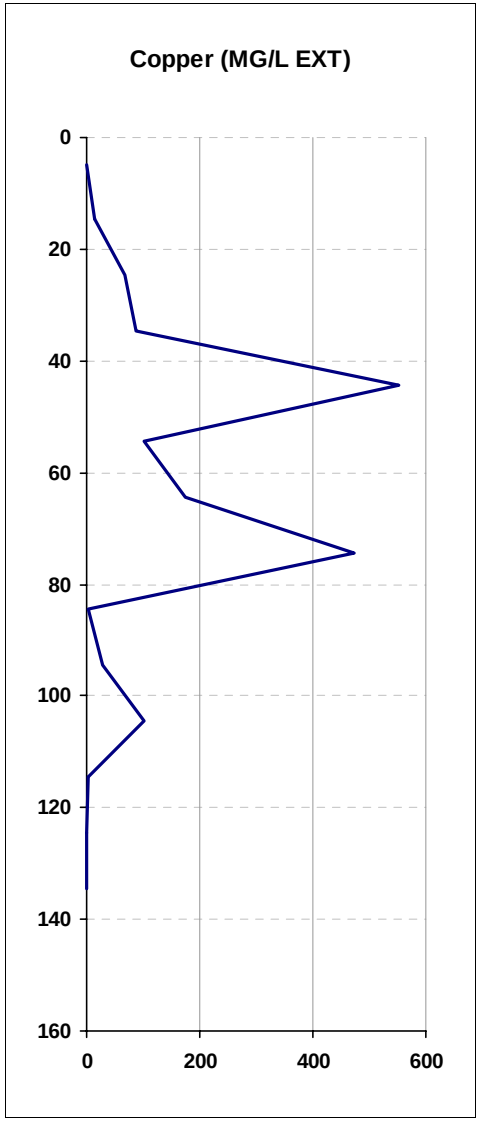
EnviroGroup Limited 2005

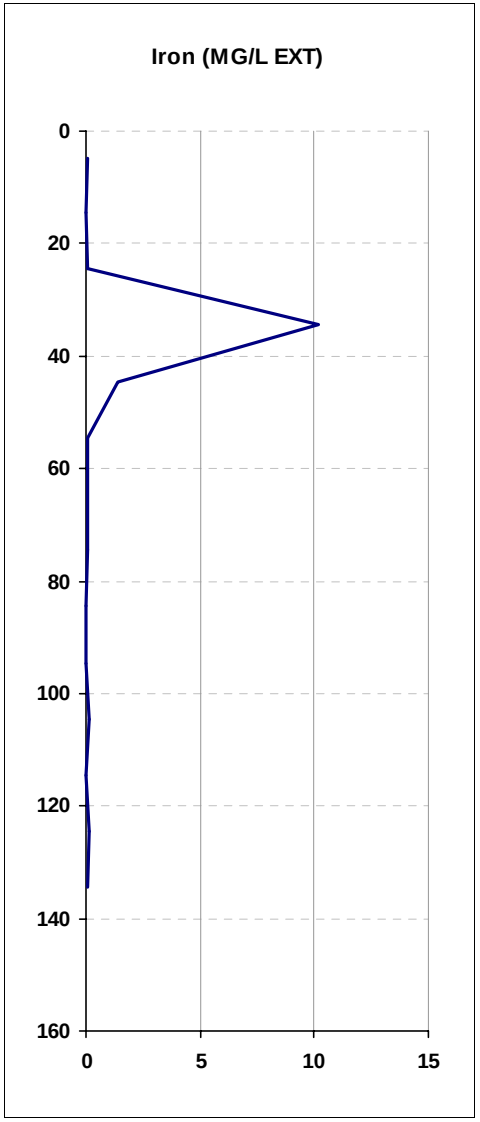
Tyrone Mine Sample Test Results by Location, Test Type

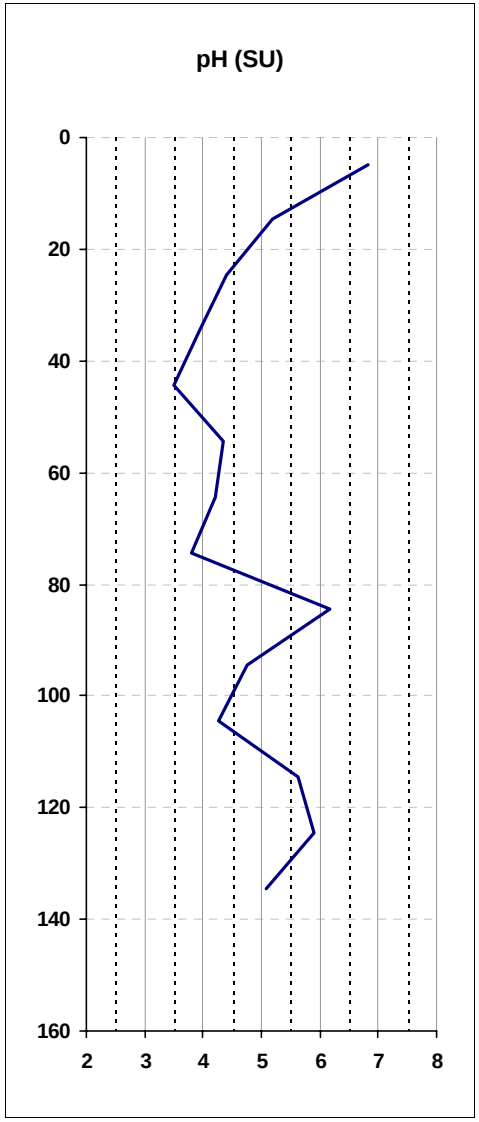
Location: TBGC-5

Test Type: MWMP







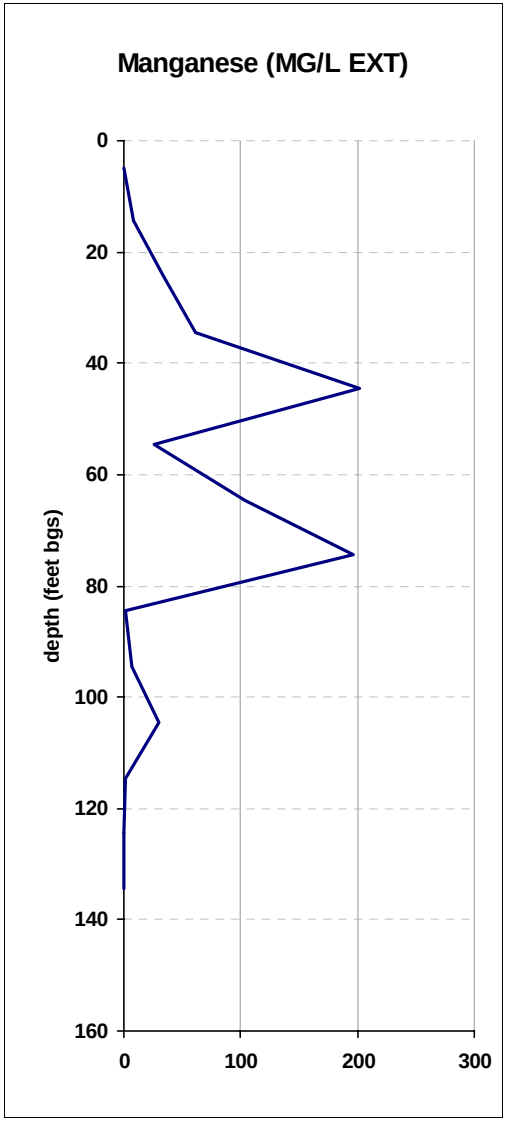


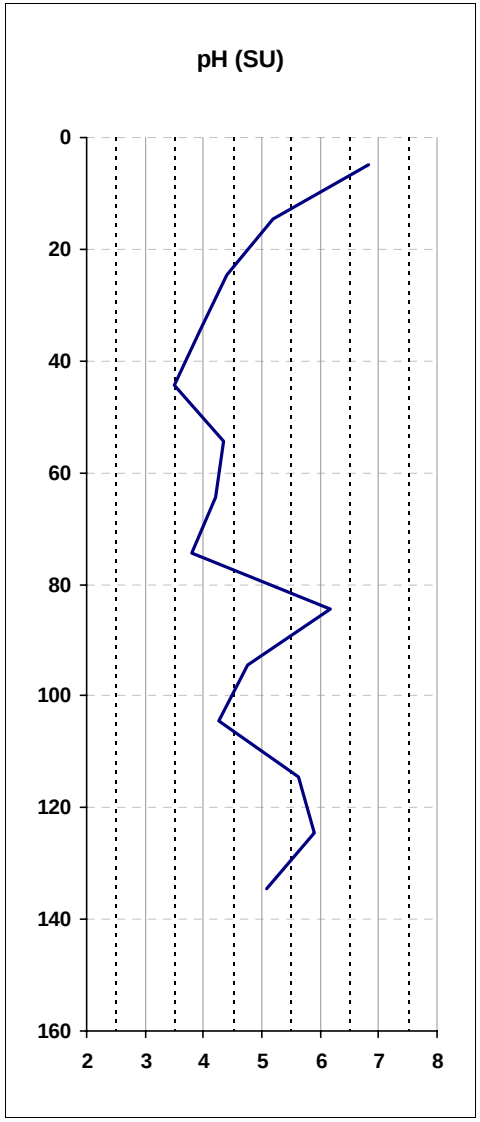
EnviroGroup Limited 2005

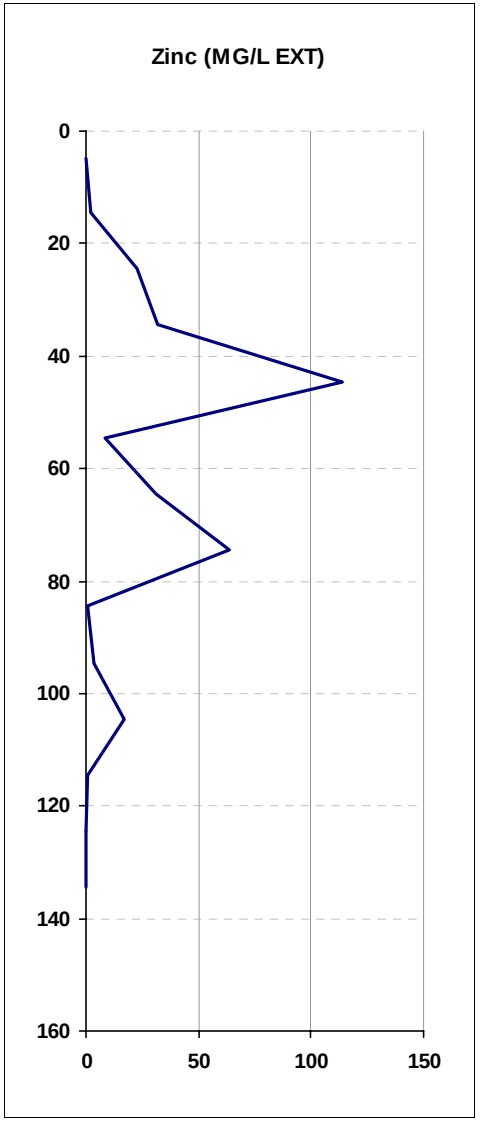
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-5

Test Type: MWMP





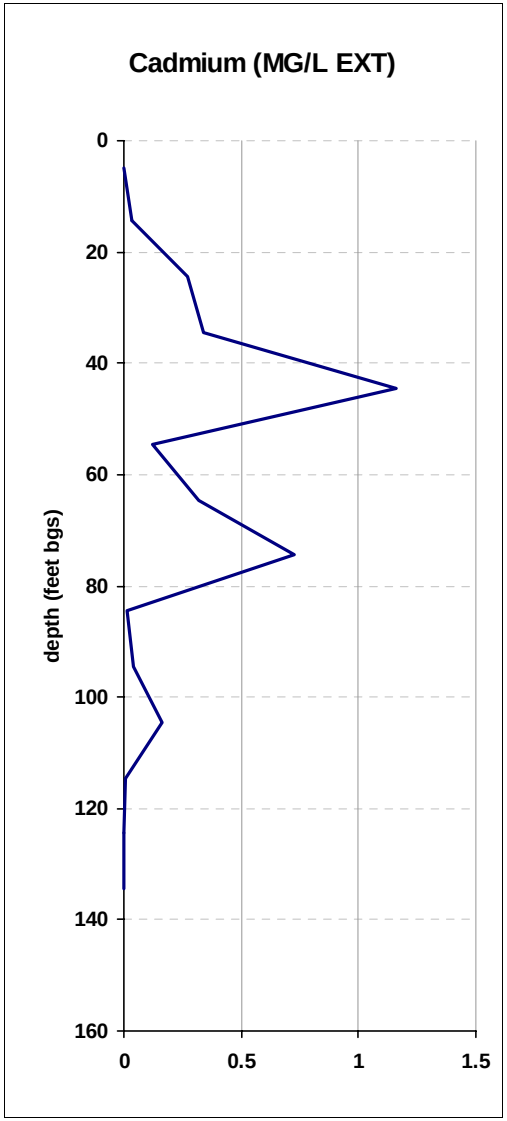


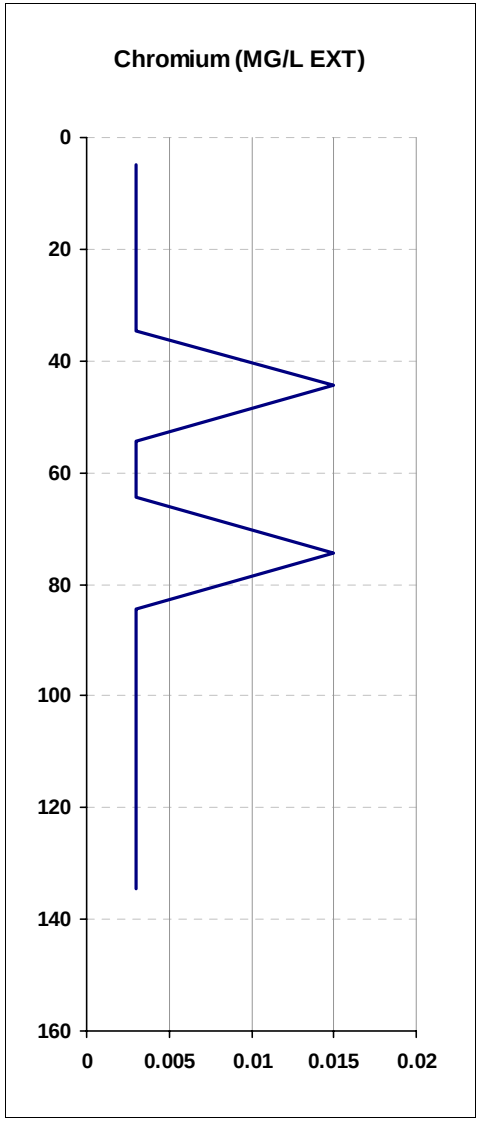
EnviroGroup Limited 2005

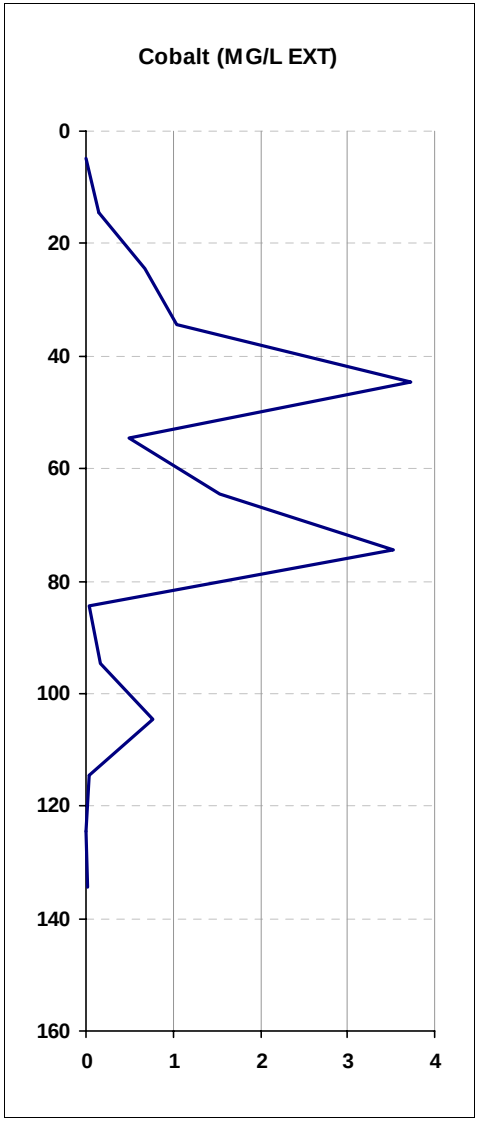
Tyrone Mine Sample Test Results by Location, Test Type

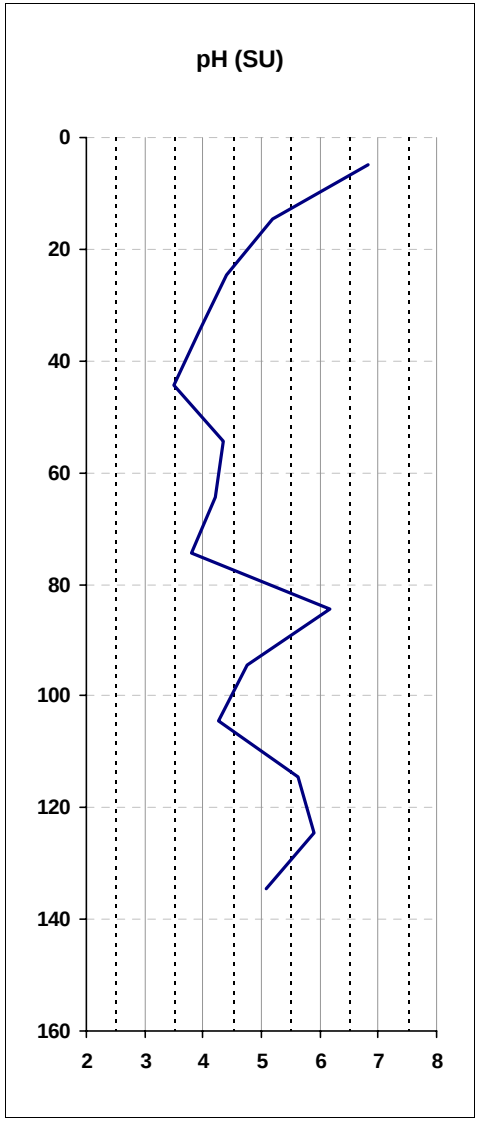
Location: TBGC-5

Test Type: MWMP







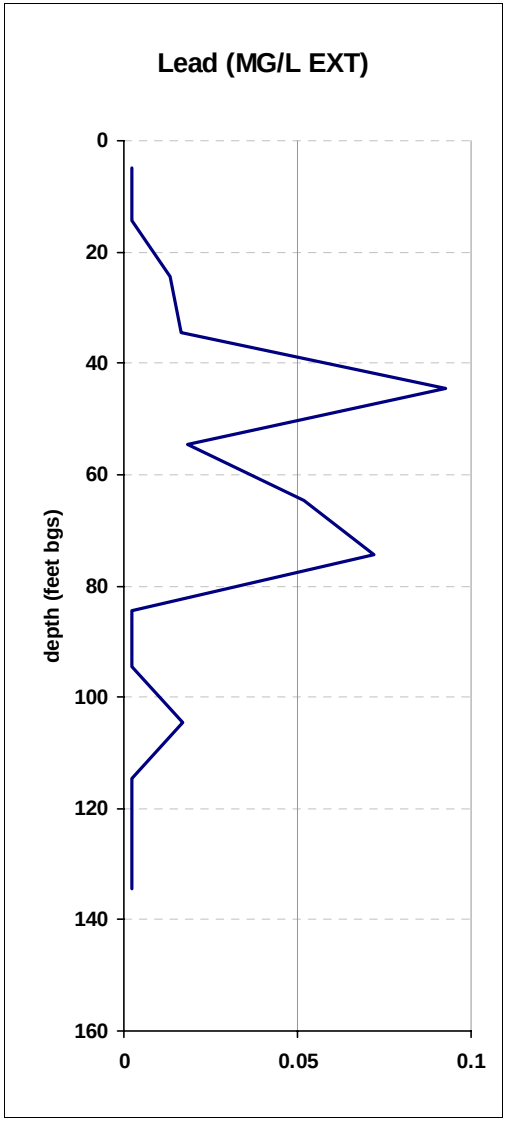


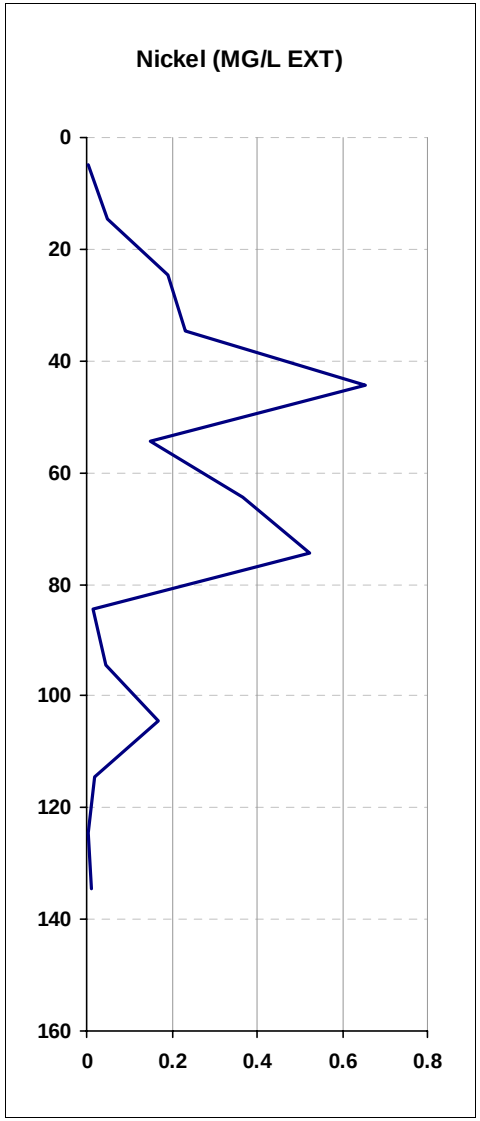
EnviroGroup Limited 2005

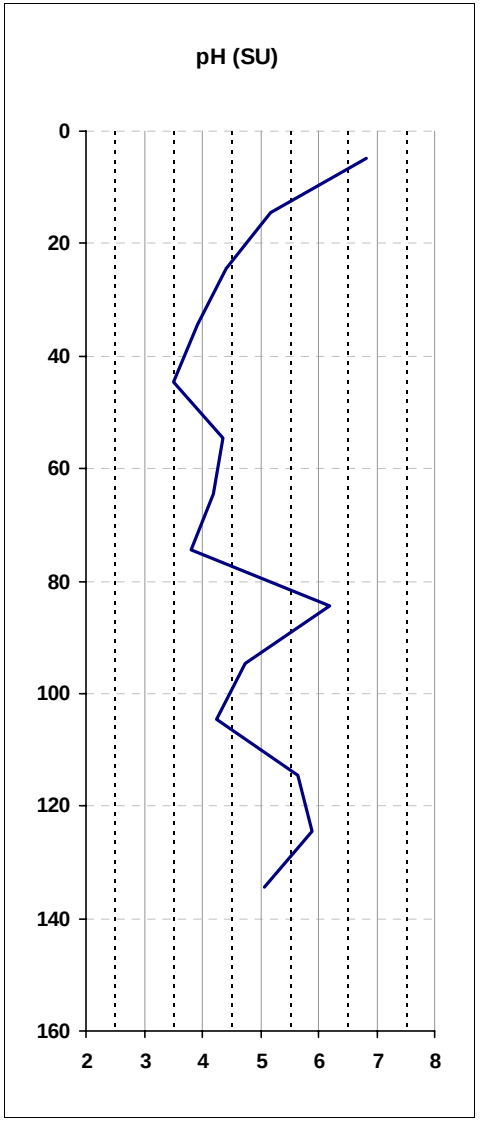
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-5

Test Type: MWMP







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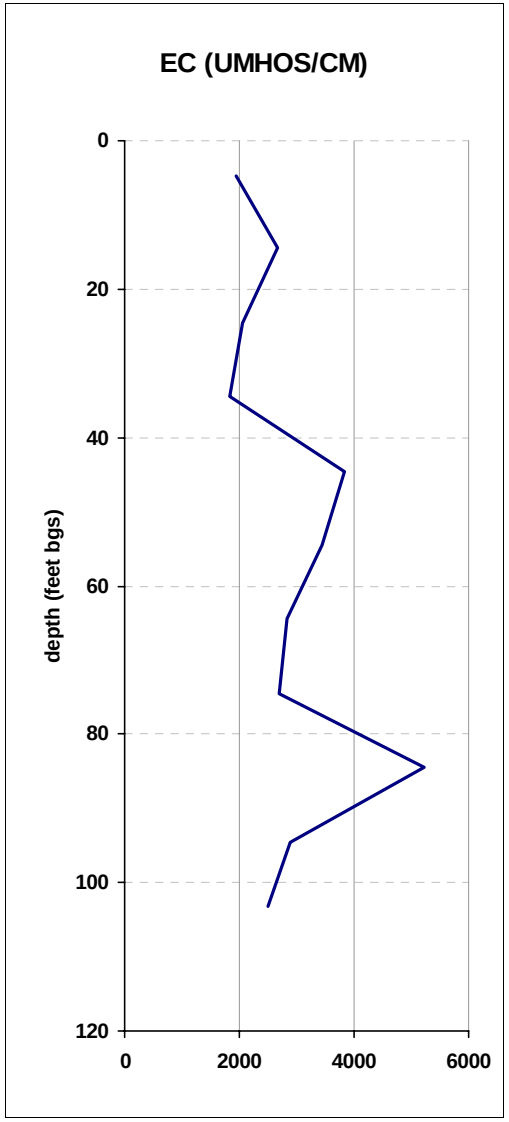
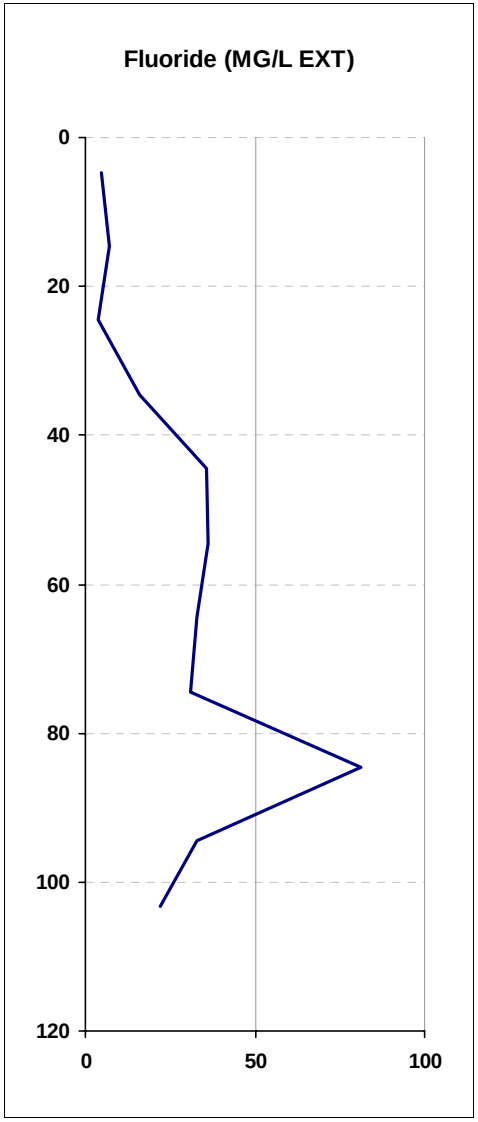
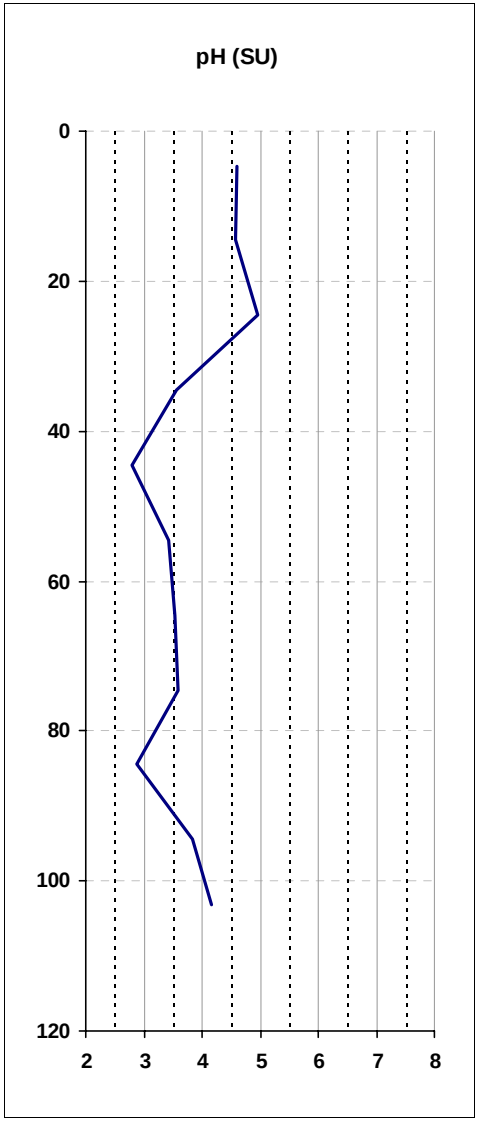
Tyrone Mine Sample Test Results by Location, Test Type

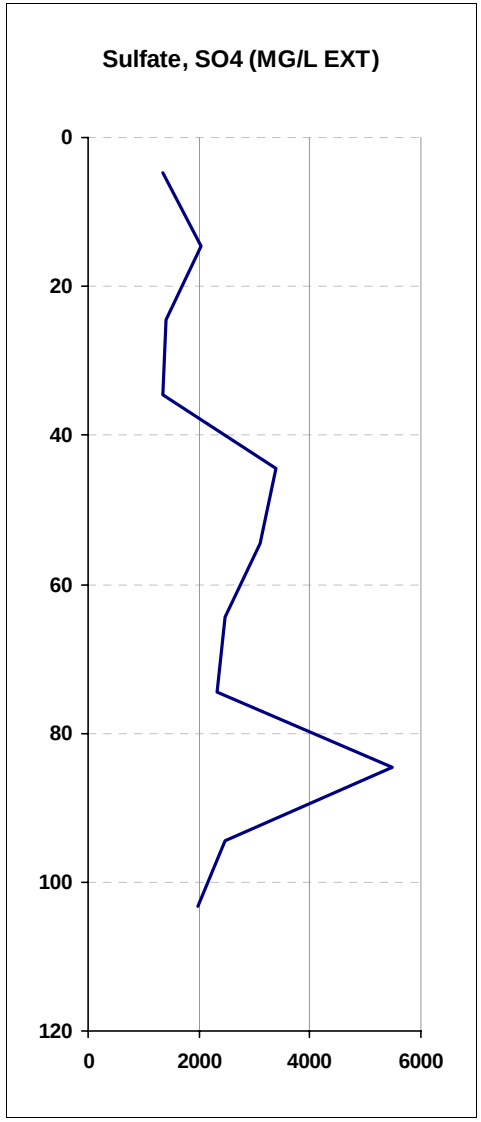
Location: TBGC-6

Test Type: MWMP







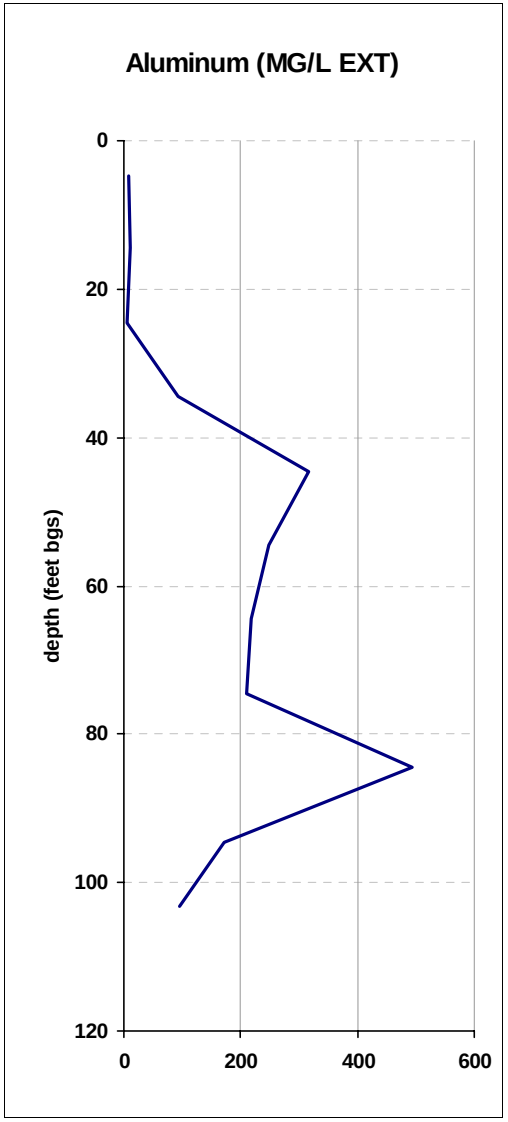


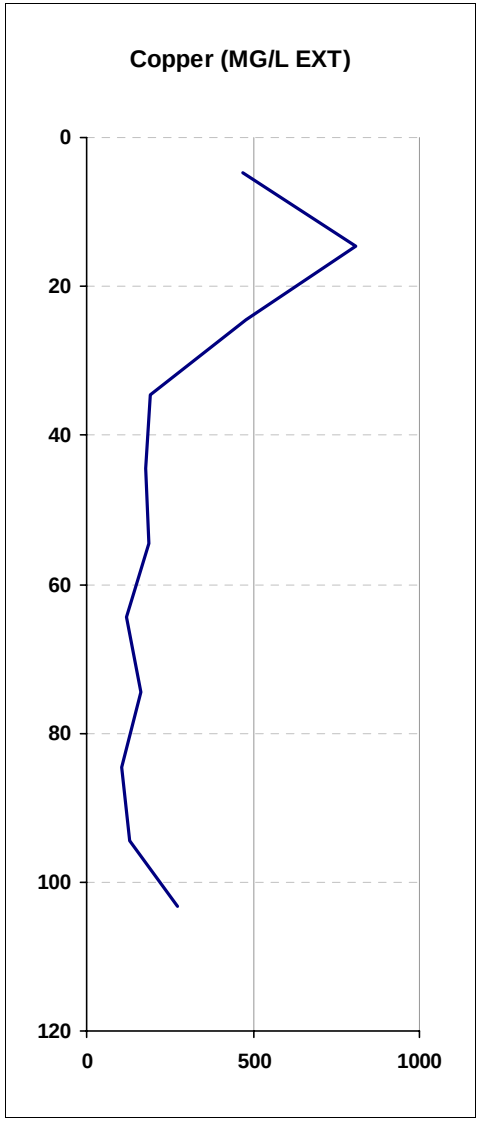
EnviroGroup Limited 2005

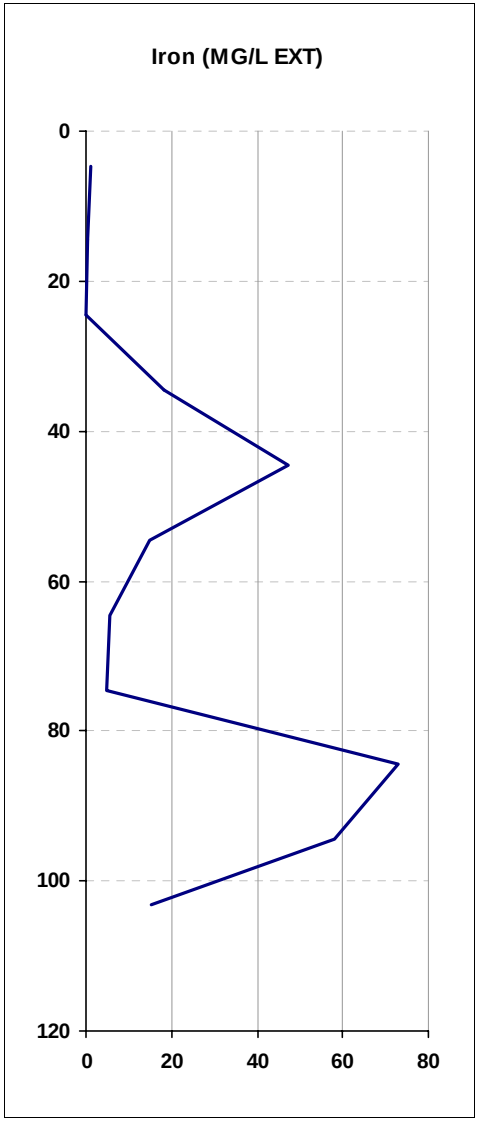
Tyrone Mine Sample Test Results by Location, Test Type

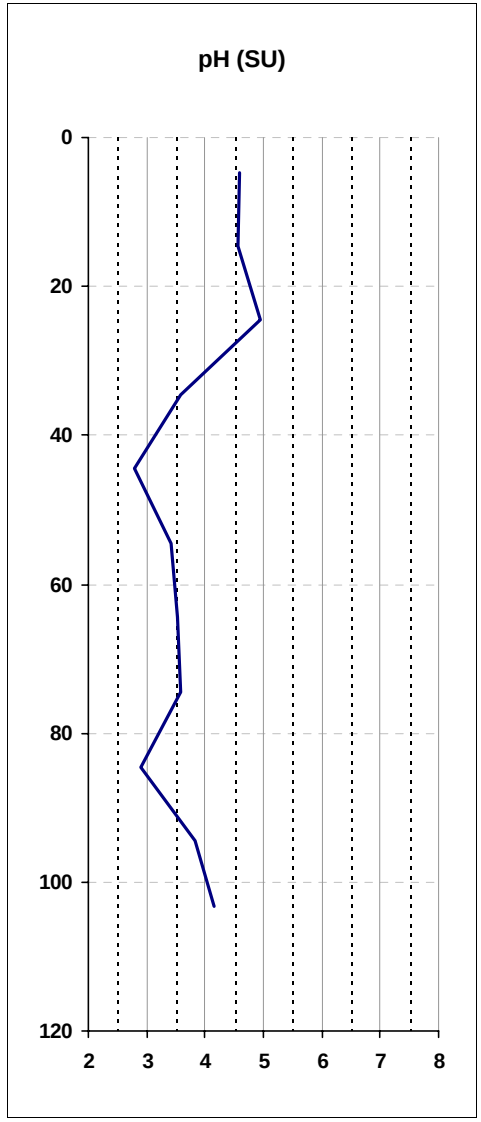
Location: TBGC-6

Test Type: MWMP







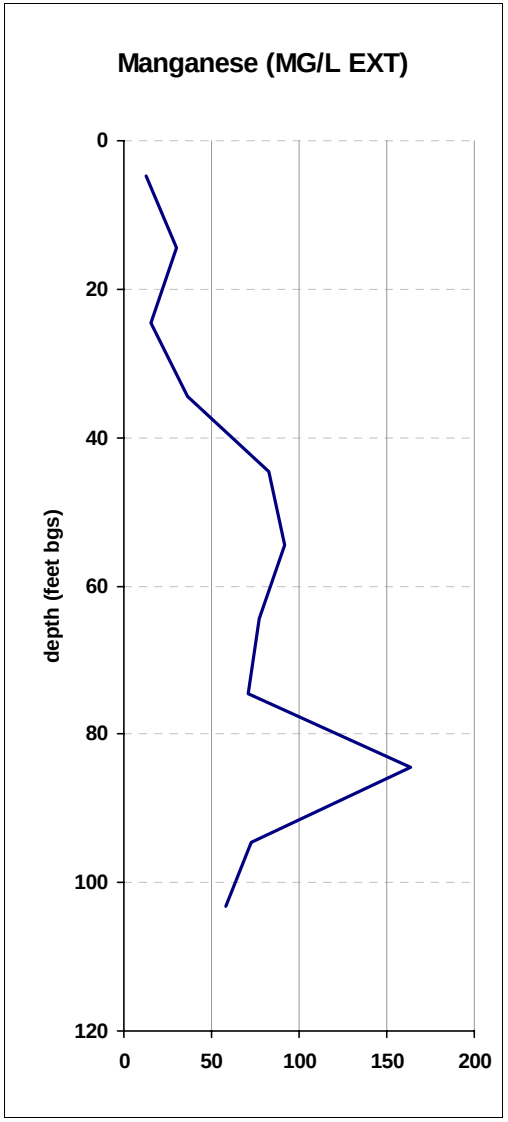


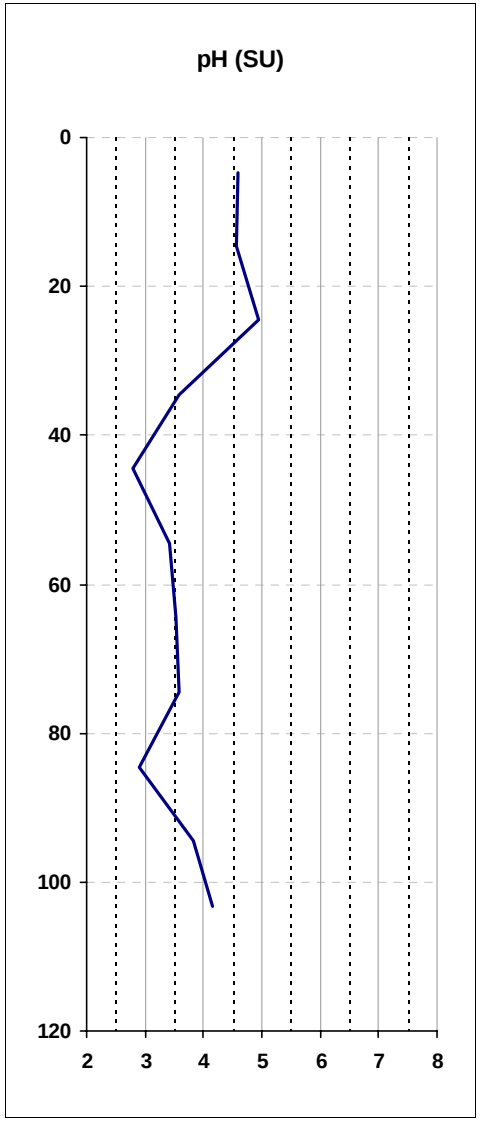
EnviroGroup Limited 2005

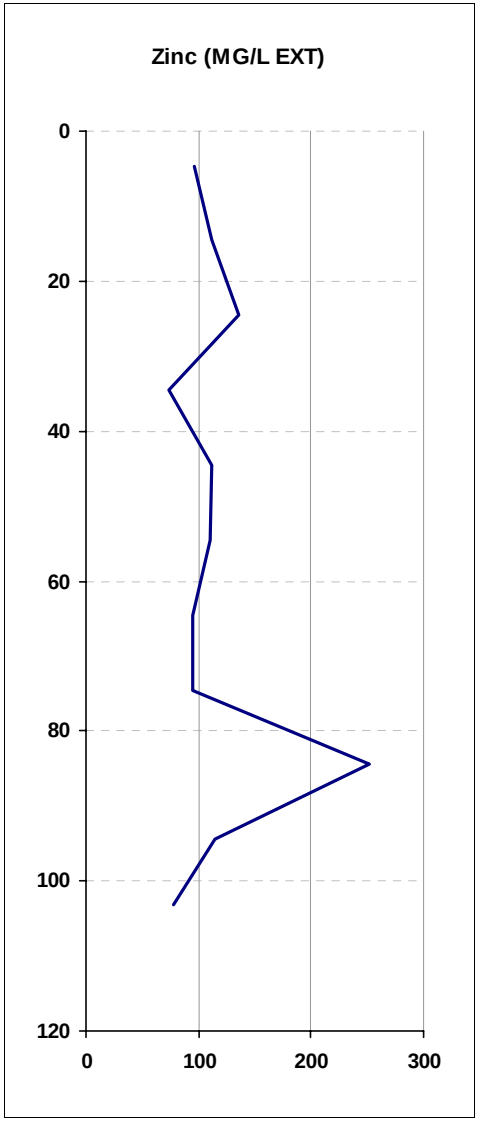
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-6

Test Type: MWMP





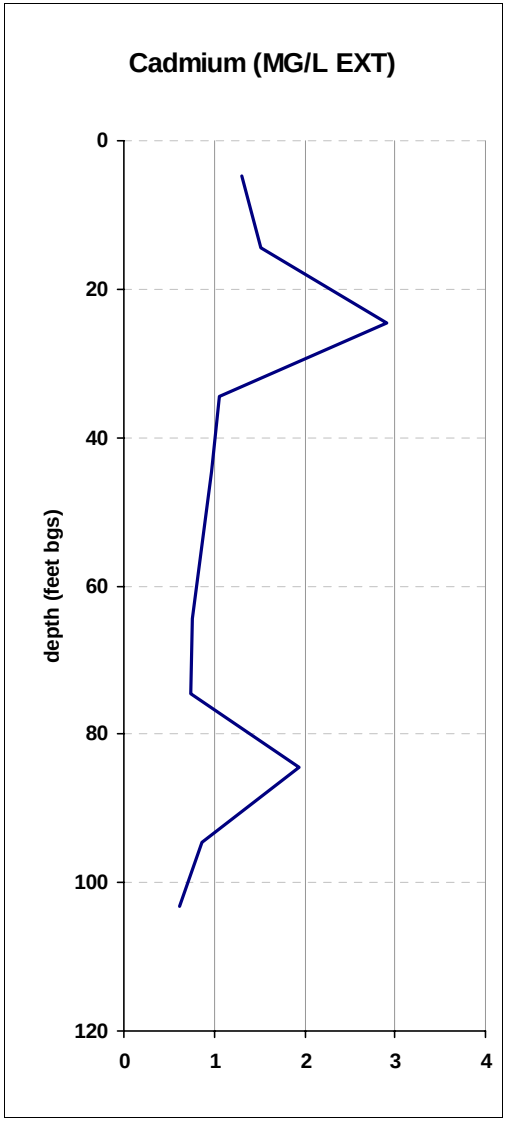


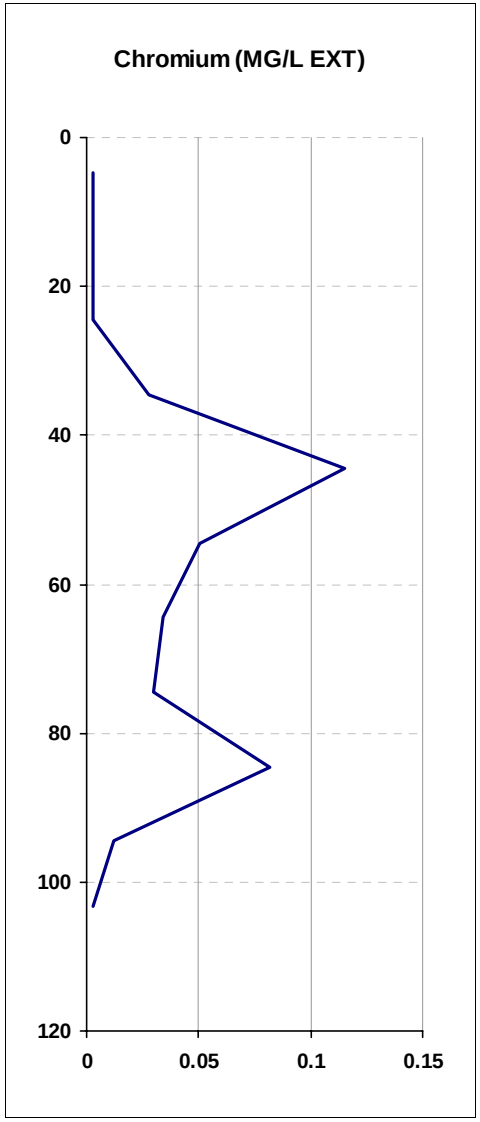
EnviroGroup Limited 2005

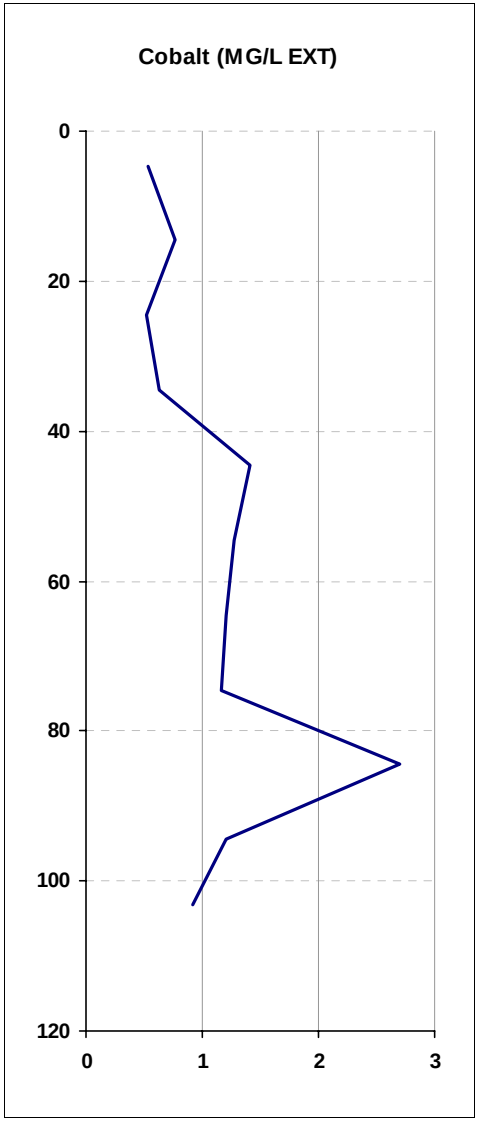
Tyrone Mine Sample Test Results by Location, Test Type

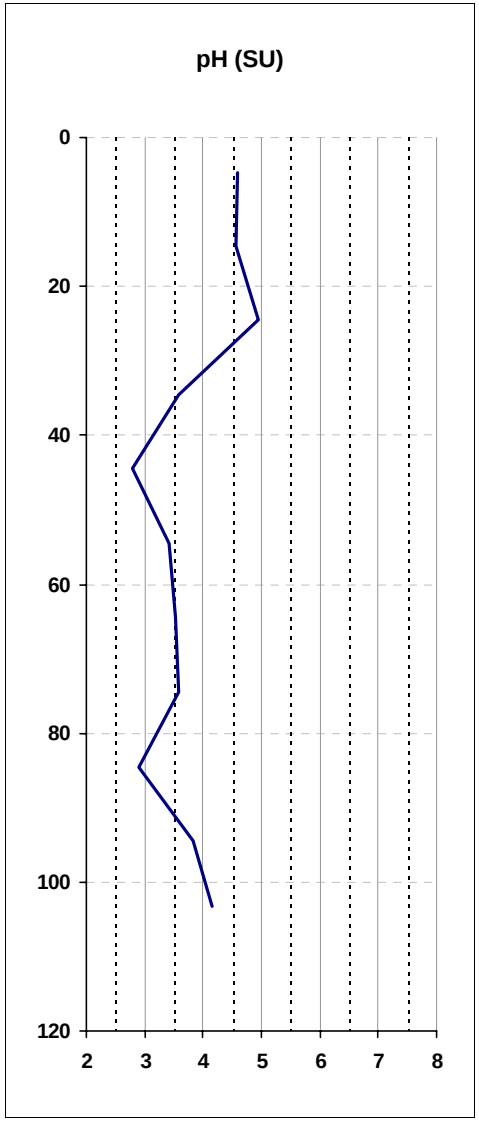
Location: TBGC-6

Test Type: MWMP







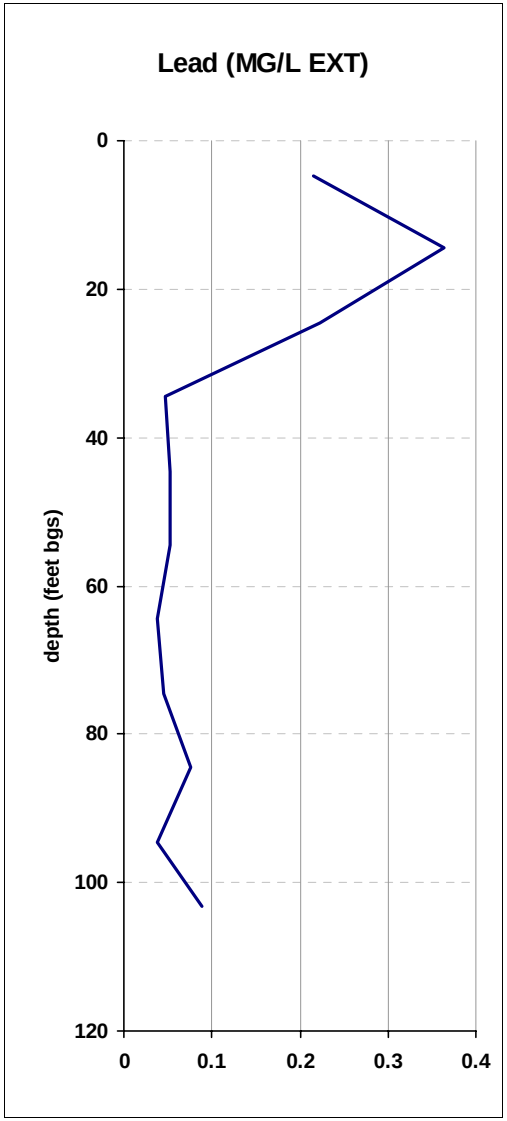


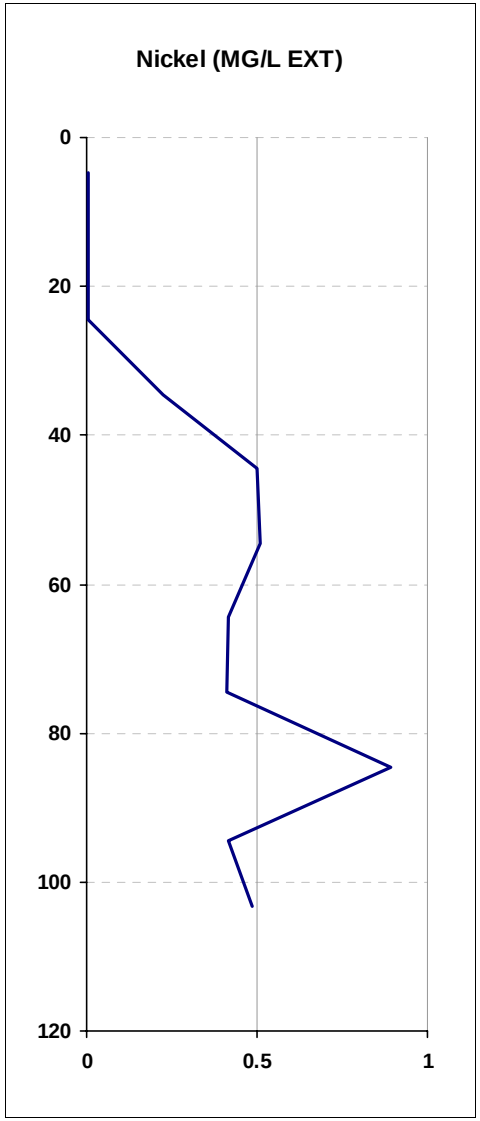
EnviroGroup Limited 2005

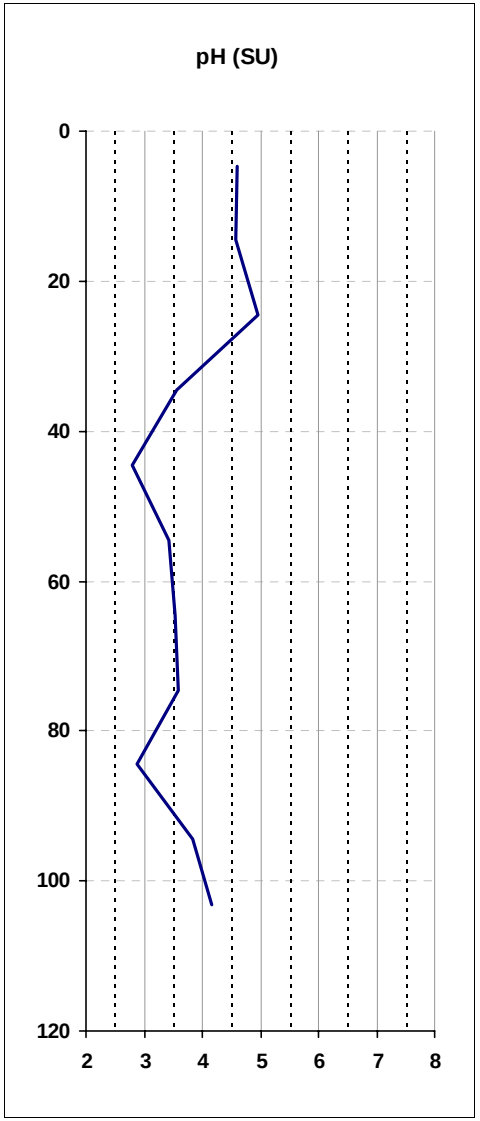
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-6

Test Type: MWMP





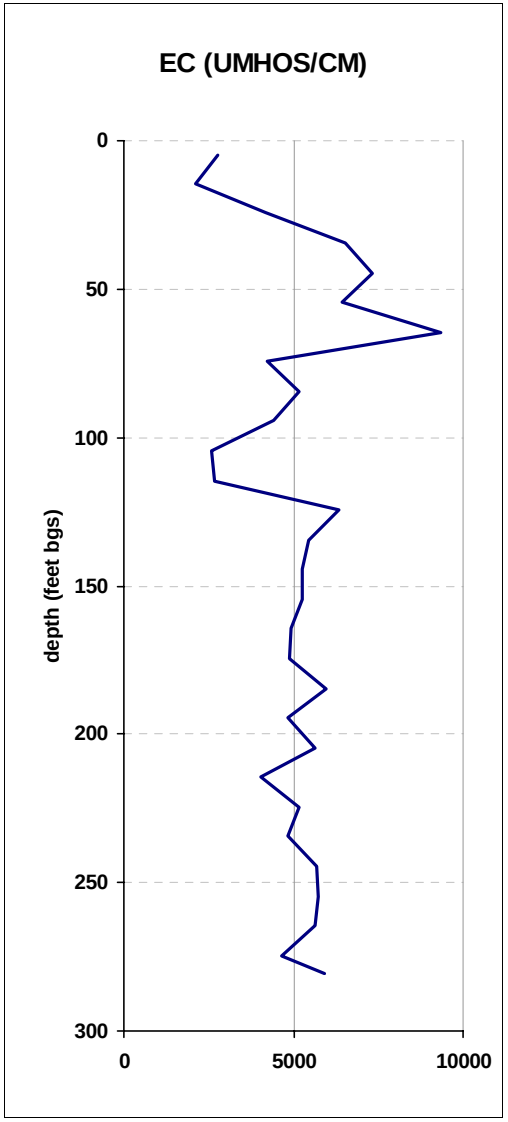


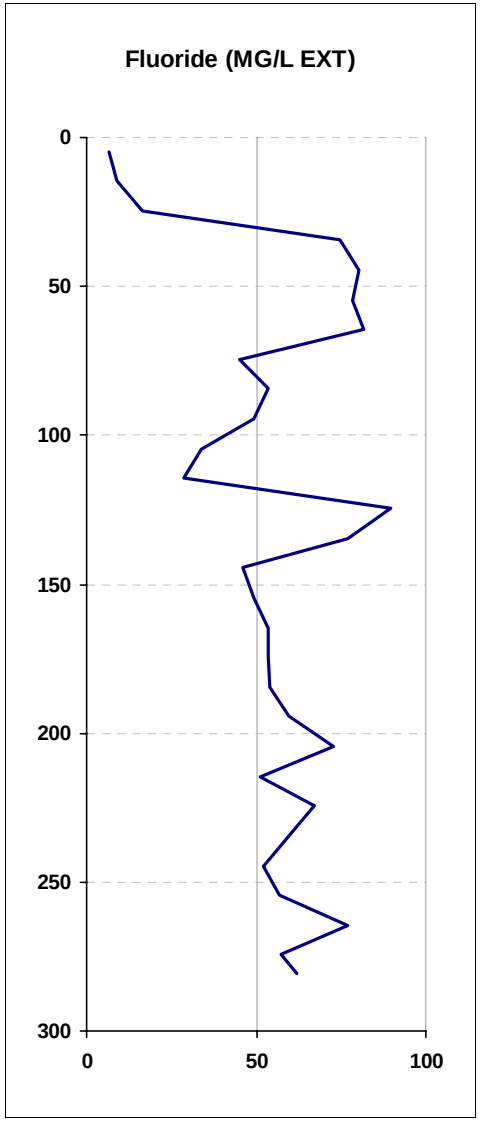
EnviroGroup Limited 2005

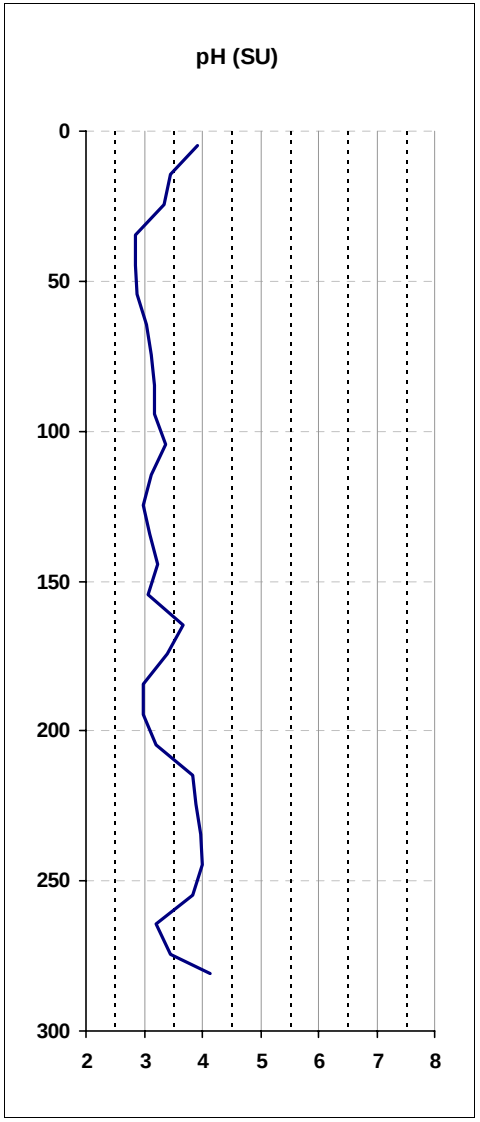
Tyrone Mine Sample Test Results by Location, Test Type

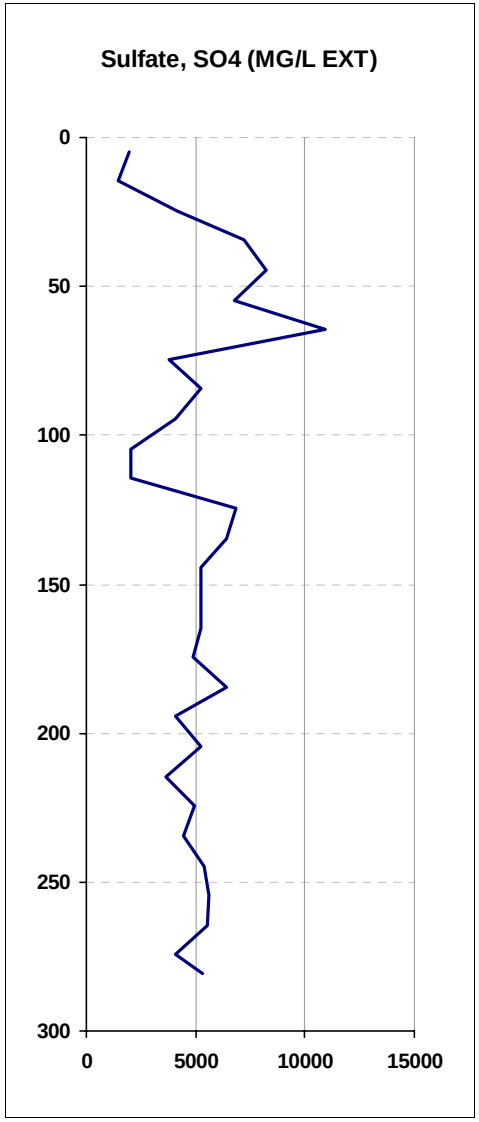
Location: TBGC-7

Test Type: MWMP







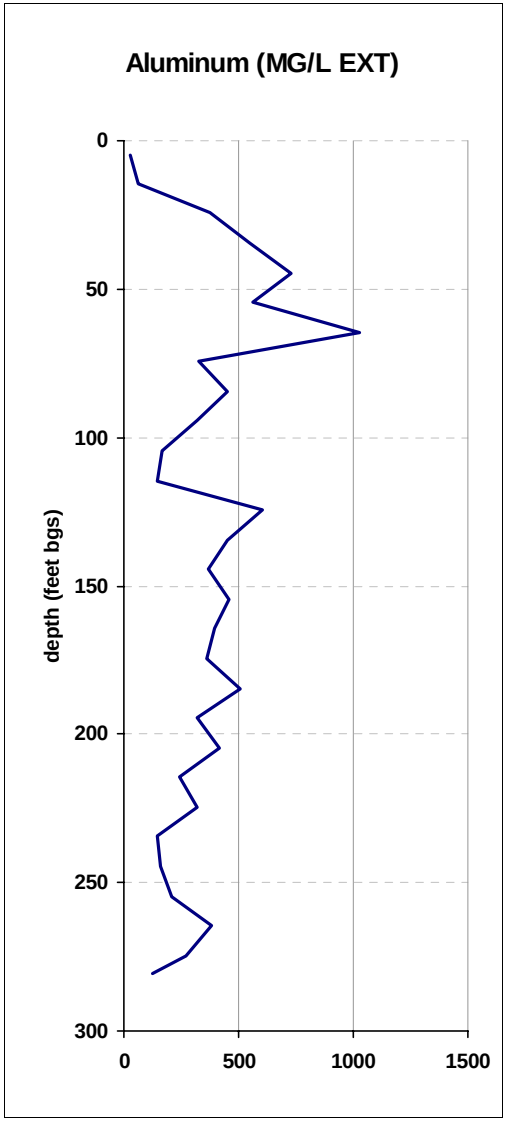


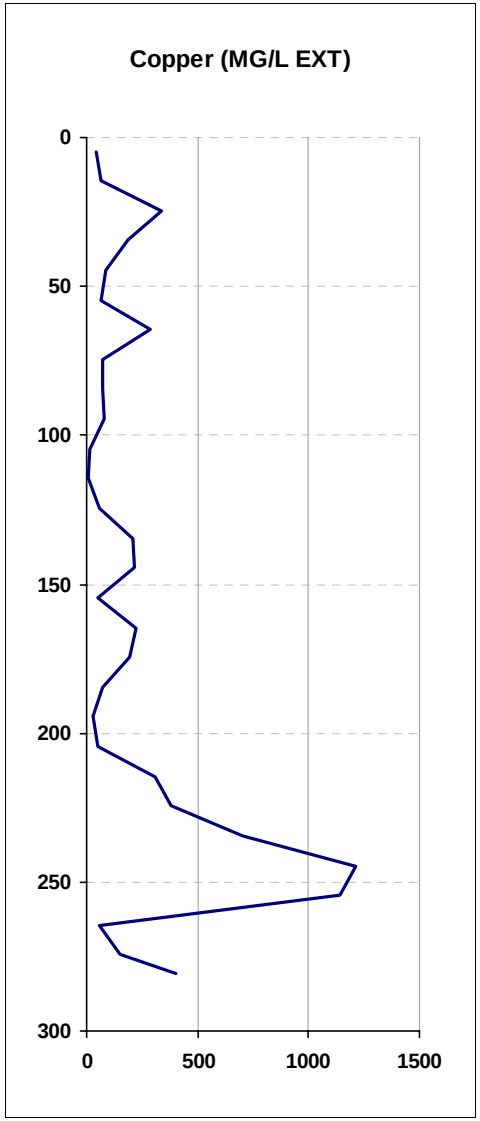
EnviroGroup Limited 2005

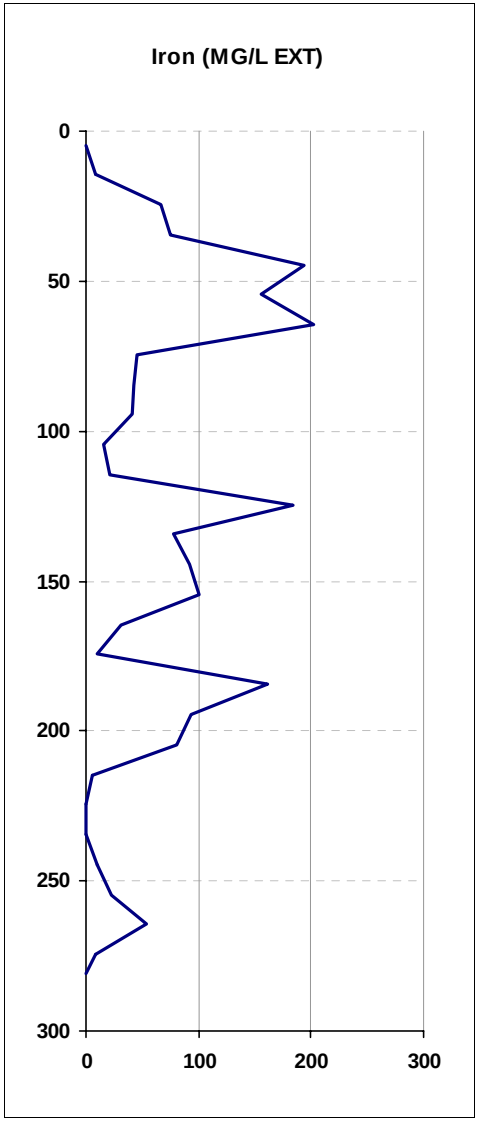
Tyrone Mine Sample Test Results by Location, Test Type

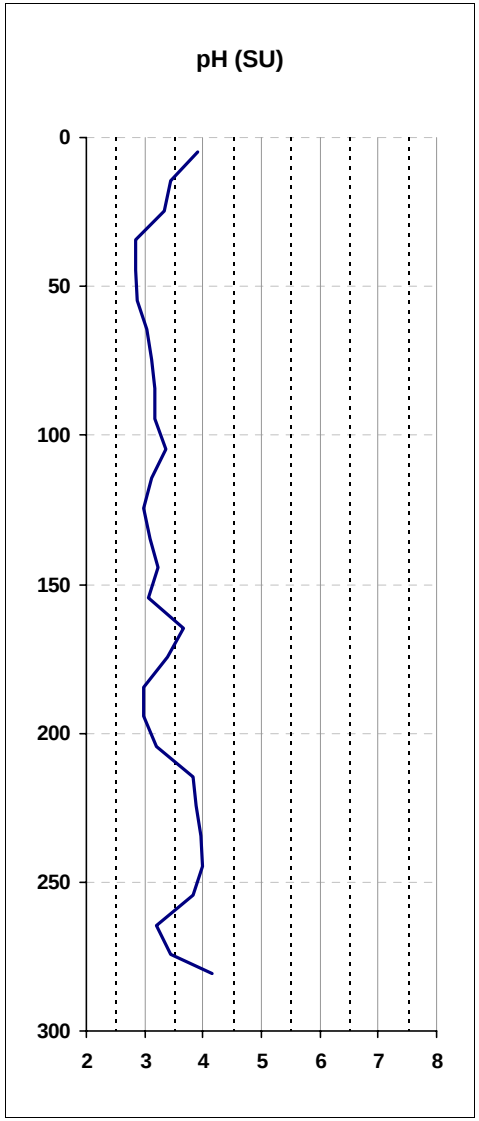
Location: TBGC-7

Test Type: MWMP







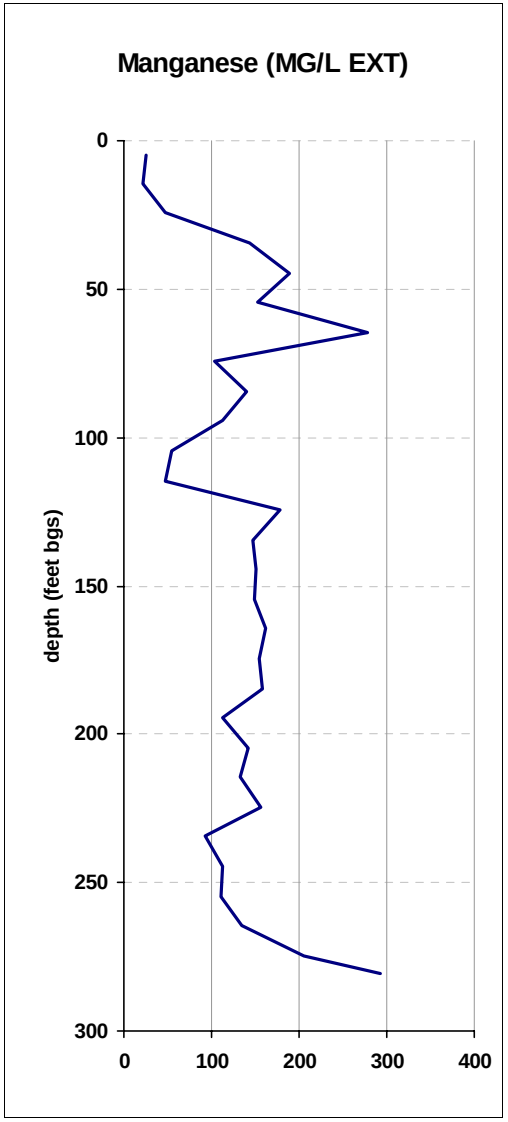


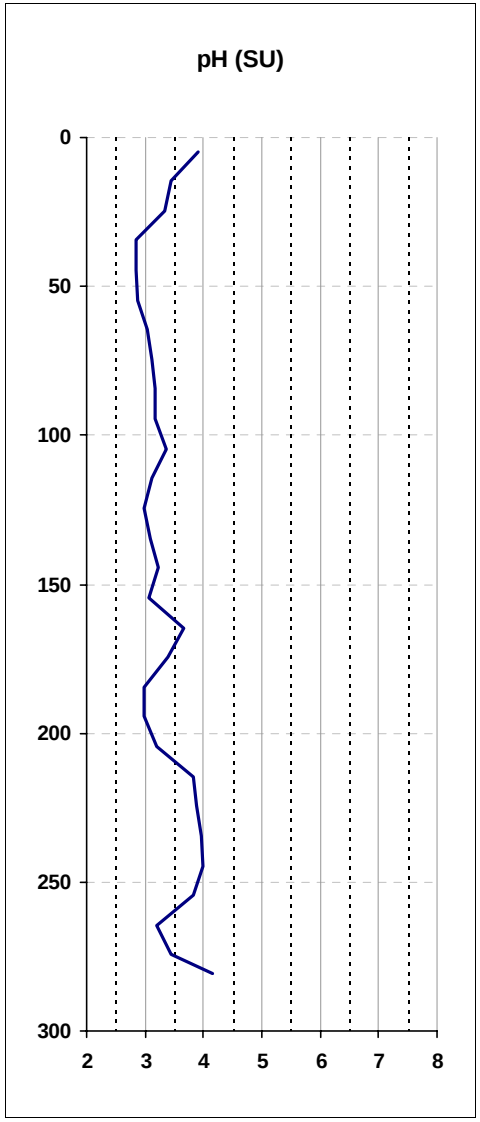
EnviroGroup Limited 2005

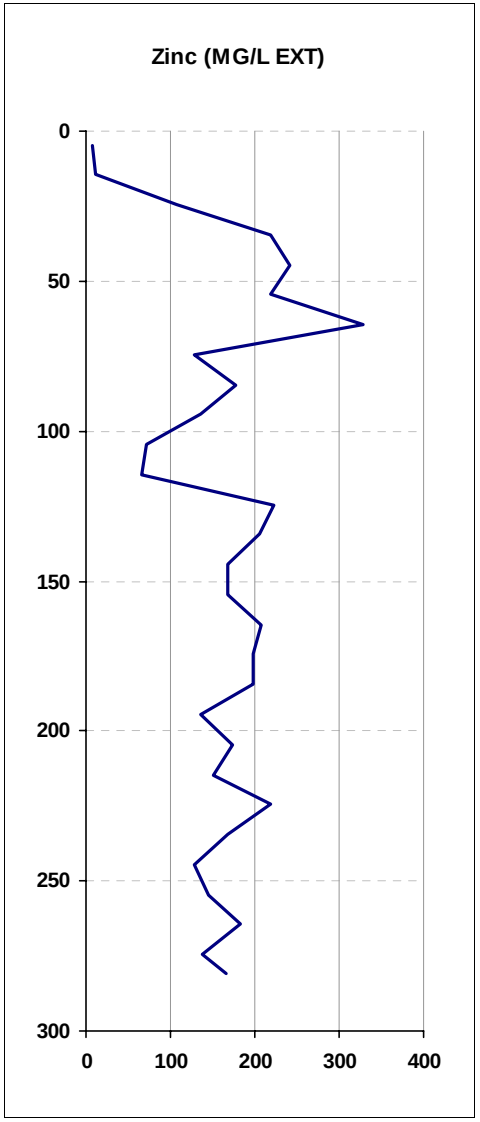
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7

Test Type: MWMP





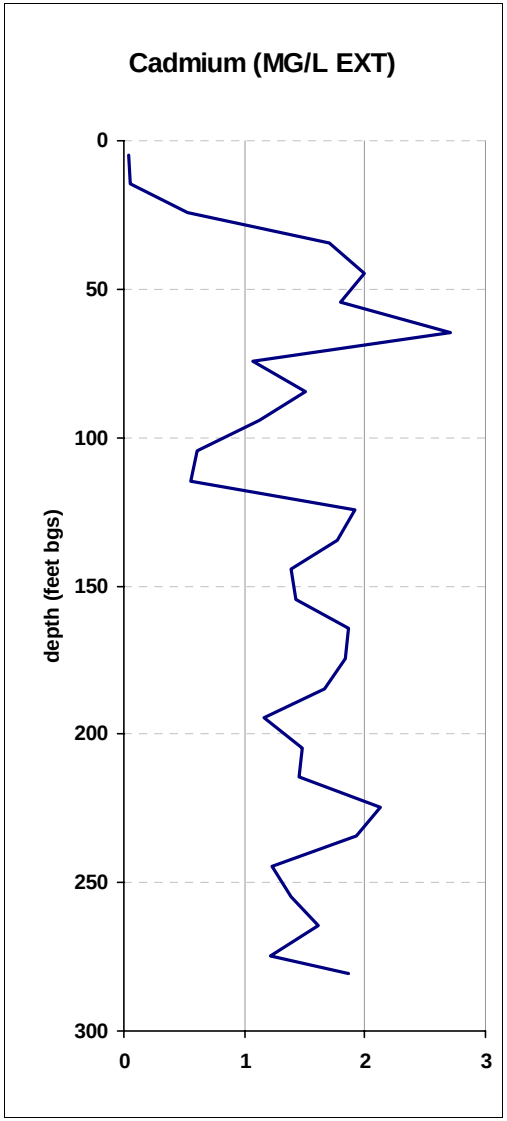


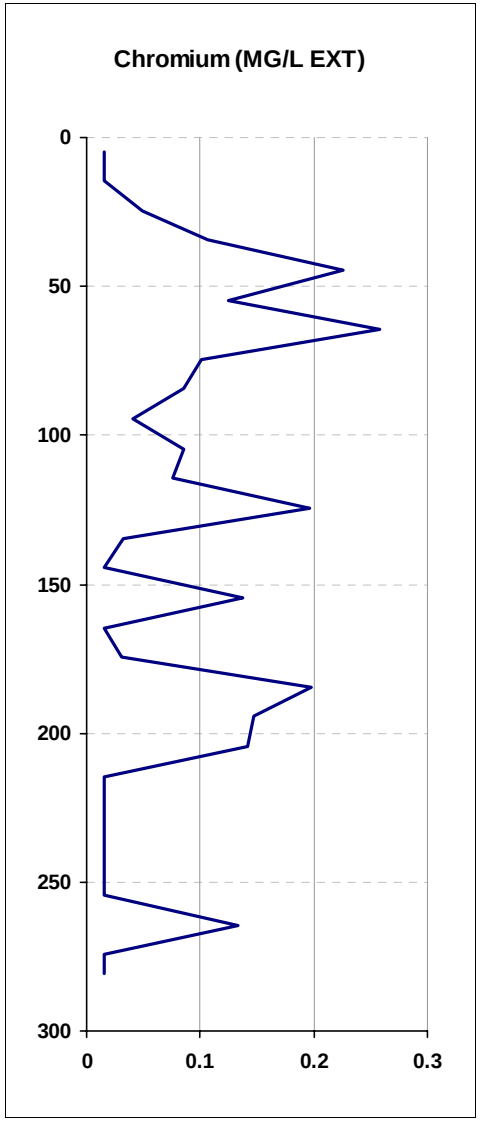
EnviroGroup Limited 2005

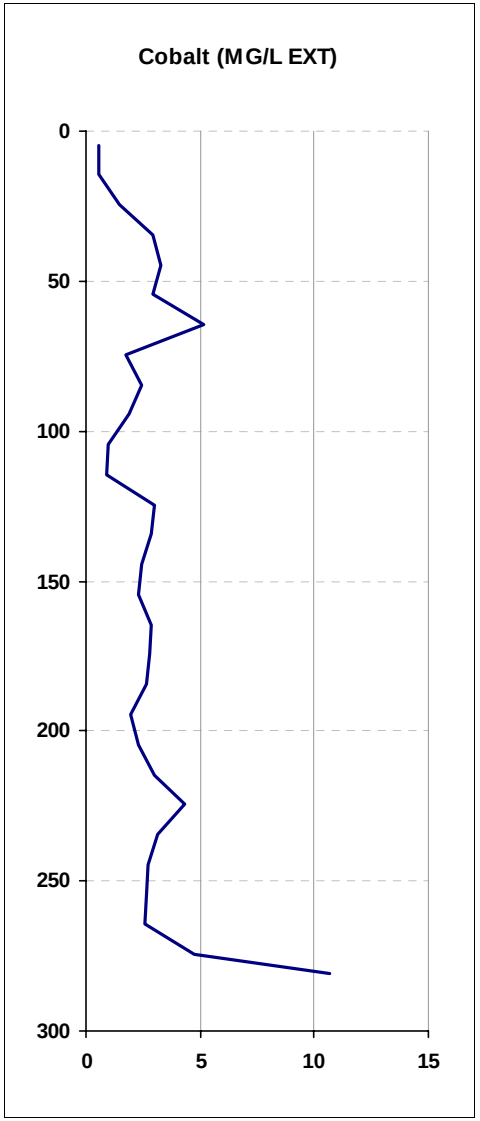
Tyrone Mine Sample Test Results by Location, Test Type

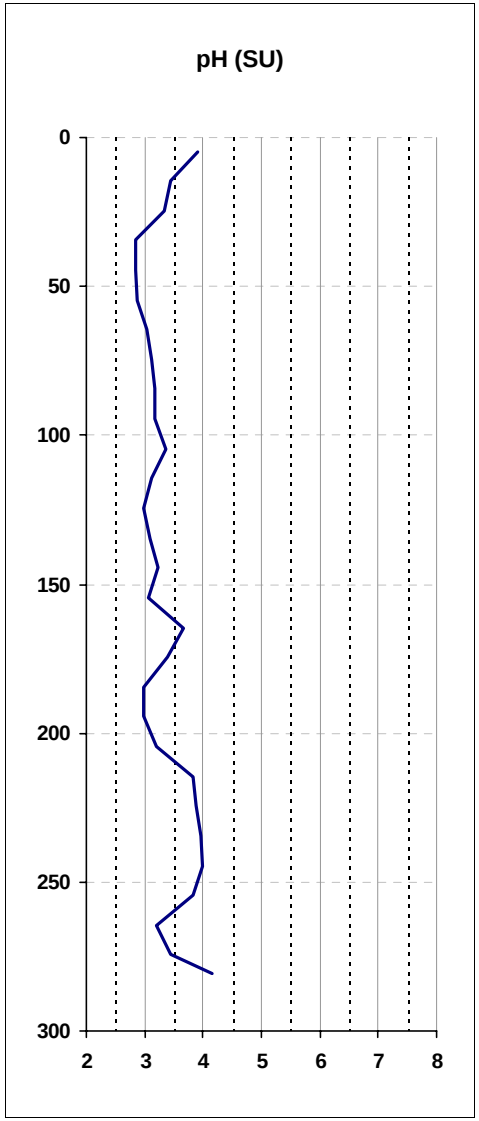
Location: TBGC-7

Test Type: MWMP







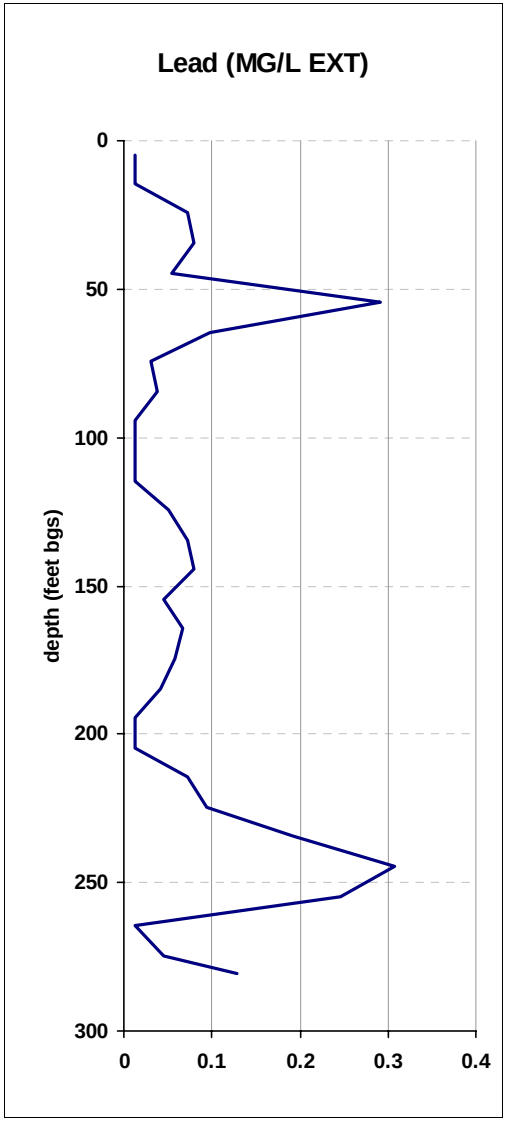


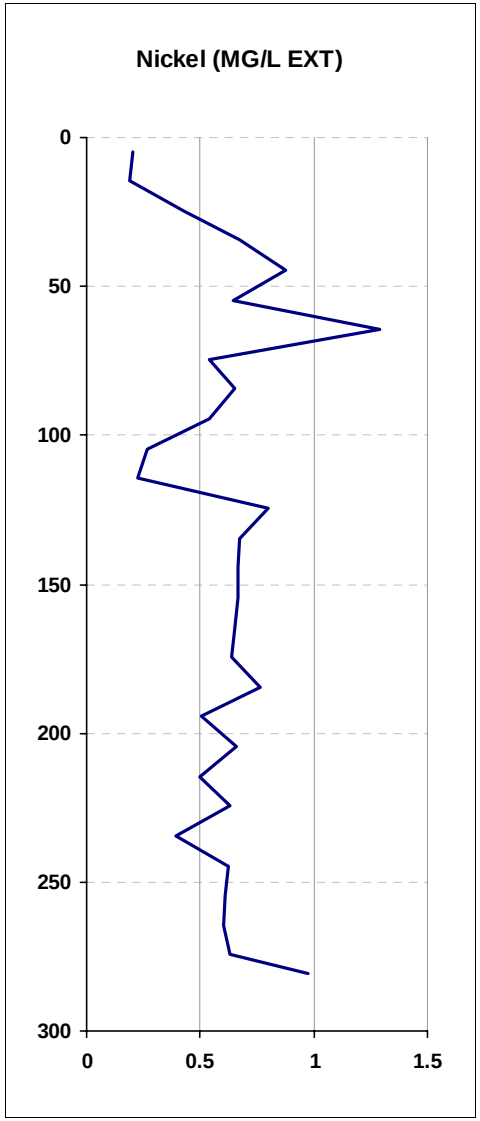
EnviroGroup Limited 2005

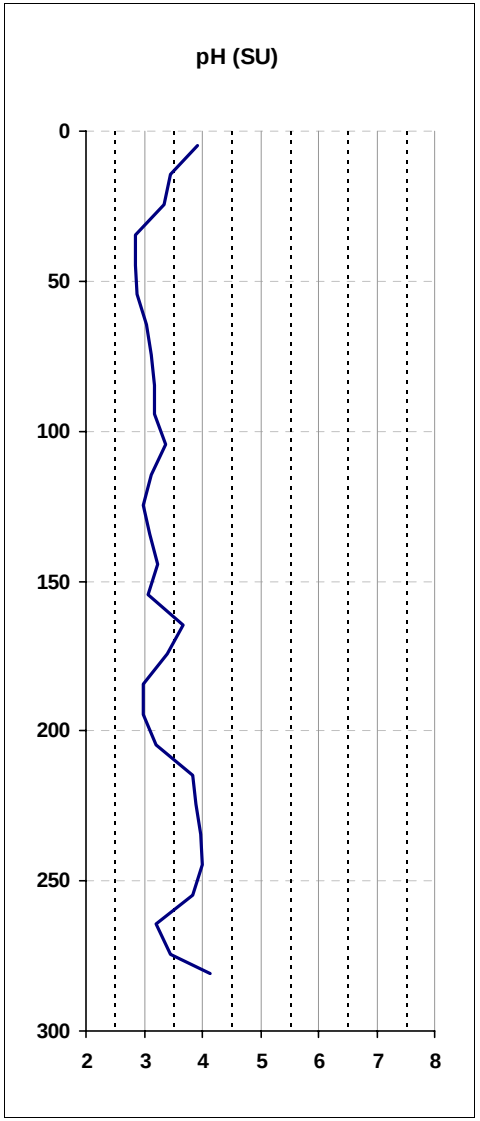
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7

Test Type: MWMP







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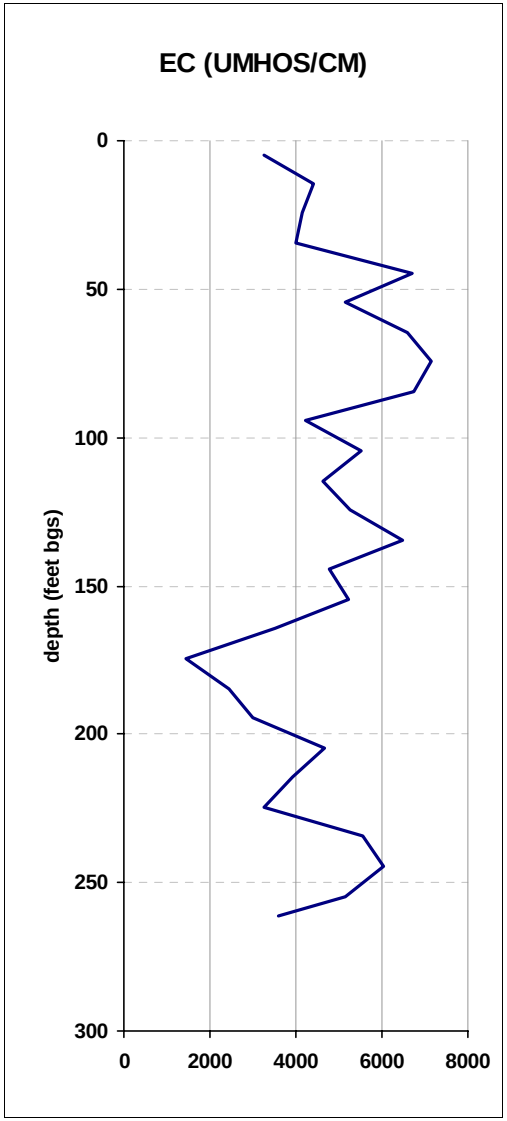
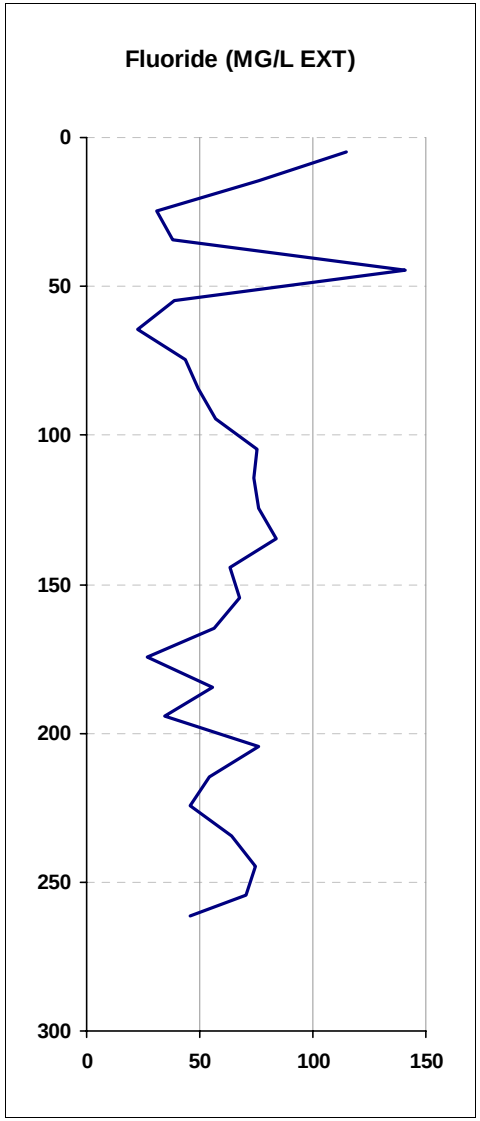
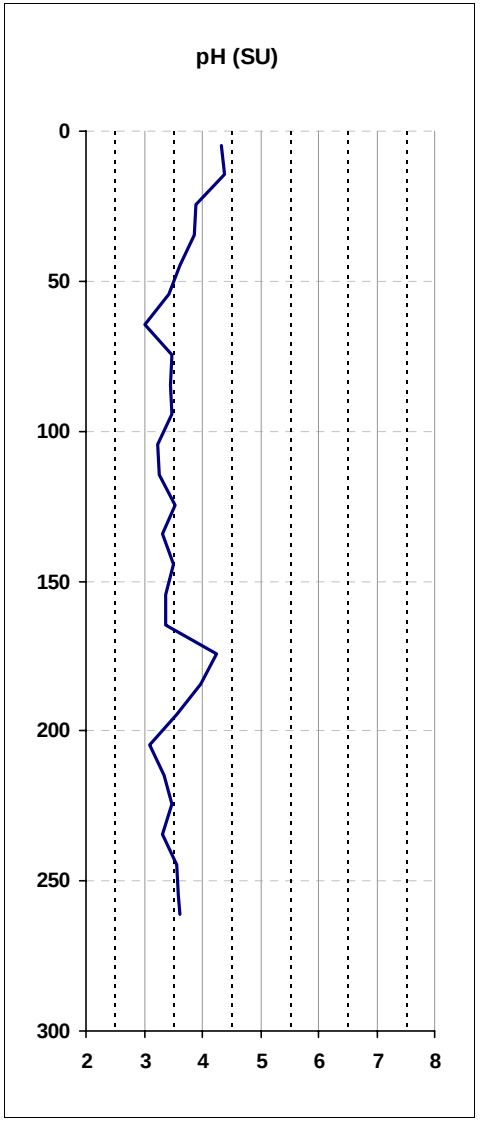
Tyrone Mine Sample Test Results by Location, Test Type

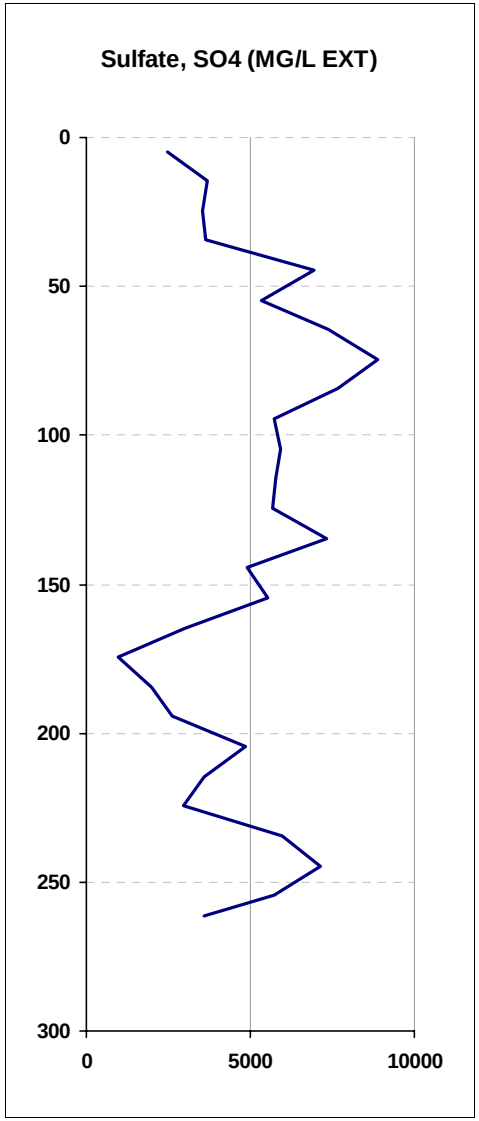
Location: TBGC-7A

Test Type: MWMP







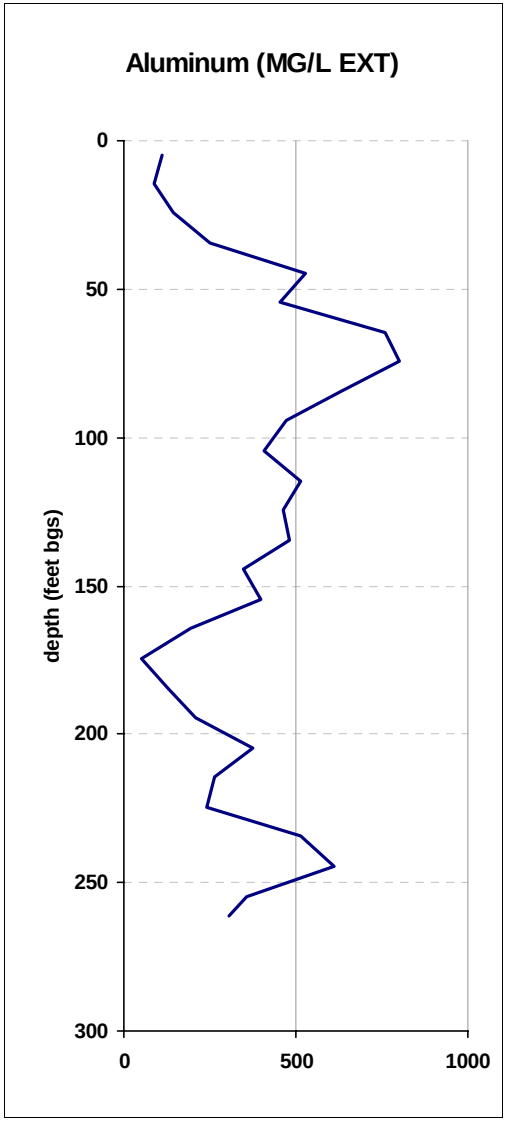


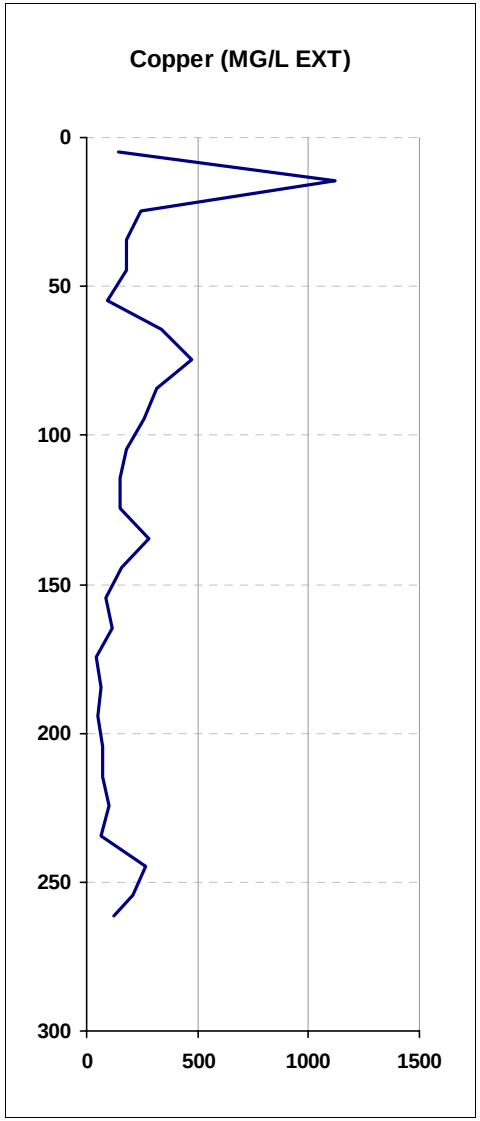
EnviroGroup Limited 2005

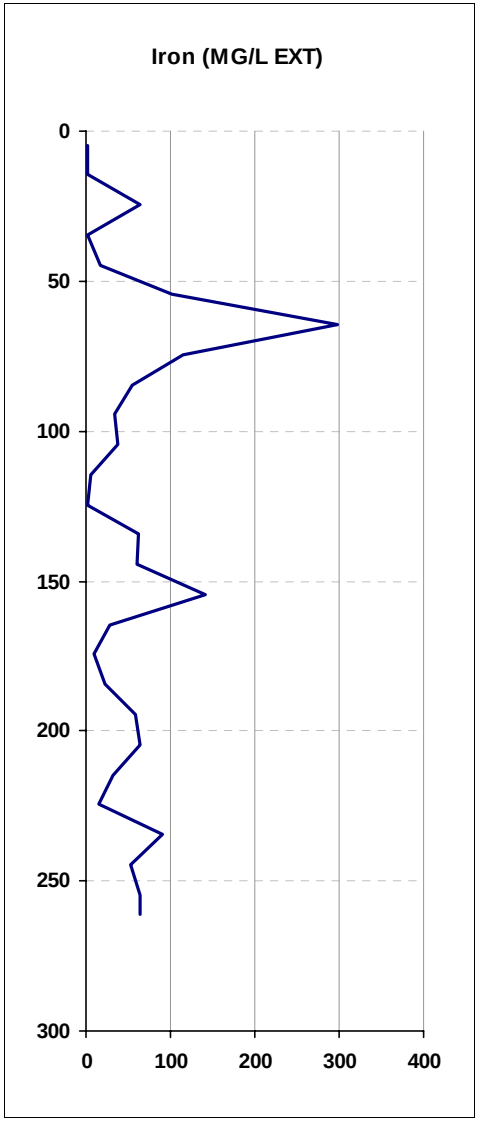
Tyrone Mine Sample Test Results by Location, Test Type

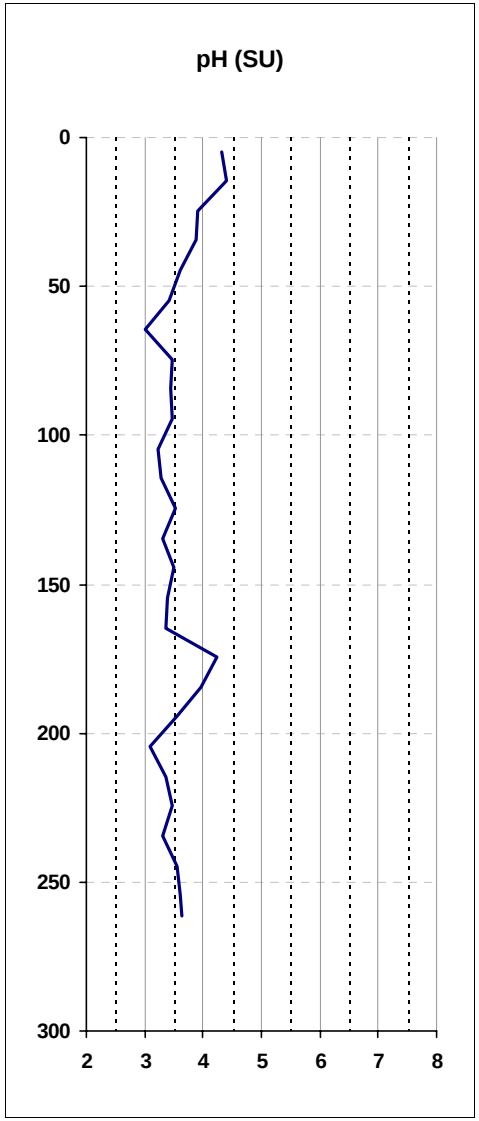
Location: TBGC-7A

Test Type: MWMP







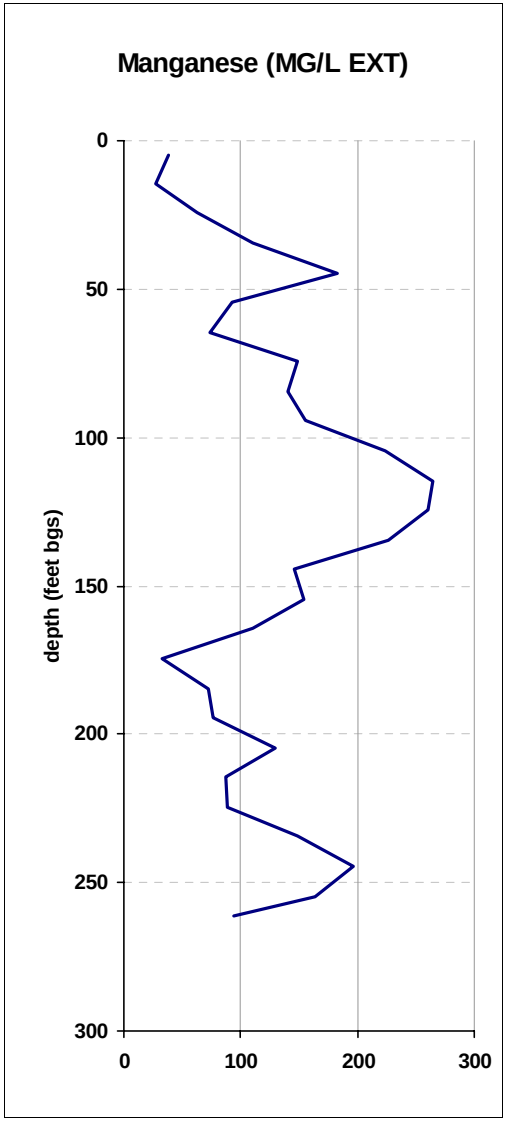


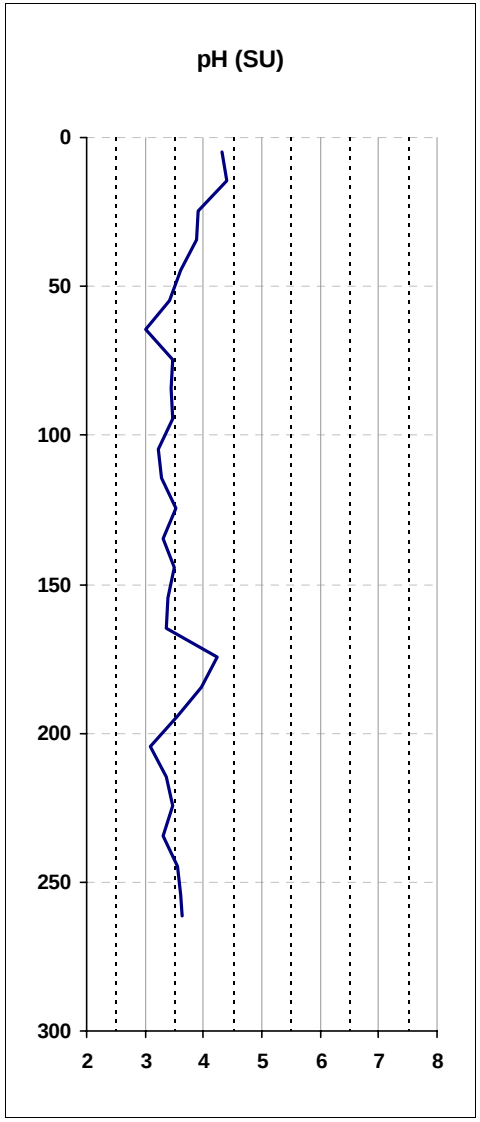
EnviroGroup Limited 2005

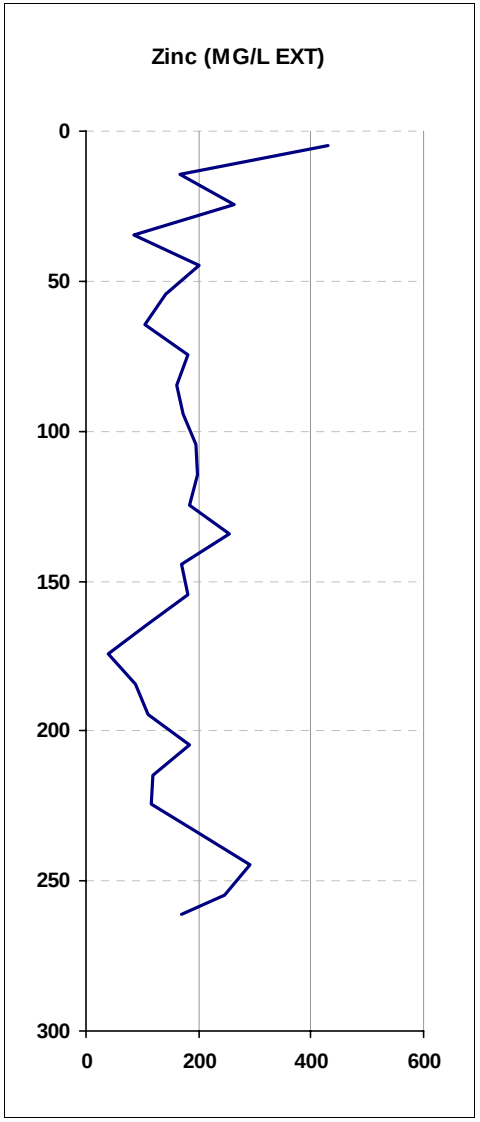
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7A

Test Type: MWMP





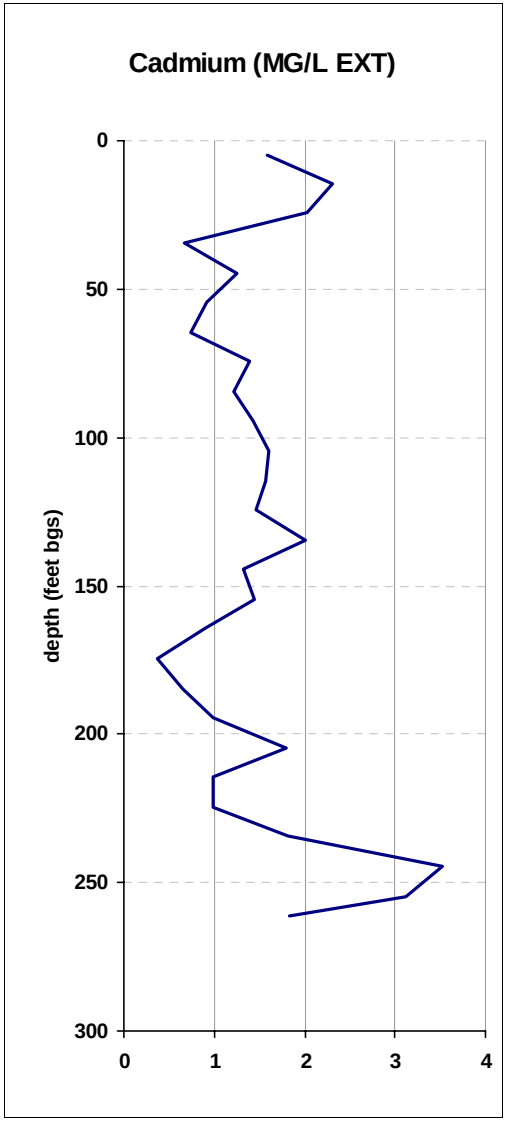


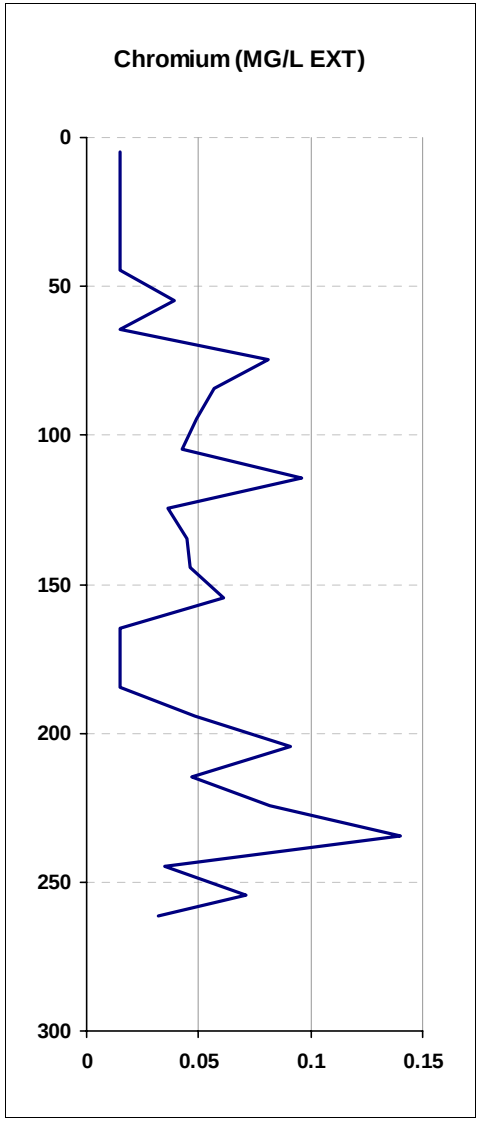
EnviroGroup Limited 2005

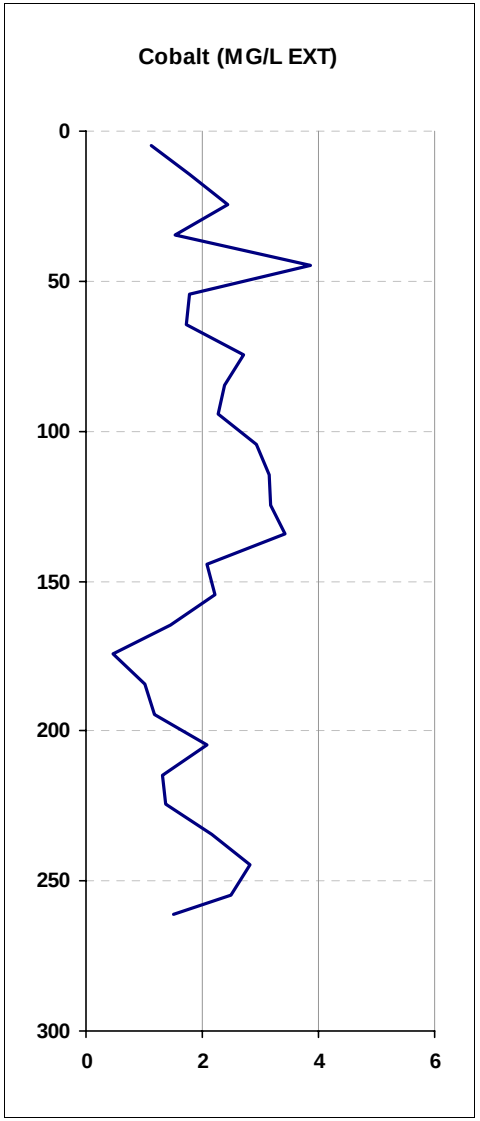
Tyrone Mine Sample Test Results by Location, Test Type

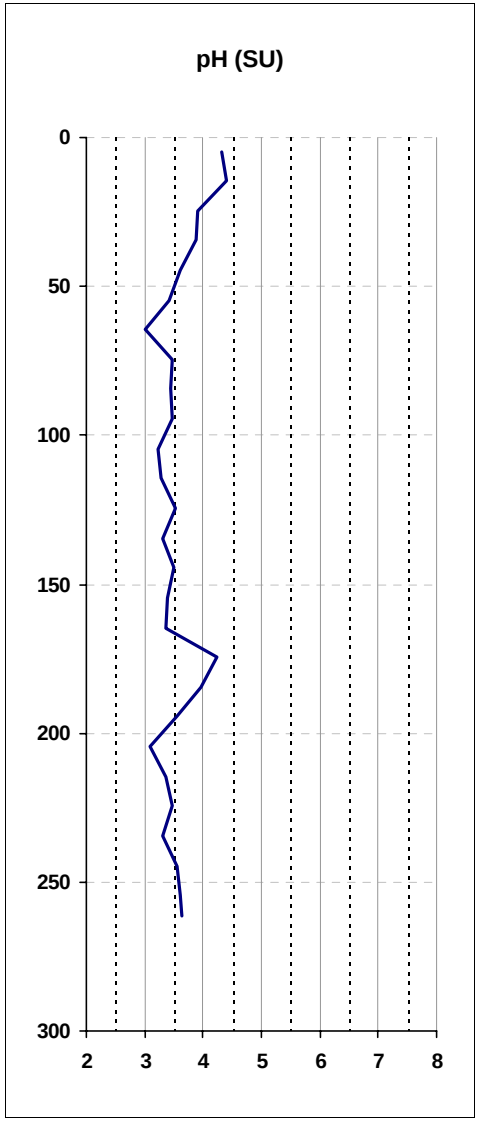
Location: TBGC-7A

Test Type: MWMP







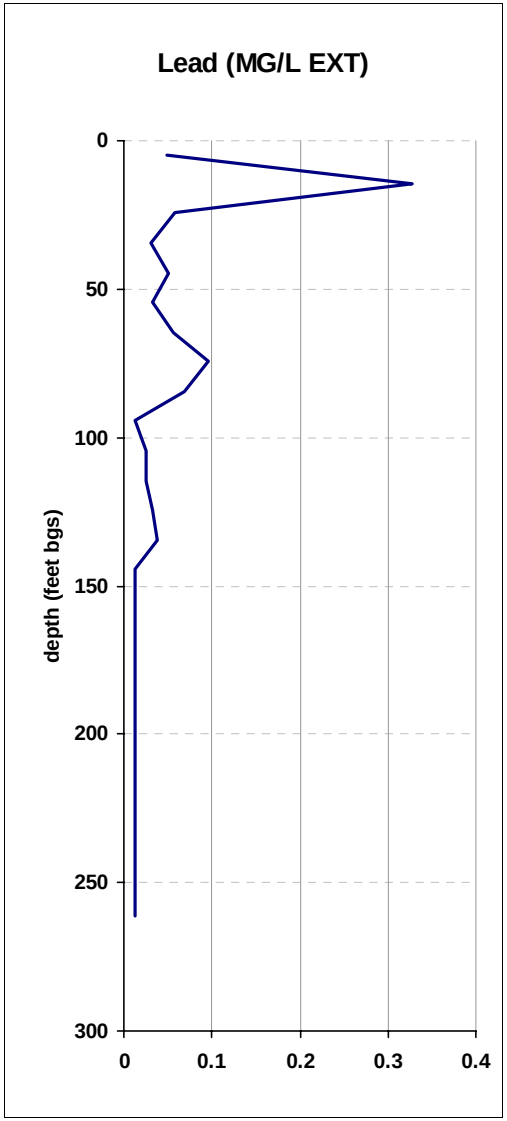


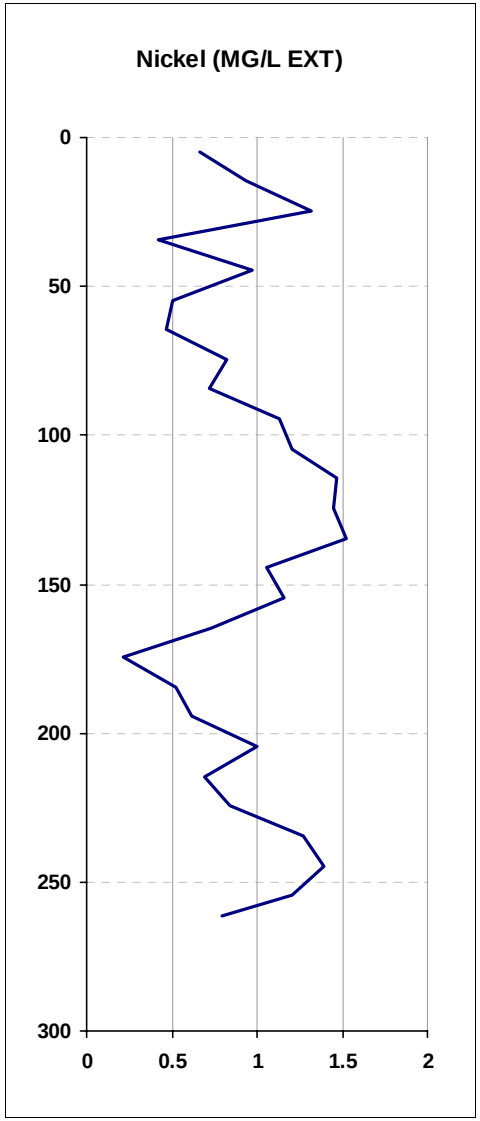
EnviroGroup Limited 2005

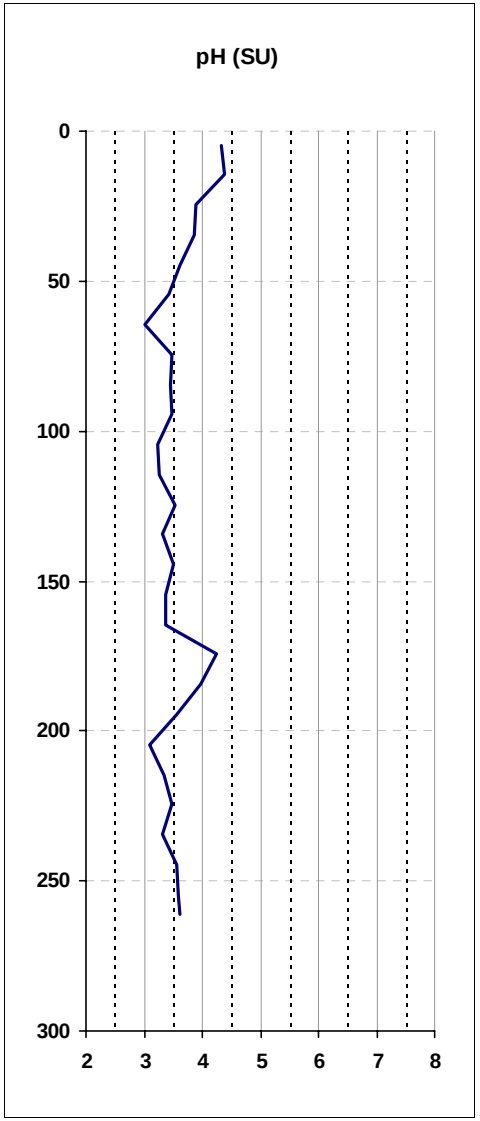
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7A

Test Type: MWMP







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MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Acidity (mg/L)	Alkalinity (mg/L)	Aluminum (mg/L)	Anion Sum (meq/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bicarbonate (mg/L as $CaCO_3$)
TBGC-1_0-9.5	<1	4.59	<0.03	1.27	<0.025	0.0168	<0.002	4.59
TBGC-1_9.5-19.5	<1	3.84	0.0620	1.45	<0.025	0.0103	<0.002	3.84
TBGC-1_19.5-29.5	<1	<1	2.00	3.29	<0.025	0.0328	<0.002	<1
TBGC-1_29.5-39.5	<1	4.51	<0.03	1.14	<0.025	0.0139	<0.002	4.51
TBGC-1_39.5-49.5	<1	1.98	0.0440	1.26	<0.025	0.00790	<0.002	1.98
TBGC-1_49.5-59.5	<1	7.56	<0.03	0.740	<0.025	0.00360	<0.002	7.56
TBGC-1_59.5-69.5	<1	<1	3.84	15.6	<0.025	0.0255	0.00320	<1
TBGC-1_69.5-79.5	<1	12.9	<0.03	3.79	<0.025	0.0261	<0.002	12.9
TBGC-1_79.5-89.5	<1	4.67	<0.03	3.99	<0.025	0.0249	<0.002	4.67
TBGC-1_89.5-99.5	<1	2.57	0.0360	12.7	<0.025	0.0240	<0.002	2.57
TBGC-1_99.5-109.5	1,250	<1	118	66.0	<0.025	0.0138	0.0286	<1
TBGC-1_109.5-119.5	246	<1	24.0	15.0	<0.025	0.0227	0.00460	<1
TBGC-1_119.5-129.5	3,230	<1	545	84.0	0.0654	0.00710	0.0188	<1
TBGC-1_129.5-139.5	6,110	<1	777	156	0.145	<0.01	0.0380	<1
TBGC-1_139.5-149.5	6,850	<1	874	174	0.145	<0.01	0.0410	<1
TBGC-1_149.5-159.5	7,020	<1	820	184	0.126	<0.01	0.0530	<1
TBGC-1_159.5-169.5	162	<1	8.77	10.8	<0.025	0.00820	0.00300	<1
TBGC-1_169.5-179.5	2,850	<1	237	106	<0.025	<0.002	0.0458	<1
TBGC-1_179.5-189.5	<1	<1	1.07	2.42	<0.025	0.0159	<0.002	<1
TBGC-1_189.5-199.5	<1	<1	0.350	1.95	<0.025	0.0170	<0.002	<1
TBGC-1_199.5-209.5	<1	<1	0.0660	1.89	<0.025	0.0156	<0.002	<1
TBGC-1_209.5-219.5	<1	<1	0.305	2.43	<0.025	0.0334	<0.002	<1
TBGC-1_219.5-222	<1	<1	8.99	26.0	<0.025	0.0129	<0.002	<1
TBGC-2_0-9.5	4,560	<1	577	155	<0.1	<0.02	0.0840	<1
TBGC-2_9.5-19.5	2,310	<1	212	101	<0.1	<0.02	0.0270	<1
TBGC-2_19.5-29.5	1,540	<1	132	54.7	<0.1	<0.02	0.0270	<1
TBGC-2_29.5-39.5	1,740	<1	69.4	71.9	<0.1	<0.02	<0.02	<1
TBGC-2_39.5-49.5	2,780	<1	98.4	108	<0.2	<0.04	<0.04	<1
TBGC-2_49.5-59.5	1,800	<1	146	66.0	<0.1	<0.02	0.0230	<1
TBGC-2_59.5-69.5	2,130	<1	238	76.6	<0.1	<0.02	0.0300	<1
TBGC-2_69.5-79.5	1,800	<1	160	72.9	<0.1	<0.02	0.0320	<1
TBGC-2_79.5-89.5	1,160	<1	134	45.9	<0.01	0.0096	0.0164	<1
TBGC-3_0-9.5	1,080	<1	73.6	46.6	<0.05	<0.01	0.0190	<1
TBGC-3_9.5-19.5	<1	<1	4.95	20.3	<0.05	0.0160	<0.01	<1

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Acidity (mg/L)	Alkalinity (mg/L)	Aluminum (mg/L)	Anion Sum (meq/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bicarbonate (mg/L as $CaCO_3$)
TBGC-3_19.5-29.5	1,600	<1	122	62.4	0.060	<0.01	0.0100	<1
TBGC-3_29.5-39.5	612	<1	20.4	37.2	0.053	<0.01	<0.01	<1
TBGC-3_39.5-49.5	867	<1	80.3	43.7	<0.05	<0.01	0.0130	<1
TBGC-3_49.5-59.5	1,340	<1	177	58.5	<0.05	<0.01	0.0200	<1
TBGC-3_59.5-69.5	1,720	<1	197	70.3	<0.05	<0.01	0.0290	<1
TBGC-3_69.5-79.5	1,510	<1	119	65.3	<0.05	<0.01	0.0300	<1
TBGC-3_79.5-89.5	1,610	<1	126	68.3	<0.05	<0.01	0.0280	<1
TBGC-3_89.5-99.5	1,490	<1	97.1	70.7	<0.05	<0.01	0.0270	<1
TBGC-3_99.5-109.5	2,010	<1	195	81.0	<0.05	<0.01	0.0330	<1
TBGC-3_109.5-119.5	1,370	<1	75.8	66.3	<0.05	<0.01	0.0270	<1
TBGC-3_119.5-129.5	1,550	<1	87.8	75.3	<0.05	<0.01	0.0120	<1
TBGC-3_129.5-139.5	867	<1	41.0	51.2	<0.05	0.0140	<0.01	<1
TBGC-3_13.95-149.5	1,140	<1	48.0	58.3	<0.05	<0.01	0.0110	<1
TBGC-3_149.5-159.5	765	<1	32.1	38.2	<0.05	0.0140	<0.01	<1
TBGC-3_159.5-169.5	816	<1	36.1	39.3	<0.05	0.0200	<0.01	<1
TBGC-3_169.5-179.5	1,090	<1	47.2	51.0	<0.05	<0.01	0.0130	<1
TBGC-4_0-9.5	151	<1	10.7	11.0	<0.01	0.0164	0.0021	<1
TBGC-4_9.5-19.5	641	<1	55.0	31.6	<0.1	<0.02	<0.02	<1
TBGC-4_19.5-29.5	858	<1	82.2	45.2	<0.1	<0.02	0.0250	<1
TBGC-4_29.5-39.5	1,600	<1	148	56.6	<0.1	<0.02	0.0260	<1
TBGC-4_39.5-49.5	1,650	<1	168	72.0	<0.1	<0.02	0.0250	<1
TBGC-5_0-9.5	<1	76.6	0.098	4.85	0.013	0.0193	<0.002	76.6
TBGC-5_9.5-19.5	<1	<1	3.38	16	<0.01	0.0373	0.0021	<1
TBGC-5_19.5-29.5	281	<1	23.2	28.4	<0.01	0.0316	0.0082	<1
TBGC-5_29.5-39.5	579	<1	59.9	35.7	<0.01	0.0105	0.0126	<1
TBGC-5_39.5-49.5	3,130	<1	358	113	<0.05	<0.01	0.047	<1
TBGC-5_49.5-59.5	260	<1	16.1	23	<0.01	0.0278	0.0068	<1
TBGC-5_59.5-69.5	641	<1	46.5	47.6	<0.01	0.0311	0.025	<1
TBGC-5_69.5-79.5	1,500	<1	116	79.8	<0.05	<0.01	0.041	<1
TBGC-5_79.5-89.5	<1	2.7	0.099	6.35	<0.01	0.02	<0.002	2.7
TBGC-5_89.5-99.5	<1	<1	3.09	13.3	<0.01	0.0247	<0.002	<1
TBGC-5_99.5-109.5	290	<1	16.3	28.9	<0.01	0.0138	0.005	<1
TBGC-5_109.5-119.5	<1	1.5	0.214	6.8	<0.01	0.0153	<0.002	1.5
TBGC-5_119.5-129.5	<1	7	0.187	1.39	<0.01	0.006	<0.002	7

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Acidity (mg/L)	Alkalinity (mg/L)	Aluminum (mg/L)	Anion Sum (meq/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bicarbonate (mg/L as $CaCO_3$)
TBGC-5_129.5-139.5	<1	<1	0.77	5.05	<0.01	0.0134	<0.002	<1
TBGC-6_0-9.5	<1	<1	9.24	28.5	<0.025	0.0132	<0.002	<1
TBGC-6_9.5-19.5	<1	<1	10.5	43.1	<0.025	0.0144	<0.002	<1
TBGC-6_19.5-29.5	<1	<1	4.55	29.9	<0.025	0.0214	<0.002	<1
TBGC-6_29.5-39.5	889	<1	93.5	28.8	<0.025	0.0165	0.00940	<1
TBGC-6_39.5-49.5	2,330	<1	317	72.3	<0.025	0.0177	0.0332	<1
TBGC-6_49.5-59.5	1,810	<1	248	66.4	<0.025	0.0157	0.0255	<1
TBGC-6_59.5-69.5	1,520	<1	217	52.9	<0.025	0.0107	0.0250	<1
TBGC-6_69.5-79.5	1,550	<1	211	50.2	<0.025	0.00990	0.0257	<1
TBGC-6_79.5-89.5	3,330	<1	493	118	<0.025	0.0157	0.0526	<1
TBGC-6_89.5-99.5	1,390	<1	172	53.1	<0.025	0.0213	0.0255	<1
TBGC-6_99.5-107	1,030	<1	95.0	42.3	<0.025	<0.002	0.0151	<1
TBGC-7_0-9.5	243	<1	25.2	41.9	<0.125	0.013	<0.01	<1
TBGC-7_9.5-19.5	521	<1	63.4	30.4	<0.125	<0.01	<0.01	<1
TBGC-7_19.5-29.5	2,830	<1	372	86.9	<0.125	<0.01	0.022	<1
TBGC-7_29.5-39.5	4,280	<1	546	153	<0.125	0.02	0.05	<1
TBGC-7_39.5-49.5	5,310	<1	729	176	<0.125	0.018	0.066	<1
TBGC-7_49.5-59.5	4,440	<1	561	144	<0.125	0.021	0.055	<1
TBGC-7_59.5-69.5	7,370	<1	1,030	230	<0.125	<0.01	0.1	<1
TBGC-7_69.5-79.5	2,430	<1	328	81.9	<0.125	0.01	0.034	<1
TBGC-7_79.5-89.5	3,290	<1	454	111	<0.125	<0.01	0.051	<1
TBGC-7_89.5-99.5	2,280	<1	318	87.5	<0.125	<0.01	0.037	<1
TBGC-7_99.5-109.5	1,300	<1	166	44.9	<0.125	<0.01	0.019	<1
TBGC-7_109.5-119.5	1,190	<1	144	43.3	<0.125	0.039	0.016	<1
TBGC-7_119.5-129.5	4,500	<1	603	148	<0.125	0.032	0.062	<1
TBGC-7_129.5-139.5	3,970	<1	450	137	<0.125	<0.01	0.055	<1
TBGC-7_139.5-149.5	2,990	<1	365	111	<0.125	<0.01	0.047	<1
TBGC-7_149.5-159.5	3,210	<1	457	111	<0.125	0.023	0.047	<1
TBGC-7_159.5-169.5	3,180	<1	399	111	<0.125	<0.01	0.049	<1
TBGC-7_169.5-179.5	3,050	<1	362	104	<0.125	<0.01	0.04	<1
TBGC-7_179.5-189.5	3,960	<1	507	137	<0.125	<0.01	0.055	<1
TBGC-7_189.5-199.5	2,560	<1	319	87.7	<0.125	0.011	0.037	<1
TBGC-7_199.5-209.5	3,500	<1	420	113	<0.125	<0.01	0.047	<1
TBGC-7_209.5-219.5	2,470	<1	240	78.5	<0.125	<0.01	0.034	<1

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Acidity (mg/L)	Alkalinity (mg/L)	Aluminum (mg/L)	Anion Sum (meq/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bicarbonate (mg/L as $CaCO_3$)
TBGC-7_219.5-229.5	3,220	<1	322	107	<0.125	<0.01	0.043	<1
TBGC-7_229.5-239.5	2,700	<1	147	95.4	<0.125	<0.01	0.028	<1
TBGC-7_239.5-249.5	3,010	<1	157	116	<0.125	<0.01	0.033	<1
TBGC-7_249.5-259.5	3,240	<1	207	120	<0.125	<0.01	0.03	<1
TBGC-7_259.5-269.5	3,520	<1	381	118	<0.125	<0.01	0.043	<1
TBGC-7_269.5-279.5	2,500	<1	268	88.5	<0.125	0.011	0.049	<1
TBGC-7_279.5-289.5	2,130	<1	126	113	<0.125	0.036	0.059	<1
TBGC-7A_0-9.5	1,670	<1	109	57.5	<0.125	<0.01	0.011	<1
TBGC-7A_9.5-19.5	17.5	<1	89.1	81.2	<0.125	<0.01	0.011	<1
TBGC-7A_19.5-29.5	2,540	<1	145	75.1	<0.125	<0.01	0.023	<1
TBGC-7A_29.5-39.5	2,150	<1	251	77.3	<0.125	<0.01	0.028	<1
TBGC-7A_39.5-49.5	4,100	<1	527	152	<0.125	<0.01	0.058	<1
TBGC-7A_49.5-59.5	3,570	<1	452	114	<0.125	<0.01	0.037	<1
TBGC-7A_59.5-69.5	6,190	<1	757	154	<0.125	<0.01	0.037	<1
TBGC-7A_69.5-79.5	6,350	<1	803	187	<0.125	<0.01	0.054	<1
TBGC-7A_79.5-89.5	5,220	<1	630	162	<0.125	<0.01	0.047	<1
TBGC-7A_89.5-99.5	3,810	<1	474	123	<0.125	<0.01	0.041	<1
TBGC-7A_99.5-109.5	3,750	<1	407	127	<0.125	0.014	0.044	<1
TBGC-7A_109.5-119.5	3,640	<1	512	125	<0.125	<0.01	0.052	<1
TBGC-7A_119.5-129.5	3,330	<1	463	122	<0.125	<0.01	0.047	<1
TBGC-7A_129.5-139.5	4,260	<1	480	157	<0.125	<0.01	0.066	<1
TBGC-7A_139.5-149.5	2,720	<1	345	106	<0.125	<0.01	0.045	<1
TBGC-7A_149.5-159.5	3,080	<1	399	119	<0.125	<0.01	0.043	<1
TBGC-7A_159.5-169.5	1,690	<1	193	65.9	<0.125	<0.01	0.026	<1
TBGC-7A_169.5-179.5	462	<1	51.1	22.1	<0.125	<0.01	<0.01	<1
TBGC-7A_179.5-189.5	1,110	<1	128	43.9	<0.125	<0.01	0.018	<1
TBGC-7A_189.5-199.5	1,640	<1	208	56.9	<0.125	0.013	0.022	<1
TBGC-7A_199.5-209.5	3,070	<1	374	105	<0.125	<0.01	0.037	<1
TBGC-7A_209.5-219.5	1,960	<1	266	77.1	<0.125	<0.01	0.026	<1
TBGC-7A_219.5-229.5	1,880	<1	239	64.5	<0.126	<0.01	0.023	<1
TBGC-7A_229.5-239.5	3,820	<1	513	128	<0.125	<0.01	0.049	<1
TBGC-7A_239.5-249.5	4,560	<1	610	152	<0.125	<0.01	0.072	<1
TBGC-7A_249.5-259.5	3,860	<1	356	123	<0.125	<0.01	0.046	<1
TBGC-7A_259.5-263	2,450	<1	307	77.5	<0.125	<0.01	0.041	<1

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Carbonate (mg/L as $CaCO_3$)	Cation Sum (meq/L)	Cation-Anion Balance (%)	Chloride (mg/L)	Chromium (mg/L)
TBGC-1_0-9.5	<0.04	<0.002	10.3	<1	1.31	1.55	1.58	<0.006
TBGC-1_9.5-19.5	0.0430	<0.002	10.6	<1	1.42	-1.05	3.29	<0.006
TBGC-1_19.5-29.5	0.0560	0.00240	27.7	<1	3.30	0.150	1.80	<0.006
TBGC-1_29.5-39.5	0.0890	<0.002	8.67	<1	1.13	-0.440	1.55	<0.006
TBGC-1_39.5-49.5	<0.04	<0.002	8.55	<1	1.24	-0.800	2.17	<0.006
TBGC-1_49.5-59.5	0.0450	<0.002	4.91	<1	0.750	0.670	2.07	<0.006
TBGC-1_59.5-69.5	0.0560	0.0345	155	<1	16.1	1.58	6.35	<0.006
TBGC-1_69.5-79.5	<0.04	<0.002	24.3	<1	3.84	0.660	26.7	<0.006
TBGC-1_79.5-89.5	<0.04	0.00200	30.4	<1	4.17	2.21	19.7	<0.006
TBGC-1_89.5-99.5	0.0590	0.0208	128	<1	12.4	-1.12	17.4	<0.006
TBGC-1_99.5-109.5	0.0600	0.408	323	<1	60.9	-4.08	<10	<0.006
TBGC-1_109.5-119.5	0.0780	0.0840	85.0	<1	12.5	-9.03	1.71	<0.006
TBGC-1_119.5-129.5	0.0880	0.0233	130	<1	73.5	-6.62	<10	0.0587
TBGC-1_129.5-139.5	<0.2	0.0580	109	<1	131	-8.55	<10	0.0890
TBGC-1_139.5-149.5	<0.2	0.0620	116	<1	147	-8.62	<10	0.0800
TBGC-1_149.5-159.5	<0.2	0.130	81.7	<1	151	-10.0	<10	0.0350
TBGC-1_159.5-169.5	<0.04	0.0347	72.2	<1	9.96	-4.09	8.18	<0.006
TBGC-1_169.5-179.5	0.0520	3.10	293	<1	89.8	-8.23	<10	<0.006
TBGC-1_179.5-189.5	0.0710	0.00780	14.1	<1	2.28	-2.98	3.01	<0.006
TBGC-1_189.5-199.5	0.0780	<0.002	10.3	<1	1.94	-0.260	9.54	<0.006
TBGC-1_199.5-209.5	<0.04	0.00230	11.6	<1	1.91	0.530	6.90	<0.006
TBGC-1_209.5-219.5	0.0410	0.00350	14.5	<1	2.36	-1.46	3.56	<0.006
TBGC-1_219.5-222	0.0430	1.32	81.7	<1	26.3	0.590	<2	<0.006
TBGC-2_0-9.5	<0.4	1.13	298	<1	139	-5.57	10.2	0.308
TBGC-2_9.5-19.5	<0.4	0.592	289	<1	81.2	-10.6	10.3	<0.06
TBGC-2_19.5-29.5	<0.4	0.236	177	<1	46.9	-7.66	<10	<0.06
TBGC-2_29.5-39.5	<0.4	0.182	246	<1	60.7	-8.43	<10	<0.06
TBGC-2_39.5-49.5	<0.8	0.660	347	<1	90.4	-9.00	<10	<0.12
TBGC-2_49.5-59.5	<0.4	0.619	229	<1	59.3	-5.33	<10	<0.06
TBGC-2_59.5-69.5	<0.4	0.432	305	<1	69.7	-4.72	<10	<0.06
TBGC-2_69.5-79.5	<0.4	0.249	346	<1	65.4	-5.37	<10	<0.06
TBGC-2_79.5-89.5	0.071	0.105	208	<1	41.8	-4.74	<5	0.0213
TBGC-3_0-9.5	<0.2	0.0690	210	<1	41.8	-5.42	<10	<0.03
TBGC-3_9.5-19.5	<0.2	0.0330	160	<1	19.2	-2.94	2.53	<0.03

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Carbonate (mg/L as $CaCO_3$)	Cation Sum (meq/L)	Cation-Anion Balance (%)	Chloride (mg/L)	Chromium (mg/L)
TBGC-3_19.5-29.5	<0.2	0.0200	262	<1	56.3	-5.15	<10	<0.03
TBGC-3_29.5-39.5	<0.2	0.0470	194	<1	32.2	-7.27	<10	<0.03
TBGC-3_39.5-49.5	<0.2	0.0590	241	<1	37.7	-7.27	<10	<0.03
TBGC-3_49.5-59.5	<0.2	0.127	365	<1	54.4	-3.62	<10	<0.03
TBGC-3_59.5-69.5	<0.2	0.165	373	<1	64.3	-4.42	<10	<0.03
TBGC-3_69.5-79.5	<0.2	0.113	347	<1	59.8	-4.38	<10	<0.03
TBGC-3_79.5-89.5	<0.2	0.0720	336	<1	62.5	-4.41	<10	<0.03
TBGC-3_89.5-99.5	<0.2	0.105	374	<1	64.4	-4.72	<10	<0.03
TBGC-3_99.5-109.5	<0.2	0.131	352	<1	72.8	-5.33	<10	<0.03
TBGC-3_109.5-119.5	<0.2	0.109	297	<1	57.5	-7.10	<10	<0.03
TBGC-3_119.5-129.5	<0.2	0.113	318	<1	65.5	-6.98	<10	<0.03
TBGC-3_129.5-139.5	<0.2	0.109	304	<1	46.9	-4.38	<10	<0.03
TBGC-3_13.95-149.5	<0.2	0.182	309	<1	53.1	-4.66	<10	<0.03
TBGC-3_149.5-159.5	<0.2	0.107	177	<1	34.6	-4.87	<10	<0.03
TBGC-3_159.5-169.5	<0.2	0.124	166	<1	35.0	-5.82	<10	<0.03
TBGC-3_169.5-179.5	<0.2	0.177	253	<1	46.9	-4.20	<10	<0.03
TBGC-4_0-9.5	0.120	0.0231	93.3	<1	9.95	-4.78	2.16	<0.006
TBGC-4_9.5-19.5	<0.4	0.0270	212	<1	27.6	-6.84	<5	<0.06
TBGC-4_19.5-29.5	<0.4	0.0510	311	<1	39.1	-7.18	<5	<0.06
TBGC-4_29.5-39.5	<0.4	0.223	212	<1	50.8	-5.37	<5	<0.06
TBGC-4_39.5-49.5	<0.4	0.0690	347	<1	65.1	-5.04	<10	<0.06
TBGC-5_0-9.5	0.087	<0.002	31	<1	4.62	-2.43	3.05	<0.006
TBGC-5_9.5-19.5	0.12	0.0308	174	<1	15.7	-0.92	2.98	<0.006
TBGC-5_19.5-29.5	0.07	0.272	223	<1	26.2	-3.88	3.15	<0.006
TBGC-5_29.5-39.5	0.052	0.341	226	<1	32.7	-4.36	2.22	<0.006
TBGC-5_39.5-49.5	<0.2	1.16	319	<1	100	-6.06	<5	<0.03
TBGC-5_49.5-59.5	0.051	0.12	159	<1	20.6	-5.49	4.07	<0.006
TBGC-5_59.5-69.5	0.055	0.32	271	<1	41.2	-7.15	9.93	<0.006
TBGC-5_69.5-79.5	<0.2	0.725	364	<1	68.3	-7.79	5.15	<0.03
TBGC-5_79.5-89.5	0.064	0.0118	64.6	<1	6.17	-1.44	5.82	<0.006
TBGC-5_89.5-99.5	0.062	0.0374	129	<1	12.6	-2.62	0.79	<0.006
TBGC-5_99.5-109.5	0.052	0.164	229	<1	26.6	-4.22	2.42	<0.006
TBGC-5_109.5-119.5	0.074	0.009	68.9	<1	6.67	-0.97	7.68	<0.006
TBGC-5_119.5-129.5	0.06	<0.002	9.55	<1	1.38	-0.36	3.56	<0.006

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Carbonate (mg/L as $CaCO_3$)	Cation Sum (meq/L)	Cation-Anion Balance (%)	Chloride (mg/L)	Chromium (mg/L)
TBGC-5_129.5-139.5	0.072	<0.002	35.4	<1	4.86	-1.92	9.07	<0.006
TBGC-6_0-9.5	<0.04	1.30	102	<1	27.9	-1.08	2.26	<0.006
TBGC-6_9.5-19.5	<0.04	1.52	134	<1	42.5	-0.680	<2	<0.006
TBGC-6_19.5-29.5	<0.04	2.91	118	<1	30.7	1.32	3.64	<0.006
TBGC-6_29.5-39.5	0.0570	1.06	46.1	<1	25.4	-6.38	<2	0.0278
TBGC-6_39.5-49.5	0.0510	0.966	119	<1	65.8	-4.69	<5	0.115
TBGC-6_49.5-59.5	0.0450	0.871	217	<1	60.4	-4.74	<5	0.0505
TBGC-6_59.5-69.5	0.0530	0.753	77.8	<1	47.4	-5.45	<5	0.0340
TBGC-6_69.5-79.5	0.0500	0.747	42.0	<1	45.5	-4.88	<5	0.0301
TBGC-6_79.5-89.5	0.0650	1.94	111	<1	99.7	-8.59	<10	0.0816
TBGC-6_89.5-99.5	0.0620	0.861	120	<1	47.4	-5.71	<5	0.0123
TBGC-6_99.5-107	0.0880	0.624	131	<1	37.6	-5.82	2.78	<0.006
TBGC-7_0-9.5	<0.2	0.041	517	<1	41.3	-0.75	7.47	<0.03
TBGC-7_9.5-19.5	<0.2	0.059	212	<1	29.9	-0.83	5.4	<0.03
TBGC-7_19.5-29.5	<0.2	0.532	170	<1	83	-2.32	<5	0.049
TBGC-7_29.5-39.5	<0.2	1.7	353	<1	129	-8.66	<5	0.106
TBGC-7_39.5-49.5	<0.2	1.99	462	<1	163	-4.04	<5	0.226
TBGC-7_49.5-59.5	<0.2	1.8	320	<1	131	-4.93	<5	0.125
TBGC-7_59.5-69.5	<0.2	2.71	478	<1	222	-1.94	<10	0.258
TBGC-7_69.5-79.5	<0.2	1.07	234	<1	78.8	-1.95	<5	0.101
TBGC-7_79.5-89.5	<0.2	1.51	315	<1	106	-2.26	<5	0.086
TBGC-7_89.5-99.5	<0.2	1.12	305	<1	81.7	-3.42	<5	0.04
TBGC-7_99.5-109.5	<0.2	0.612	118	<1	41	-4.5	<5	0.085
TBGC-7_109.5-119.5	<0.2	0.559	128	<1	38	-6.45	<5	0.076
TBGC-7_119.5-129.5	<0.2	1.92	368	<1	140	-2.94	<5	0.196
TBGC-7_129.5-139.5	<0.2	1.77	318	<1	120	-6.83	<5	0.032
TBGC-7_139.5-149.5	<0.2	1.39	379	<1	102	-4.29	<5	<0.03
TBGC-7_149.5-159.5	<0.2	1.43	329	<1	104	-3.43	<5	0.137
TBGC-7_159.5-169.5	<0.2	1.86	234	<1	97.9	-6.49	<5	<0.03
TBGC-7_169.5-179.5	<0.2	1.84	317	<1	98	-2.89	<5	0.031
TBGC-7_179.5-189.5	<0.2	1.67	402	<1	127	-3.69	<5	0.197
TBGC-7_189.5-199.5	<0.2	1.16	200	<1	78.6	-5.5	<10	0.147
TBGC-7_199.5-209.5	<0.2	1.48	248	<1	105	-3.62	<10	0.142
TBGC-7_209.5-219.5	<0.2	1.46	191	<1	74.1	-2.86	<10	<0.03

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Carbonate (mg/L as $CaCO_3$)	Cation Sum (meq/L)	Cation-Anion Balance (%)	Chloride (mg/L)	Chromium (mg/L)
TBGC-7_219.5-229.5	<0.2	2.13	313	<1	98.7	-4.06	<10	<0.03
TBGC-7_229.5-239.5	<0.2	1.93	200	<1	76.3	-11.1	<10	<0.03
TBGC-7_239.5-249.5	<0.2	1.23	315	<1	100	-7.17	<10	<0.03
TBGC-7_249.5-259.5	<0.2	1.39	303	<1	105	-6.9	<10	<0.03
TBGC-7_259.5-269.5	<0.2	1.61	240	<1	104	-6.53	<10	0.133
TBGC-7_269.5-279.5	<0.2	1.21	231	<1	81.9	-3.87	<10	<0.03
TBGC-7_279.5-289.5	<0.2	1.86	249	<1	87.1	-13	<10	<0.03
TBGC-7A_0-9.5	<0.2	1.58	131	<1	51.8	-5.26	<0.5	<0.03
TBGC-7A_9.5-19.5	<0.2	2.31	120	<1	20	-60.4	<10	<0.03
TBGC-7A_19.5-29.5	<0.2	2.03	141	<1	80.6	3.56	<10	<0.03
TBGC-7A_29.5-39.5	<0.2	0.675	186	<1	72.7	-3.07	<10	<0.03
TBGC-7A_39.5-49.5	<0.2	1.25	342	<1	140	-4.24	<10	<0.03
TBGC-7A_49.5-59.5	<0.2	0.92	180	<1	104	-4.29	<10	0.039
TBGC-7A_59.5-69.5	<0.2	0.736	95.1	<1	146	-2.75	<10	<0.03
TBGC-7A_69.5-79.5	<0.2	1.4	264	<1	171	-4.6	<10	0.081
TBGC-7A_79.5-89.5	<0.04	1.21	285	<1	150	-3.85	<10	0.057
TBGC-7A_89.5-99.5	<0.2	1.42	255	<1	114	-3.91	<10	0.049
TBGC-7A_99.5-109.5	<0.2	1.61	232	<1	106	-9.23	<10	0.043
TBGC-7A_109.5-119.5	<0.2	1.57	264	<1	110	-6.07	<10	0.096
TBGC-7A_119.5-129.5	<0.2	1.47	337	<1	108	-6.37	<10	0.036
TBGC-7A_129.5-139.5	<0.2	2	378	<1	133	-8.45	<10	0.045
TBGC-7A_139.5-149.5	<0.2	1.32	351	<1	92.9	-6.36	<10	0.046
TBGC-7A_149.5-159.5	<0.2	1.45	375	<1	105	-6.05	<10	0.061
TBGC-7A_159.5-169.5	<0.2	0.902	191	<1	56.5	-7.67	<10	<0.03
TBGC-7A_169.5-179.5	<0.2	0.371	92.6	<1	18.3	-9.23	<10	<0.03
TBGC-7A_179.5-189.5	<0.2	0.645	143	<1	39.1	-5.68	<10	<0.03
TBGC-7A_189.5-199.5	<0.2	0.985	144	<1	51.3	-5.11	<10	0.048
TBGC-7A_199.5-209.5	<0.2	1.79	264	<1	92.7	-6.34	<10	0.091
TBGC-7A_209.5-219.5	<0.2	0.987	341	<1	70.1	-4.77	<10	0.047
TBGC-7A_219.5-229.5	<0.2	0.979	151	<1	57.8	-5.55	<10	0.082
TBGC-7A_229.5-239.5	<0.2	1.82	357	<1	117	-4.22	<10	0.14
TBGC-7A_239.5-249.5	<0.2	3.53	356	<1	135	-6.14	<10	0.035
TBGC-7A_249.5-259.5	<0.2	3.12	174	<1	102	-9.75	<10	0.071
TBGC-7A_259.5-263	<0.2	1.83	198	<1	72.5	-3.31	<10	0.032

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Cobalt (mg/L)	Copper (mg/L)	EC (µmhos/cm)	Eh (mv)	Fluoride (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)
TBGC-1_0-9.5	<0.006	0.0250	149	236	0.597	<0.06	<0.005	2.17
TBGC-1_9.5-19.5	<0.006	0.205	165	273	1.65	<0.06	<0.005	2.41
TBGC-1_19.5-29.5	0.00940	3.26	353	318	2.69	<0.06	<0.005	5.91
TBGC-1_29.5-39.5	<0.006	0.0510	140	280	0.987	<0.06	<0.005	2.02
TBGC-1_39.5-49.5	<0.006	0.202	152	292	0.795	<0.06	<0.005	2.01
TBGC-1_49.5-59.5	<0.006	0.0130	86.0	277	1.16	<0.06	<0.005	1.22
TBGC-1_59.5-69.5	0.112	16.2	1,340	341	2.39	<0.06	<0.005	56.1
TBGC-1_69.5-79.5	<0.006	<0.01	438	281	1.33	<0.06	<0.005	7.44
TBGC-1_79.5-89.5	<0.006	0.0100	462	286	1.64	<0.06	<0.005	9.27
TBGC-1_89.5-99.5	0.0393	1.40	1,160	314	0.500	<0.06	<0.005	41.3
TBGC-1_99.5-109.5	1.38	312	3,790	351	34.8	2.78	0.103	232
TBGC-1_109.5-119.5	0.712	72.6	1,220	355	4.10	<0.06	0.0266	29.1
TBGC-1_119.5-129.5	2.09	96.6	3,630	389	13.2	32.7	0.0236	26.0
TBGC-1_129.5-139.5	3.56	1,540	6,170	388	14.7	76.7	0.382	40.9
TBGC-1_139.5-149.5	3.98	1,850	6,790	390	14.2	81.6	0.468	44.5
TBGC-1_149.5-159.5	4.51	2,250	7,020	378	14.7	45.8	0.648	73.7
TBGC-1_159.5-169.5	0.139	64.6	1,060	337	4.38	3.95	0.0162	21.7
TBGC-1_169.5-179.5	1.38	451	5,210	366	154	3.45	0.305	211
TBGC-1_179.5-189.5	0.00860	1.43	289	322	0.649	0.812	<0.005	3.86
TBGC-1_189.5-199.5	<0.006	0.256	245	301	0.307	0.636	<0.005	3.13
TBGC-1_199.5-209.5	0.0254	4.57	246	384	0.162	<0.06	<0.005	3.16
TBGC-1_209.5-219.5	0.0541	10.2	290	346	0.310	0.330	<0.005	4.48
TBGC-1_219.5-222	0.523	466	1,800	390	4.63	0.953	0.211	29.9
TBGC-2_0-9.5	5.99	172	6,660	442	30.9	14.4	0.0510	390
TBGC-2_9.5-19.5	2.68	373	4,830	419	44.0	1.77	0.0570	243
TBGC-2_19.5-29.5	1.29	392	3,080	409	17.1	4.70	<0.05	89.4
TBGC-2_29.5-39.5	2.06	816	3,860	428	29.6	0.280	0.110	160
TBGC-2_39.5-49.5	1.74	1,440	5,240	387	41.1	3.44	0.110	200
TBGC-2_49.5-59.5	1.41	344	3,490	383	28.1	3.52	0.0700	136
TBGC-2_59.5-69.5	1.35	155	3,810	440	20.5	5.26	<0.05	145
TBGC-2_69.5-79.5	2.00	233	3,820	353	21.4	126	<0.05	144
TBGC-2_79.5-89.5	1.16	113	2,730	399	14.4	13.8	0.0228	92.3
TBGC-3_0-9.5	1.57	350	2,400	449	11.5	<0.1	0.0443	108
TBGC-3_9.5-19.5	0.309	97.1	1,610	408	3.59	<0.1	<0.025	60.3

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Cobalt (mg/L)	Copper (mg/L)	EC (µmhos/cm)	Eh (mv)	Fluoride (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)
TBGC-3_19.5-29.5	0.949	641	3,570	415	9.98	1.86	0.0505	123
TBGC-3_29.5-39.5	1.61	240	2,500	441	9.75	<0.1	0.0328	111
TBGC-3_39.5-49.5	1.55	135	2,720	453	13.7	<0.1	<0.025	91.4
TBGC-3_49.5-59.5	1.26	71.7	3,360	480	16.9	3.02	<0.025	107
TBGC-3_59.5-69.5	2.13	176	3,830	415	19.2	1.80	<0.025	129
TBGC-3_69.5-79.5	3.15	355	3,750	379	16.7	3.33	0.0690	139
TBGC-3_79.5-89.5	2.72	425	3,840	375	19.2	17.8	0.0600	155
TBGC-3_89.5-99.5	3.30	440	4,000	424	22.4	<0.1	0.0650	184
TBGC-3_99.5-109.5	3.33	355	4,260	416	21.2	<0.1	0.0630	170
TBGC-3_109.5-119.5	3.27	443	3,850	395	19.9	<0.1	0.0745	172
TBGC-3_119.5-129.5	3.74	444	4,250	398	24.2	<0.1	0.147	211
TBGC-3_129.5-139.5	2.02	329	3,270	383	13.2	0.360	0.0615	154
TBGC-3_13.95-149.5	2.43	441	3,580	403	17.5	<0.1	0.0580	164
TBGC-3_149.5-159.5	1.42	307	2,560	373	12.8	1.45	0.0432	108
TBGC-3_159.5-169.5	1.51	344	2,590	385	11.4	0.560	0.0428	107
TBGC-3_169.5-179.5	2.00	447	3,210	405	13.4	<0.1	0.0585	133
TBGC-4_0-9.5	0.172	47.8	929	381	2.45	0.536	0.0074	18.2
TBGC-4_9.5-19.5	0.707	166	2,080	448	6.12	0.370	<0.05	47.2
TBGC-4_19.5-29.5	1.18	177	2,610	469	9.93	<0.2	<0.05	78.4
TBGC-4_29.5-39.5	1.27	380	3,100	471	16.9	5.20	<0.05	100
TBGC-4_39.5-49.5	1.74	271	3,800	393	21.9	15.9	<0.05	180
TBGC-5_0-9.5	<0.006	0.043	488	228	4.84	0.041	<0.005	5.27
TBGC-5_9.5-19.5	0.139	14.5	1,370	337	3.18	<0.02	<0.005	38.3
TBGC-5_19.5-29.5	0.682	68.5	2,040	381	13.9	0.097	0.0131	92.3
TBGC-5_29.5-39.5	1.04	86.5	2,330	349	12.7	10.2	0.0167	107
TBGC-5_39.5-49.5	3.73	553	5,260	445	9.13	1.4	0.0925	255
TBGC-5_49.5-59.5	0.494	102	1,730	398	6.4	0.063	0.0182	62.8
TBGC-5_59.5-69.5	1.54	175	2,960	392	21.4	0.05	0.0518	156
TBGC-5_69.5-79.5	3.53	474	4,360	422	28.4	<0.1	0.072	225
TBGC-5_79.5-89.5	0.029	1.49	635	367	0.83	<0.02	<0.005	17.3
TBGC-5_89.5-99.5	0.17	27.6	1,140	403	1.89	<0.02	<0.005	39.1
TBGC-5_99.5-109.5	0.775	102	2,080	395	7.37	0.134	0.0168	94.2
TBGC-5_109.5-119.5	0.0437	2.11	678	351	0.6	<0.02	<0.005	19
TBGC-5_119.5-129.5	<0.006	0.0306	166	317	0.82	0.109	<0.005	2.43

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Cobalt (mg/L)	Copper (mg/L)	EC (µmhos/cm)	Eh (mv)	Fluoride (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)
TBGC-5_129.5-139.5	0.012	0.312	528	300	0.83	0.097	<0.005	12.3
TBGC-6_0-9.5	0.540	470	1,940	381	4.50	1.03	0.215	32.0
TBGC-6_9.5-19.5	0.771	807	2,660	412	7.14	0.275	0.363	45.6
TBGC-6_19.5-29.5	0.516	479	2,050	417	3.67	<0.06	0.223	36.2
TBGC-6_29.5-39.5	0.627	192	1,830	450	16.0	18.2	0.0473	60.7
TBGC-6_39.5-49.5	1.41	179	3,830	585	35.5	47.4	0.0517	158
TBGC-6_49.5-59.5	1.28	185	3,440	546	36.3	14.9	0.0517	158
TBGC-6_59.5-69.5	1.21	120	2,840	539	32.8	5.73	0.0388	157
TBGC-6_69.5-79.5	1.17	164	2,690	520	30.8	4.73	0.0454	147
TBGC-6_79.5-89.5	2.70	106	5,210	590	81.1	72.8	0.0761	329
TBGC-6_89.5-99.5	1.20	130	2,880	365	32.8	57.9	0.0378	159
TBGC-6_99.5-107	0.915	271	2,490	361	22.2	15.1	0.0893	121
TBGC-7_0-9.5	0.585	41.1	2,770	489	6.68	0.69	<0.025	78
TBGC-7_9.5-19.5	0.586	66.2	2,110	564	9.08	8.75	<0.025	85.3
TBGC-7_19.5-29.5	1.49	336	4,170	594	16.3	66	0.0725	215
TBGC-7_29.5-39.5	2.93	184	6,530	612	74.5	75.1	0.08	309
TBGC-7_39.5-49.5	3.27	85.2	7,320	633	80.4	194	0.0545	399
TBGC-7_49.5-59.5	2.94	66.5	6,440	630	78.4	155	0.291	313
TBGC-7_59.5-69.5	5.19	287	9,320	631	81.9	203	0.098	602
TBGC-7_69.5-79.5	1.76	73	4,220	541	45.2	45.1	0.0301	219
TBGC-7_79.5-89.5	2.47	69.1	5,180	565	53.5	42.5	0.0375	298
TBGC-7_89.5-99.5	1.87	76.2	4,400	585	49.2	41.1	<0.025	246
TBGC-7_99.5-109.5	0.992	14.5	2,580	573	33.8	15.5	<0.025	109
TBGC-7_109.5-119.5	0.885	10.2	2,690	578	28.6	21	<0.025	93.6
TBGC-7_119.5-129.5	3.02	57.2	6,350	535	89.6	184	0.05	374
TBGC-7_129.5-139.5	2.89	207	5,440	556	76.8	78.4	0.0725	290
TBGC-7_139.5-149.5	2.44	218	5,280	600	45.8	91.5	0.079	278
TBGC-7_149.5-159.5	2.3	50.4	5,250	573	49.4	101	0.046	281
TBGC-7_159.5-169.5	2.89	223	4,920	460	53.3	30.5	0.0675	271
TBGC-7_169.5-179.5	2.8	191	4,900	543	53.6	10.2	0.0575	244
TBGC-7_179.5-189.5	2.66	71.4	5,940	624	54.2	161	0.0421	333
TBGC-7_189.5-199.5	1.95	25.8	4,830	596	59.5	93.3	<0.025	210
TBGC-7_199.5-209.5	2.31	47.9	5,620	602	72.7	81	<0.025	273
TBGC-7_209.5-219.5	3.01	310	4,040	432	51.3	5.87	0.073	179

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Cobalt (mg/L)	Copper (mg/L)	EC (µmhos/cm)	Eh (mv)	Fluoride (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)
TBGC-7_219.5-229.5	4.32	383	5,170	452	67	<0.3	0.095	219
TBGC-7_229.5-239.5	3.14	700	4,850	459	59.6	<0.3	0.191	141
TBGC-7_239.5-249.5	2.71	1,210	5,690	404	52	9.5	0.307	283
TBGC-7_249.5-259.5	2.68	1,140	5,730	378	56.7	23.2	0.246	294
TBGC-7_259.5-269.5	2.6	54.9	5,630	578	77.1	53.9	<0.025	259
TBGC-7_269.5-279.5	4.77	150	4,660	561	57.4	8.96	0.0458	240
TBGC-7_279.5-289.5	10.7	400	5,930	478	61.8	<0.3	0.128	362
TBGC-7A_0-9.5	1.11	143	3,250	386	115	2.43	0.049	140
TBGC-7A_9.5-19.5	1.78	1,120	4,400	380	75.8	2.51	0.327	163
TBGC-7A_19.5-29.5	2.43	243	4,130	367	30.9	64	0.0585	277
TBGC-7A_29.5-39.5	1.54	177	4,010	387	38.3	2.14	0.0305	246
TBGC-7A_39.5-49.5	3.86	180	6,690	529	141	16.6	0.0505	492
TBGC-7A_49.5-59.5	1.79	93.5	5,140	365	39	101	0.0331	289
TBGC-7A_59.5-69.5	1.72	334	6,590	422	22.7	299	0.056	215
TBGC-7A_69.5-79.5	2.72	471	7,130	574	43.8	116	0.0965	370
TBGC-7A_79.5-89.5	2.37	315	6,740	584	49.3	54.4	0.0695	379
TBGC-7A_89.5-99.5	2.27	255	4,230	431	57.1	33.2	<0.025	297
TBGC-7A_99.5-109.5	2.93	182	5,530	527	75	37.8	0.026	235
TBGC-7A_109.5-119.5	3.15	151	4,640	523	73.9	5.53	0.0256	297
TBGC-7A_119.5-129.5	3.17	153	5,270	502	76	1.2	0.0328	293
TBGC-7A_129.5-139.5	3.42	281	6,470	444	83.7	62.5	0.0378	346
TBGC-7A_139.5-149.5	2.09	159	4,760	383	63.3	60.4	<0.025	253
TBGC-7A_149.5-159.5	2.23	87.7	5,220	411	67.4	141	<0.025	301
TBGC-7A_159.5-169.5	1.45	112	3,530	530	56.2	28.7	<0.025	158
TBGC-7A_169.5-179.5	0.459	43.9	1,460	361	26.9	9.7	<0.025	53.1
TBGC-7A_179.5-189.5	1.01	67.5	2,450	362	55.4	22.7	<0.025	117
TBGC-7A_189.5-199.5	1.19	50.1	3,010	378	34.4	58.5	<0.025	135
TBGC-7A_199.5-209.5	2.08	70.7	4,660	567	76.1	64.3	<0.025	218
TBGC-7A_209.5-219.5	1.32	72.9	3,910	565	53.9	31.8	<0.025	165
TBGC-7A_219.5-229.5	1.37	104	3,270	557	46.1	15.7	<0.025	151
TBGC-7A_229.5-239.5	2.16	61.8	5,560	392	64.3	91.3	<0.025	280
TBGC-7A_239.5-249.5	2.82	265	6,040	357	74.8	52.2	<0.025	306
TBGC-7A_249.5-259.5	2.49	211	5,140	361	70.4	63.9	<0.025	187
TBGC-7A_259.5-263	1.51	119	3,580	359	46.1	63.9	<0.025	164

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Manganese (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	pH (su)	Potassium (mg/L)	Selenium (mg/L)	Silica (mg/L)	Silver (mg/L)
TBGC-1_0-9.5	0.307	<0.008	<0.01	6.28	6.17	<0.04	6.71	<0.005
TBGC-1_9.5-19.5	0.112	<0.008	<0.01	6.24	8.61	<0.04	22.2	<0.005
TBGC-1_19.5-29.5	1.62	<0.008	<0.01	5.16	21.6	<0.04	14.1	<0.005
TBGC-1_29.5-39.5	0.147	0.00860	<0.01	6.45	7.92	<0.04	10.2	<0.005
TBGC-1_39.5-49.5	0.146	<0.008	<0.01	5.67	8.48	<0.04	15.1	<0.005
TBGC-1_49.5-59.5	0.0273	0.0154	<0.01	6.56	4.28	<0.04	12.0	<0.005
TBGC-1_59.5-69.5	11.3	0.00920	0.103	5.00	13.9	<0.04	20.8	<0.005
TBGC-1_69.5-79.5	0.155	0.0946	<0.01	6.72	12.4	<0.04	36.1	<0.005
TBGC-1_79.5-89.5	0.835	0.0213	<0.01	6.55	17.3	<0.04	39.8	<0.005
TBGC-1_89.5-99.5	4.81	0.0118	0.0470	6.07	7.34	<0.04	22.7	<0.005
TBGC-1_99.5-109.5	112	0.00850	0.836	4.07	5.65	<0.04	10.8	0.0132
TBGC-1_109.5-119.5	44.8	0.00980	0.261	3.96	25.2	<0.04	18.5	<0.005
TBGC-1_119.5-129.5	26.1	0.0145	0.419	3.20	2.23	<0.04	22.6	<0.005
TBGC-1_129.5-139.5	47.1	<0.04	0.847	3.28	<2.5	<0.2	7.53	0.0570
TBGC-1_139.5-149.5	51.1	<0.04	0.901	3.20	3.10	<0.2	7.87	0.0640
TBGC-1_149.5-159.5	70.0	<0.04	1.09	3.45	2.50	<0.2	12.3	0.0745
TBGC-1_159.5-169.5	7.64	<0.008	0.109	4.22	41.9	<0.04	29.6	<0.005
TBGC-1_169.5-179.5	231	0.00870	1.27	4.03	13.2	<0.04	11.9	0.0225
TBGC-1_179.5-189.5	0.843	<0.008	<0.01	4.79	23.4	<0.04	15.4	<0.005
TBGC-1_189.5-199.5	0.114	<0.008	<0.01	5.00	22.3	<0.04	18.1	<0.005
TBGC-1_199.5-209.5	0.508	<0.008	<0.01	4.67	17.3	<0.04	17.2	<0.005
TBGC-1_209.5-219.5	0.772	<0.008	0.0150	5.14	21.0	<0.04	12.2	<0.005
TBGC-1_219.5-222	12.4	<0.008	<0.01	4.61	19.0	<0.04	6.81	0.0115
TBGC-2_0-9.5	315	0.109	1.24	3.02	<10	<0.1	20.4	<0.05
TBGC-2_9.5-19.5	231	0.101	0.650	3.50	12.0	<0.1	16.7	<0.05
TBGC-2_19.5-29.5	98.9	<0.08	0.400	3.60	<10	<0.1	13.9	<0.05
TBGC-2_29.5-39.5	177	<0.08	0.850	4.06	16.0	<0.1	17.3	0.0510
TBGC-2_39.5-49.5	184	<0.16	0.790	4.10	38.0	<0.2	17.3	<0.1
TBGC-2_49.5-59.5	191	<0.08	0.430	3.85	15.0	<0.1	15.8	<0.05
TBGC-2_59.5-69.5	224	<0.08	0.490	3.36	<10	<0.1	19.0	<0.05
TBGC-2_69.5-79.5	186	<0.08	0.700	3.67	11.0	<0.1	21.3	<0.05
TBGC-2_79.5-89.5	64.3	0.0112	0.539	3.29	15.2	<0.01	22.0	0.0054
TBGC-3_0-9.5	145	0.0490	0.480	3.72	16.9	<0.05	22.8	<0.025
TBGC-3_9.5-19.5	24.3	<0.04	0.111	4.69	26.7	<0.05	20.8	<0.025

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Manganese (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	pH (su)	Potassium (mg/L)	Selenium (mg/L)	Silica (mg/L)	Silver (mg/L)
TBGC-3_19.5-29.5	29.3	0.0440	0.322	3.61	18.9	<0.05	22.9	0.0364
TBGC-3_29.5-39.5	116	0.0480	0.458	4.33	28.2	<0.05	23.3	<0.025
TBGC-3_39.5-49.5	153	0.0440	0.624	3.86	26.3	<0.05	18.9	<0.025
TBGC-3_49.5-59.5	115	0.0480	0.609	3.42	12.1	<0.05	22.8	<0.025
TBGC-3_59.5-69.5	178	0.0470	0.851	3.70	22.7	<0.05	28.0	<0.025
TBGC-3_69.5-79.5	248	0.0650	0.915	3.91	25.2	<0.05	26.3	<0.025
TBGC-3_79.5-89.5	208	0.0620	1.02	3.83	23.9	<0.05	29.9	0.0268
TBGC-3_89.5-99.5	256	0.0690	1.15	3.90	24.0	<0.05	30.5	0.0280
TBGC-3_99.5-109.5	314	0.0640	1.11	3.80	25.1	<0.05	29.9	<0.025
TBGC-3_109.5-119.5	283	0.0660	1.08	4.12	28.4	<0.05	24.1	0.0290
TBGC-3_119.5-129.5	355	0.0690	1.24	3.94	33.2	<0.05	23.5	0.0293
TBGC-3_129.5-139.5	176	0.0600	0.721	4.27	54.3	<0.05	22.2	<0.025
TBGC-3_13.95-149.5	206	0.0600	0.830	4.25	45.8	<0.05	24.1	0.0275
TBGC-3_149.5-159.5	124	0.0470	0.507	4.37	46.8	<0.05	16.2	<0.025
TBGC-3_159.5-169.5	130	0.0480	0.488	4.34	41.7	<0.05	21.7	<0.025
TBGC-3_169.5-179.5	145	0.0560	0.574	4.21	43.5	<0.05	28.9	0.0302
TBGC-4_0-9.5	11.4	0.0089	0.104	4.36	10.5	<0.01	10.6	<0.005
TBGC-4_9.5-19.5	60.3	<0.08	0.270	3.62	11.0	<0.1	21.0	<0.05
TBGC-4_19.5-29.5	86.6	<0.08	0.400	3.71	<10	<0.1	25.1	<0.05
TBGC-4_29.5-39.5	99.6	<0.08	0.480	3.60	<10	<0.1	15.8	<0.05
TBGC-4_39.5-49.5	139	<0.08	0.660	3.50	<10	<0.1	20.2	<0.05
TBGC-5_0-9.5	0.0712	0.73	<0.01	6.82	6.1	0.034	18	<0.005
TBGC-5_9.5-19.5	8.23	0.0159	0.047	5.18	16.2	<0.01	22.7	<0.005
TBGC-5_19.5-29.5	34.4	0.0126	0.19	4.41	18.9	<0.01	18.9	<0.005
TBGC-5_29.5-39.5	61.1	0.0114	0.23	3.93	11.1	<0.01	17.3	<0.005
TBGC-5_39.5-49.5	202	0.061	0.656	3.50	5.4	<0.05	22.6	0.0298
TBGC-5_49.5-59.5	26.4	0.0124	0.151	4.35	18.8	<0.01	23.7	0.0052
TBGC-5_59.5-69.5	104	0.01	0.366	4.20	19.8	<0.01	21.1	0.0114
TBGC-5_69.5-79.5	197	0.056	0.524	3.81	23.1	<0.05	24.1	0.0292
TBGC-5_79.5-89.5	1.33	0.0121	0.016	6.18	6.7	<0.01	25.5	<0.005
TBGC-5_89.5-99.5	7.37	0.0116	0.045	4.75	14.4	<0.01	24	<0.005
TBGC-5_99.5-109.5	29.9	0.0113	0.167	4.26	14.9	<0.01	22.3	0.0067
TBGC-5_109.5-119.5	1.66	0.0127	0.017	5.64	10.2	<0.01	21.3	<0.005
TBGC-5_119.5-129.5	0.0625	0.0549	<0.01	5.89	3.8	<0.01	17.8	<0.005

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Manganese (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	pH (su)	Potassium (mg/L)	Selenium (mg/L)	Silica (mg/L)	Silver (mg/L)
TBGC-5_129.5-139.5	0.262	<0.008	0.011	5.07	8.1	<0.01	21.8	<0.005
TBGC-6_0-9.5	12.8	<0.008	<0.01	4.60	25.7	<0.04	8.78	0.0119
TBGC-6_9.5-19.5	29.6	<0.008	<0.01	4.57	26.7	0.0540	7.94	0.0192
TBGC-6_19.5-29.5	15.1	0.00820	<0.01	4.95	48.2	<0.04	9.55	0.0124
TBGC-6_29.5-39.5	36.3	<0.008	0.222	3.57	5.10	<0.04	7.69	0.00530
TBGC-6_39.5-49.5	82.5	0.00920	0.502	2.80	1.92	<0.04	16.4	0.00690
TBGC-6_49.5-59.5	92.0	<0.008	0.509	3.43	3.42	<0.04	14.1	0.00820
TBGC-6_59.5-69.5	77.1	0.00920	0.416	3.53	1.48	<0.04	18.1	0.00540
TBGC-6_69.5-79.5	71.0	0.00880	0.409	3.58	1.05	<0.04	16.4	0.00690
TBGC-6_79.5-89.5	164	0.00900	0.894	2.89	6.40	<0.04	42.4	0.00730
TBGC-6_89.5-99.5	72.4	0.00870	0.414	3.84	3.69	<0.04	23.4	<0.005
TBGC-6_99.5-107	58.0	0.0124	0.487	4.16	10.5	<0.04	14.7	0.0125
TBGC-7_0-9.5	26.1	0.041	0.206	3.92	23.6	<0.2	95.5	<0.025
TBGC-7_9.5-19.5	21.6	<0.04	0.188	3.44	17.6	<0.2	90.4	<0.025
TBGC-7_19.5-29.5	46.7	0.058	0.426	3.33	<2.5	<0.2	9.22	<0.025
TBGC-7_29.5-39.5	143	0.077	0.673	2.85	<2.5	<0.2	25.6	<0.025
TBGC-7_39.5-49.5	189	0.083	0.878	2.84	<2.5	<0.2	36.4	<0.025
TBGC-7_49.5-59.5	153	0.079	0.648	2.87	<2.5	<0.2	29	<0.025
TBGC-7_59.5-69.5	279	0.083	1.29	3.04	<2.5	<0.2	48.8	<0.025
TBGC-7_69.5-79.5	104	0.06	0.542	3.13	<2.5	<0.2	21.7	<0.025
TBGC-7_79.5-89.5	140	0.071	0.652	3.17	<2.5	<0.2	24.3	<0.025
TBGC-7_89.5-99.5	112	0.062	0.537	3.18	2.8	<0.2	18.1	<0.025
TBGC-7_99.5-109.5	54	0.045	0.266	3.36	<2.5	<0.2	11.1	<0.025
TBGC-7_109.5-119.5	46.6	0.042	0.224	3.11	<2.5	<0.2	8.58	<0.025
TBGC-7_119.5-129.5	178	0.074	0.801	2.99	<2.5	<0.2	31.4	<0.025
TBGC-7_129.5-139.5	148	0.075	0.672	3.10	6.8	<0.2	20.3	<0.025
TBGC-7_139.5-149.5	150	0.068	0.666	3.23	3.9	<0.2	28.4	<0.025
TBGC-7_149.5-159.5	149	0.067	0.663	3.07	<2.5	<0.2	29.7	<0.025
TBGC-7_159.5-169.5	161	0.064	0.655	3.66	3.3	<0.2	21.7	<0.025
TBGC-7_169.5-179.5	154	0.067	0.636	3.40	10.8	<0.2	25.2	<0.025
TBGC-7_179.5-189.5	159	0.07	0.767	2.98	<2.5	<0.2	26.8	<0.025
TBGC-7_189.5-199.5	112	0.062	0.507	2.99	<2.5	<0.2	19.1	<0.025
TBGC-7_199.5-209.5	141	0.063	0.656	3.20	<2.5	<0.2	20	<0.025
TBGC-7_209.5-219.5	132	0.053	0.496	3.83	11.3	<0.2	23.5	<0.025

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Manganese (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	pH (su)	Potassium (mg/L)	Selenium (mg/L)	Silica (mg/L)	Silver (mg/L)
TBGC-7_219.5-229.5	157	0.062	0.631	3.89	17.8	<0.2	32.6	<0.025
TBGC-7_229.5-239.5	93.6	0.06	0.392	3.97	20.9	<0.2	22.8	0.0371
TBGC-7_239.5-249.5	112	0.056	0.627	4.00	23	<0.2	25.2	0.0605
TBGC-7_249.5-259.5	111	0.057	0.607	3.84	17.1	<0.2	25.2	0.0535
TBGC-7_259.5-269.5	134	0.066	0.606	3.21	<2.5	<0.2	17.4	<0.025
TBGC-7_269.5-279.5	206	0.058	0.631	3.45	11.2	<0.2	17.3	<0.025
TBGC-7_279.5-289.5	293	0.069	0.977	4.15	60.7	<0.2	12.2	0.0274
TBGC-7A_0-9.5	38.1	0.053	0.663	4.33	7.6	<0.2	6.94	<0.025
TBGC-7A_9.5-19.5	27.4	0.044	0.93	4.39	4.8	<0.2	5.59	0.061
TBGC-7A_19.5-29.5	63.1	0.055	1.32	3.90	3.9	<0.2	5.81	<0.025
TBGC-7A_29.5-39.5	110	0.05	0.416	3.87	3.8	<0.2	8.23	<0.025
TBGC-7A_39.5-49.5	183	0.063	0.971	3.62	<2.5	<0.2	11.4	<0.025
TBGC-7A_49.5-59.5	92.1	0.054	0.505	3.42	<2.5	<0.2	6.38	<0.025
TBGC-7A_59.5-69.5	73.9	0.053	0.465	3.00	<2.5	<0.2	4.56	<0.025
TBGC-7A_69.5-79.5	148	0.066	0.825	3.47	3.7	<0.2	8.74	<0.025
TBGC-7A_79.5-89.5	140	0.061	0.715	3.44	<2.5	<0.2	1.84	<0.025
TBGC-7A_89.5-99.5	155	0.06	1.13	3.48	<2.5	<0.2	8.49	<0.025
TBGC-7A_99.5-109.5	223	0.058	1.21	3.23	<2.5	<0.2	11.6	<0.025
TBGC-7A_109.5-119.5	265	0.061	1.47	3.27	<2.5	<0.2	15.2	<0.025
TBGC-7A_119.5-129.5	260	0.057	1.45	3.53	<2.5	<0.2	14.2	<0.025
TBGC-7A_129.5-139.5	227	0.058	1.52	3.31	<2.5	<0.2	17.2	<0.025
TBGC-7A_139.5-149.5	146	0.053	1.06	3.51	<2.5	<0.2	11.3	<0.025
TBGC-7A_149.5-159.5	154	0.051	1.16	3.38	<2.5	<0.2	12.8	<0.025
TBGC-7A_159.5-169.5	110	0.045	0.729	3.36	<2.5	<0.2	8.06	<0.025
TBGC-7A_169.5-179.5	32.4	<0.04	0.219	4.24	<2.5	<0.2	3.84	<0.025
TBGC-7A_179.5-189.5	72.9	<0.04	0.522	3.97	<2.5	<0.2	5.87	<0.025
TBGC-7A_189.5-199.5	76.1	0.044	0.617	3.56	<2.5	<0.2	7.07	<0.025
TBGC-7A_199.5-209.5	130	0.055	1	3.09	<2.5	<0.2	11.5	<0.025
TBGC-7A_209.5-219.5	87.7	0.045	0.695	3.35	3.5	<0.2	8.59	<0.025
TBGC-7A_219.5-229.5	88.9	0.042	0.84	3.47	<2.5	<0.2	6.57	<0.025
TBGC-7A_229.5-239.5	148	0.055	1.27	3.31	<2.5	<0.2	20.5	<0.025
TBGC-7A_239.5-249.5	197	0.063	1.39	3.55	8.5	<0.2	19.6	<0.025
TBGC-7A_249.5-259.5	164	0.055	1.21	3.60	<2.6	<0.2	12.4	<0.025
TBGC-7A_259.5-263	93.9	0.042	0.793	3.63	<2.5	<0.2	11.6	<0.025

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Sodium (mg/L)	Sulfate (mg/L)	Thallium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
TBGC-1_0-9.5	10.4	53.4	<0.015	<0.005	0.0860
TBGC-1_9.5-19.5	10.2	57.1	<0.015	<0.005	0.192
TBGC-1_19.5-29.5	11.2	149	<0.015	<0.005	0.398
TBGC-1_29.5-39.5	7.43	46.3	<0.015	<0.005	0.0330
TBGC-1_39.5-49.5	9.04	53.7	<0.015	<0.005	0.164
TBGC-1_49.5-59.5	6.62	22.8	<0.015	<0.005	0.0140
TBGC-1_59.5-69.5	41.7	732	<0.015	<0.005	5.87
TBGC-1_69.5-79.5	38.9	130	<0.015	<0.005	<0.01
TBGC-1_79.5-89.5	32.6	156	<0.015	<0.005	0.0670
TBGC-1_89.5-99.5	49.9	582	<0.015	<0.005	1.31
TBGC-1_99.5-109.5	13.9	3,080	<0.015	<0.005	66.2
TBGC-1_109.5-119.5	7.09	706	<0.015	<0.005	11.2
TBGC-1_119.5-129.5	4.60	4,000	<0.015	<0.005	7.28
TBGC-1_129.5-139.5	5.20	7,450	<0.075	0.0350	36.4
TBGC-1_139.5-149.5	6.00	8,340	<0.075	0.0421	42.8
TBGC-1_149.5-159.5	5.40	8,820	<0.075	<0.025	46.7
TBGC-1_159.5-169.5	6.07	497	<0.015	<0.005	6.30
TBGC-1_169.5-179.5	10.3	4,700	<0.015	<0.005	593
TBGC-1_179.5-189.5	9.03	111	<0.015	<0.005	1.19
TBGC-1_189.5-199.5	12.2	79.9	<0.015	<0.005	0.100
TBGC-1_199.5-209.5	10.3	81.3	<0.015	<0.005	0.411
TBGC-1_209.5-219.5	6.87	111	<0.015	<0.005	1.22
TBGC-1_219.5-222	5.68	1,240	0.0227	<0.005	94.8
TBGC-2_0-9.5	10.0	7,350	<0.1	<0.05	198
TBGC-2_9.5-19.5	7.70	4,710	<0.1	<0.05	111
TBGC-2_19.5-29.5	<5	2,590	<0.1	<0.05	56.9
TBGC-2_29.5-39.5	<5	3,380	<0.1	<0.05	104
TBGC-2_39.5-49.5	<10	5,100	<0.2	<0.1	126
TBGC-2_49.5-59.5	5.10	3,100	<0.1	<0.05	103
TBGC-2_59.5-69.5	<5	3,630	<0.1	<0.05	143
TBGC-2_69.5-79.5	<5	3,450	<0.1	<0.05	95.2
TBGC-2_79.5-89.5	3.89	2,170	<0.01	<0.005	50.4
TBGC-3_0-9.5	8.50	2,210	<0.05	<0.025	41.9
TBGC-3_9.5-19.5	16.7	964	<0.05	<0.025	10.8

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Sodium (mg/L)	Sulfate (mg/L)	Thallium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
TBGC-3_19.5-29.5	15.8	2,970	<0.05	<0.025	9.63
TBGC-3_29.5-39.5	8.80	1,760	<0.05	<0.025	43.6
TBGC-3_39.5-49.5	4.10	2,060	<0.05	<0.025	60.7
TBGC-3_49.5-59.5	5.50	2,770	<0.05	<0.025	67.6
TBGC-3_59.5-69.5	4.70	3,330	<0.05	<0.025	90.6
TBGC-3_69.5-79.5	6.40	3,090	<0.05	<0.025	96.3
TBGC-3_79.5-89.5	6.00	3,230	<0.05	<0.025	102
TBGC-3_89.5-99.5	5.20	3,340	<0.05	<0.025	118
TBGC-3_99.5-109.5	7.40	3,840	<0.05	<0.025	112
TBGC-3_109.5-119.5	8.20	3,130	<0.05	<0.025	112
TBGC-3_119.5-129.5	9.30	3,560	<0.05	<0.025	128
TBGC-3_129.5-139.5	8.20	2,430	<0.05	<0.025	76.4
TBGC-3_13.95-149.5	7.30	2,760	<0.05	<0.025	86.7
TBGC-3_149.5-159.5	9.90	1,800	<0.05	<0.025	54.6
TBGC-3_159.5-169.5	11.7	1,860	<0.05	<0.025	52.5
TBGC-3_169.5-179.5	8.90	2,410	<0.05	<0.025	62.5
TBGC-4_0-9.5	11.5	517	<0.01	<0.005	7.05
TBGC-4_9.5-19.5	<5	1,500	<0.1	<0.05	21.1
TBGC-4_19.5-29.5	<5	2,150	<0.1	<0.05	46.7
TBGC-4_29.5-39.5	<5	2,670	<0.1	<0.05	56.9
TBGC-4_39.5-49.5	<5	3,400	<0.1	<0.05	70.2
TBGC-5_0-9.5	56.8	143	<0.01	<0.005	<0.005
TBGC-5_9.5-19.5	51.2	755	<0.01	<0.005	2.17
TBGC-5_19.5-29.5	32.4	1,320	<0.01	<0.005	22.7
TBGC-5_29.5-39.5	17.4	1,680	<0.01	<0.005	31.6
TBGC-5_39.5-49.5	16.9	5,420	<0.05	<0.025	114
TBGC-5_49.5-59.5	42.9	1,090	<0.01	<0.005	8.42
TBGC-5_59.5-69.5	35.9	2,220	<0.01	<0.005	30.9
TBGC-5_69.5-79.5	24	3,750	<0.05	<0.025	63.4
TBGC-5_79.5-89.5	28.2	293	<0.01	<0.005	0.646
TBGC-5_89.5-99.5	23.2	634	<0.01	<0.005	3.81
TBGC-5_99.5-109.5	27.7	1,370	<0.01	<0.005	16.9
TBGC-5_109.5-119.5	28.6	313	<0.01	<0.005	0.804
TBGC-5_119.5-129.5	13.3	53.4	<0.01	<0.005	0.0115

MWMP Results for Geochemical Boreholes

Borehole ID and Sample Interval	Sodium (mg/L)	Sulfate (mg/L)	Thallium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
TBGC-5_129.5-139.5	40.5	228	<0.01	<0.005	0.0808
TBGC-6_0-9.5	6.09	1,360	<0.015	<0.005	95.7
TBGC-6_9.5-19.5	6.60	2,050	0.0355	<0.005	112
TBGC-6_19.5-29.5	7.03	1,420	0.0176	<0.005	136
TBGC-6_29.5-39.5	3.86	1,350	0.0372	<0.005	73.1
TBGC-6_39.5-49.5	3.42	3,380	0.100	<0.005	112
TBGC-6_49.5-59.5	4.78	3,100	0.115	<0.005	110
TBGC-6_59.5-69.5	5.56	2,460	0.0980	<0.005	95.3
TBGC-6_69.5-79.5	6.11	2,330	0.0908	<0.005	95.3
TBGC-6_79.5-89.5	7.57	5,490	0.197	<0.005	252
TBGC-6_89.5-99.5	9.46	2,470	0.0903	<0.005	114
TBGC-6_99.5-107	6.66	1,970	<0.015	<0.005	78.1
TBGC-7_0-9.5	82.7	1,990	<0.075	<0.025	7.24
TBGC-7_9.5-19.5	32.4	1,430	<0.075	<0.025	11.1
TBGC-7_19.5-29.5	4.7	4,130	<0.075	0.0765	108
TBGC-7_29.5-39.5	5.5	7,180	<0.075	<0.025	218
TBGC-7_39.5-49.5	9.1	8,260	<0.075	0.106	241
TBGC-7_49.5-59.5	8.1	6,740	<0.075	0.119	218
TBGC-7_59.5-69.5	23.4	10,900	<0.075	0.175	328
TBGC-7_69.5-79.5	10.1	3,820	<0.075	<0.025	129
TBGC-7_79.5-89.5	7.9	5,210	<0.075	<0.025	177
TBGC-7_89.5-99.5	11.3	4,080	<0.075	<0.025	135
TBGC-7_99.5-109.5	4.2	2,070	<0.075	<0.025	72.3
TBGC-7_109.5-119.5	3.4	2,010	<0.075	<0.025	65.9
TBGC-7_119.5-129.5	7.3	6,880	<0.075	<0.025	223
TBGC-7_129.5-139.5	6	6,400	<0.075	<0.025	205
TBGC-7_139.5-149.5	8.4	5,220	<0.075	<0.025	167
TBGC-7_149.5-159.5	6.3	5,230	<0.075	<0.025	167
TBGC-7_159.5-169.5	6.8	5,220	<0.075	<0.025	208
TBGC-7_169.5-179.5	18.1	4,850	<0.075	<0.025	198
TBGC-7_179.5-189.5	8.3	6,440	<0.075	0.0258	198
TBGC-7_189.5-199.5	4	4,060	<0.075	0.0416	136
TBGC-7_199.5-209.5	6	5,240	<0.075	0.03	173
TBGC-7_209.5-219.5	3.7	3,640	<0.075	<0.025	151

MWMP Results for Geochemical Boreholes

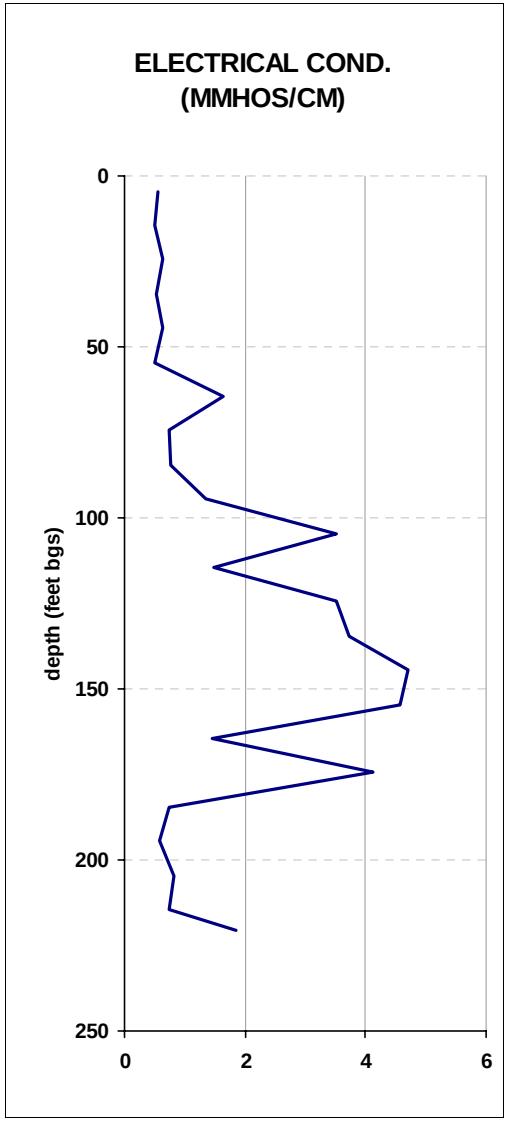
Borehole ID and Sample Interval	Sodium (mg/L)	Sulfate (mg/L)	Thallium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
TBGC-7_219.5-229.5	3.9	4,970	<0.075	<0.025	218
TBGC-7_229.5-239.5	4.7	4,430	<0.075	<0.025	168
TBGC-7_239.5-249.5	7	5,420	<0.075	<0.025	129
TBGC-7_249.5-259.5	6.9	5,640	<0.075	<0.025	146
TBGC-7_259.5-269.5	5.1	5,500	<0.075	<0.025	183
TBGC-7_269.5-279.5	7.2	4,110	<0.075	<0.025	137
TBGC-7_279.5-289.5	16.8	5,280	<0.075	<0.025	166
TBGC-7A_0-9.5	5	2,470	<0.075	<0.025	431
TBGC-7A_9.5-19.5	3.8	3,710	<0.075	<0.025	167
TBGC-7A_19.5-29.5	<2.5	3,530	<0.075	<0.025	262
TBGC-7A_29.5-39.5	2.9	3,620	<0.075	<0.025	85.8
TBGC-7A_39.5-49.5	4.1	6,950	<0.075	<0.025	202
TBGC-7A_49.5-59.5	<2.5	5,360	<0.075	0.141	141
TBGC-7A_59.5-69.5	<2.5	7,360	<0.075	0.305	106
TBGC-7A_69.5-79.5	4	8,890	<0.075	0.167	180
TBGC-7A_79.5-89.5	1.02	7,650	<0.075	0.104	160
TBGC-7A_89.5-99.5	4.4	5,750	<0.075	<0.025	174
TBGC-7A_99.5-109.5	<2.5	5,930	<0.075	<0.025	196
TBGC-7A_109.5-119.5	<2.5	5,800	<0.075	<0.025	197
TBGC-7A_119.5-129.5	2.9	5,690	<0.075	<0.025	184
TBGC-7A_129.5-139.5	4.3	7,350	<0.075	<0.025	255
TBGC-7A_139.5-149.5	4.6	4,910	<0.075	<0.025	170
TBGC-7A_149.5-159.5	3.7	5,530	<0.075	0.0458	180
TBGC-7A_159.5-169.5	3.8	3,030	<0.075	<0.025	108
TBGC-7A_169.5-179.5	2.7	992	<0.075	<0.025	40
TBGC-7A_179.5-189.5	3.3	1,970	<0.075	<0.025	87.4
TBGC-7A_189.5-199.5	3.3	2,640	<0.075	<0.025	111
TBGC-7A_199.5-209.5	2.7	4,860	<0.075	<0.025	183
TBGC-7A_209.5-219.5	3	3,570	<0.075	<0.025	118
TBGC-7A_219.5-229.5	2.7	2,980	<0.075	<0.025	117
TBGC-7A_229.5-239.5	3.8	5,970	<0.075	<0.025	203
TBGC-7A_239.5-249.5	4.9	7,120	<0.075	<0.025	291
TBGC-7A_249.5-259.5	3.2	5,750	<0.075	<0.025	246
TBGC-7A_259.5-263	3	3,600	<0.075	<0.025	169

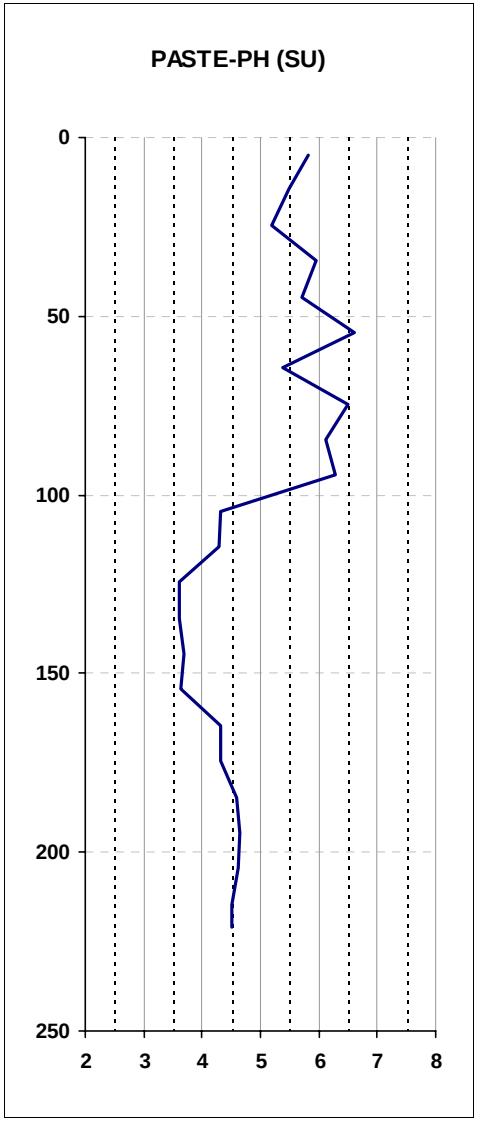
APPENDIX A

Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-1

Paste pH and Paste EC





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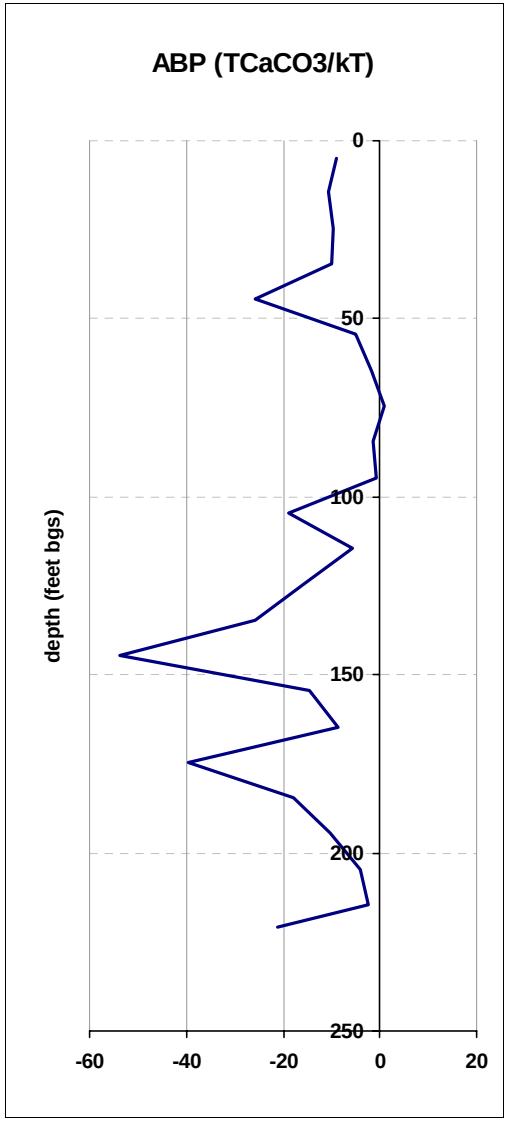
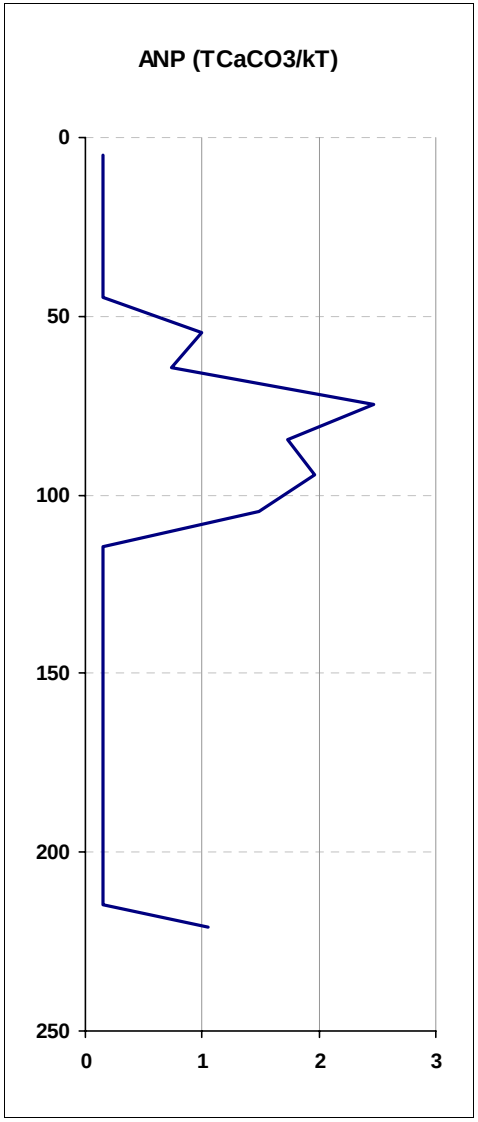
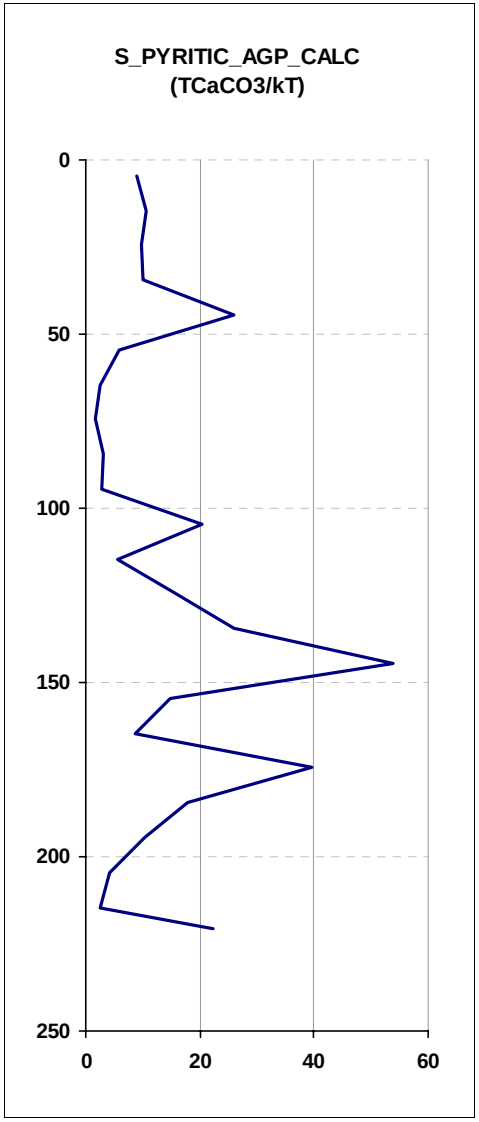
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-1

Test Type: ABA







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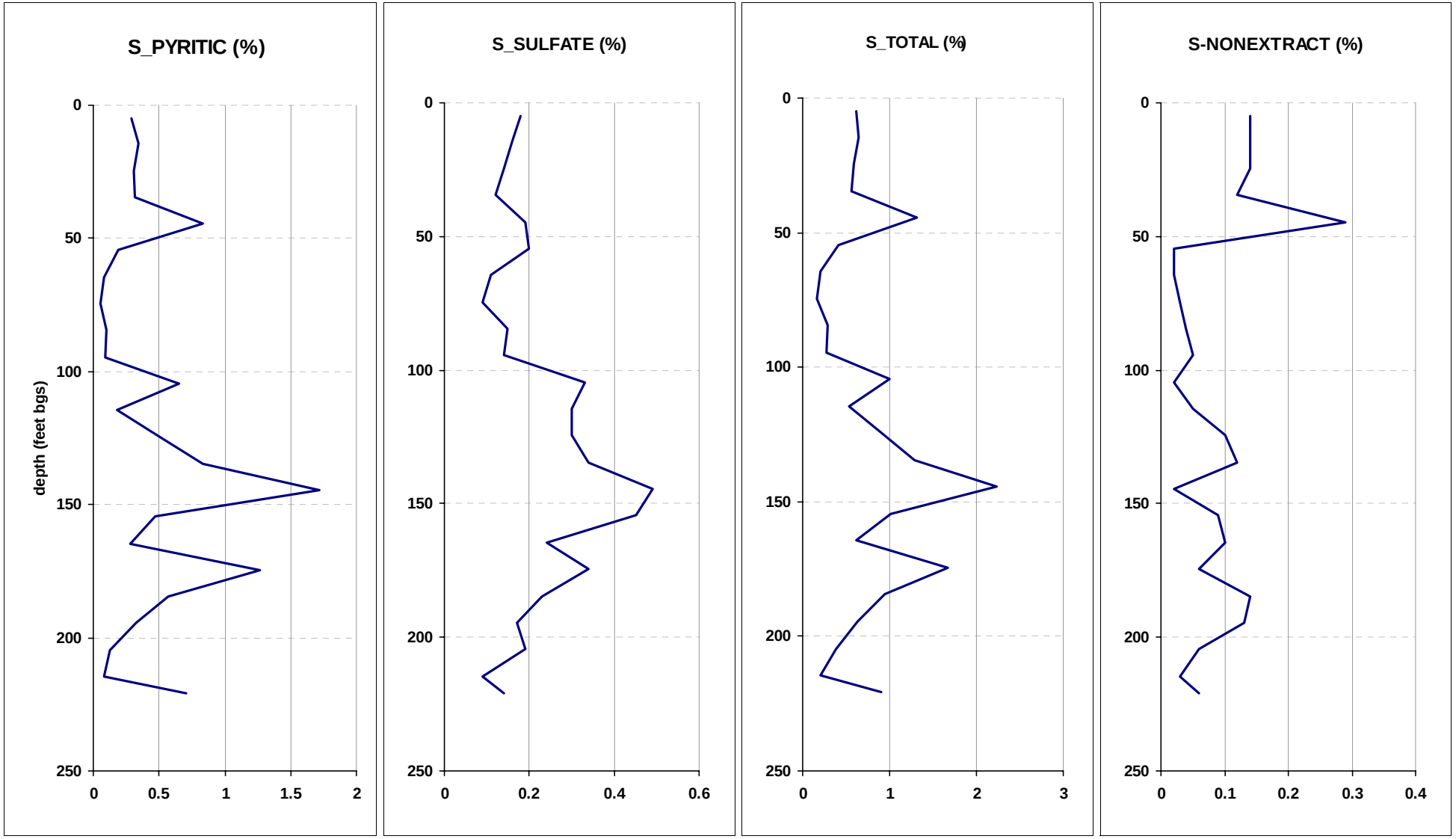
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-1

Test Type: ABA



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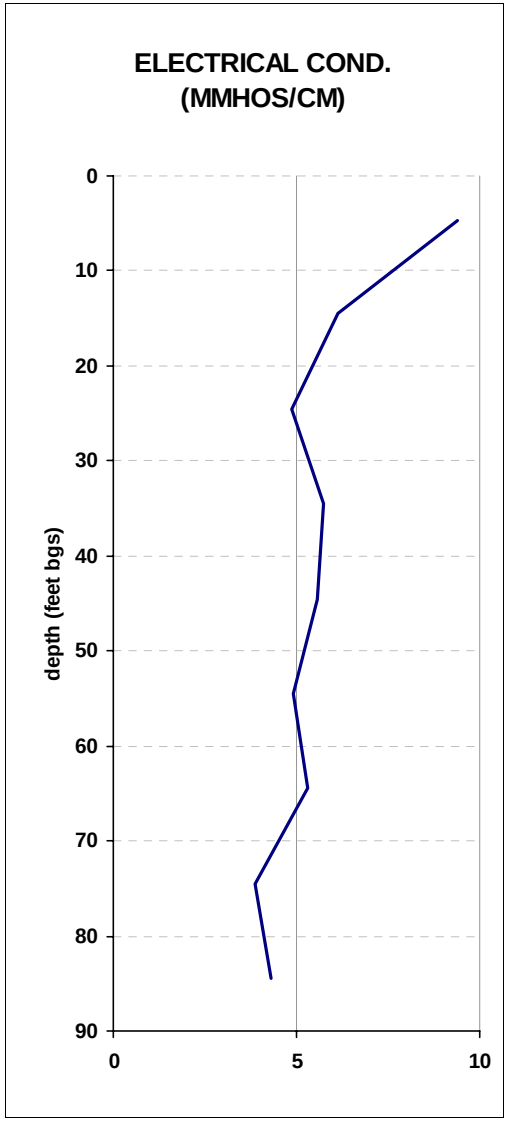
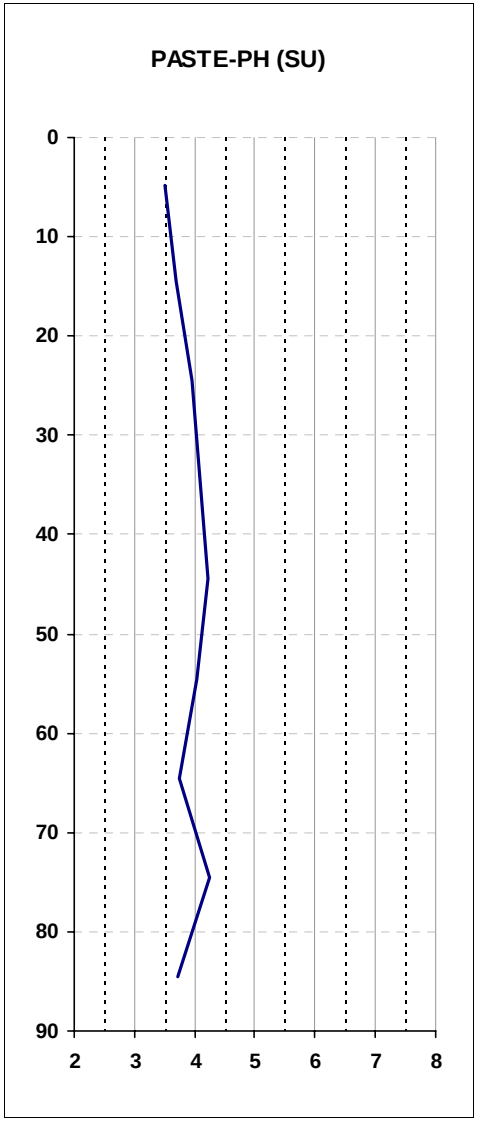
Location: TBGC-2

Paste pH and Paste EC





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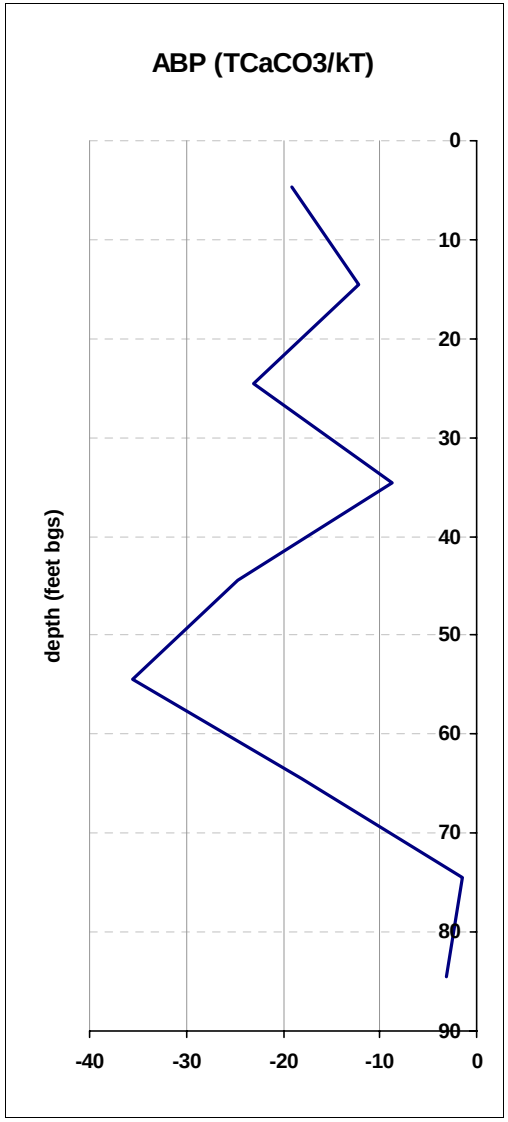
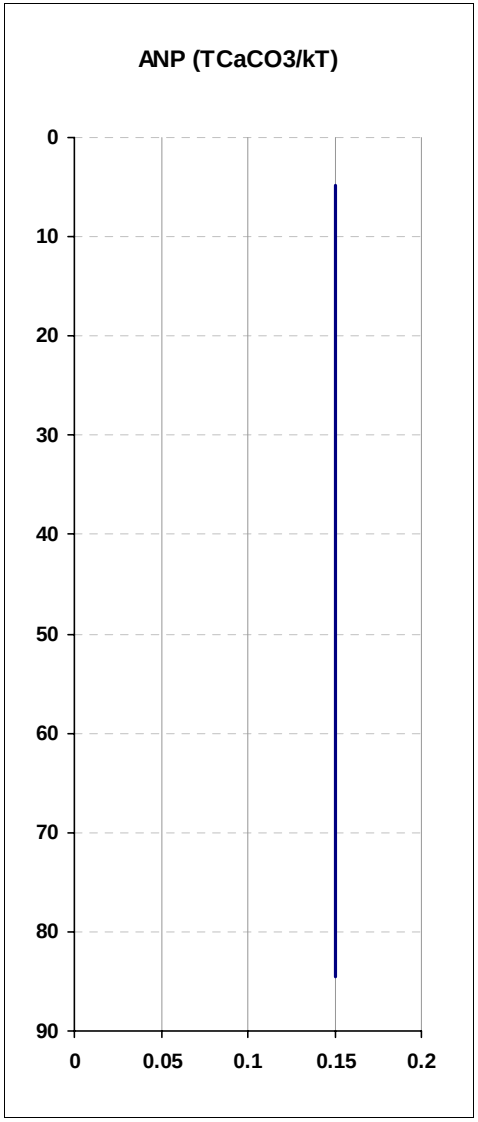
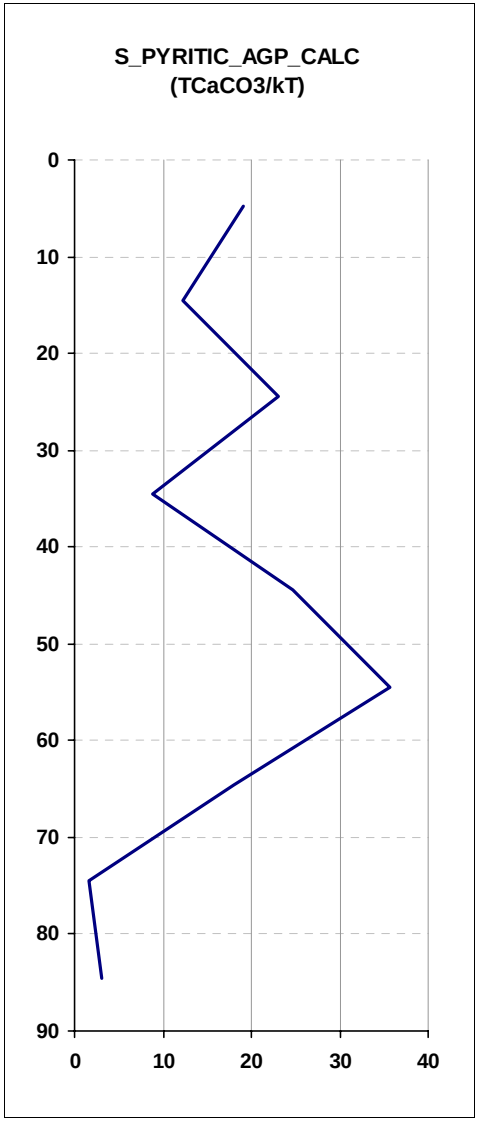
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-2

Test Type: ABA







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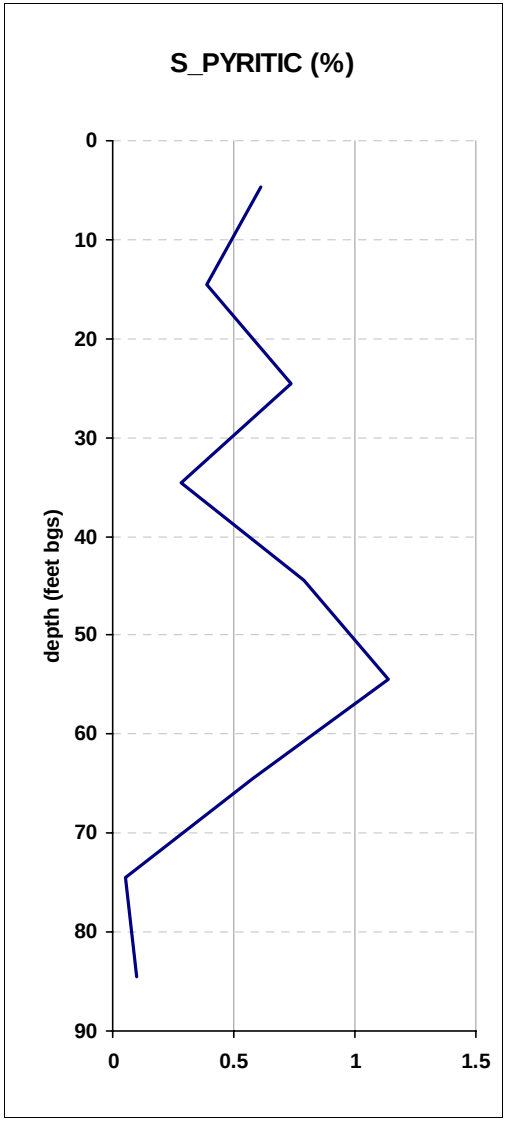
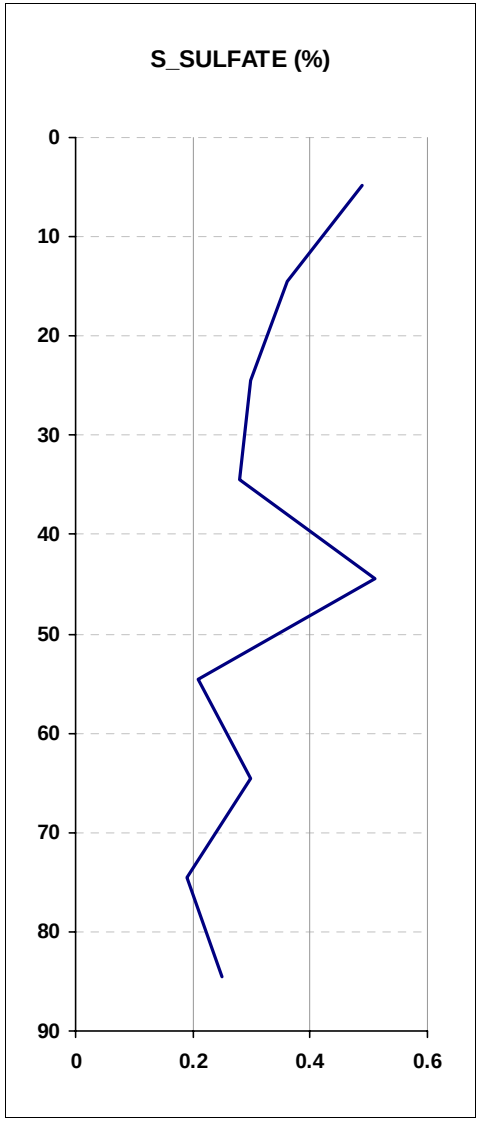
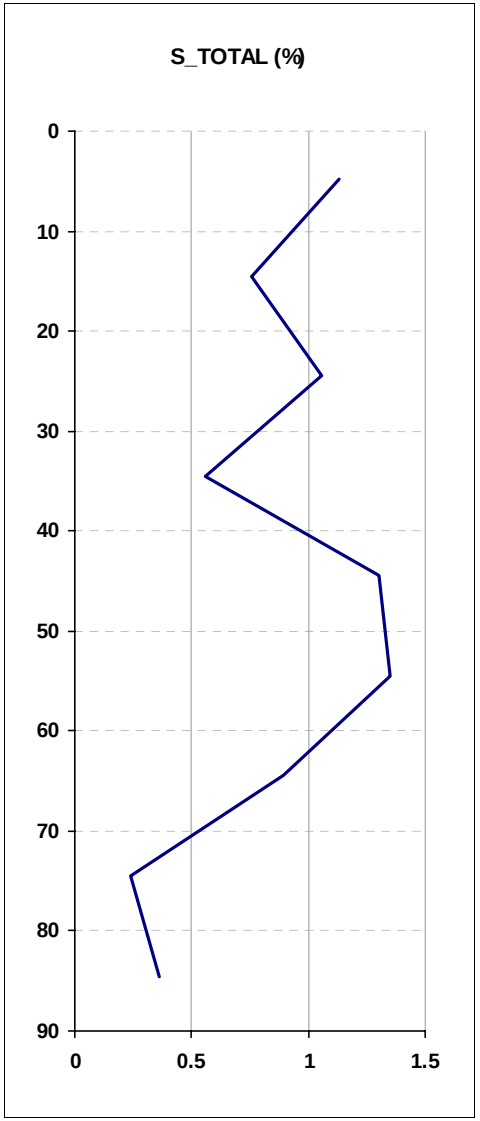
Tyrone Mine Sample Test Results by Location, Test Type

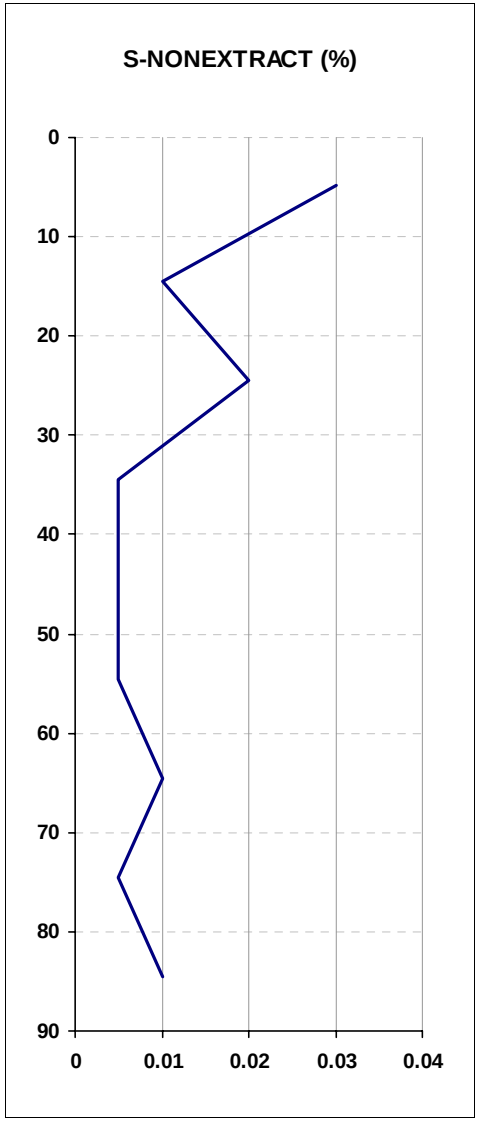
Location: TBGC-2

Test Type: ABA









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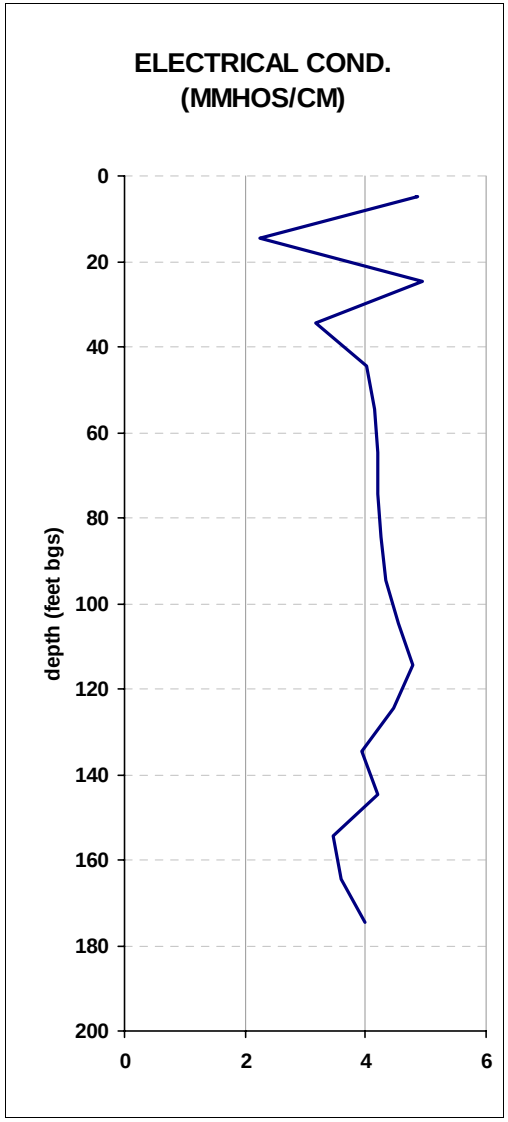
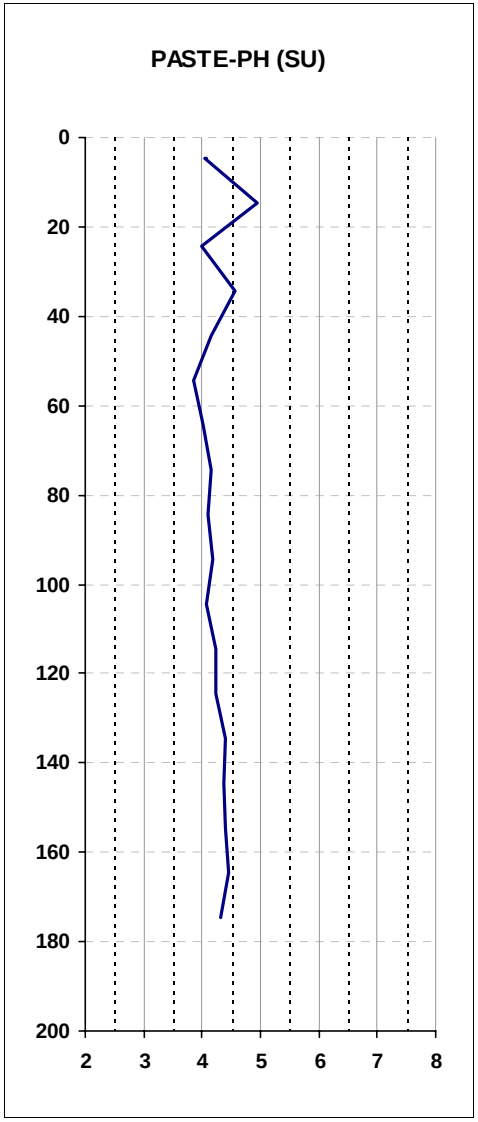
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-3

Paste pH and Paste EC





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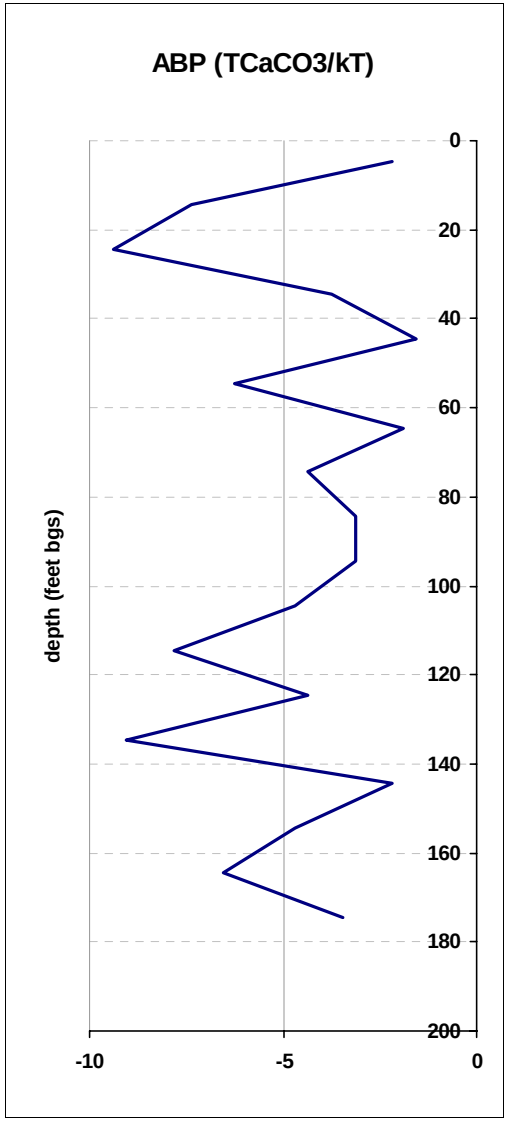
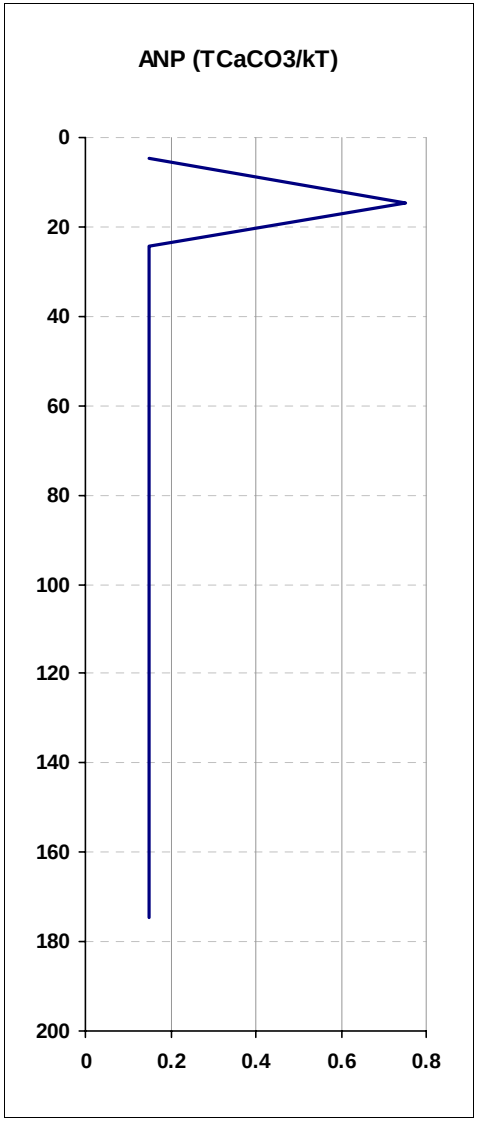
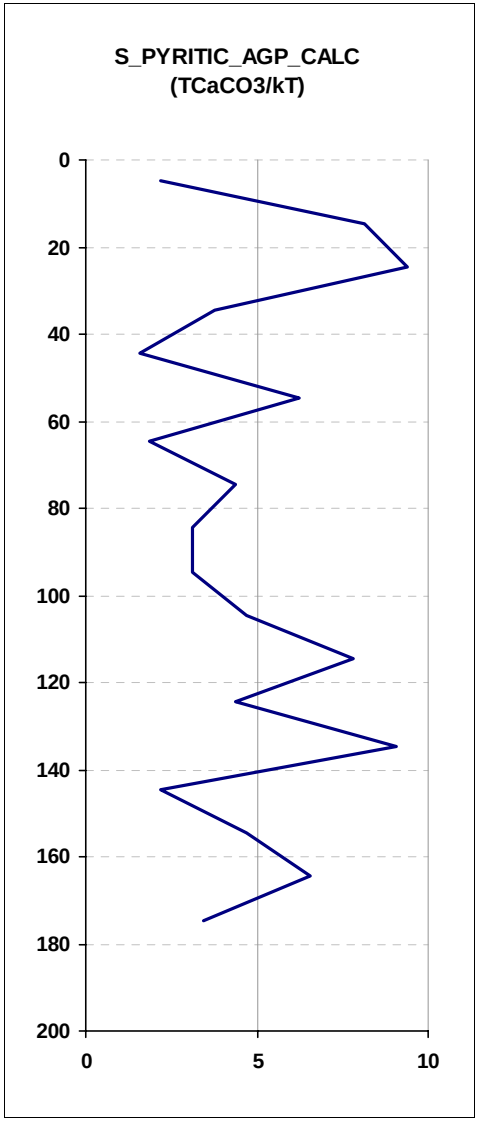
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-3

Test Type: ABA







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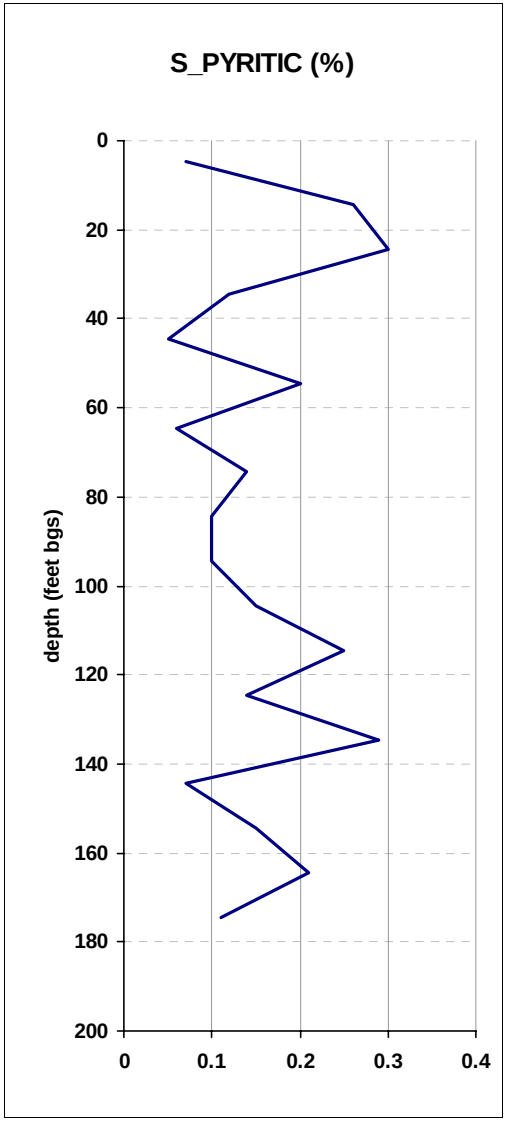
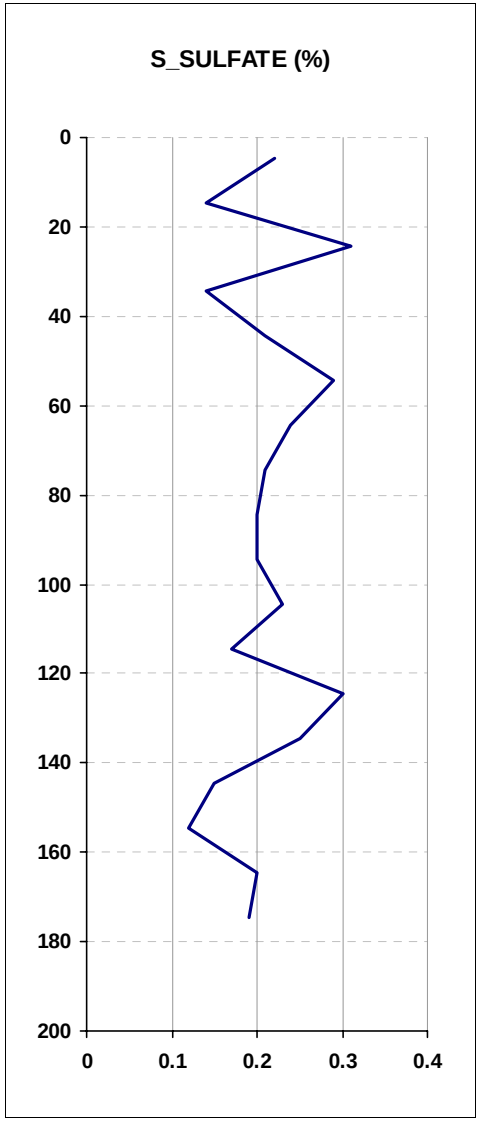
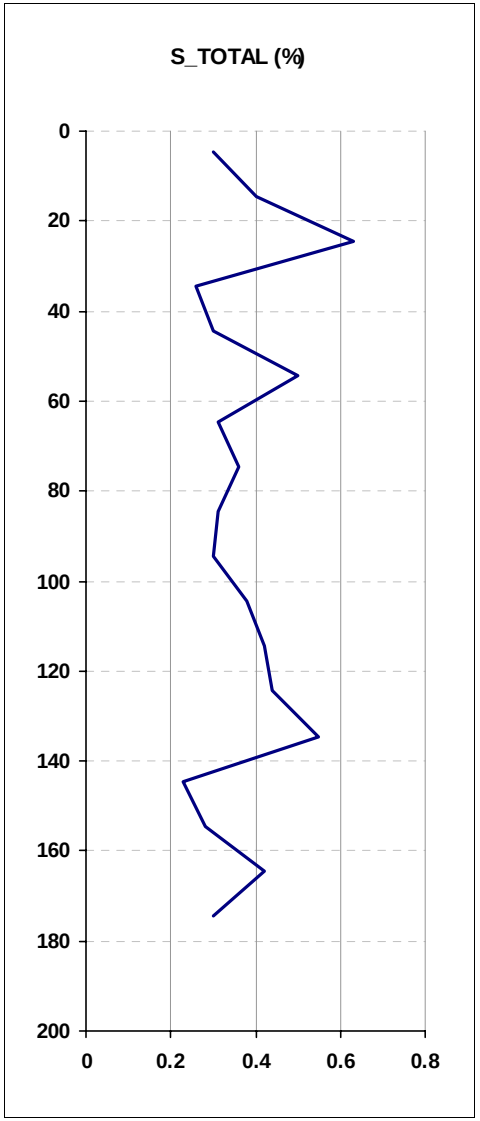
Tyrone Mine Sample Test Results by Location, Test Type

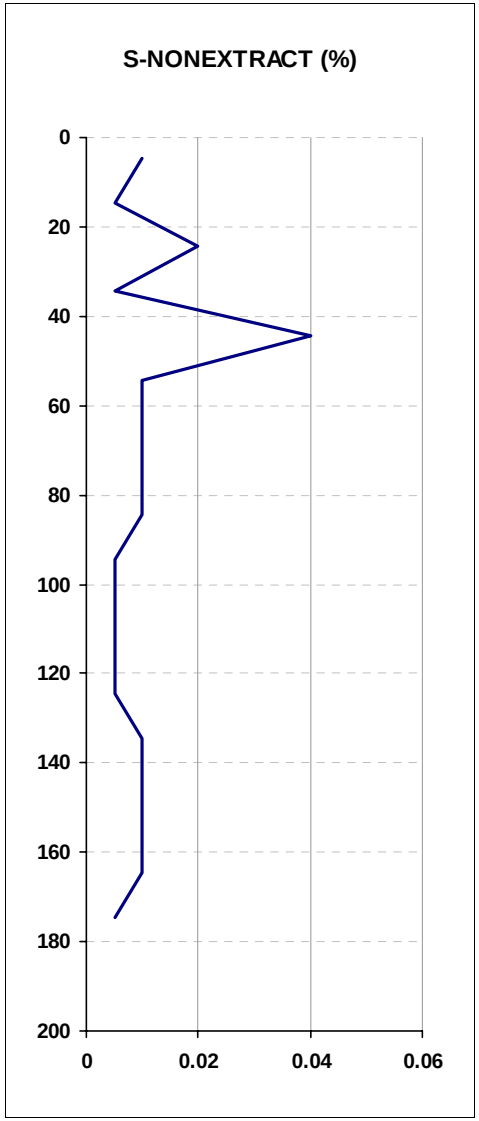
Location: TBGC-3

Test Type: ABA









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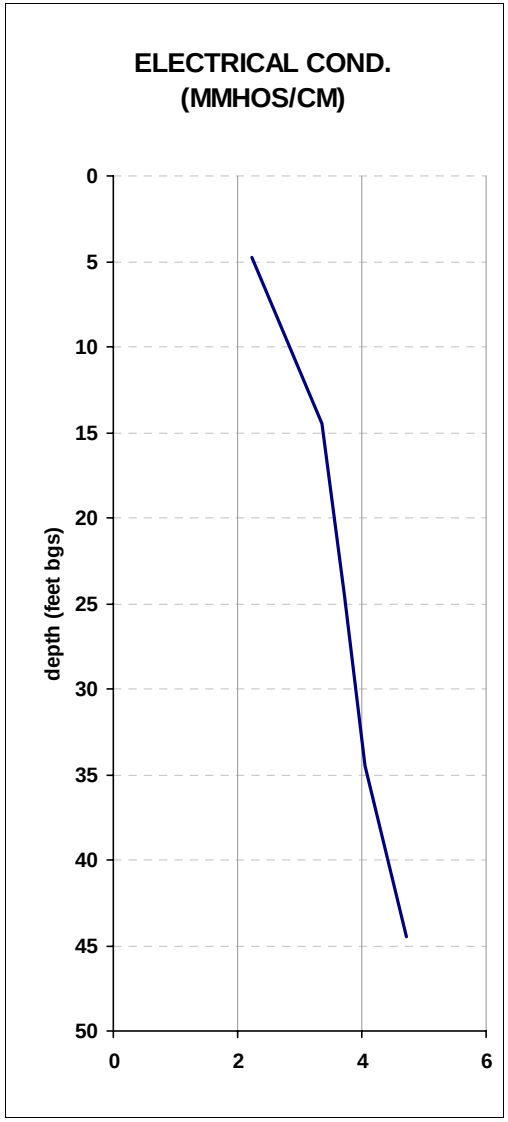
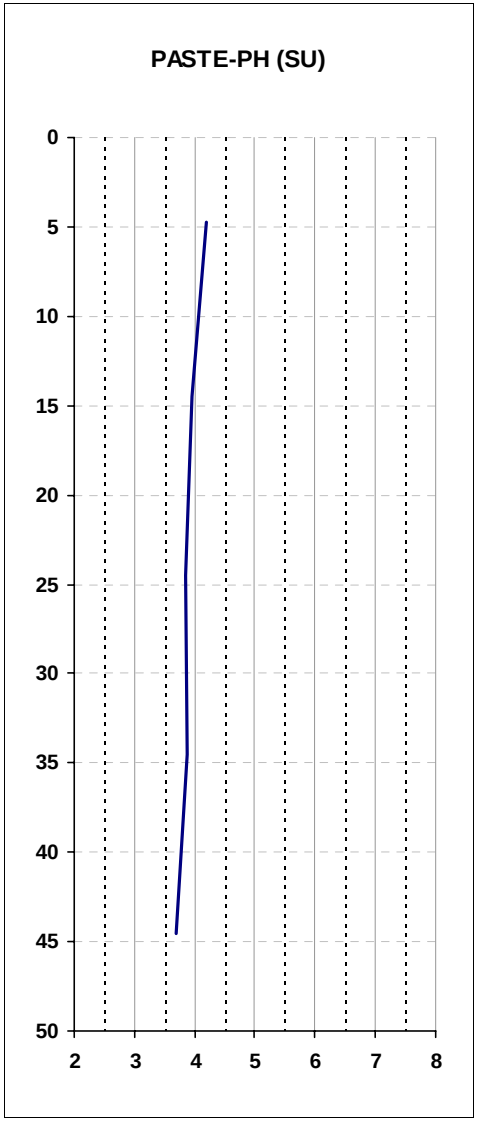
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-4

Paste pH and Paste EC





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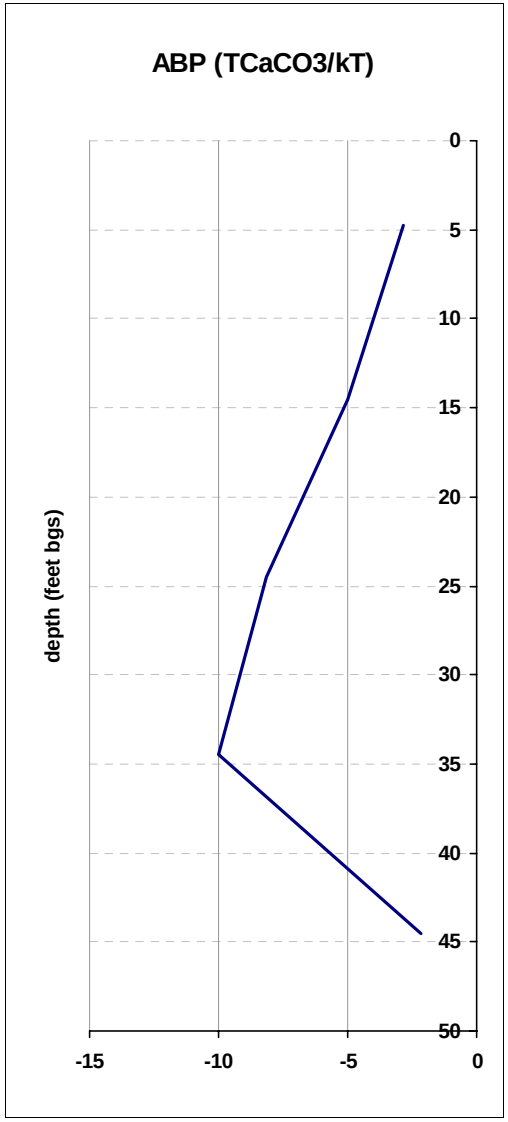
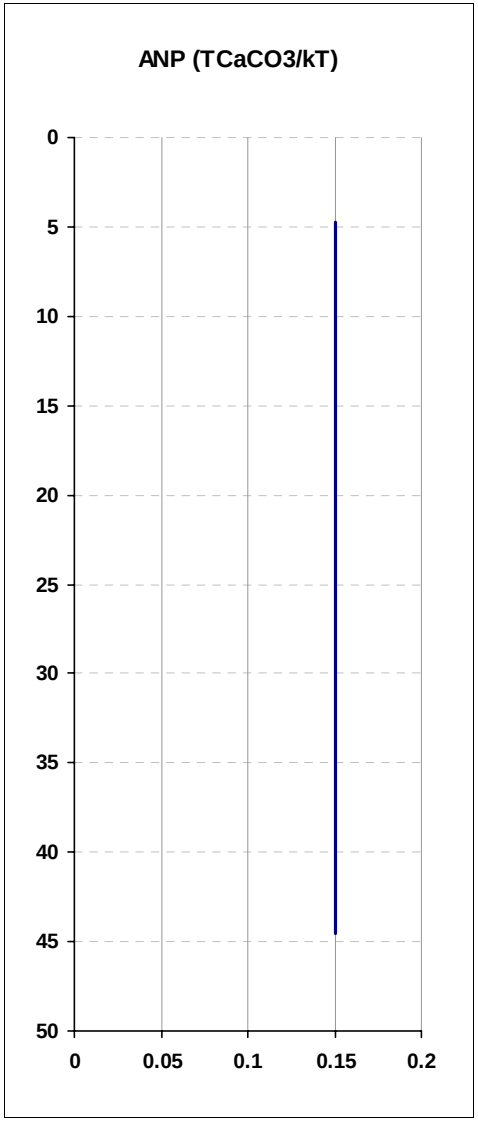
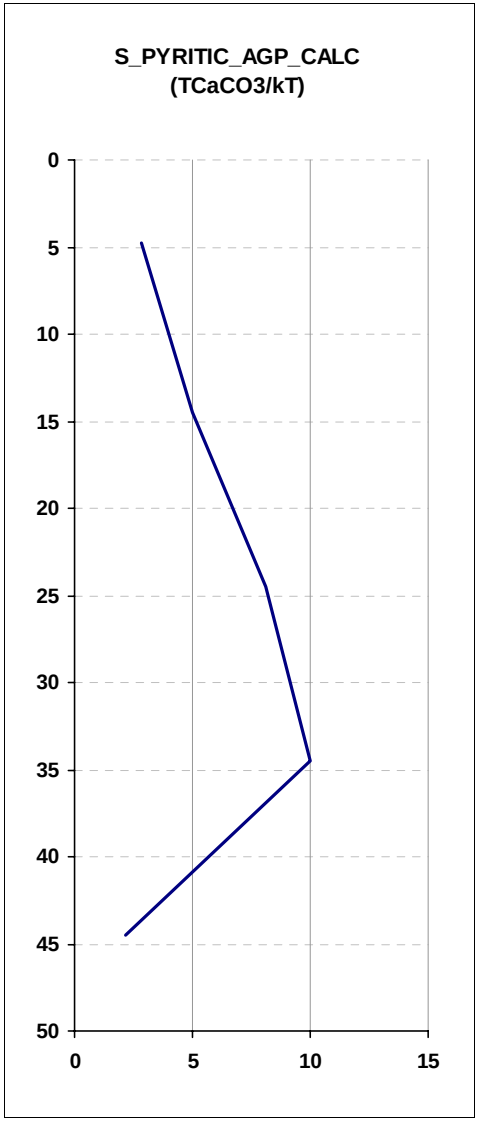
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-4

Test Type: ABA







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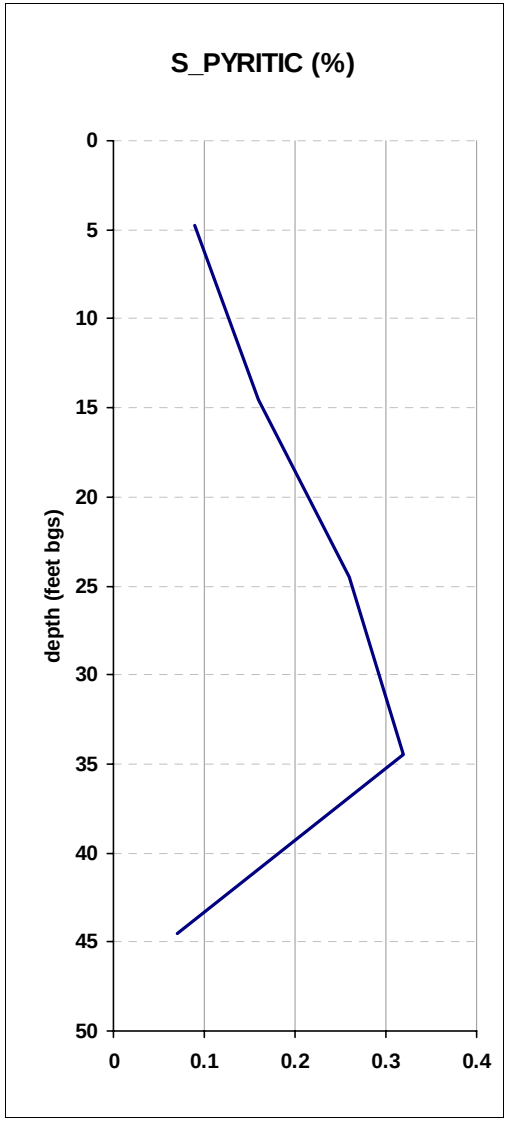
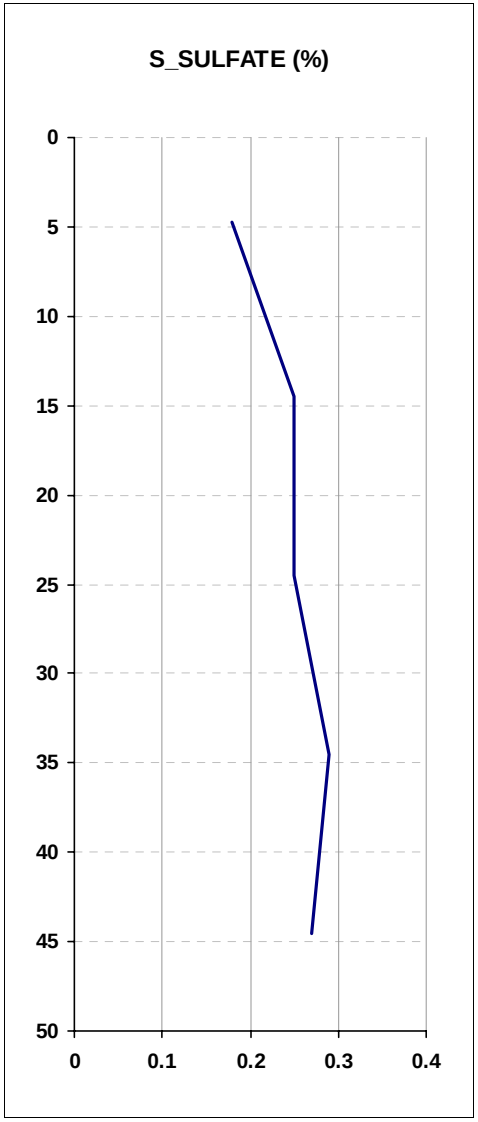
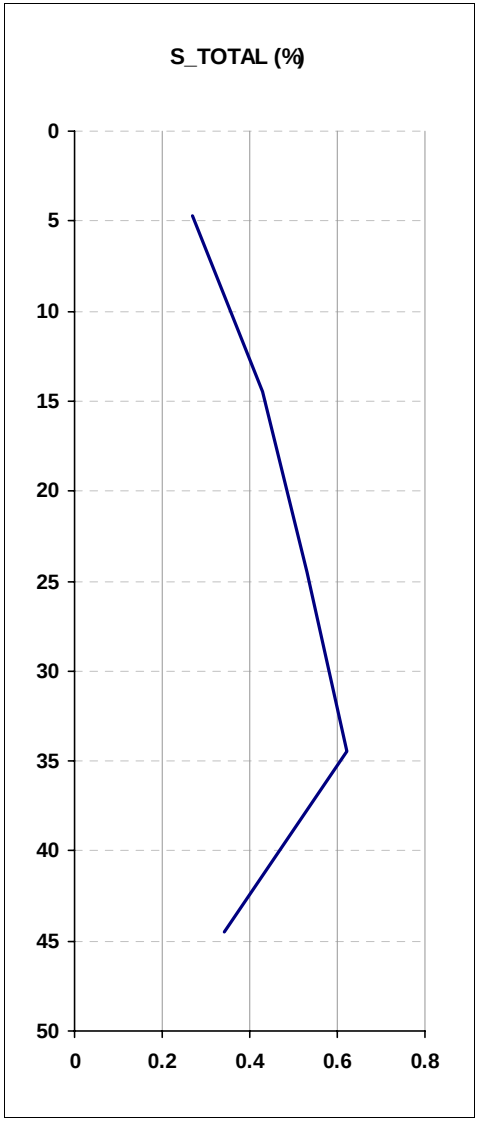
Tyrone Mine Sample Test Results by Location, Test Type

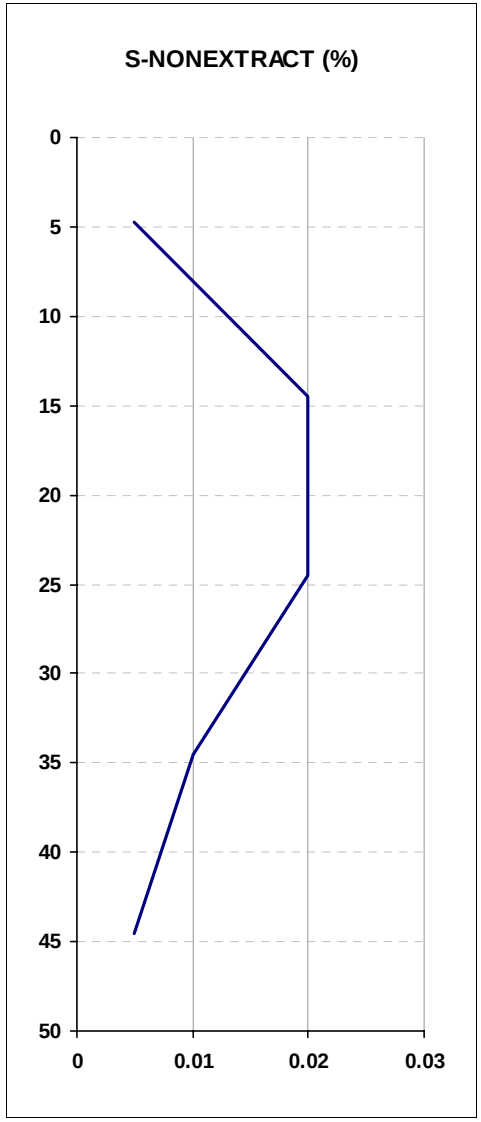
Location: TBGC-4

Test Type: ABA









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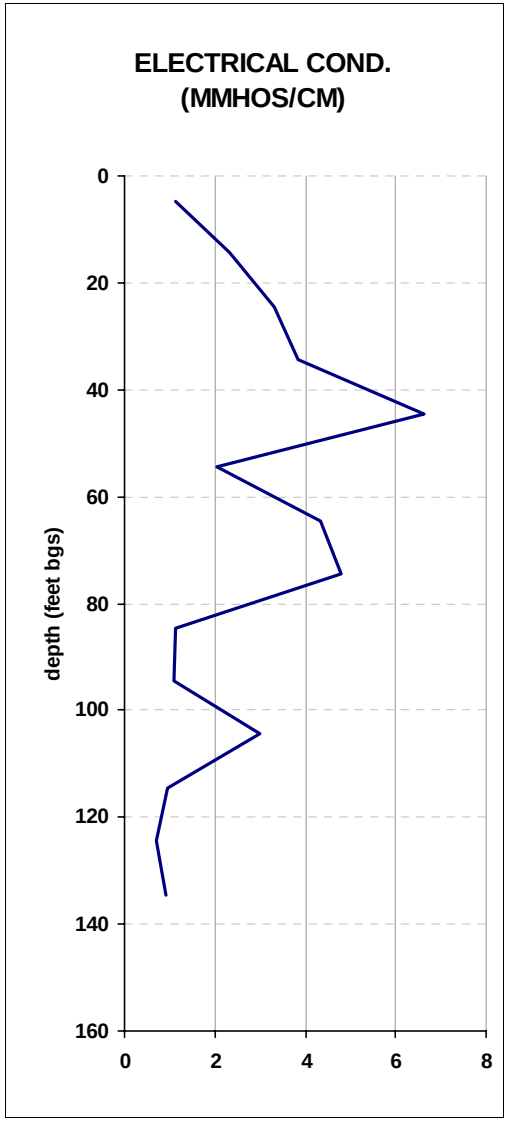
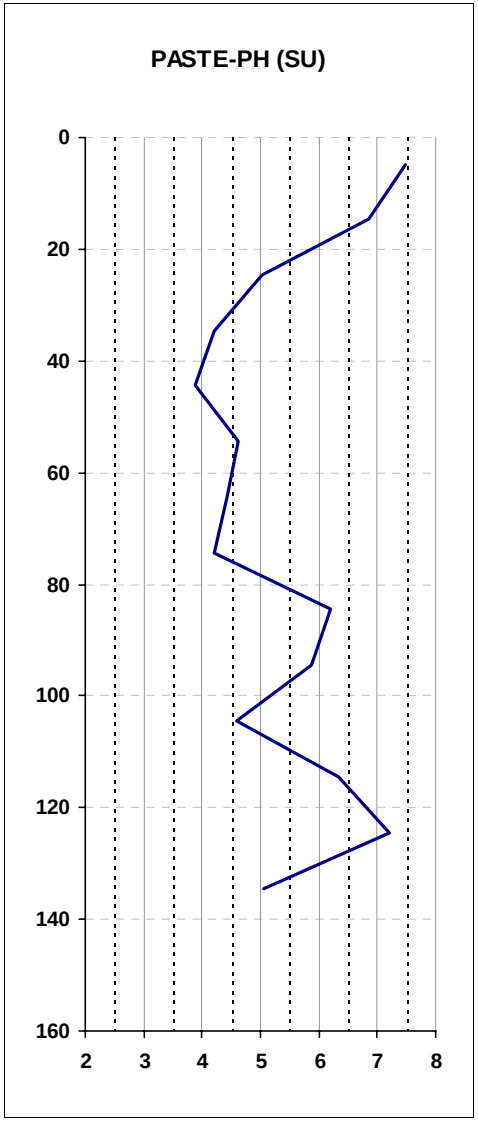
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-5

Paste pH and Paste EC





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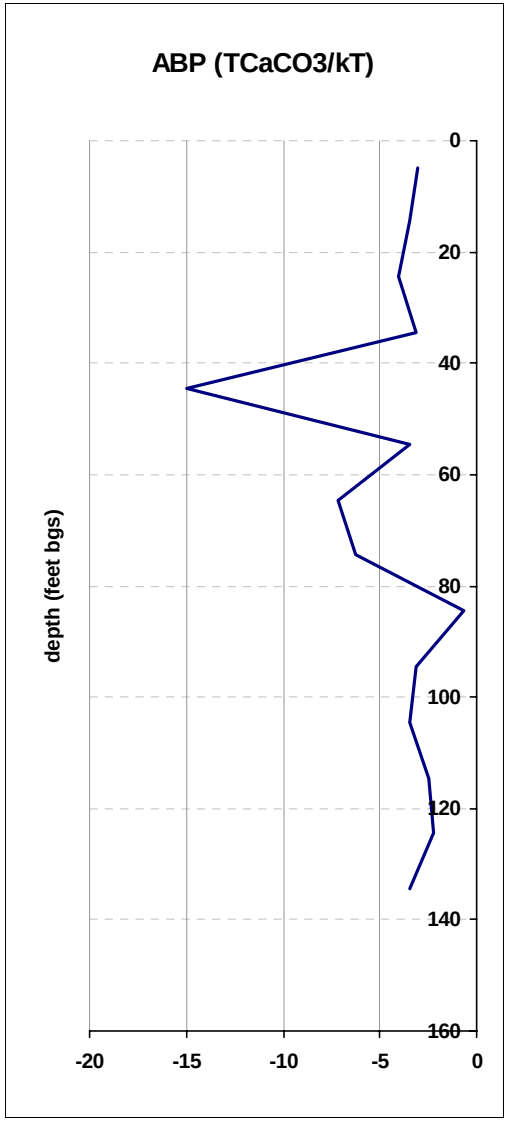
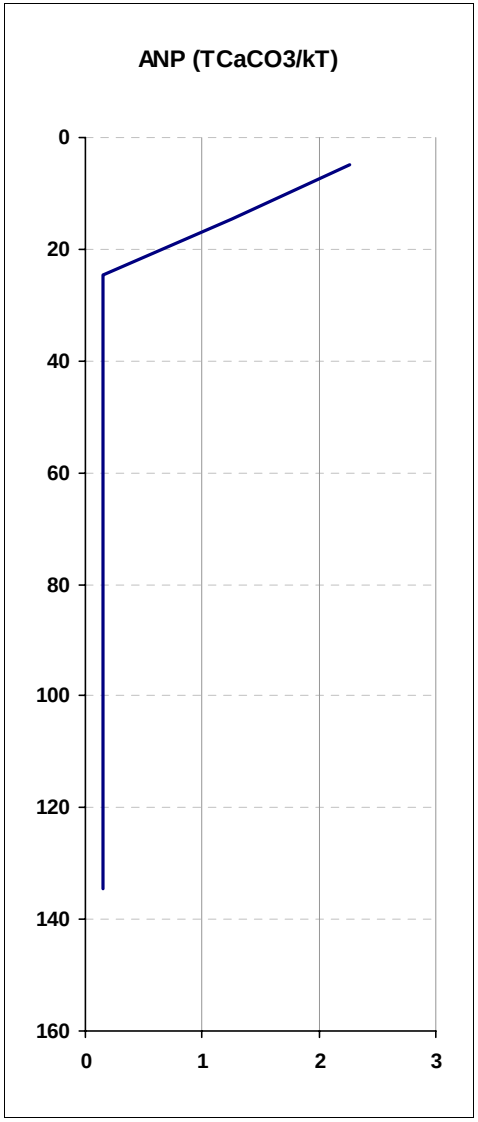
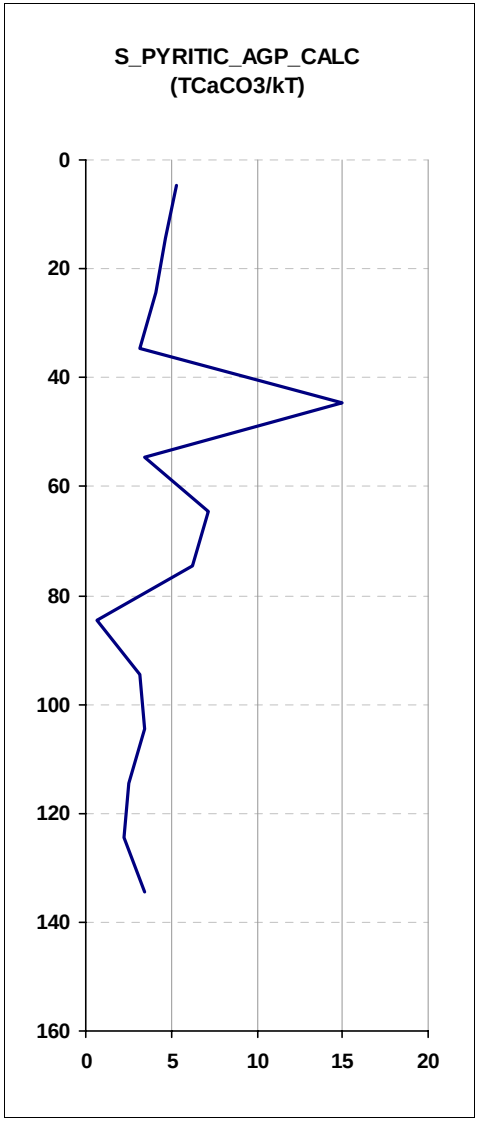
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-5

Test Type: ABA







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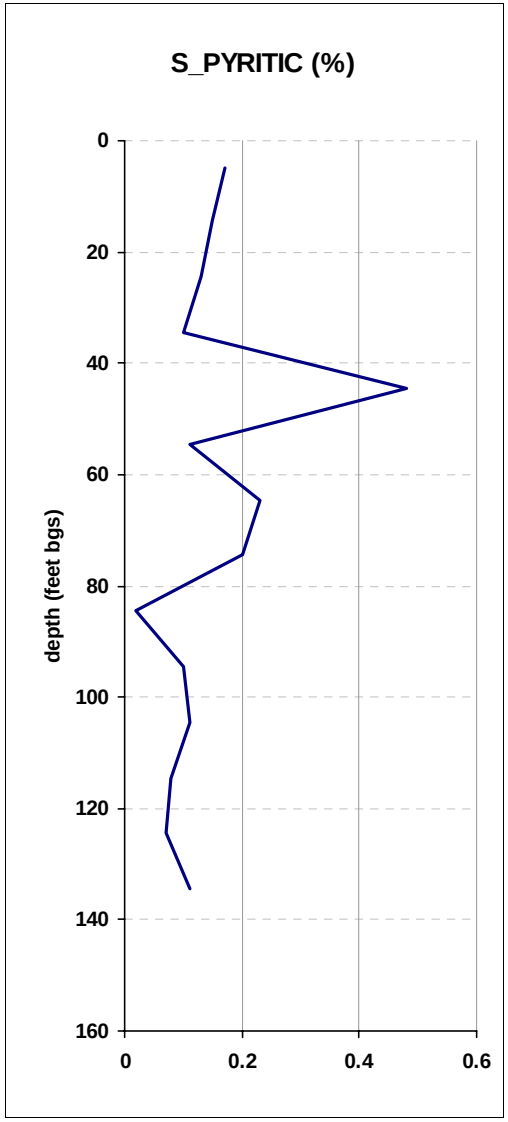
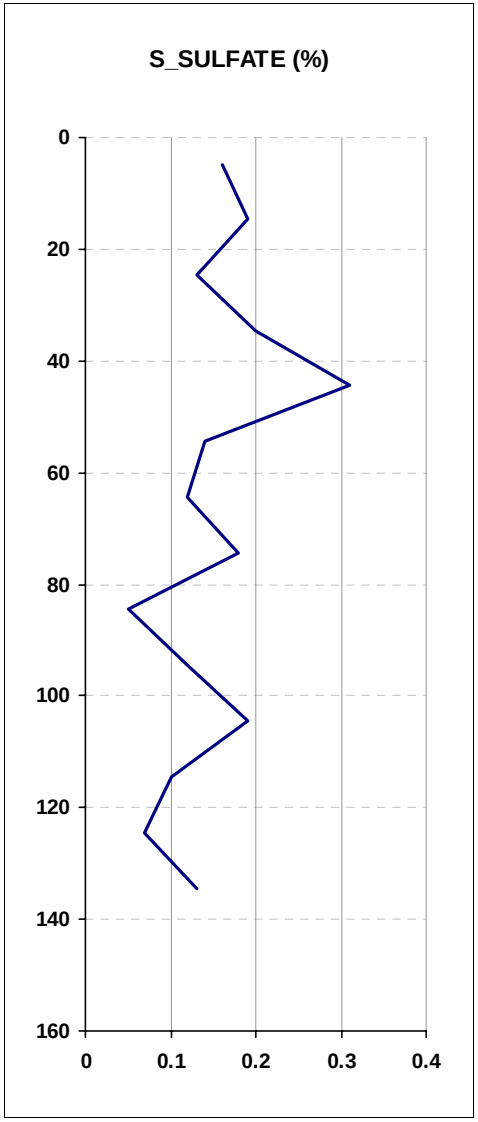
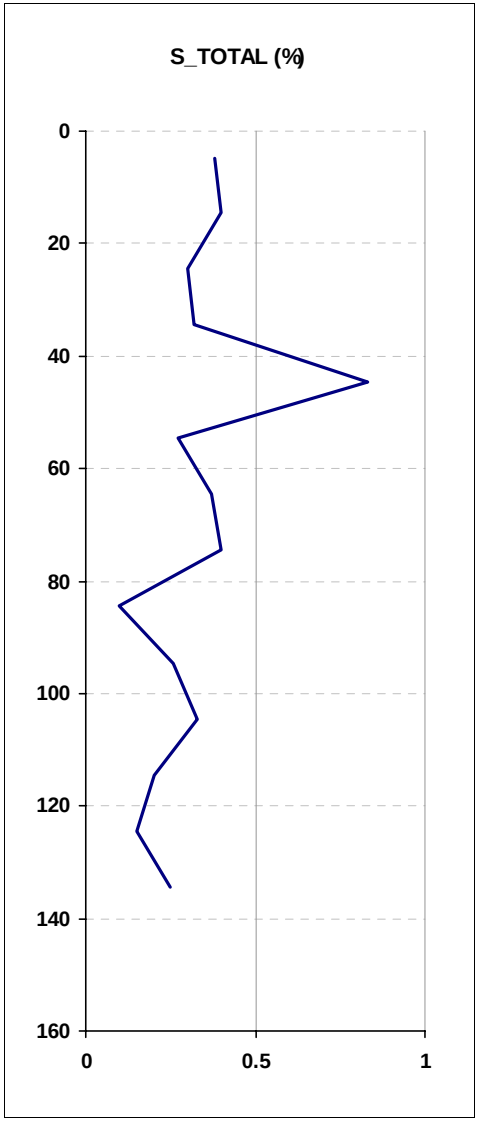
Tyrone Mine Sample Test Results by Location, Test Type

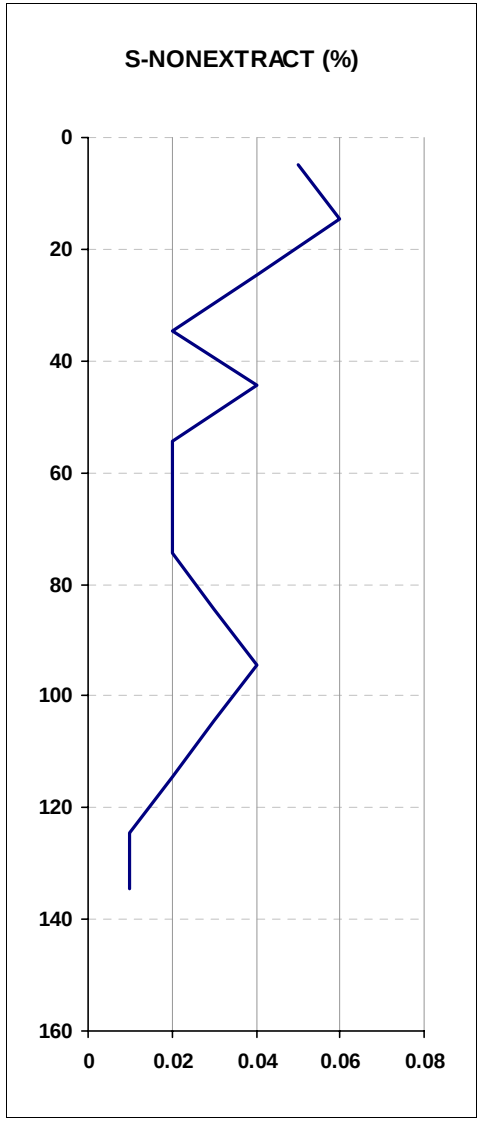
Location: TBGC-5

Test Type: ABA









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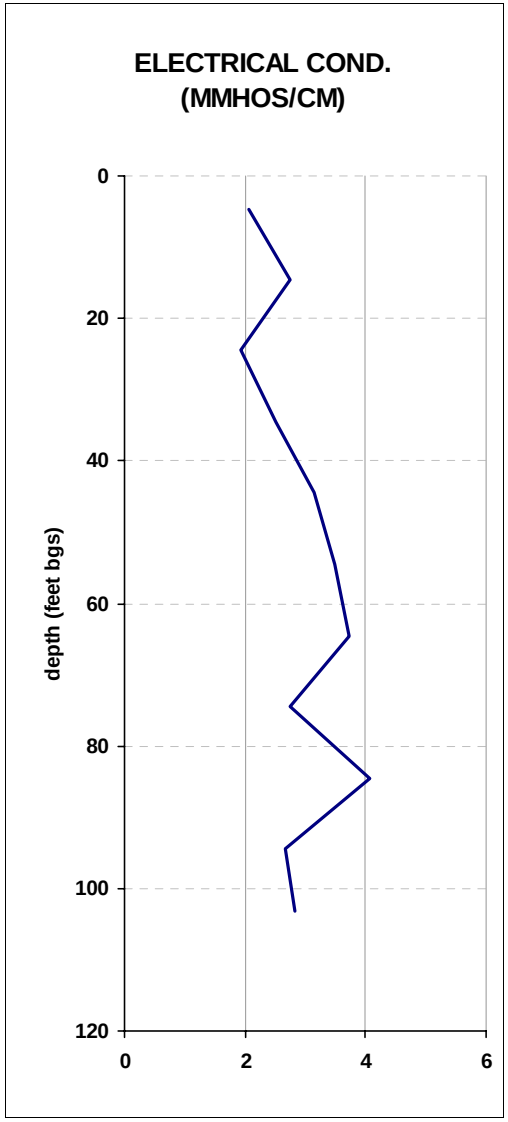
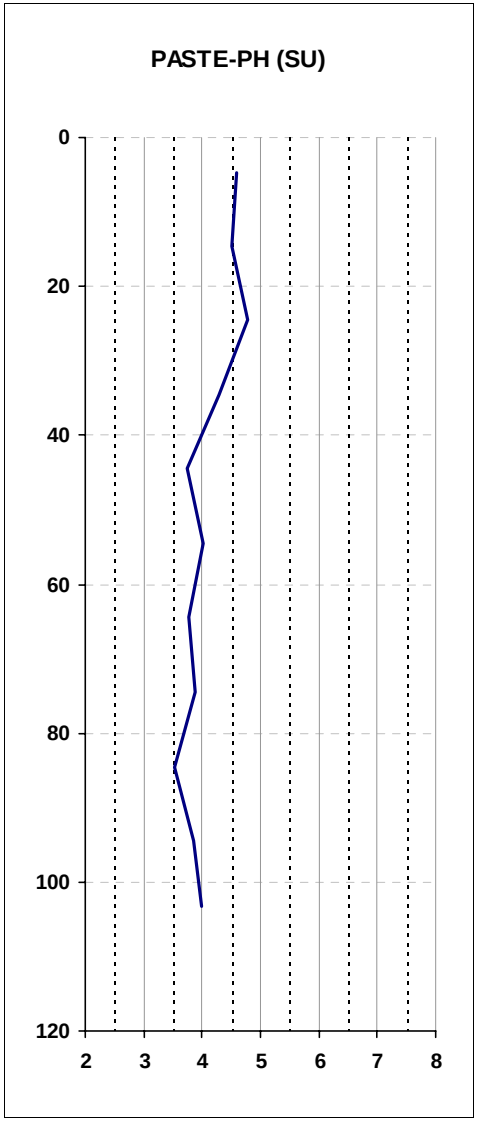
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-6

Paste pH and Paste EC





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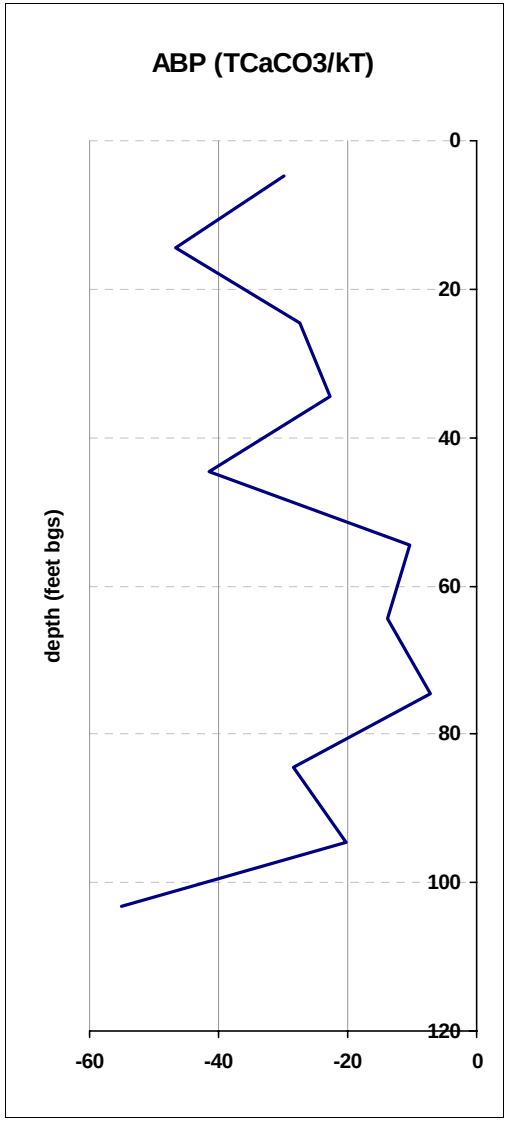
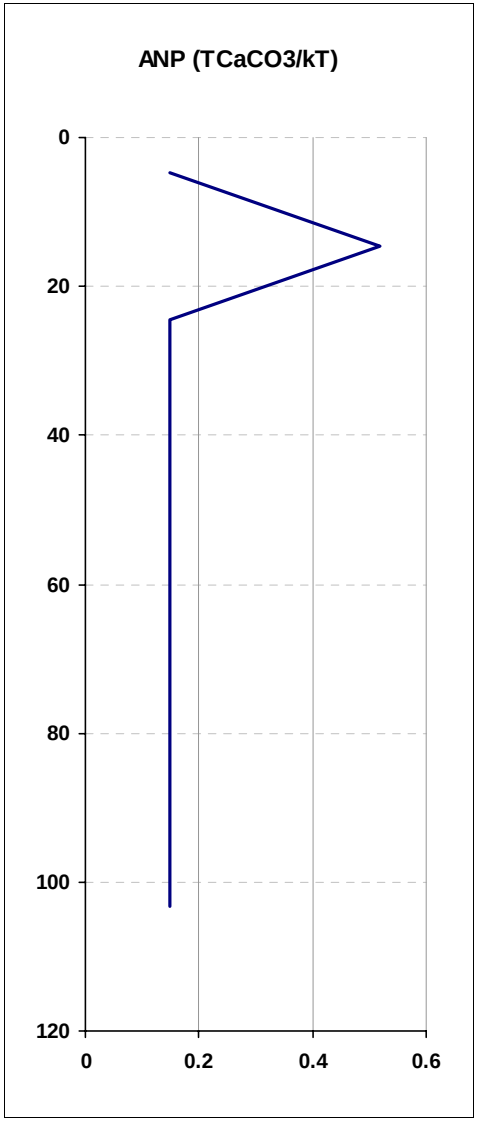
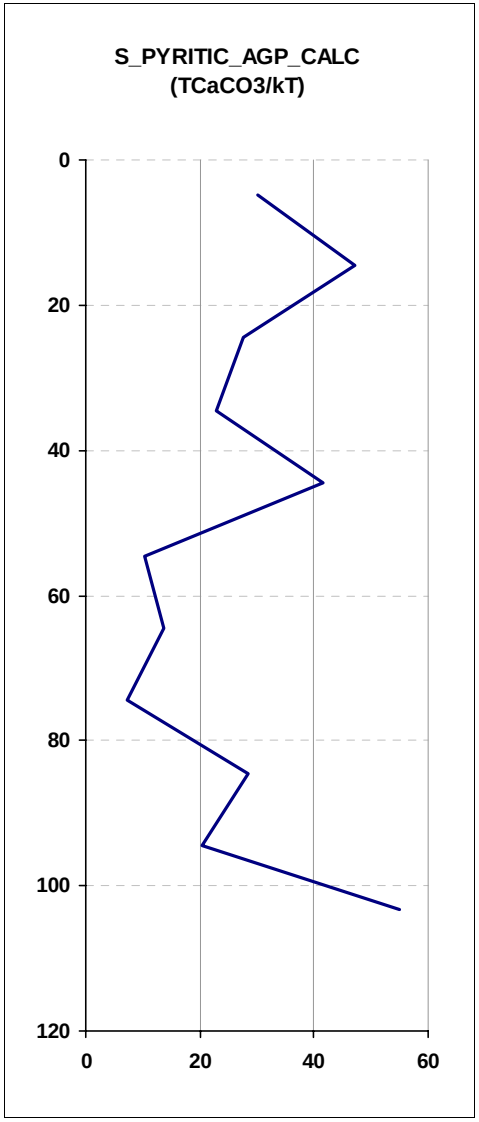
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-6

Test Type: ABA







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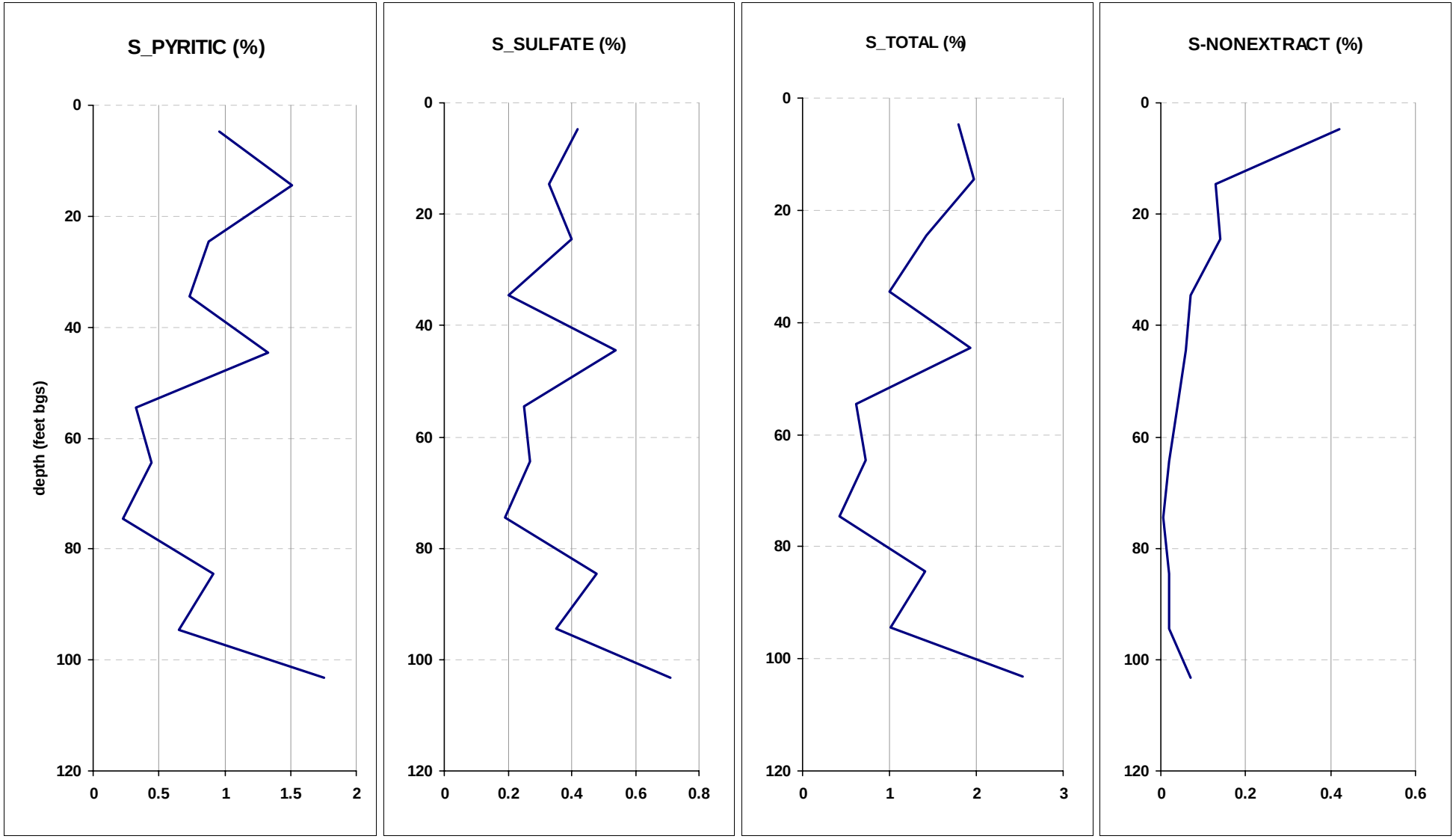
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-6

Test Type: ABA



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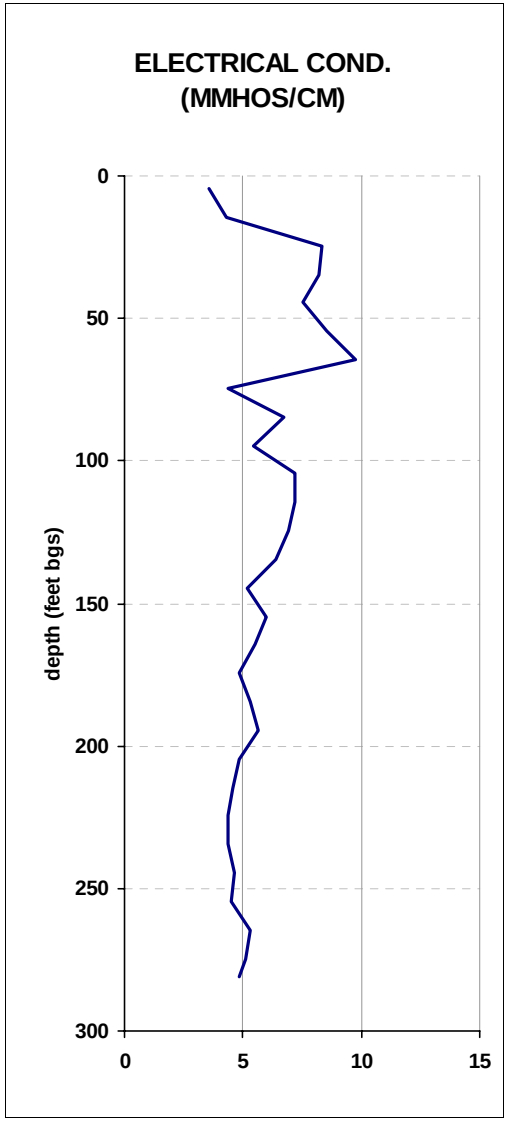
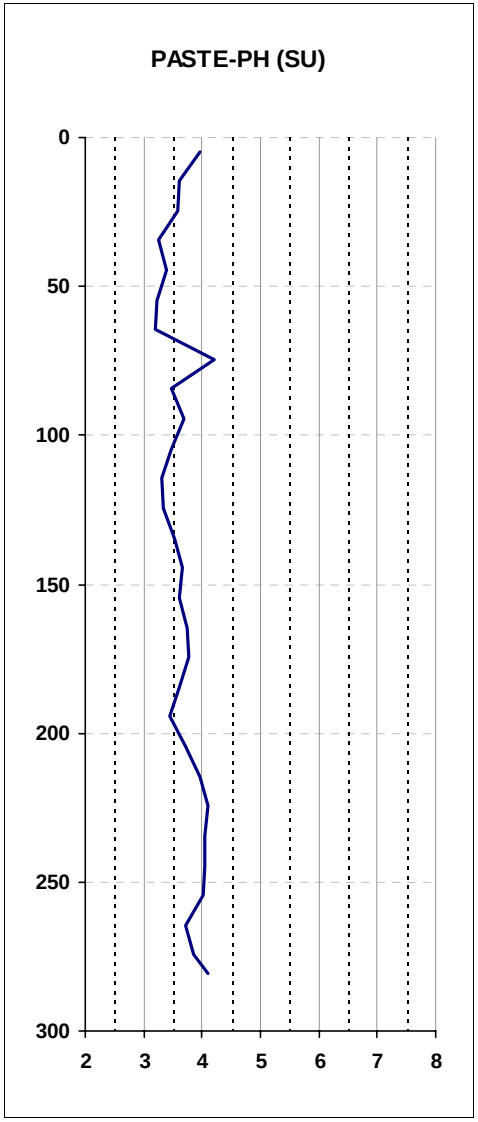
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7

Paste pH and Paste EC



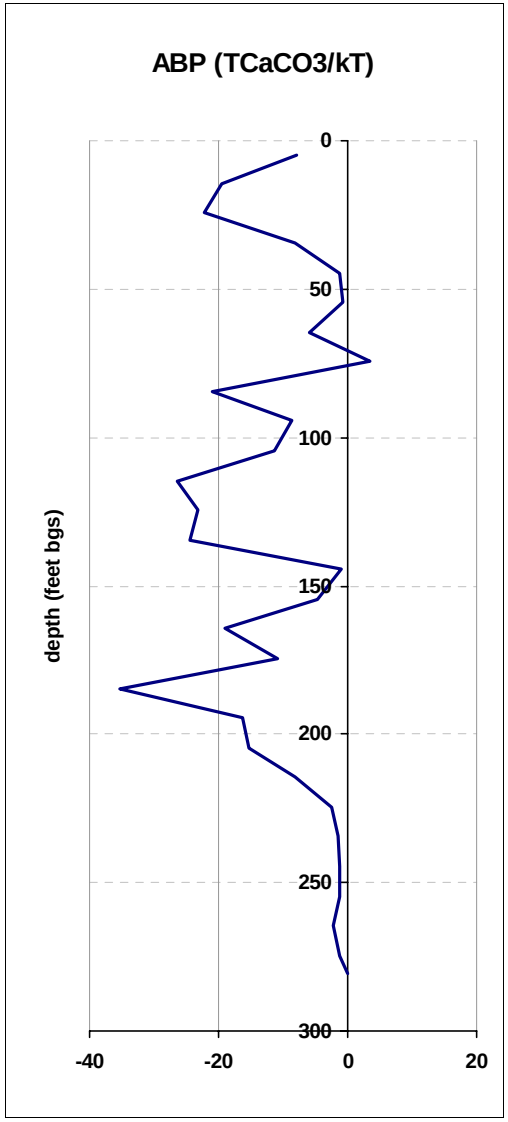


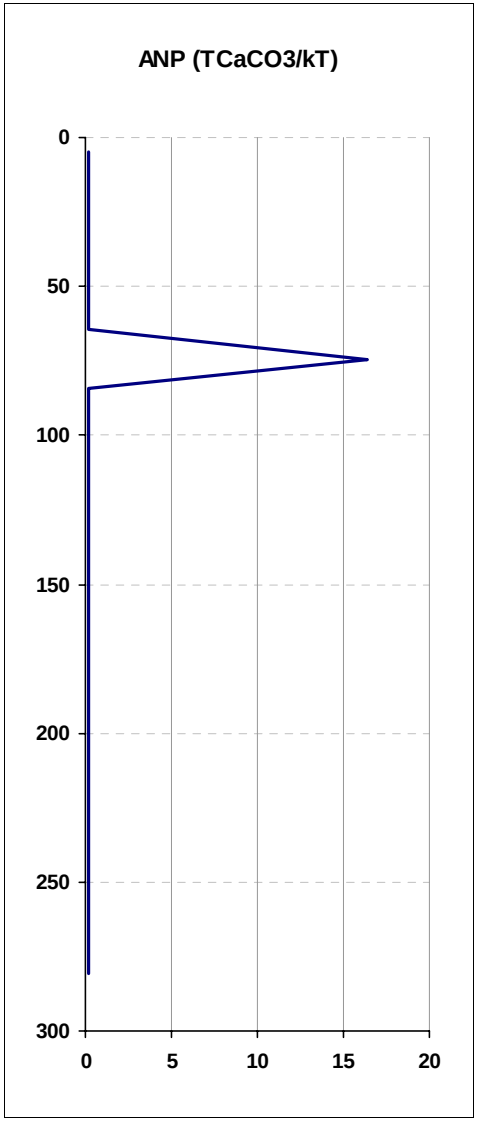
EnviroGroup Limited 2005

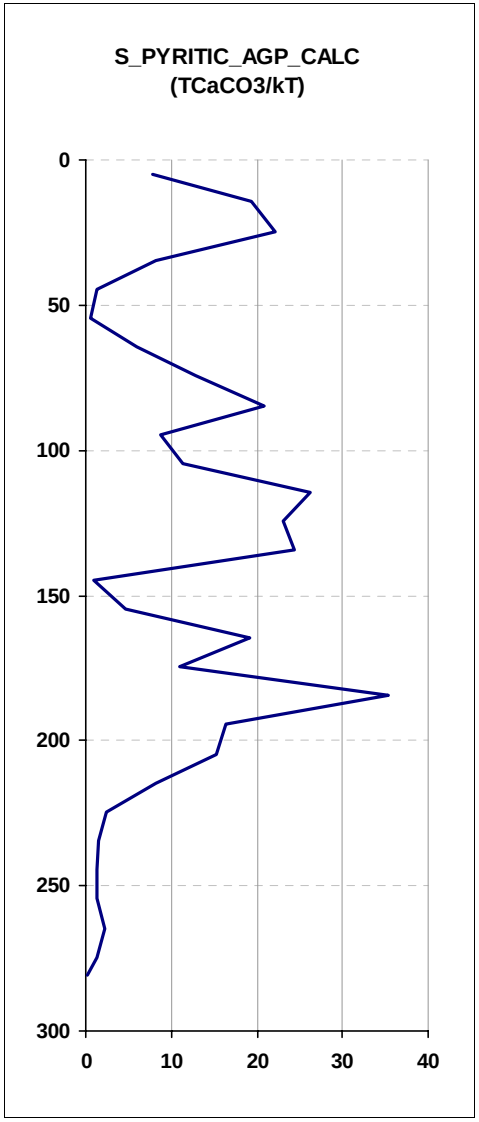
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7

Test Type: ABA





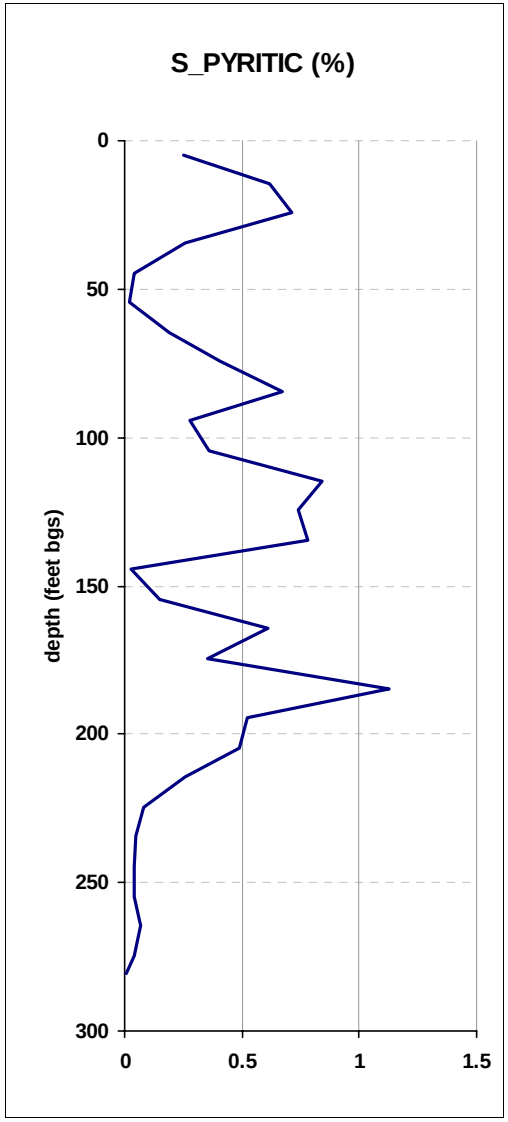


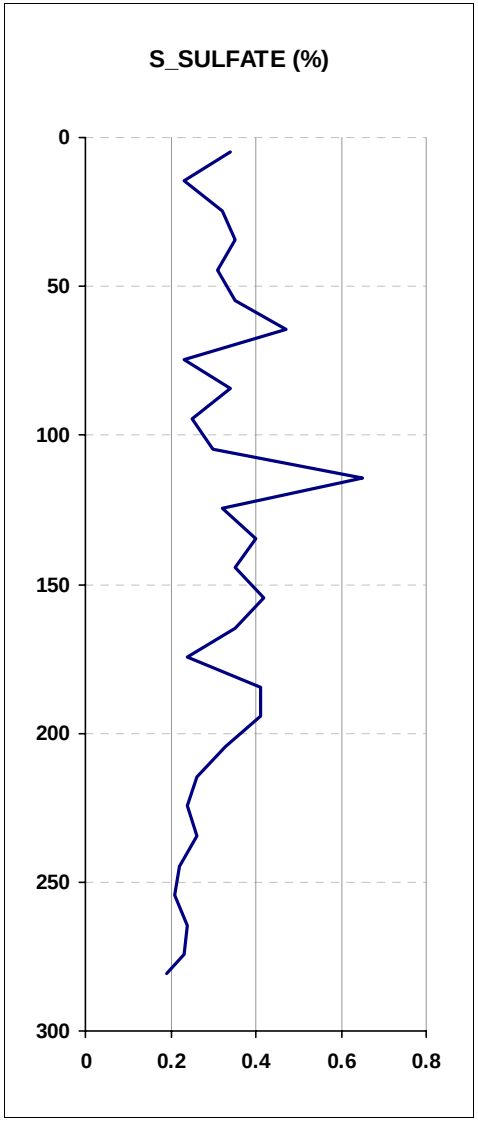
EnviroGroup Limited 2005

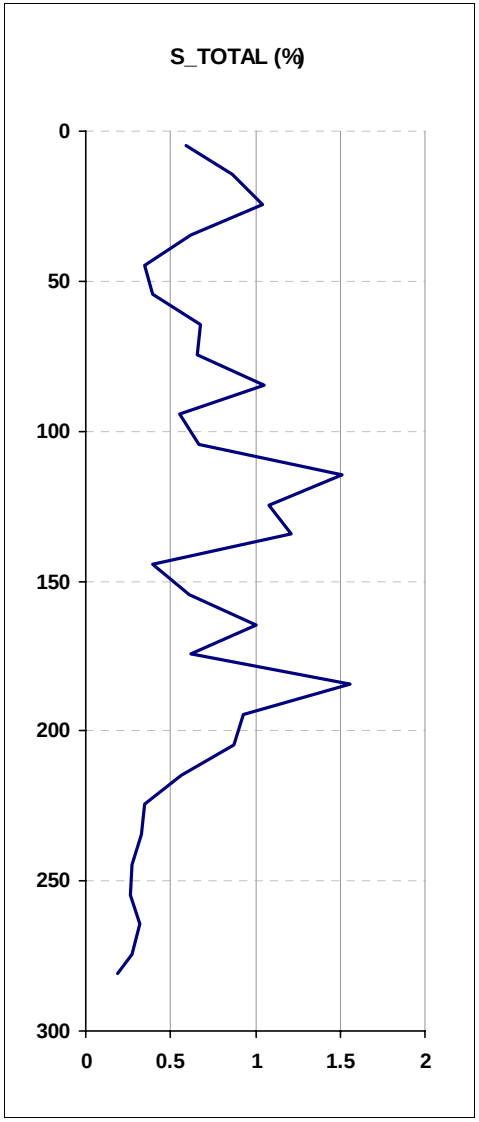
Tyrone Mine Sample Test Results by Location, Test Type

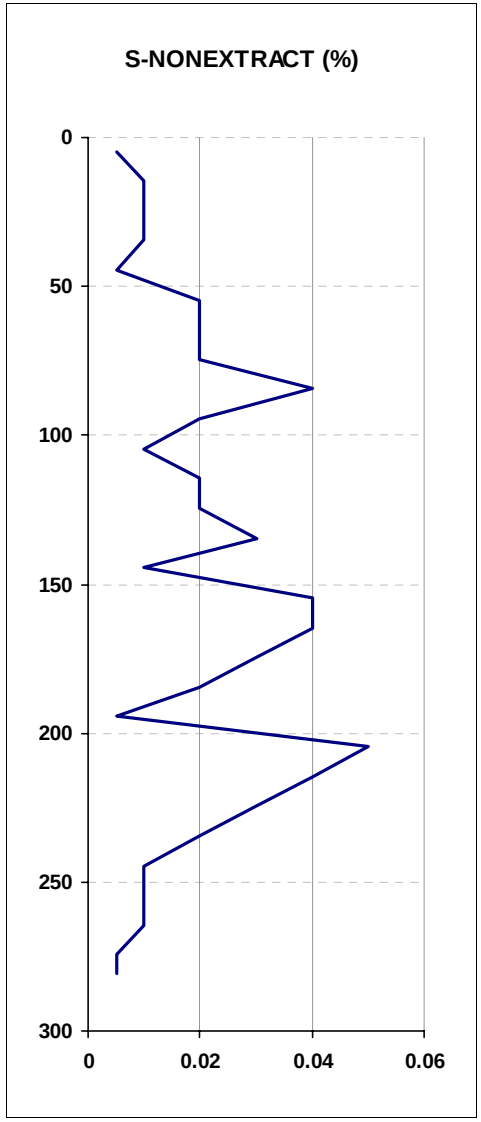
Location: TBGC-7

Test Type: ABA









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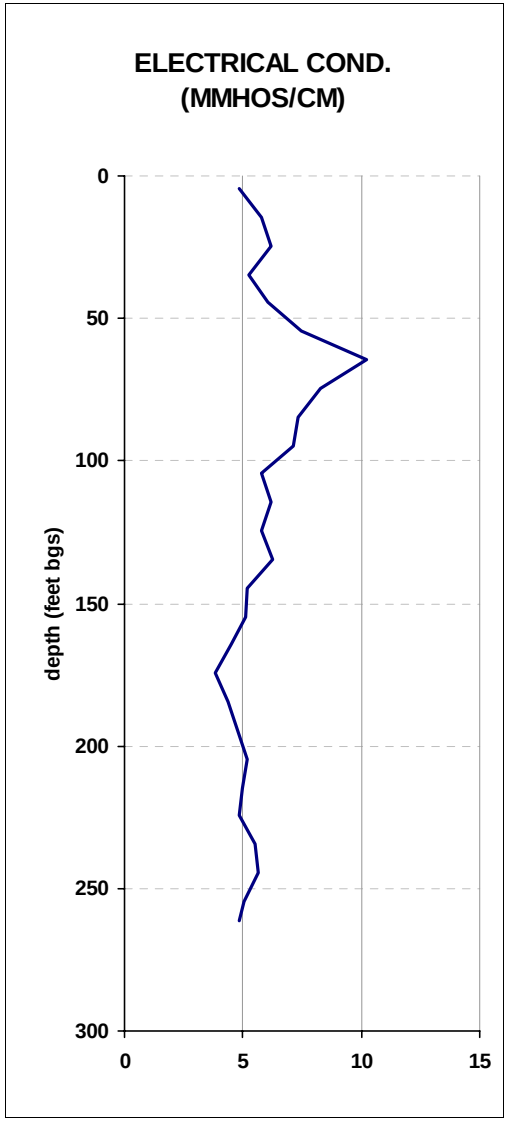
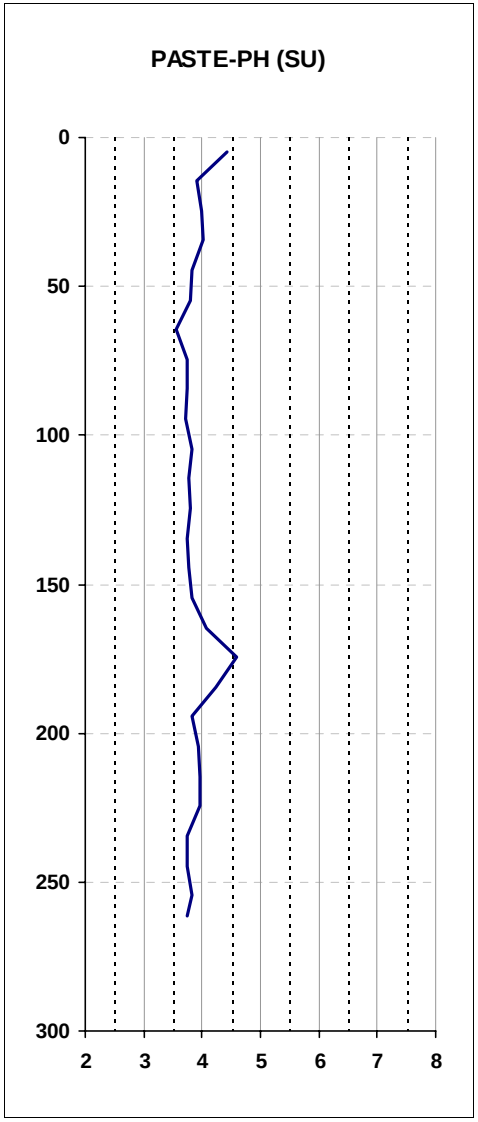
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7A

Paste pH and Paste EC



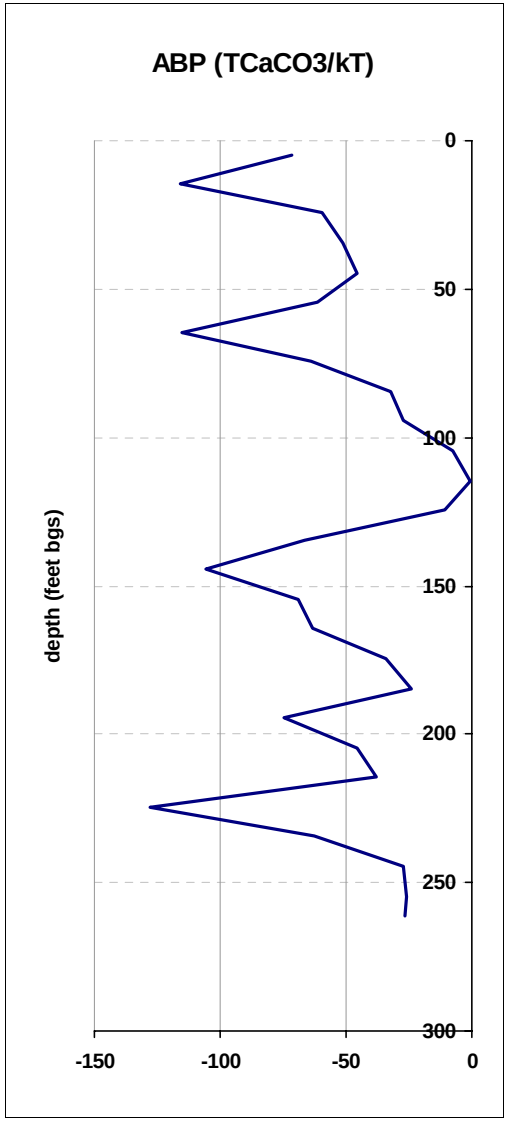


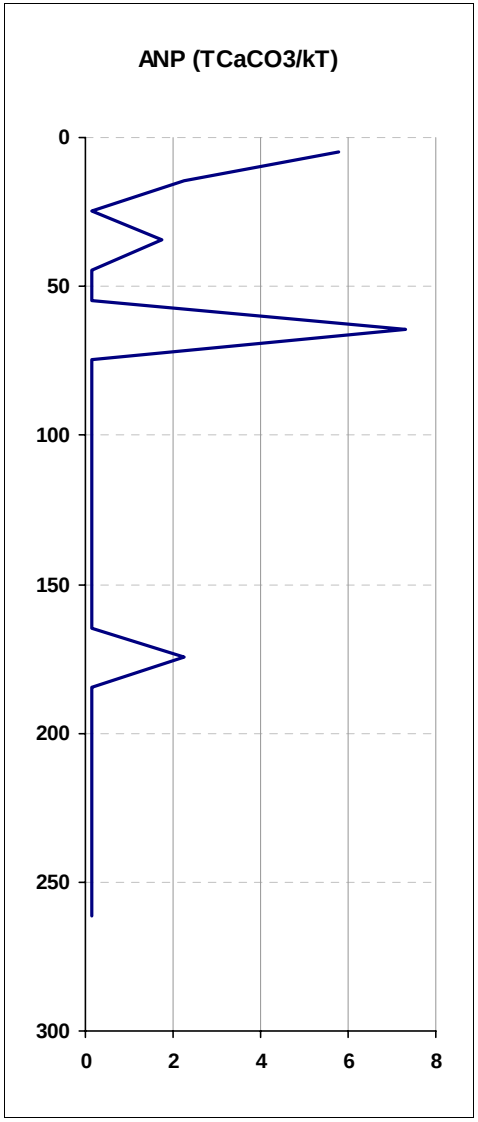
EnviroGroup Limited 2005

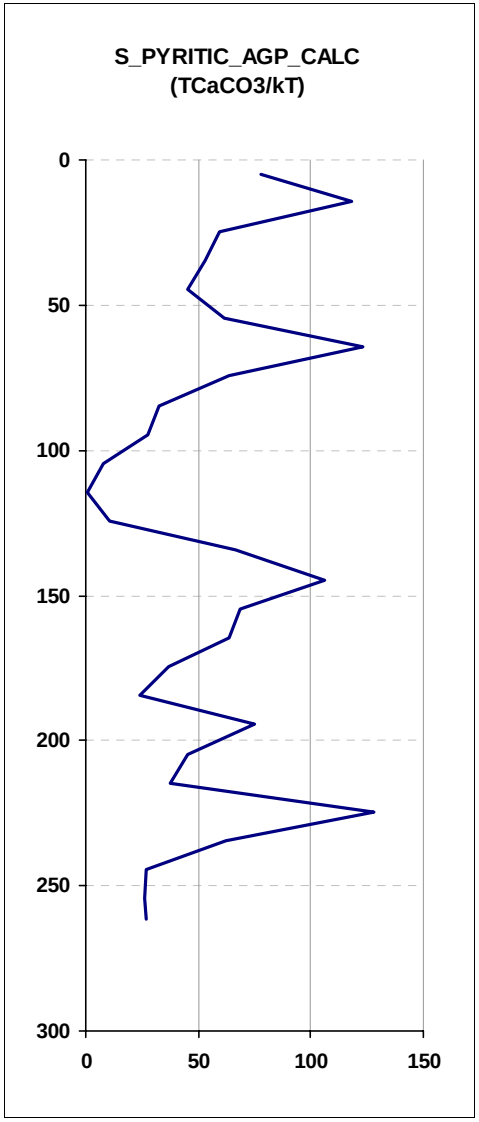
Tyrone Mine Sample Test Results by Location, Test Type

Location: TBGC-7A

Test Type: ABA







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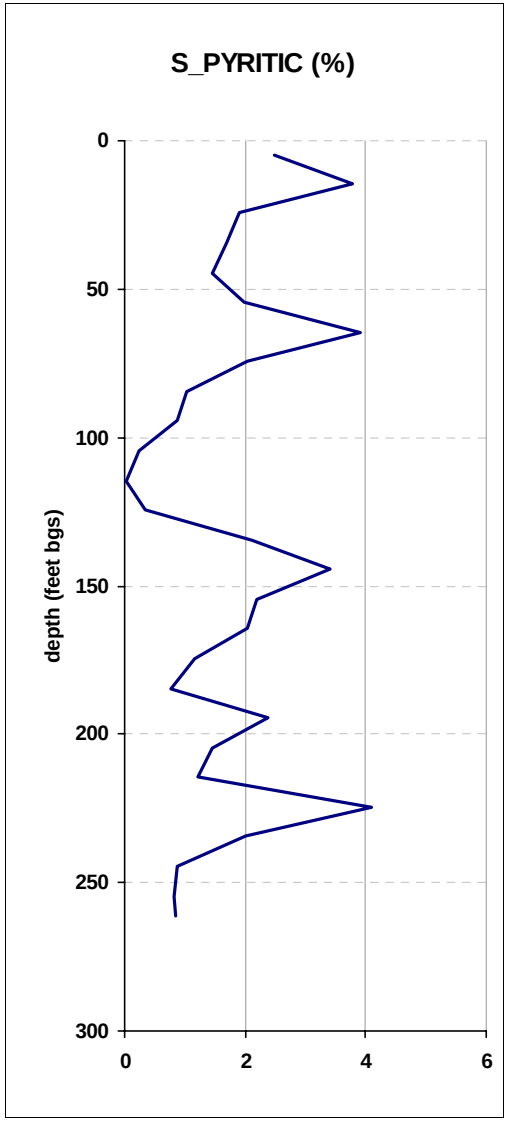
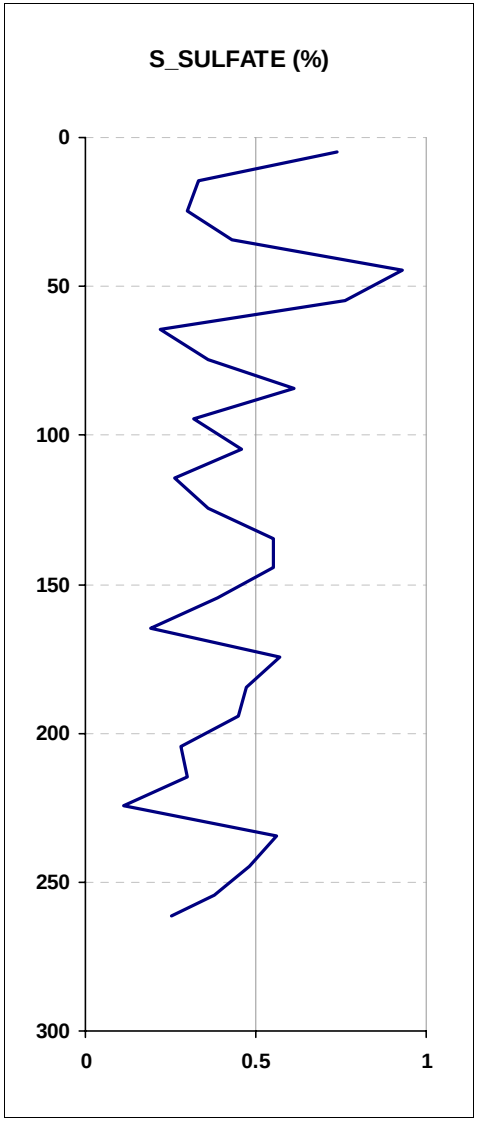
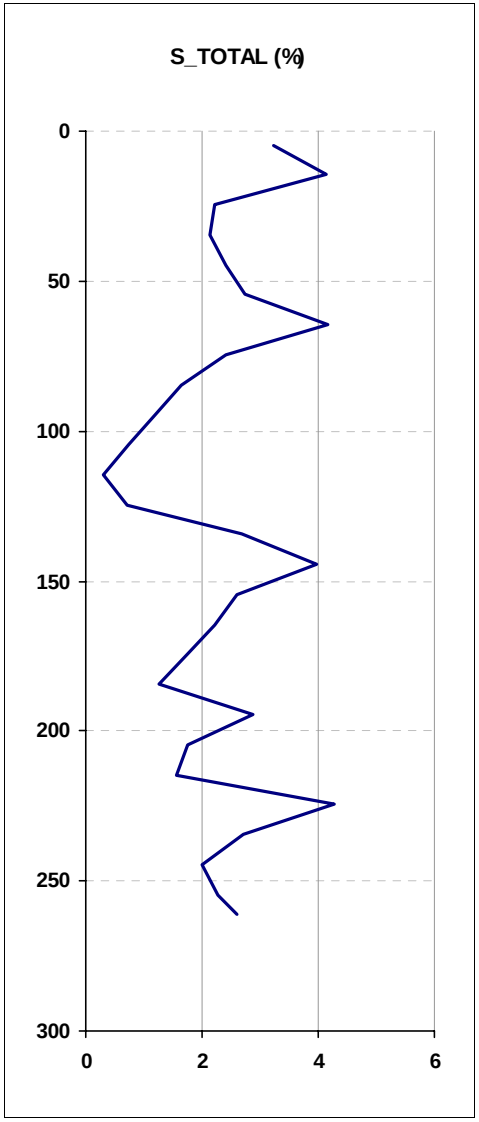
Tyrone Mine Sample Test Results by Location, Test Type

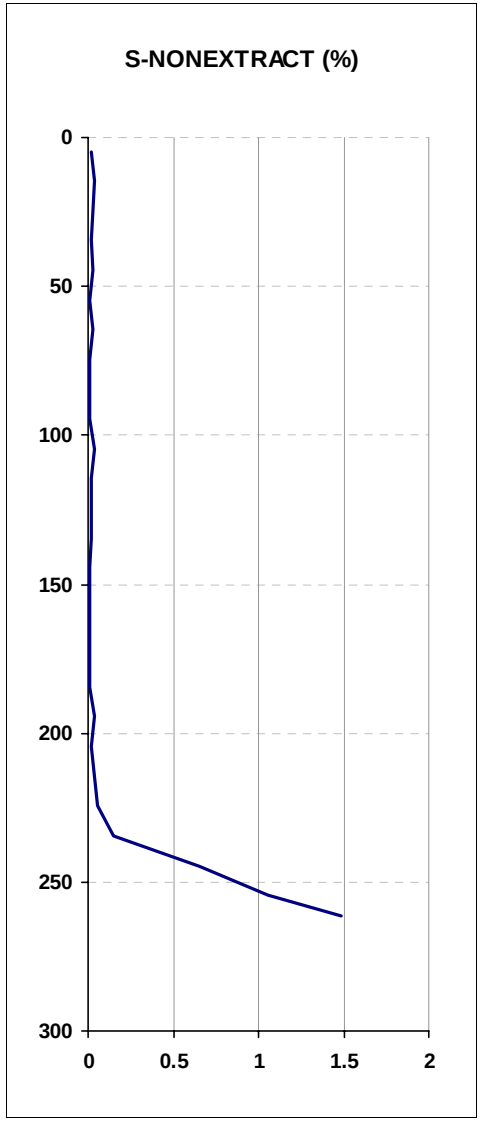
Location: TBGC-7A

Test Type: ABA









EnviroGroup Limited 2005

ABA Results for Geochemical Boreholes

Borehole ID and Sample Interval	AGP (Tons $CaCO_3$/kTon)	ABP (Tons $CaCO_3$/kTon)	ANP (Tons $CaCO_3$/kTon)	Paste EC (mmhos/cm)	Paste pH (su)	Pyritic S (%)	Sulfate S (%)	Residual S (%)	Total S (%)
TBGC-1_0-9.5	9.06	-9.06	<0.3	0.551	5.81	0.290	0.180	0.140	0.610
TBGC-1_9.5-19.5	10.6	-10.6	<0.3	0.499	5.50	0.340	0.160	0.140	0.640
TBGC-1_19.5-29.5	9.69	-9.69	<0.3	0.624	5.20	0.310	0.140	0.140	0.590
TBGC-1_29.5-39.5	10.0	-10.0	<0.3	0.527	5.96	0.320	0.120	0.120	0.560
TBGC-1_39.5-49.5	25.9	-25.9	<0.3	0.634	5.72	0.830	0.190	0.290	1.31
TBGC-1_49.5-59.5	5.94	-4.95	0.990	0.506	6.62	0.190	0.200	0.0200	0.410
TBGC-1_59.5-69.5	2.50	-1.76	0.740	1.63	5.39	0.0800	0.110	0.0200	0.210
TBGC-1_69.5-79.5	1.56	0.910	2.47	0.750	6.51	0.0500	0.0900	0.0300	0.170
TBGC-1_79.5-89.5	3.13	-1.40	1.73	0.760	6.13	0.100	0.150	0.0400	0.290
TBGC-1_89.5-99.5	2.81	-0.840	1.97	1.34	6.28	0.0900	0.140	0.0500	0.280
TBGC-1_99.5-109.5	20.3	-18.8	1.48	3.51	4.32	0.650	0.330	0.0200	1.00
TBGC-1_109.5-119.5	5.63	-5.63	<0.3	1.47	4.29	0.180	0.300	0.0500	0.530
TBGC-1_119.5-129.5	15.6	-15.6	<0.3	3.52	3.61	0.500	0.300	0.100	0.900
TBGC-1_129.5-139.5	25.9	-25.9	<0.3	3.72	3.60	0.830	0.340	0.120	1.29
TBGC-1_139.5-149.5	53.8	-53.8	<0.3	4.71	3.68	1.72	0.490	0.0200	2.23
TBGC-1_149.5-159.5	14.7	-14.7	<0.3	4.58	3.65	0.470	0.450	0.0900	1.01
TBGC-1_159.5-169.5	8.75	-8.75	<0.3	1.45	4.32	0.280	0.240	0.100	0.620
TBGC-1_169.5-179.5	39.7	-39.7	<0.3	4.13	4.31	1.27	0.340	0.0600	1.67
TBGC-1_179.5-189.5	17.8	-17.8	<0.3	0.746	4.58	0.570	0.230	0.140	0.940
TBGC-1_189.5-199.5	10.3	-10.3	<0.3	0.572	4.64	0.330	0.170	0.130	0.630
TBGC-1_199.5-209.5	4.06	-4.06	<0.3	0.829	4.63	0.130	0.190	0.0600	0.380
TBGC-1_209.5-219.5	2.50	-2.50	<0.3	0.730	4.51	0.0800	0.0900	0.0300	0.200
TBGC-1_219.5-222	22.2	-21.1	1.05	1.84	4.52	0.710	0.140	0.0600	0.910
TBGC-2_0-9.5	19.1	-19.1	<0.3	9.39	3.50	0.610	0.490	0.030	1.13
TBGC-2_9.5-19.5	12.2	-12.2	<0.3	6.14	3.70	0.390	0.360	0.010	0.760
TBGC-2_19.5-29.5	23.1	-23.1	<0.3	4.86	3.95	0.740	0.300	0.020	1.06
TBGC-2_29.5-39.5	8.75	-8.75	<0.3	5.75	4.08	0.280	0.280	<0.01	0.560
TBGC-2_39.5-49.5	24.7	-24.7	<0.3	5.56	4.23	0.790	0.510	<0.01	1.30
TBGC-2_49.5-59.5	35.6	-35.6	<0.3	4.90	4.04	1.14	0.210	<0.01	1.35
TBGC-2_59.5-69.5	18.1	-18.1	<0.3	5.29	3.74	0.580	0.300	0.010	0.890
TBGC-2_69.5-79.5	1.56	-1.56	<0.3	3.87	4.24	0.050	0.190	<0.01	0.240
TBGC-2_79.5-89.5	3.13	-3.13	<0.3	4.30	3.71	0.100	0.250	0.010	0.360
TBGC-3_0-9.5	2.19	-2.19	<0.3	4.86	4.05	0.070	0.220	0.010	0.300
TBGC-3_9.5-19.5	8.13	-7.38	0.75	2.24	4.94	0.260	0.140	<0.01	0.400
TBGC-3_19.5-29.5	9.38	-9.38	<0.3	4.94	4.00	0.300	0.310	0.020	0.630

ABA Results for Geochemical Boreholes

Borehole ID and Sample Interval	AGP (Tons $CaCO_3$/kTon)	ABP (Tons $CaCO_3$/kTon)	ANP (Tons $CaCO_3$/kTon)	Paste EC (mmhos/cm)	Paste pH (su)	Pyritic S (%)	Sulfate S (%)	Residual S (%)	Total S (%)
TBGC-3_29.5-39.5	3.75	-3.75	<0.3	3.17	4.57	0.120	0.140	<0.01	0.260
TBGC-3_39.5-49.5	1.56	-1.56	<0.3	4.02	4.15	0.050	0.210	0.040	0.300
TBGC-3_49.5-59.5	6.25	-6.25	<0.3	4.14	3.85	0.200	0.290	0.010	0.500
TBGC-3_59.5-69.5	1.88	-1.88	<0.3	4.20	4.03	0.060	0.240	0.010	0.310
TBGC-3_69.5-79.5	4.38	-4.38	<0.3	4.20	4.15	0.140	0.210	0.010	0.360
TBGC-3_79.5-89.5	3.13	-3.13	<0.3	4.25	4.09	0.100	0.200	0.010	0.310
TBGC-3_89.5-99.5	3.13	-3.13	<0.3	4.34	4.19	0.100	0.200	<0.01	0.300
TBGC-3_99.5-109.5	4.69	-4.69	<0.3	4.55	4.07	0.150	0.230	<0.01	0.380
TBGC-3_109.5-119.5	7.81	-7.81	<0.3	4.78	4.24	0.250	0.170	<0.01	0.420
TBGC-3_119.5-129.5	4.38	-4.38	<0.3	4.47	4.23	0.140	0.300	<0.01	0.440
TBGC-3_129.5-139.5	9.06	-9.06	<0.3	3.95	4.41	0.290	0.250	0.010	0.550
TBGC-3_139.5-149.5	2.19	-2.19	<0.3	4.21	4.36	0.070	0.150	0.010	0.230
TBGC-3_149.5-159.5	4.69	-4.69	<0.3	3.45	4.41	0.150	0.120	0.010	0.280
TBGC-3_159.5-169.5	6.56	-6.56	<0.3	3.60	4.45	0.210	0.200	0.010	0.420
TBGC-3_169.5-179.5	3.44	-3.44	<0.3	4.00	4.31	0.110	0.190	<0.01	0.300
TBGC-4_0-9.5	2.81	-2.81	<0.3	2.24	4.19	0.090	0.180	<0.01	0.270
TBGC-4_9.5-19.5	5.00	-5.00	<0.3	3.35	3.95	0.160	0.250	0.020	0.430
TBGC-4_19.5-29.5	8.13	-8.13	<0.3	3.71	3.85	0.260	0.250	0.020	0.530
TBGC-4_29.5-39.5	10.0	-10.0	<0.3	4.06	3.87	0.320	0.290	0.010	0.620
TBGC-4_39.5-49.5	2.19	-2.19	<0.3	4.71	3.69	0.070	0.270	<0.01	0.340
TBGC-5_0-9.5	5.31	-3.05	2.26	1.14	7.49	0.17	0.16	0.05	0.38
TBGC-5_9.5-19.5	4.69	-3.43	1.26	2.33	6.85	0.15	0.19	0.06	0.4
TBGC-5_19.5-29.5	4.06	-4.06	<0.3	3.33	5.03	0.13	0.13	0.04	0.3
TBGC-5_29.5-39.5	3.13	-3.13	<0.3	3.85	4.2	0.1	0.2	0.02	0.32
TBGC-5_39.5-49.5	15	-15	<0.3	6.62	3.87	0.48	0.31	0.04	0.83
TBGC-5_49.5-59.5	3.44	-3.44	<0.3	2.06	4.62	0.11	0.14	0.02	0.27
TBGC-5_59.5-69.5	7.19	-7.19	<0.3	4.33	4.43	0.23	0.12	0.02	0.37
TBGC-5_69.5-79.5	6.25	-6.25	<0.3	4.81	4.2	0.2	0.18	0.02	0.4
TBGC-5_79.5-89.5	0.63	-0.63	<0.3	1.14	6.2	0.02	0.05	0.03	0.1
TBGC-5_89.5-99.5	3.13	-3.13	<0.3	1.08	5.87	0.1	0.12	0.04	0.26
TBGC-5_99.5-109.5	3.44	-3.44	<0.3	3	4.59	0.11	0.19	0.03	0.33
TBGC-5_109.5-119.5	2.5	-2.5	<0.3	0.96	6.34	0.08	0.1	0.02	0.2
TBGC-5_119.5-129.5	2.19	-2.19	<0.3	0.7	7.2	0.07	0.07	0.01	0.15
TBGC-5_129.5-139.5	3.44	-3.44	<0.3	0.93	5.06	0.11	0.13	0.01	0.25
TBGC-6_0-9.5	30.0	-30.0	<0.3	2.06	4.58	0.960	0.420	0.420	1.80

ABA Results for Geochemical Boreholes

Borehole ID and Sample Interval	AGP (Tons $CaCO_3$/kTon)	ABP (Tons $CaCO_3$/kTon)	ANP (Tons $CaCO_3$/kTon)	Paste EC (mmhos/cm)	Paste pH (su)	Pyritic S (%)	Sulfate S (%)	Residual S (%)	Total S (%)
TBGC-6_9.5-19.5	47.2	-46.7	0.520	2.75	4.50	1.51	0.330	0.130	1.97
TBGC-6_19.5-29.5	27.5	-27.5	<0.3	1.93	4.79	0.880	0.400	0.140	1.42
TBGC-6_29.5-39.5	22.8	-22.8	<0.3	2.51	4.29	0.730	0.200	0.0700	1.00
TBGC-6_39.5-49.5	41.6	-41.6	<0.3	3.14	3.75	1.33	0.540	0.0600	1.93
TBGC-6_49.5-59.5	10.3	-10.3	<0.3	3.48	4.01	0.330	0.250	0.0400	0.620
TBGC-6_59.5-69.5	13.8	-13.8	<0.3	3.73	3.78	0.440	0.270	0.0200	0.730
TBGC-6_69.5-79.5	7.19	-7.19	<0.3	2.75	3.88	0.230	0.190	<0.01	0.420
TBGC-6_79.5-89.5	28.4	-28.4	<0.3	4.07	3.54	0.910	0.480	0.0200	1.41
TBGC-6_89.5-99.5	20.3	-20.3	<0.3	2.67	3.86	0.650	0.350	0.0200	1.02
TBGC-6_99.5-107	55.0	-55.0	<0.3	2.83	4.00	1.76	0.710	0.0700	2.54
TBGC-7_0-9.5	7.81	-7.81	<0.3	3.59	3.97	0.25	0.34	<0.01	0.59
TBGC-7_9.5-19.5	19.4	-19.4	<0.3	4.3	3.62	0.62	0.23	0.01	0.86
TBGC-7_19.5-29.5	22.2	-22.2	<0.3	8.36	3.57	0.71	0.32	0.01	1.04
TBGC-7_29.5-39.5	8.13	-8.13	<0.3	8.22	3.26	0.26	0.35	0.01	0.62
TBGC-7_39.5-49.5	1.25	-1.25	<0.3	7.53	3.4	0.04	0.31	<0.01	0.35
TBGC-7_49.5-59.5	0.63	-0.63	<0.3	8.56	3.24	0.02	0.35	0.02	0.39
TBGC-7_59.5-69.5	5.94	-5.94	<0.3	9.76	3.21	0.19	0.47	0.02	0.68
TBGC-7_69.5-79.5	12.8	3.54	16.4	4.4	4.22	0.41	0.23	0.02	0.66
TBGC-7_79.5-89.5	20.9	-20.9	<0.3	6.7	3.48	0.67	0.34	0.04	1.05
TBGC-7_89.5-99.5	8.75	-8.75	<0.3	5.42	3.69	0.28	0.25	0.02	0.55
TBGC-7_99.5-109.5	11.3	-11.3	<0.3	7.18	3.48	0.36	0.3	0.01	0.67
TBGC-7_109.5-119.5	26.3	-26.3	<0.3	7.19	3.32	0.84	0.65	0.02	1.51
TBGC-7_119.5-129.5	23.1	-23.1	<0.3	6.93	3.34	0.74	0.32	0.02	1.08
TBGC-7_129.5-139.5	24.4	-24.4	<0.3	6.42	3.54	0.78	0.4	0.03	1.21
TBGC-7_139.5-149.5	0.94	-0.94	<0.3	5.17	3.66	0.03	0.35	0.01	0.39
TBGC-7_149.5-159.5	4.69	-4.69	<0.3	6	3.62	0.15	0.42	0.04	0.61
TBGC-7_159.5-169.5	19.1	-19.1	<0.3	5.52	3.74	0.61	0.35	0.04	1
TBGC-7_169.5-179.5	10.9	-10.9	<0.3	4.86	3.77	0.35	0.24	0.03	0.62
TBGC-7_179.5-189.5	35.3	-35.3	<0.3	5.32	3.6	1.13	0.41	0.02	1.56
TBGC-7_189.5-199.5	16.3	-16.3	<0.3	5.64	3.45	0.52	0.41	<0.01	0.93
TBGC-7_199.5-209.5	15.3	-15.3	<0.3	4.84	3.71	0.49	0.33	0.05	0.87
TBGC-7_209.5-219.5	8.13	-8.13	<0.3	4.58	3.96	0.26	0.26	0.04	0.56
TBGC-7_219.5-229.5	2.5	-2.5	<0.3	4.39	4.1	0.08	0.24	0.03	0.35
TBGC-7_229.5-239.5	1.56	-1.56	<0.3	4.35	4.05	0.05	0.26	0.02	0.33
TBGC-7_239.5-249.5	1.25	-1.25	<0.3	4.66	4.04	0.04	0.22	0.01	0.27

ABA Results for Geochemical Boreholes

Borehole ID and Sample Interval	AGP (Tons $CaCO_3$/kTon)	ABP (Tons $CaCO_3$/kTon)	ANP (Tons $CaCO_3$/kTon)	Paste EC (mmhos/cm)	Paste pH (su)	Pyritic S (%)	Sulfate S (%)	Residual S (%)	Total S (%)
TBGC-7_249.5-259.5	1.25	-1.25	<0.3	4.48	4.03	0.04	0.21	0.01	0.26
TBGC-7_259.5-269.5	2.19	-2.19	<0.3	5.32	3.71	0.07	0.24	0.01	0.32
TBGC-7_269.5-279.5	1.25	-1.25	<0.3	5.12	3.85	0.04	0.23	<0.01	0.27
TBGC-7_279.5-282	<0.3	<0	<0.3	4.83	4.09	<0.01	0.19	<0.01	0.19
TBGC-7A_0-9.5	77.5	-71.7	5.79	4.86	4.44	2.48	0.74	0.02	3.24
TBGC-7A_9.5-19.5	118	-116	2.26	5.79	3.92	3.77	0.33	0.04	4.14
TBGC-7A_19.5-29.5	59.4	-59.4	<0.3	6.17	4	1.9	0.3	0.03	2.23
TBGC-7A_29.5-39.5	53.1	-51.4	1.76	5.28	4.02	1.7	0.43	0.02	2.15
TBGC-7A_39.5-49.5	45.6	-45.6	<0.3	6.08	3.82	1.46	0.93	0.03	2.42
TBGC-7A_49.5-59.5	61.6	-61.6	<0.3	7.47	3.81	1.97	0.76	0.01	2.74
TBGC-7A_59.5-69.5	123	-115	7.3	10.2	3.56	3.92	0.22	0.03	4.17
TBGC-7A_69.5-79.5	63.8	-63.8	<0.3	8.26	3.74	2.04	0.36	<0.01	2.4
TBGC-7A_79.5-89.5	32.5	-32.5	<0.3	7.35	3.74	1.04	0.61	<0.01	1.65
TBGC-7A_89.5-99.5	27.5	-27.5	<0.3	7.12	3.72	0.88	0.32	0.01	1.21
TBGC-7A_99.5-109.5	7.81	-7.81	<0.3	5.76	3.82	0.25	0.46	0.04	0.75
TBGC-7A_109.5-119.5	0.94	-0.94	<0.3	6.16	3.78	0.03	0.26	0.02	0.31
TBGC-7A_119.5-129.5	10.6	-10.6	<0.3	5.77	3.8	0.34	0.36	0.02	0.72
TBGC-7A_129.5-139.5	66.3	-66.3	<0.3	6.27	3.74	2.12	0.55	0.02	2.69
TBGC-7A_139.5-149.5	106	-106	<0.3	5.19	3.77	3.4	0.55	0.01	3.96
TBGC-7A_149.5-159.5	68.8	-68.8	<0.3	5.08	3.83	2.2	0.39	<0.01	2.59
TBGC-7A_159.5-169.5	63.4	-63.4	<0.3	4.52	4.07	2.03	0.19	0.01	2.23
TBGC-7A_169.5-179.5	36.6	-34.3	2.26	3.82	4.58	1.17	0.57	<0.01	1.74
TBGC-7A_179.5-189.5	24.1	-24.1	<0.3	4.37	4.24	0.77	0.47	0.01	1.25
TBGC-7A_189.5-199.5	74.7	-74.7	<0.3	4.78	3.82	2.39	0.45	0.04	2.88
TBGC-7A_199.5-209.5	45.6	-45.6	<0.3	5.15	3.93	1.46	0.28	0.02	1.76
TBGC-7A_209.5-219.5	37.8	-37.8	<0.3	4.98	3.97	1.21	0.3	0.04	1.55
TBGC-7A_219.5-229.5	128	-128	<0.3	4.81	3.97	4.11	0.11	0.06	4.28
TBGC-7A_229.5-239.5	62.5	-62.5	<0.3	5.53	3.74	2	0.56	0.15	2.71
TBGC-7A_239.5-249.5	27.2	-27.2	<0.3	5.66	3.75	0.87	0.48	0.65	2
TBGC-7A_249.5-259.5	25.9	-25.9	<0.3	5.04	3.82	0.83	0.38	1.06	2.27
TBGC-7A_259.5-263	26.6	-26.6	<0.3	4.81	3.75	0.85	0.25	1.49	2.59

phelps dodge Tyrone, Inc. P. O. Drawer 571, Tyrone, New Mexico 88065 • (505) 538-5331

December 27, 2005

Via UPS Overnight
Tracking #1Z8753E50199594747

Mr. Clint Marshall
New Mexico Environment Department
Mining Environmental Compliance Section
P.O. Box 26110
Santa Fe, New Mexico 87502

Dear Mr. Marshall:

Re: Phelps Dodge Tyrone, Inc., Supplemental Materials Characterization of the Leached Ore Stockpiles and Waste Rock Stockpiles Final Report DP 1341, Condition 80 Tyrone Mine

Attached are three hardcopies of the Phelps Dodge Tyrone, Inc., (Tyrone) Supplemental Materials Characterization of the Leached Ore Stockpiles and Waste Rock Stockpiles Final Report which is submitted as fulfillment of DP-1341, Condition 80 for the Tyrone Mine.

These copies were sent to your attention by EnviroGroup Limited on our behalf. Because of file size, electronic copies cannot be emailed, so CDs of the report are also attached.

Should you have questions or comments regarding this report, please contact Mr. Greg Schoen at (505)574-6359

Very truly yours,

E. L. (Ned) Hall, Manager
Environment, Land & Water
New Mexico Operations

ELH:gs
Attachments
20051222-100

c Mary Ann Menetrey, NMED (w/o attachments)
Keith Ehlert, NMED (w/o attachments)
Holland Shepherd, MMD (w/o attachments)
David Ohori, MMD (with attachments)
Dusty Earley, EnviroGroup Ltd

Supplemental Materials Characterization of the Leached Ore Stockpiles and Waste Rock Stockpiles
Final Report for DP-1341, Condition 80
Tyrone Mine

Prepared by:

EnviroGroup Limited
Centennial, Colorado

Prepared for:

Phelps Dodge Tyrone, Inc
Tyrone, NM

December 29, 2005

Project No. PD-0447

Prepared by — 12/28/05 Date

Reviewed by — 12/28/05 Date

TABLE OF CONTENTS

TABLE OF CONTENTS I
LIST OF TABLES II
LIST OF FIGURES III
APPENDICES IV
LIST OF ACRONYMS V
1.0 INTRODUCTION 1-1
1.1 STUDY OBJECTIVES AND SCOPE 1-1
1.2 BACKGROUND 1-3
2.0 MATERIAL EVALUATION PROCEDURES 2-1
2.1 STOCKPILE CHARACTERIZATION 2-1
2.1.1 Borehole Logging and Monitoring 2-2
2.1.2 Borehole Material Laboratory Analysis 2-3
2.2 DATA QUALITY ASSURANCE AND CONTROL 2-3
3.0 STOCKPILE MATERIAL DATA ANALYSIS 3-1
3.1 PASTE PH AND PASTE EC 3-3
3.2 ABA 3-8
3.3 MWMP 3-10
3.3.1 pH 3-10
3.3.2 EC 3-11
3.3.3 Sulfate 3-11
3.3.4 Fluoride 3-11
3.3.5 Metals 3-12
3.4 XRD MINERALOGY 3-14
3.5 XRF BULK COMPOSITION 3-17
3.6 STOCKPILE MONITORING 3-19
3.7 STOCKPILE WEATHERING AND LEACHING 3-22
4.0 DISCUSSION 4-1
4.1 STOCKPILE SEEPAGE QUALITY 4-2
4.2 STOCKPILE GEOCHEMICAL STABILITY 4-2
5.0 CONCLUSIONS 5-1
6.0 REFERENCES 6-1

LIST OF TABLES

Table 1.1 Tyrone Materials Characterization Studies

Table 2.1 Analytical Method Descriptions

Table 3.1 Statistical Summary of Paste pH, Paste EC and ABA Results; No. 1 Leach Stockpile

Table 3.2 Statistical Summary of Paste pH, Paste EC and ABA Results; No. 1A and No. 1B Leach Stockpiles

Table 3.3 Statistical Summary of Paste pH, Paste EC and ABA Results; No. 1C Stockpile

Table 3.4 Statistical Summary of Paste pH, Paste EC and ABA Results; East Main Stockpile

Table 3.5 Statistical Summary of Paste pH, Paste EC and ABA Results; No. 2 Leach Stockpile

Table 3.6 Statistical Summary of Paste pH, Paste EC and ABA Results; No. 2A Leach Stockpile

Table 3.7 Statistical Summary of Paste pH, Paste EC and ABA Results; No. 3 Leach Stockpile

Table 3.8 Statistical Summary of Paste pH, Paste EC and ABA Results; No. 3B Stockpile

Table 3.9 Statistical Summary for Selected MWMP Results

Table 3.10 Statistical Summary of XRD Mineralogy Results

Table 3.11 Statistical Summary of XRF Bulk Composition Results

LIST OF FIGURES

Figure 1.1 Stockpile Characterization Locations
Figure 3.1 Particle Size Profiles
Figure 3.2 Moisture Content Profiles
Figure 3.3 Retained Moisture Profiles
Figure 3.4 Stockpile Mean Paste pH and Mean ABP
Figure 3.5 Pyritic AGP versus ANP
Figure 3.6 Pyritic AGP versus ANP - Area of Detail
Figure 3.7 Sulfate versus Pyritic AGP
Figure 3.8 Sulfate versus Pyritic AGP – Area of Detail

APPENDICES

Appendix A Paste pH, Paste EC and ABA Borehole Profiles and Data

Appendix B MWMP Borehole Profiles and Data

Appendix C XRD Mineralogy Borehole Profiles and Data

Appendix D XRF Bulk Composition Borehole Profiles and Data

Appendix E Stockpile Monitoring Profiles and Data

Appendix F Stockpile Borehole Cross Sections

Appendix G Material Age Analysis Charts

LIST OF ACRONYMS

ABA	Acid Base Accounting
ABP	Acid Base Potential
AGP	Acid Generating Potential
ANP	Acid Neutralizing Potential
bgs	Below Ground Surface
ASTM	American Society of Testing and Measurement
CCP	Closure / Closeout Plan
COC	Constituents of Concern
CO_2	Carbon Dioxide
DBS&A	Daniel B. Stephens and Associates
DP	Discharge Permit
EC	Electrical Conductivity
GETS	Geochemical Evaluation of Tailings and Stockpiles
LCS	Laboratory Control Standard
MA	Mineral Assemblage
mg/l	milligrams per liter
mmhos/cm	millimhos per centimeter
MWMP	Meteoric Water Mobility Procedure
NMED	New Mexico Environment Department
O_2	Oxygen
PDTI	Phelps Dodge Tyrone Inc.
pct	percent
ppm	parts per million
PLS	Pregnant Leach Solution
PMC	Preliminary Materials Characterization
PMET	Pittsburg Mineral and Environmental Technology
REE	Rare Earth Elements
RPD	Relative Percent Difference

SEM	
SMC	Supplementary Materials Characterization
SPLP	Synthetic Precipitation Leaching Procedure
$TCaCO_3/kT$	Tons $CaCO_3$ per Kiloton of Rock
wt pct	weight percent
XRD	X-Ray Diffraction
XRF	X-Ray Fluorescence

1.0 INTRODUCTION

This final report on the Supplemental Materials Characterization Study of the Leach Ore Stockpiles and Waste Rock Stockpiles at the Tyrone Mine is being submitted by Phelps Dodge Tyrone Inc. (PDTI) to the New Mexico Environment Department (NMED) in fulfillment of the permit requirements of Discharge Permit (DP) 1341, Condition 80 (NMED, 2003) (referred to herein as Condition 80). Condition 80 is a supplemental technical study for mine closure planning purposes and the objectives, scope and background of this study were presented in the work plan (Greystone, 2003c) and interim report (Greystone, 2004b) and are summarized briefly in Sections 1.1 and 1.2. The purpose of this report is to provide an analysis of the stockpile material data gathered for Condition 80 and to compare this information with materials data collected under previous studies.

This report is organized into six sections including this introduction. The materials evaluation procedures are presented in section 2.0. Section 3.0 provides analyses of the field and laboratory data. Section 4.0 provides a discussion of these findings and Section 5.0 provides the conclusions for the entire study. References cited in this report are provided in Section 6.0.

1.1 STUDY OBJECTIVES AND SCOPE

The two objectives of the Condition 80 study are:

1) Characterize the internal composition and geochemistry of the leach ore stockpiles and waste rock stockpiles by collecting an adequate number of samples;

2) Collect other physical and chemical data to support Conditions 50, 78, 81, 82, and 83 of DP-1341.

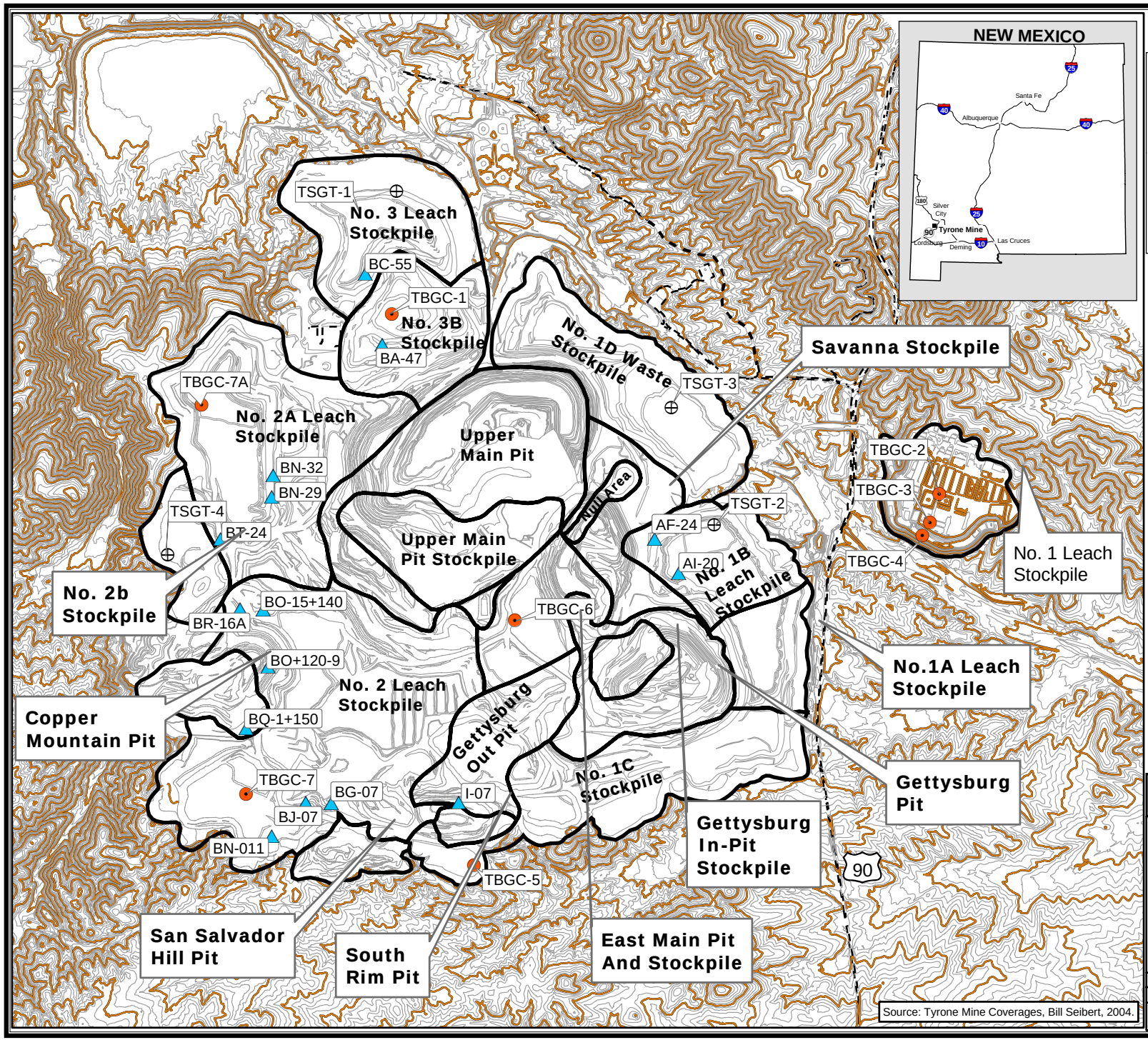
As summarized in Section 1.2, mine materials have been characterized in previous reports and this study provides data and analyses that supplement the existing database.

This work is being closely coordinated with the Revised Seepage Investigation (Greystone, 2004a) (EnviroGroup, 2005a) and the Supplemental Slope Stability Analysis (Golder, 2003) for DP-1341, Conditions 81 and 78, respectively. These studies will use information on stockpile seepage quality and geochemical stability that is provided in this report. In addition, the results of the materials characterization study will be used to develop the stockpile closure alternatives considered in the Feasibility Study under Condition 89 of the permit. The overall performance objectives and conceptual designs for closure and reclamation of the major facilities at Tyrone will be based on the outcome of the supplemental supporting studies required in DP-1341 (NMED, 2003), including this study.

The stockpiles and stockpile complexes that are being evaluated for closure and closeout planning purposes are defined as follows:

- No. 1 Stockpile
- No. 1 Stockpile Complex (No. 1A, No. 1B, No. 1C, and No. 1D Stockpiles)
- East Main Pit Stockpile
- Gettysburg Out Pit Stockpile
- No. 2 Stockpile Complex (No. 2, No. 2A, and No. 2B Stockpiles)
- No. 3 Stockpile Complex (No. 3 and No. 3B Stockpiles)

These facilities are located within the Tyrone Mine Stockpile Unit (M3, 2001) and the boundaries of these facilities are shown in Figure 1.1. These facilities contain the majority of stockpiled material that will remain at the Tyrone Mine after closure. The



LEGEND

- Road-Paved
- Becker, Geochemical Borehole
- Rotosonic, Geotechnical Borehole
- Stockpile Boreholes, Assay Pulps
- Stockpile Outlines With Name

phelps dodge Corporation

N W E S

0 1,000 2,000 4,000 Feet

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TYRONE MINE

DP-1341, CONDITION 80 SUPPLEMENTAL MATERIALS CHARACTERIZATION

FIGURE 1.1 STOCKPILE CHARACTERIZATION LOCATIONS

ANALYSIS AREA: Tyrone Mine, Grant County, New Mexico

Date: 09/09/05	PD-0447	Drawn By: JCG

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No. 1 Stockpile exists wholly within the Mimbres Valley drainage system. The No. 1 Stockpile Complex East Main Pit Stockpile and Gettysburg Out Pit Stockpile exist within the Mimbres Valley, Main Pit and Gettysburg Pit drainage systems. The No. 2 Stockpile Complex and the No. 3 Stockpile Complex exist within the Main Pit and Mangas Valley drainage systems.

1.2 BACKGROUND

Detailed background information on the Tyrone mine and its stockpile facilities was presented in the Tyrone Mine Closure /Closeout Plan (CCP) (M3, 2001) and other documents cited in the Work Plan (Greystone, 2003c) and Interim Report (Greystone, 2004b) for Condition 80. A brief summary of the information available on the Tyrone mine stockpiles is presented in this section.

The Tyrone copper deposit is a member of a class of mineral deposits known as porphyry copper deposits. The geology of the deposit has been described in various reports cited in the Condition 80 Work Plan and Interim Report. The predominant host rocks are Tertiary quartz monzonite porphyry and Precambrian granite. The rocks have been subject to hypogene and supergene alteration as part of the ore forming processes (Kolessar, 1982). The geology of the mine is an important factor in the mining operations and stockpile construction and composition. Geologists at Tyrone use a mineral assemblage (MA) classification system to designate mined materials based on the mineralogical characteristics of primary and secondary porphyry copper ore deposit formation and associated host rock alteration. A summary of the classification system was provided in the Condition 80 Interim and Preliminary Reports (Greystone, 2004b; EnviroGroup, 2005b). These reports are referred to as the Interim Report and Preliminary Report without references in the remainder of this report.

Open pit mining operations have been conducted at the Tyrone Mine since May of 1967 and the location of the stockpiles is based on mine plans that minimize haulage distances and maintains access to ore reserves. Therefore the stockpiles were constructed near and within the Main, Gettysburg and other mine pits shown in Figure 1.1. The stockpiles are most commonly constructed by end-dumping the materials excavated from the pits in 30 to 50-foot lifts that have nearly level top surfaces. This construction method results in stockpile slopes that are at an approximate angle of repose between lift levels and on stockpile outslopes.

Prior to the inception of leaching operations on the No. 1 Stockpile in 1972 most stockpile materials were considered waste. However, mine wide leaching operations began after the commissioning of the solution extraction electrowinning plant in 1984 and since that time waste rock stockpiles have been differentiated from leach ore stockpiles. Acidic raffinate solution is applied to the tops of the leach ore stockpiles for the economical recovery of copper from pregnant leach solution (PLS). Therefore, individual lifts of stockpiled materials have been exposed to leach solutions and weathering for variable periods of time.

The Tyrone ore, overburden materials, and stockpile materials have been studied and the materials characterization data are provided primarily in the reports listed in Table 1.1. Reports submitted as part of the CCP (M3, 2001) include the Preliminary Materials Characterization (PMC) (DBS&A, 1997a), Supplemental Materials Characterization (SMC) (DBS&A, 1997b), and Geochemical Evaluation of Tailings and Stockpiles (GETS) (SARB, 1999). The materials characterization data in these reports includes acid-base accounting (ABA), synthetic precipitation leaching procedure (SPLP), whole rock constituent concentrations, soil pH (paste pH), mineralogy, and kinetic testing results of sulfide oxidation using humidity cells. In the PMC and SMC reports the geochemical analyses were used to categorize the stockpile materials into two broad groups, A and B through statistical analysis. Group A consists primarily of sulfide-bearing materials having significant acid-generation potential with an average ABA of -

43.3 equivalent tons of calcium carbonate ($CaCO_3$) per kiloton of rock ($TCaCO_3$/kT). Group B is comprised of leached cap and copper oxide materials that are approximately neutral, with an average ABA of 6.7 $TCaCO_3$/kT.

Stockpile characterization and monitoring data were also provided in the Interim and Preliminary reports for Condition 80.

Table 1.1. Tyrone Materials Characterization Studies

Permit Requirement	Report Title	
DP1341-Condition 80	Supplemental Materials Characterization of the Leached Ore Stockpiles and Waste Rock Stockpiles Preliminary Report	EnviroGroup, 2005b
	Supplemental Materials Characterization of the Leached Ore Stockpiles and Waste Rock Stockpiles Interim Report	Greystone, 2004b
Tyrone CCP	Geochemical Evaluation of Tailings and Stockpiles (GETS)	SARB, 1999
	Supplemental Materials Characterization Study (SMC)	DBS&A, 1997b
	Preliminary Materials Characterization Study (PMC)	DBS&A, 1997a

2.0 MATERIAL EVALUATION PROCEDURES

A materials characterization database has been compiled from the CCP studies and the studies performed for DP-1341, Condition 80. The database contains approximately 740 samples of fresh rock and stockpile materials that have been characterized through field and laboratory analyses. The stockpile materials characterization database is used to determine material reactivity and the effects of leaching and weathering. In Section 3.0 the chemical and mineralogical composition of the stockpile samples is compared to those of fresh rock samples characterized in the PMC and SMC studies (DBS&A, 1997a and b). Geochemical characterization of samples from greater depths within the stockpile also provides information on the progressive effects of leaching and weathering as these samples have been leached and weathered for up to 3 decades. Similarly, comparison of physical characteristics such as grain size and grain density of samples collected from the surface and deeper within the stockpiles yields information on the physical effects of weathering. Methods for the physical analysis and testing are described in the work plan for the Condition 78 stability study (Golder, 2003).

Section 2.1 briefly describes the methods used for stockpile material characterization and Section 2.2 provides a summary of the Condition 80 laboratory data quality.

2.1 STOCKPILE CHARACTERIZATION

Stockpile surface samples were collected as part of the SMC and selected stockpile borehole assay pulp samples were characterized in the GETS (SARB, 1999). As part of the Condition 80 study, additional assay pulps from the Tyrone archives were retrieved from 15 stockpile boreholes to perform geochemical characterization analyses. In addition, supplemental stockpile borehole sampling was conducted for Condition 80, and a total of eight stockpile boreholes were completed using percussion hammer drilling to collect material samples for geochemical characterization. Four boreholes were

completed using sonic coring drilling to collect material samples for geotechnical characterization samples for the Condition 78 stability study (Golder, 2003). The locations of the boreholes sampled for Condition 80 are shown in Figure 1.1

Section 2.1.1 describes the field logging that was conducted during the Condition 80 drilling campaign and section 2.1.2 summarizes the laboratory analyses that were performed on the stockpile borehole samples.

2.1.1 Borehole Logging and Monitoring

Samples collected from the percussion hammer and sonic boreholes were described in geologic logs, and downhole geophysical and geochemical logging was also conducted in selected boreholes as described in the Condition 80 Preliminary Report (EnviroGroup, 2005b). Geologic logging included descriptions of the texture, lithology, mineralization and color and degree of alteration based on macroscopic observation. In addition blow counts from the hammer percussion drilling were recorded as a relative indicator of material consolidation density and toughness. The geophysical and geochemical logging included; elemental capture spectroscopy sonde, lithodensity, compensated neutron, and natural gamma ray spectrometry. These techniques provide information on the chemical composition, bulk density, moisture content, and clay content of the stockpile materials, respectively.

Stockpile monitoring wells were installed into the geochemical characterization boreholes during the Condition 80 drilling campaign. Thermistor strings and gas sampling tubes were installed in the monitoring wells to monitor temperature, and oxygen (O_2) and carbon dioxide (CO_2) concentrations, respectively, in the stockpiles. Details of the monitoring well installations and measurements are provided in the Preliminary Report.

2.1.2 Borehole Material Laboratory Analysis

The laboratory analysis and testing methods used for sample characterization were described in the Interim and Preliminary Reports. Stockpile samples collected from borehole and open cut samples were analyzed for paste pH, paste electrical conductivity (EC), modified acid base accounting (ABA), meteoric water mobility procedure (MWMP), mineralogy by x-ray diffraction (XRD), reflectance spectroscopy, and bulk composition by x-ray fluorescence (XRF). These methods are summarized in Table 2.1. The laboratory ABA, MWMP, XRD and XRF reports presented in the Preliminary Report are summarized in tabular format in Appendices A through D, respectively.

Table 2.1. Analytical Method Descriptions

Test	Method	Description
Paste pH and paste electrical conductivity (EC)	Sobek (1978)	Effective indicator tests of acid generation and soluble salt content.
Acid Base Accounting (ABA)	Sobek (1978)	Static test evaluating acid generating potential of mine materials
X-ray Diffraction (XRD)	PMET (2004)	Quantifies relative abundance of major and minor mineralogical components.
Reflectance Spectroscopy	SII SOP (2003)	Characterizes mineralogical properties of alteration and weathering products.
X-ray Fluorescence (XRF)	Rollinson (1993), Crock et al. (1999)	Characterizes the whole rock chemical composition of the sample.
Meteoric Water Mobility Procedure (MWMP)	ASTM E 2242-02	Static leach test designed to assess the mobility of chemical constituents during leaching and weathering of mined materials.

2.2 DATA QUALITY ASSURANCE AND CONTROL

Data quality assurance and quality control (QA/QC) for the Condition 80 study was ensured through the use of sampling protocols, analytical data quality criteria, and the collection of quality assurance/quality control (QA/QC) samples. Sampling was

conducted in accordance with Greystone's SOPs 001 and 003 (Greystone, 2003a and b), per American Society for Testing and Materials (ASTM) standards (ASTM D 4220-95, D 4700-91), per SVL's Quality Assurance Plan (SVL, 2003), and analytical testing laboratory SOPs. These SOPs were presented in the Interim Report and are available on the internet (SVL, 2003).

Reporting of laboratory analytical data was specified as SVL level 2, which is approximately equivalent to EPA Level III. An SVL Level 2 report provides sample results and dedicated QC data for blanks, duplicates, spikes and laboratory control samples.

More limited criteria exist for the evaluation of the XRF and XRD data. Standard reference materials were analyzed with the XRF samples and one sample per laboratory group was analyzed as a lab replicate. For both the XRF and the XRD data one sample per laboratory group was analyzed as a blind duplicate. Comparison of the standard and replicate analyses allowed an estimation of the accuracy and precision of the XRF results. Comparison of the blind duplicates allowed an estimation of the combined variability due to sampling and analysis for both methods.

The principal means of evaluating the variability of the various datasets is by the use of the Relative Percent Difference (RPD) between the primary sample and its replicate (for analytical precision) or its blind duplicate (for combined sampling and analytical variability).

The Relative Percent Difference (RPD) is defined as:

$$RPD = [(C_{Primary} - C_{Duplicate})/(C_{Primary} + C_{Duplicate})/2] \times 100$$

The SVL Meteoric Water Mobility data generally fell within the data quality guidelines stated in their QAP (i.e. no detections in blanks; 90-110 percent (pct) recovery for

laboratory control standard (LCS); 75-125 pct recovery for Matrix Spikes; and 20 pct RPD for duplicates above 5 times the reporting limit). The exceptions are as follows. LCS recoveries were outside of limits in data group 114162 for molybdenum (115 pct) and in data group 114039 for nickel (86.8 pct). Matrix spike recoveries were outside of limits in data group 114037 for calcium and magnesium (125 pct), in group 114162 for silica (128 pct), in group 113843 for sodium (71 pct), in group 114036 for lead (60 to 74 pct) and in group 114033 for fluoride (133 pct). Precision as measured by RPD of duplicates was outside of the stated limits in group 114037 for copper (27.2 pct) and lead (31 pct), in group 114162 for aluminum (28.6 pct) and S N-EX (18.2 pct), in group 114036 for acidity (38.8 pct) and in group 114033 for S N-EX (40 pct). In summary, the percent recovery for the LCS always fell within generally acceptable limits of 85-115 pct, the matrix spike recoveries were generally acceptable except for lead and fluoride in one group, and the duplicate precision was generally acceptable except for acidity and S N-EX in one group.

For the mineralogic determinations by XRD, the analyses of six blind field duplicates were compared to the primary samples. A single lab replicate was analyzed in one analytical batch. The RPD for this replicate analysis can be considered to provide a measure of the analytical precision since the split was taken after crushing the sample to minus 20 mesh.

With the exception of the amorphous clay/organic fraction, minerals with an abundance of at least 2 pct had RPDs of less than 3 pct in the single lab replicate sample. The amorphous fraction had a lower precision of 11 pct. With the exception of chalcopyrite and goethite, all of the minor mineral phases had RPDs of less than 15 pct. Chalcopyrite and goethite had a precision of 16 to 22 pct at abundance levels of 0.1 to 0.5 pct.

For the blind field duplicates, where the sampling variability and analytical variability are combined in the RPD determinations, the RPDs for all mineral phases are substantially larger. For the minerals quartz, potassium feldspar, plagioclase and muscovite that nearly

always form greater than 5 pct of the sample, average RPDs for the six field duplicates ranged from 2 to 7 pct, with maximum RPDs ranging from 8 to 22 pct. The kaolinite content was generally the most reproducible value with an average RPD of 2.9 pct and a maximum of 5.3 pct. The minor minerals epidote, chlorite, pyrite and magnetite generally showed good reproducibility with average RPDs of 4 to 13 pct. Maximum RPDs for these minerals were less than 20 pct. The minerals chalcopyrite, jarosite, alunite, hematite and goethite had the most variability with average RPDs of 15 to 30 pct and maximum RPDs of 26 to 50 pct. The amorphous clay/organic fraction showed similar variability. The accuracy of the XRF appears acceptable for all elements except possibly phosphorus and niobium. The lack of an adequate standard comparison for sulfur, tin and molybdenum is of some concern. The analytical precision of the XRF method is acceptable and within the stated limits. The generally large RPDs for blind duplicates compared to the lab replicates are an indication of large sampling variability as is expected for coarse, heterogeneous stockpile materials.

The XRF rock chemistry data has three data quality measures available: accuracy relative to a known standard; analytical precision of laboratory replicates, and; combined sampling and analytical variability from blind field duplicates.

The accuracy of the XRF analyses can be judged by a comparison of the repeated analysis of the standard to its published (known) values. For the major and minor elements, all except phosphorus, titanium and barium agree with the published values for SY-3 within 10 pct, as stated by The Mineral Lab. Phosphorus is consistently 40 to 50 pct higher than the published value for the standard. Titanium is consistently 13 to 20 pct lower than the published values. Barium is consistently 20 pct lower than the published values. For the trace elements present at greater than twice the detection limit, as stated by the Mineral Lab, the majority show accuracy of 10 to 15 pct. The only exception for trace elements is that niobium appears to be consistently 15 to 30 pct higher than the published values. Cobalt and copper are present in the standard at levels just above the detection limit. The analytical results for these two elements are consistently higher than

the published values. There is no published value for tungsten in the standard, while sulfur, chlorine, nickel, tin and molybdenum are not present above the detection limits, so no measure of accuracy for these six elements is available.

Blind analyses of the USGS glass standards (GSC, GSD and GSE) in group 204821 indicate that magnesium is consistently high by 9-16 pct, silica is high by 5-9 pct, iron is high by 7 to 17 pct, and chlorine is high by 25 pct. This high bias results in sums for the major and minor elements that consistently exceed 102 pct (and reach 109 pct) for these standards. There may be some matrix effects for the glasses that differ from typical crystalline rocks that partially explain this discrepancy for the major elements. The glasses spiked with approximately 50 and 500 parts per million (ppm) of each trace element indicate uranium is high by 30-35 pct and yttrium is high by 17-22 pct. Tin shows unexplained anomalous enrichment of approximately 100 ppm in the glasses with lower spike concentrations. It should be noted that copper, tungsten, nickel and molybdenum show good agreement with the published values for the glass standards.

As was the case for XRD results, the RPD provides the best measure of precision. The analytical precision for the major and minor elements (those reported in pct) is consistently within the 5pct cited by The Mineral Lab for this procedure, as determined by both sample replicates and repeated analyses of the rock standard. For those trace elements present at levels greater than twice the detection limit the precision is generally within 10pct, with rare cases reaching 15pct. These are all within the stated precision for the method. At concentrations less than twice the detection limit, precision can exceed 20pct.

The results from seven blind field duplicates, which incorporate both sampling and analytical error, show much greater variability. For the major and minor elements, only aluminum and silica show maximum RPDs of less than 10pct. Magnesium, potassium and titanium show maximum RPDs in the range of 10 to 20pct. Sodium, phosphorus, sulfur and barium show maximum RPDs in the range of 20 to 30pct. Manganese shows

the poorest reproducibility of the minor elements with RPDs typically in the range of 15 to 40pct. With the exception of one extremely anomalous sample (TBGC-7 279-5-282), calcium shows RPDs in the range of 10 to 20pct and iron has RPDs of less than 15pct. The anomalous sample shows extreme variability for calcium, manganese and iron (60-82pct RPDs).

The trace elements in the blind field duplicates tend to show less variability than the major elements. With the exception of the above anomalous sample, reproducibility for most of the trace elements, above twice the detection limit, is within 20pct. Lead, yttrium, molybdenum, and strontium show greater variability, with RPDs up to 40pct for Pb and Y and up to 30pct for the other two. The anomalous sample shows extreme variability for Cr, Co, Cu, Zn, Pb, and Mo you switch between using the elemental name versus the symbol in this paragraph. May want to be consistent.

The accuracy of the XRF appears acceptable for all elements except possibly phosphorus and niobium. The lack of an adequate standard comparison for sulfur and tin leads to uncertainty regarding the accuracy of the results for these two elements. The analytical precision of the XRF method is acceptable and within the stated limits. The generally large RPDs for blind duplicates compared to the lab replicates are an indication of large sampling variability as is expected for coarse, heterogeneous stockpile materials.

3.0 STOCKPILE MATERIAL DATA ANALYSIS

The results of geologic and downhole geophysical logging were presented in the Preliminary Report. In summary, geologic and downhole logging activities revealed that the stockpiles are variable and are made up of distinct and mixed layers of material. These layers were comprised of Tertiary quartz monzonite porphyry and Precambrian granite host rocks. The rocks were further classified in the geologic logs on the basis of mineralization according to the MA classification system used at Tyrone. The predominant MA types in the stockpiles were MA-1, MA-2, and MA-4. Munsell colors of stockpile materials ranged from pink to red, reddish brown to reddish yellow, yellowish brown to brown, and greenish grey to grey. Grain size differences between layers were observed ranging from coarse cobble and gravel dominated layers, to fine layers where voids between coarser particles were filled with up to 85pct clay, silt and sand sized particles. Coarse boulder zones and compacted materials were encountered at the base of the stockpiles most likely due to gravity sorting during pile construction. This zone was identified by a high number of blow counts as the depth of the hammer drill bit neared the bottom of the stockpile.

Figure 3.1 contains profile graphs that show the greater than 2 inch diameter size fraction in the geochemical characterization borehole samples. The 2 inch size fractions were determined as part of the MWMP. The maximum particle size sampled by the percussion hammer drill rig was 5.5 inches. In general the proportion of particles greater than 2 inches is less than 20 percent in most borehole intervals. In boreholes TBGC-1 and TBGC-5 there is a significant decrease in the greater than 2 inch size fraction particles deeper in the borehole. This indicates that that fine material may be accumulating at the bottom of the waste rock stockpiles. Fine material can sift downward through the stockpiles and accumulating in the larger voids between boulders that were deposited preferentially at the base as a result of end dumping and gravity sorting. In the leach ore stockpiles the amount of oversize material is limited because the blasting pattern in the pits is denser for leach ore material in order to generate finer particles for more efficient

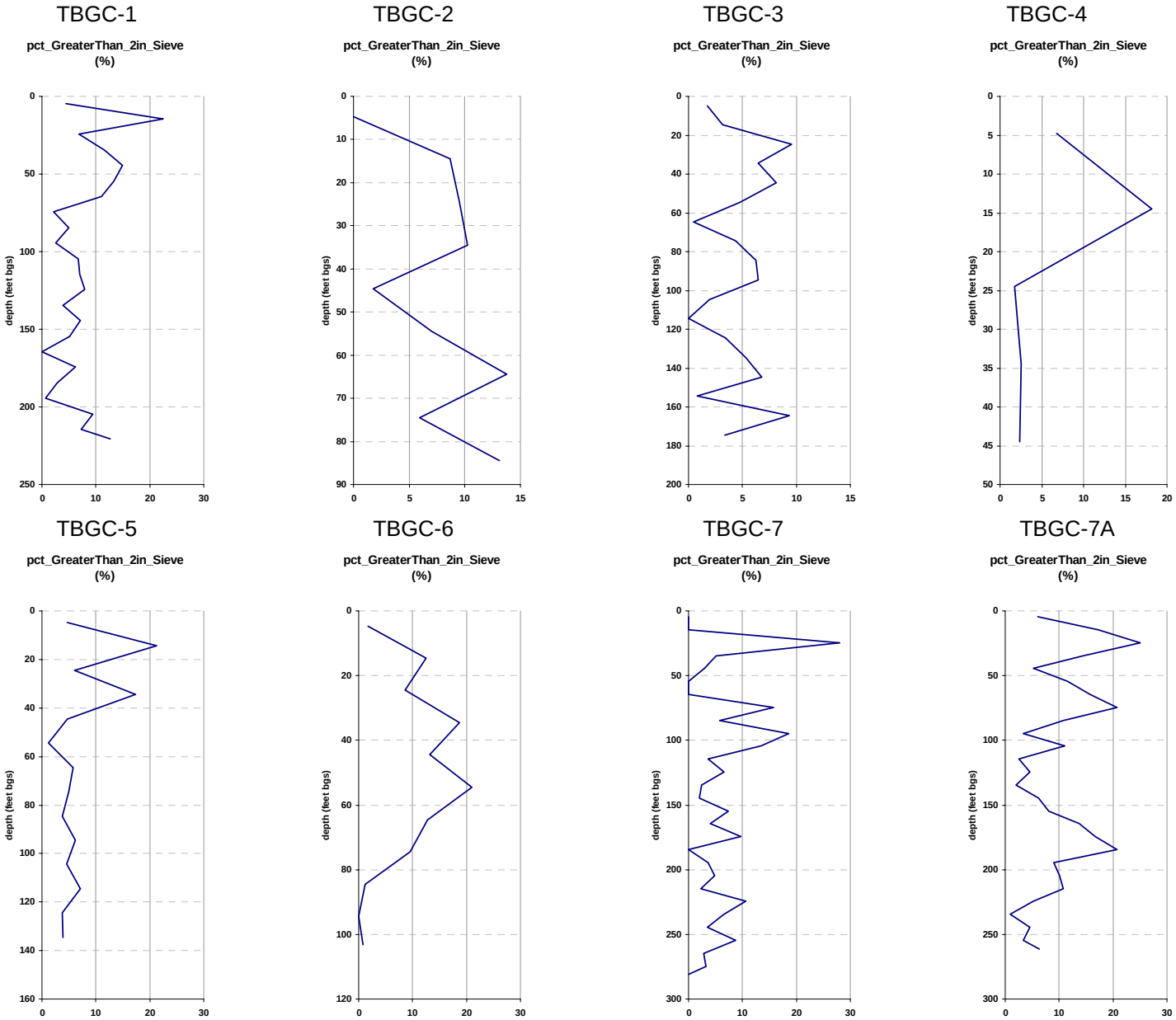


Figure 3.1. Particle Size Profiles

leaching. Therefore, the distribution of particle sizes is expected to be more uniform within the leach ore stockpiles. However, there is a weak trend towards materials less than 2 inches at the base of the leach ore stockpiles.

Geophysical logging indicates that moisture contents in the stockpiles are relatively low, between 5 and 15 percent by volume. The gravimetric moisture measurements performed on stockpile borehole samples also indicates dry conditions. The gravimetric moisture profiles for the boreholes are shown in Figure 3.2. Examination of these profiles shows that the gravimetric moisture contents are generally lower than those measured by the neutron logging device. This is expected as some drying occurred during sampling even though the samples were sealed in plastic buckets prior to analysis. Some of the borehole sequences (i.e., TBGC-1, TBGC-3, TBGC-5, and TBGC-7) become significantly drier at depth.

Retained moisture values for borehole profiles were also derived during the MWMP and are shown in Figure 3.3. Most of the retained moisture values varied between 7 and 30 pct by weight. Intervals with higher retained moisture contents have higher proportions of clay and silt size material whereas low moisture contents are generally dominated by sands, gravels, and cobbles. In general, the retained moisture values in TBGC-6 track in situ measured moisture contents determined by neutron logging. This indicates that the bulk of the stockpile materials are in a fully drained condition.

Schafer et al. (1994) performed a monitoring study on a waste rock pile at the Golden Sunlight Mine to compare reclaimed and unreclaimed waste rock dumps. They found that particle size gradually increased with depth due to gravity sorting in the end-dumping sequence. Freshly shot rock was determined to have a volumetric water content less than 6 percent. Residual saturation was found to vary between 8 and 12 percent within the dump with residual saturation generally lower near the base of the dump where larger particles were deposited. Fine waste produced by vehicle compaction at the top of

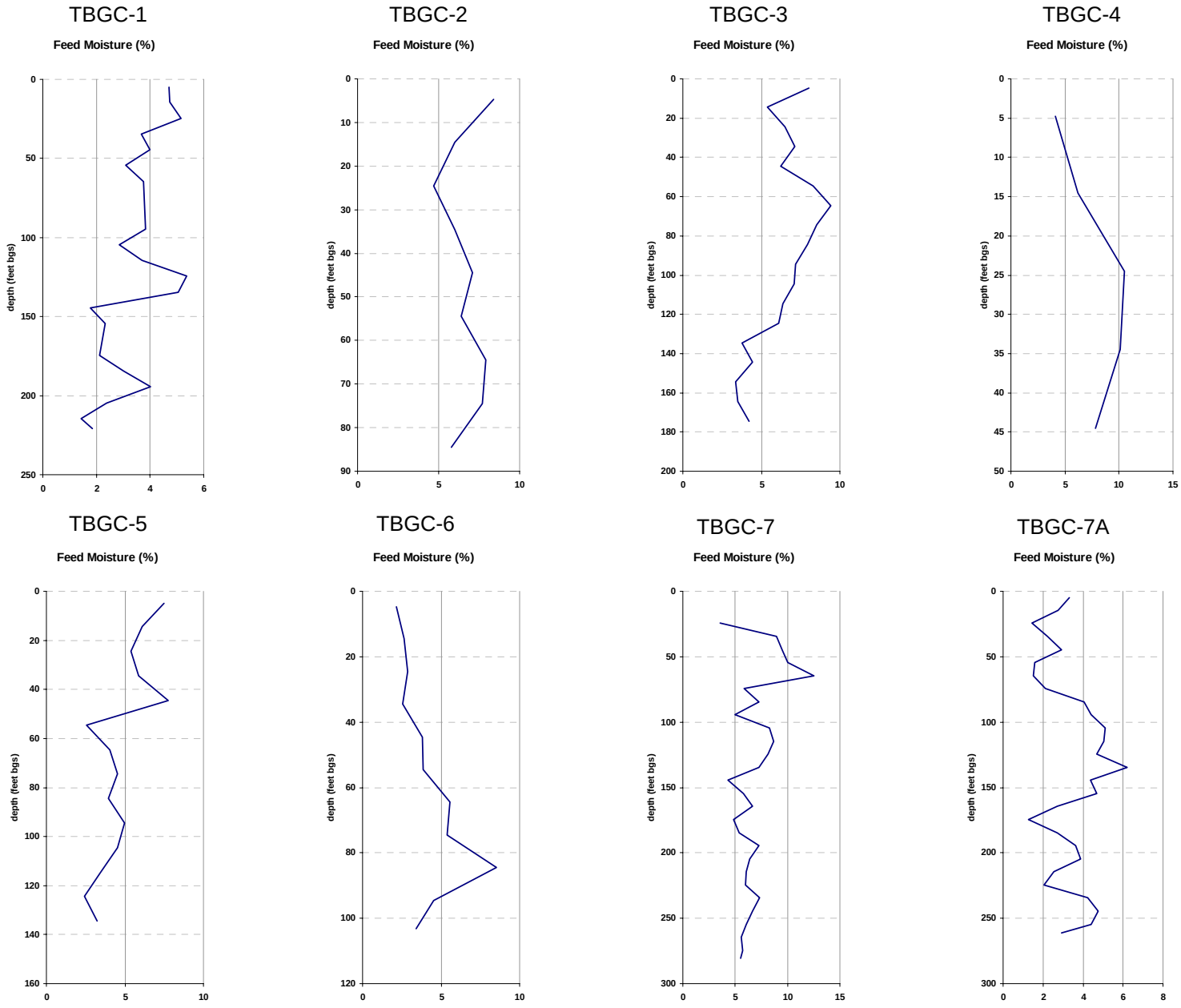


Figure 3.2. Moisture Content Profiles

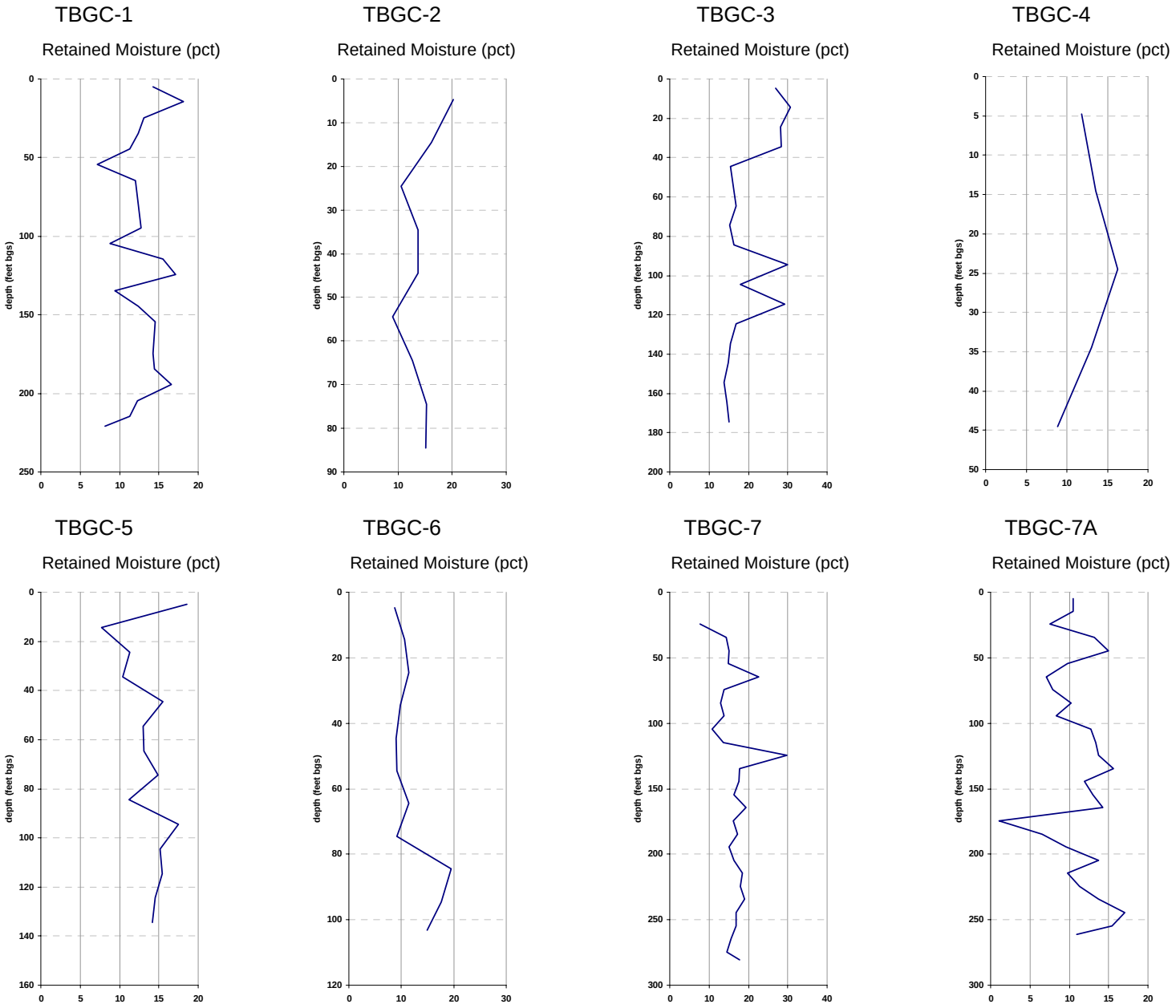


Figure 3.3 Retained Moisture Profiles

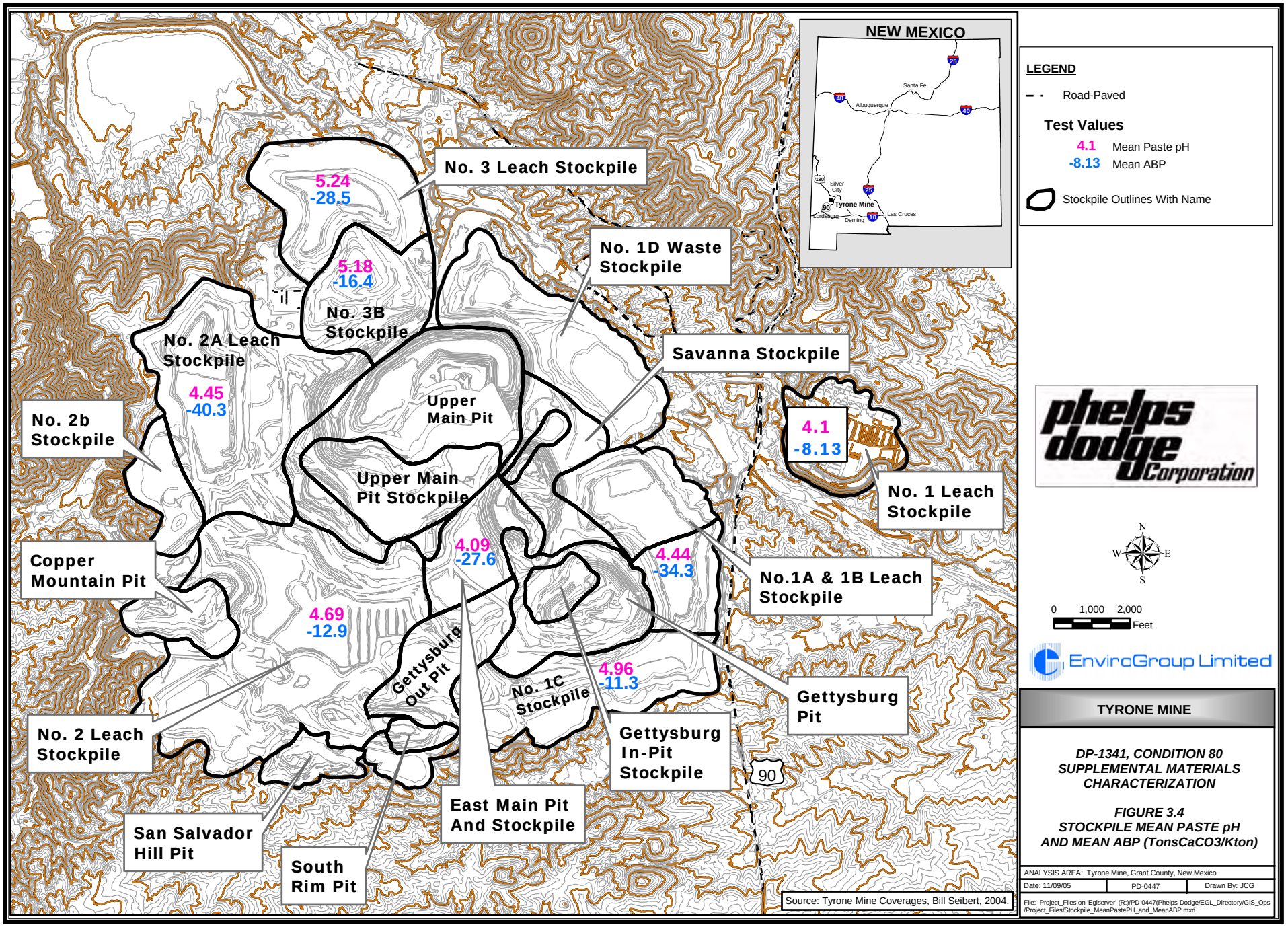
each bench was found to have a residual saturation level ranging from 15 to 20 percent. The monitoring results of Schafer are similar to the results of this Condition 80 study.

The geochemical characteristics of the stockpile materials sampled varied throughout the sampling intervals. Complete laboratory reports of geochemical data can be found in the Interim and Preliminary Reports. A more extensive analysis of the laboratory and field monitoring results from each borehole is provided in Sections 3.1 through 3.6. The geochemical characteristics of leach ore stockpile and waste rock stockpile materials are compared. Where applicable, these results are also compared to prior results from the PMC, SMC and GETS. Section 3.7 provides a summary of the inferred effects of leaching and weathering of the stockpile materials.

3.1 PASTE PH AND PASTE EC

Paste pH and paste EC profiles in the Condition 80 stockpile geochemical characterization boreholes (TBGC-1, -2, -3, -4, -5, -6, -7 and -7A) are provided in Appendix A. Paste pH and paste EC profiles for the assay pulp sample boreholes were provided in the Interim Report. The combined borehole summary statistics for paste pH and paste EC by stockpile are provided in Tables 3.1 through 3.8. The mean paste pH values for each stockpile are shown in Figure 3.4.

The paste pH profiles show acidic conditions in nearly all borehole intervals and generally ranged between 3 and 7 in the Tyrone waste rock stockpile boreholes TBGC-1 and TBGC-5. The boreholes profiles for leach ore stockpiles show that the paste pH is close to 4 over the depth ranges sampled in TBGC-2, -3, -4, -6, -7, and -7A. However, the assay pulp borehole samples from leach ore stockpiles showed a wider range of pH values.


NEW MEXICO
Santa Fe
Albuquerque
Silver City
Tyrone Mine
Lordsburg
Deming
Las Cruces
LEGEND
Road-Paved
Test Values
4.1 Mean Paste pH
-8.13 Mean ABP
Stockpile Outlines With Name
No. 3 Leach Stockpile
5.24
-28.5
5.18
-16.4
No. 3B Stockpile
No. 1D Waste Stockpile
No. 2A Leach Stockpile
4.45
-40.3
Savanna Stockpile
Upper Main Pit
No. 2b Stockpile
4.1
-8.13
No. 1 Leach Stockpile
Upper Main Pit Stockpile
Copper Mountain Pit
4.09
-27.6
4.44
-34.3
No.1A & 1B Leach Stockpile
4.69
-12.9
Gettysburg Out Pit
4.96
-11.3
No. 1C Stockpile
Gettysburg Pit
No. 2 Leach Stockpile
Gettysburg In-Pit Stockpile
90
East Main Pit And Stockpile
San Salvador Hill Pit
South Rim Pit
Source: Tyrone Mine Coverages, Bill Seibert, 2004.
N
S
E
W
0 1,000 2,000
Feet
phelps dodge Corporation
EnviroGroup Limited
TYRONE MINE
DP-1341, CONDITION 80
SUPPLEMENTAL MATERIALS
CHARACTERIZATION
FIGURE 3.4
STOCKPILE MEAN PASTE pH
AND MEAN ABP (TonsCaCO3/Kton)
ANALYSIS AREA: Tyrone Mine, Grant County, New Mexico
Date: 11/09/05
PD-0447
Drawn By: JCG
File: Project_Files on 'Eglserver' (R:)/PD-0447(Phelps-Dodge/EGL_Directory/GIS_Ops/Project_Files/Stockpile_MeanPastePH_and_MeanABP.mxd

As anticipated, the paste EC is generally higher in the leach ore stockpiles than in the waste rock stockpiles. The paste EC ranged approximately between 1 and 5 mmhos/cm in the waste rock stockpile boreholes and between 2 and 10 mmhos/cm in the leach ore stockpiles. In general, the paste EC values go up as the paste pH values decrease.

Table 3.1. Statistical Summary of Paste pH, Paste EC and ABA Results; No. 1 Leach Stockpile[a]

	n	Mean	Standard Deviation	Maximum	Minimum
Paste pH (su)	32	4.10	0.29	4.94	3.50
Paste EC (mmhos/cm)	32	4.42	1.25	9.39	2.24
ABP (Tons $CaCO_3$/kTon)	32	-8.13	7.91	-1.56	-35.6
AGP (Tons $CaCO_3$/kTon)	32	8.16	7.91	35.6	1.56
ANP (Tons $CaCO_3$/kTon)	32	0.17	0.11	0.75	ND
Total S (%)	32	0.517	0.309	1.35	0.230
Pyritic S (%)	32	0.261	0.253	1.14	0.050
Sulfate S (%)	32	0.247	0.087	0.510	0.120

Notes:
[a] Includes borehole samples from TBGC-2, TBGC-3, and TBGC-4.
n = Sample Population
Total S (%) = Total Sulfur in Weight Percent
Pyritic S (%) = HNO_3 Soluble Sulfur in Weight Percent
Sulfate S (%) = HCl Soluble Sulfur in Weight Percent
ND = Not Detected, a value of half the detection limit was assumed for calculation of statistics

Table 3.2. Statistical Summary of Paste pH, Paste EC and ABA Results; No. 1 A and No. 1B Leach Stockpiles[a]

	n	Mean	Standard Deviation	Maximum	Minimum
Paste pH (su)	23	4.44	0.46	5.77	3.70
Paste EC (mmhos/cm)	8	0.69	0.20	1.01	0.42
ABP (Tons $CaCO_3$/kTon)	23	-34.3	19.9	-5.63	-69.7
AGP (Tons $CaCO_3$/kTon)	23	34.3	19.9	69.7	5.63
ANP (Tons $CaCO_3$/kTon)	23	0.15	0.0	ND	ND
Total S (%)	23	1.50	0.76	2.80	0.31
Pyritic S (%)	23	1.10	0.64	2.23	0.18
Sulfate S (%)	23	0.37	0.15	0.63	0.09

Notes:
[a] Includes borehole samples from AF-24 and AI-20.
n = Sample Population
Total S (%) = Total Sulfur in Weight Percent
Pyritic S (%) = HNO_3 Soluble Sulfur in Weight Percent
Sulfate S (%) = HCl Soluble Sulfur in Weight Percent
ND = Not Detected, a value of half the detection limit was assumed for calculation of statistics

Table 3.3. Statistical Summary of Paste pH, Paste EC and ABA Results; No. 1 C Stockpile[a]

	n	Mean	Standard Deviation	Maximum	Minimum
Paste pH (su)	23	4.96	1.32	7.49	2.72
Paste EC (mmhos/cm)	23	3.79	2.94	11.7	0.33
ABP (Tons $CaCO_3$/kTon)	23	-11.3	14.5	-0.63	-63.4
AGP (Tons $CaCO_3$/kTon)	23	11.4	14.4	63.4	0.63
ANP (Tons $CaCO_3$/kTon)	23	0.29	0.49	2.26	ND
Total S (%)	23	0.72	0.69	3.03	0.10
Pyritic S (%)	23	0.37	0.46	2.03	0.02
Sulfate S (%)	23	0.26	0.20	0.76	0.05

Notes:
[a] Includes surface and borehole samples from GA04-TY-1, GA04-TY-2, GA04-TY-3, GA04-TY-4, GA04-TY-5, GA04-TY-6, GA04-TY-7, GA04-TY-8, I-07 and TBGC-5.
n = Sample Population
Total S (%) = Total Sulfur in Weight Percent
Pyritic S (%) = HNO_3 Soluble Sulfur in Weight Percent
Sulfate S (%) = HCl Soluble Sulfur in Weight Percent
ND = Not Detected, a value of half the detection limit was assumed for calculation of statistics

Table 3.4. Statistical Summary of Paste pH, Paste EC and ABA Results; East Main Stockpile[a]

	n	Mean	Standard Deviation	Maximum	Minimum
Paste pH (su)	11	4.09	0.40	4.79	3.54
Paste EC (mmhos/cm)	11	2.90	0.66	4.07	1.93
ABP (Tons $CaCO_3$/kTon)	11	-27.6	15.2	-7.19	-55.0
AGP (Tons $CaCO_3$/kTon)	11	27.6	15.2	55.0	7.19
ANP (Tons $CaCO_3$/kTon)	11	0.18	0.11	0.52	ND
Total S (%)	11	1.35	0.66	2.54	0.42
Pyritic S (%)	11	0.88	0.49	1.76	0.23
Sulfate S (%)	11	0.38	0.16	0.71	0.19

Notes:
[a]Includes borehole samples from TBGC-6.
n = Sample Population
Total S (%) = Total Sulfur in Weight Percent
Pyritic S (%) = HNO_3 Soluble Sulfur in Weight Percent
Sulfate S (%) = HCl Soluble Sulfur in Weight Percent
ND = Not Detected, a value of half the detection limit was assumed for calculation of statistics

Table 3.5. Statistical Summary of Paste pH, Paste EC and ABA Results; No. 2 Leach Stockpile[a]

	n	Mean	Standard Deviation	Maximum	Minimum
Paste pH (su)	126	4.69	0.81	7.16	3.21
Paste EC (mmhos/cm)	58	3.32	2.79	9.76	0.163
ABP (Tons $CaCO_3$/kTon)	126	-12.9	13.5	3.54	-56.3
AGP (Tons $CaCO_3$/kTon)	126	13.0	13.4	56.3	ND
ANP (Tons $CaCO_3$/kTon)	126	0.30	1.5	16.4	ND
Total S (%)	126	0.71	0.52	2.21	0.08
Pyritic S (%)	126	0.42	0.43	1.8	ND
Sulfate S (%)	126	0.27	0.12	0.73	0.04

Notes:
[a]Includes borehole samples from BG-07, BJ-07, BN-011, BO-15+140, BO+120-9, BQ-1+150, BR-16A, and TBGC-7.
n = Sample Population
Total S (%) = Total Sulfur in Weight Percent
Pyritic S (%) = HNO_3 Soluble Sulfur in Weight Percent
Sulfate S (%) = HCl Soluble Sulfur in Weight Percent
ND = Not Detected, a value of half the detection limit was assumed for calculation of statistics

Table 3.6. Statistical Summary of Paste pH, Paste EC and ABA Results; No. 2A Leach Stockpile[a]

	n	Mean	Standard Deviation	Maximum	Minimum
Paste pH (su)	37	4.45	0.99	6.55	3.56
Paste EC (mmhos/cm)	28	5.60	1.67	10.2	0.433
ABP (Tons $CaCO_3$/kTon)	37	-40.3	36.4	-0.94	-128
AGP (Tons $CaCO_3$/kTon)	37	40.8	37.1	128	0.94
ANP (Tons $CaCO_3$/kTon)	37	0.65	1.5	7.3	ND
Total S (%)	37	1.78	1.27	4.28	0.17
Pyritic S (%)	37	1.31	1.19	4.11	0.03
Sulfate S (%)	37	0.36	0.20	0.93	0.11

Notes:
[a]Includes borehole samples from BN-29, BN-32, BT-24, and TBGC-7A.
n = Sample Population
Total S (%) = Total Sulfur in Weight Percent
Pyritic S (%) = HNO_3 Soluble Sulfur in Weight Percent
Sulfate S (%) = HCl Soluble Sulfur in Weight Percent
ND = Not Detected, a value of half the detection limit was assumed for calculation of statistics

Table 3.7. Statistical Summary of Paste pH, Paste EC and ABA Results; No. 3 Leach Stockpile[a]

	n	Mean	Standard Deviation	Maximum	Minimum
Paste pH (su)	24	5.24	0.65	6.95	4.16
Paste EC (mmhos/cm)	7	0.476	0.306	0.931	0.204
ABP (Tons $CaCO_3$/kTon)	24	-28.5	25.7	3.16	-67.5
AGP (Tons $CaCO_3$/kTon)	24	29.3	24.9	67.5	0.63
ANP (Tons $CaCO_3$/kTon)	24	0.92	1.25	3.79	ND
Total S (%)	24	1.19	0.94	2.54	0.03
Pyritic S (%)	24	0.94	0.80	2.16	0.02
Sulfate S (%)	24	0.21	0.14	0.48	0.01

Notes:
[a]Includes borehole samples from BC-55.
n = Sample Population
Total S (%) = Total Sulfur in Weight Percent
Pyritic S (%) = HNO_3 Soluble Sulfur in Weight Percent
Sulfate S (%) = HCl Soluble Sulfur in Weight Percent
ND = Not Detected, a value of half the detection limit was assumed for calculation of statistics

Table 3.8. Statistical Summary of Paste pH, Paste EC and ABA Results; No. 3B Stockpile[a]

	n	Mean	Standard Deviation	Maximum	Minimum
Paste pH (su)	47	5.18	0.83	6.95	3.60
Paste EC (mmhos/cm)	31	1.42	1.37	4.71	0.25
ABP (Tons $CaCO_3$/kTon)	47	-16.4	13.6	0.91	-64.7
AGP (Tons $CaCO_3$/kTon)	47	16.6	13.4	64.7	0.63
ANP (Tons $CaCO_3$/kTon)	47	0.35	0.53	2.47	ND
Total S (%)	47	0.84	0.51	2.54	0.16
Pyritic S (%)	47	0.53	0.43	2.07	0.02
Sulfate S (%)	47	0.22	0.14	0.84	0.01

Notes:
[a]Includes borehole samples from BA-47 and TBGC-1.
n = Sample Population
Total S (%) = Total Sulfur in Weight Percent
Pyritic S (%) = HNO_3 Soluble Sulfur in Weight Percent
Sulfate S (%) = HCl Soluble Sulfur in Weight Percent
ND = Not Detected, a value of half the detection limit was assumed for calculation of statistics

3.2 ABA

The ABA profiles for the geochemical characterization boreholes are provided with the paste pH and paste EC profiles and a complete set of ABA data in Appendix A. In addition, the combined borehole summary statistics for ABA parameters and sulfur forms by stockpile are provided in Tables 3.1 through 3.8. The mean acid base potentials (ABPs) for each stockpile are shown in Figure 3.4. The ABP of a sample is equal to the acid neutralizing potential (ANP) minus the acid generating potential (AGP). The negative ABPs in a majority of the stockpile borehole samples tested and the negative mean ABPs calculated for each stockpile indicates a net potential to generate acid. The stockpiles have low mean AGPs that are equal to or less than 41 tons $CaCO_3$/kton rock ($TCaCO_3$/kT) owing to the relatively low sulfide content in the waste rock piles. The ABP values indicate near neutral acid generating capacity for waste rock stockpiles containing a high proportion of leached cap (e.g. No. 3B and No. 1C Stockpiles), and low

to moderate AGP for the sulfide-bearing leach ore stockpiles (e.g. No. 2A Stockpile). Therefore, the typical sulfide contents and AGPs of the leached ore stockpile samples were significantly higher than for the waste rock stockpile samples.

Only one borehole was sampled from the No. 3 Stockpile and two boreholes were sampled from the No. 3B Stockpile. However the results of downhole geochemical logging in TSGT-1, located within the No. 3 Stockpile provided in the Preliminary Report for Condition 80 show that the total sulfur concentration in the No. 3 stockpile ranged from 0 to 5 percent and averaged between 1 and 2 weight percent. This sulfur content results in an equivalent ABP that is between -30 to -60 $TCaCO_3$/kT if the ANP is assumed to be negligible as it is in most of the stockpile samples. This is a conservatively higher estimate than the calculated average presented in Table 3.7.

Overall, the mean ABPs calculated for the stockpiles based on borehole analyses are lower than the mean ABP (ABA) calculated for Group A (acid generating) materials for the SMC. The reported average ABP (ABA) for Group A is -43.3 $TCaCO_3$/kT. The average ABP for Group B (neutral) materials is 6.7 $TCaCO_3$/kT. Very few stockpile samples had positive ABPs. Figures 3.5 through 3.8 compare stockpile ABA results with the fresh rock materials analyzed in the PMC and SMC. Figure 3.5 shows that the majority of the fresh rock and stockpile samples fall into the acid generating category with an AGP:ANP ratio of 1:1 or greater. (Brodie, et al., 1991; Morin and Hutt, 1994) Figures 3.5 and 3.6 show that the ANP for most stockpile samples is at or below the detection limit (0.3 $TCaCO_3$/kT). In addition, the range in pyritic AGP and ANP values is smaller for the stockpile samples than for the fresh rock samples characterized for the PMC and SMC reports.

Figures 3.7 and 3.8 show that the sulfate content for the stockpile samples tends to be higher than that of the core samples for equivalent AGP values, although the highest sulfate values were measured in the fresh rock samples.

The ABA and sulfate trends suggest that acid generation is occurring in the stockpiles owing to sulfide oxidation and that the neutralizing potential present in the as-mined ore and waste is consumed in the process. As noted in Figure 3.5, this reduces the range of AGP and ANP values for the stockpile samples as compared to the mined rock samples. Sulfate minerals are being produced as a result of the sulfide oxidation reactions which increases the sulfate content in the stockpile samples as compared to the fresh rock samples analyzed in the PMC and SMC.

3.3 MWMP

A summary of selected MWMP results for each geochemical borehole, are provided in Table 3.9, including the constituents pH, SO_4, E.C., F and metals (Al, Cu, Fe, Mn, Zn, Cd, Co, Cr, Ni, and Pb), which are the constituents of concern (COCs) at Tyrone. Appendix B provides the borehole geochemical profiles with respect to these constituents and the MWMP data set.

The SPLP test was used on fresh rock and stockpile materials samples for the PMC and SMC. The SPLP test uses a 1:20 rock to water ratio and the MWMP uses a 1:1 rock to water ratio. Therefore the MWMP results are not compared to the previous SPLP results.

3.3.1 pH

MWMP extracts are acidic to neutral (pH values range between 2.5 and 6.8) and the MWMP pH profiles provided in Appendix B are similar to the paste pH profiles. The extract pH values in waste rock stockpile boreholes TBGC-1 and TBGC-5 are generally higher and are more varied than in the other boreholes drilled into leach ore stockpile material. The extract pH values of the waste rock stockpile boreholes TBGC-1 and TBGC-5 ranges between 3 and 7 whereas the pH of the leach ore stockpile extracts generally ranges between 3 and 5. There is no trend of increasing or decreasing pH with

Figure 3.5. Pyritic AGP versus ANP

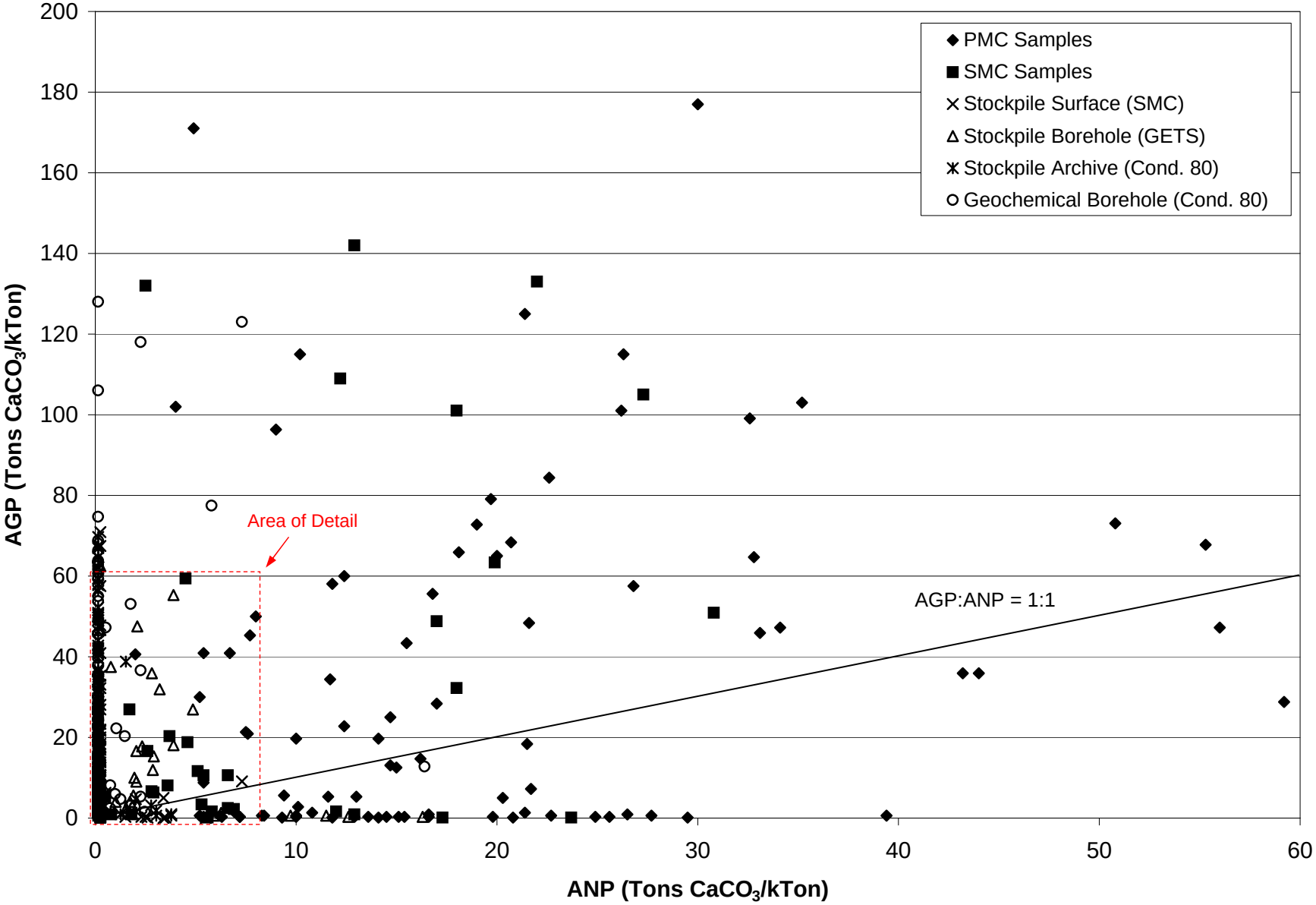


Figure 3.6. Pyritic AGP versus ANP - Area of Detail

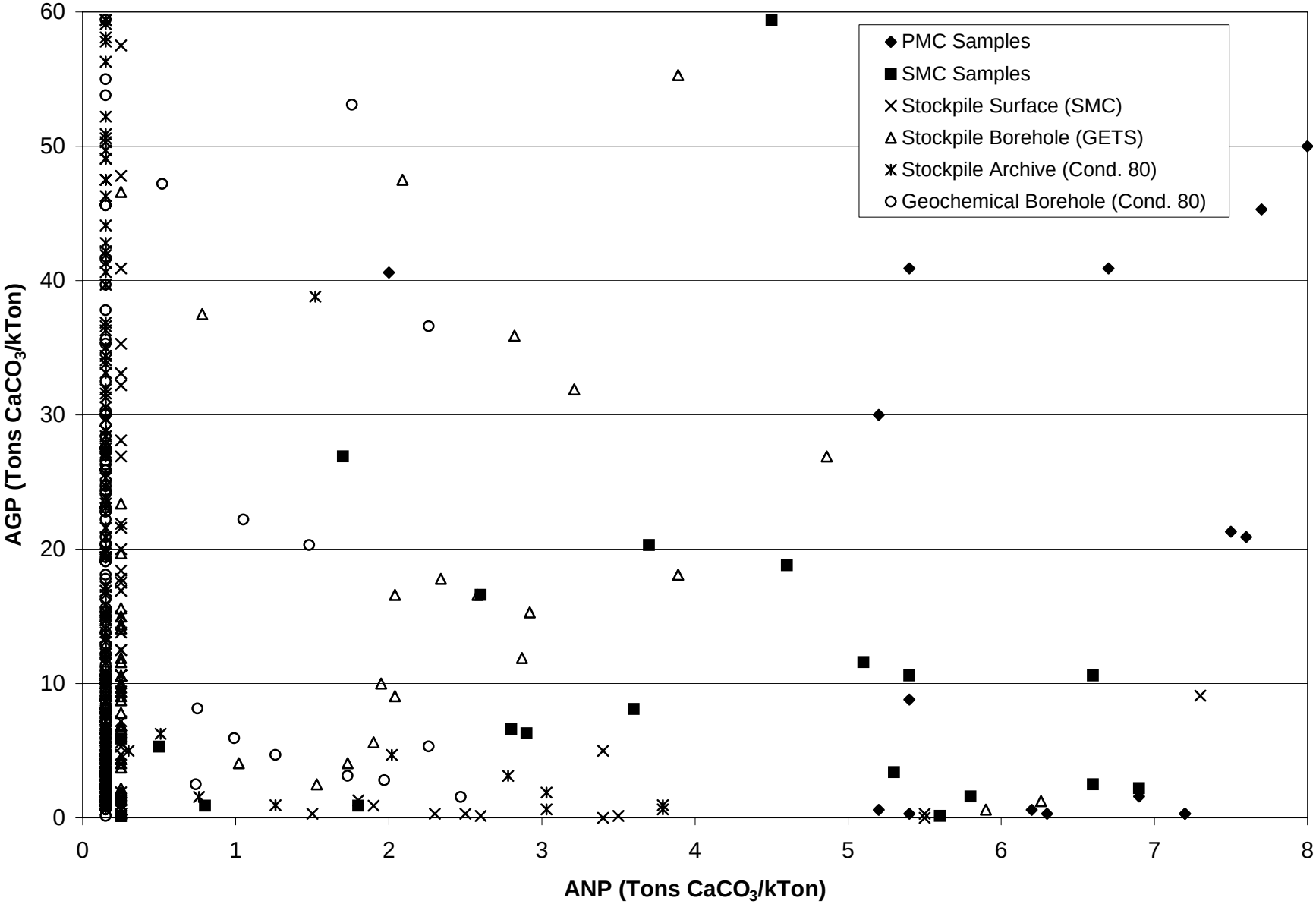


Figure 3-7. Sulfate versus Pyritic AGP

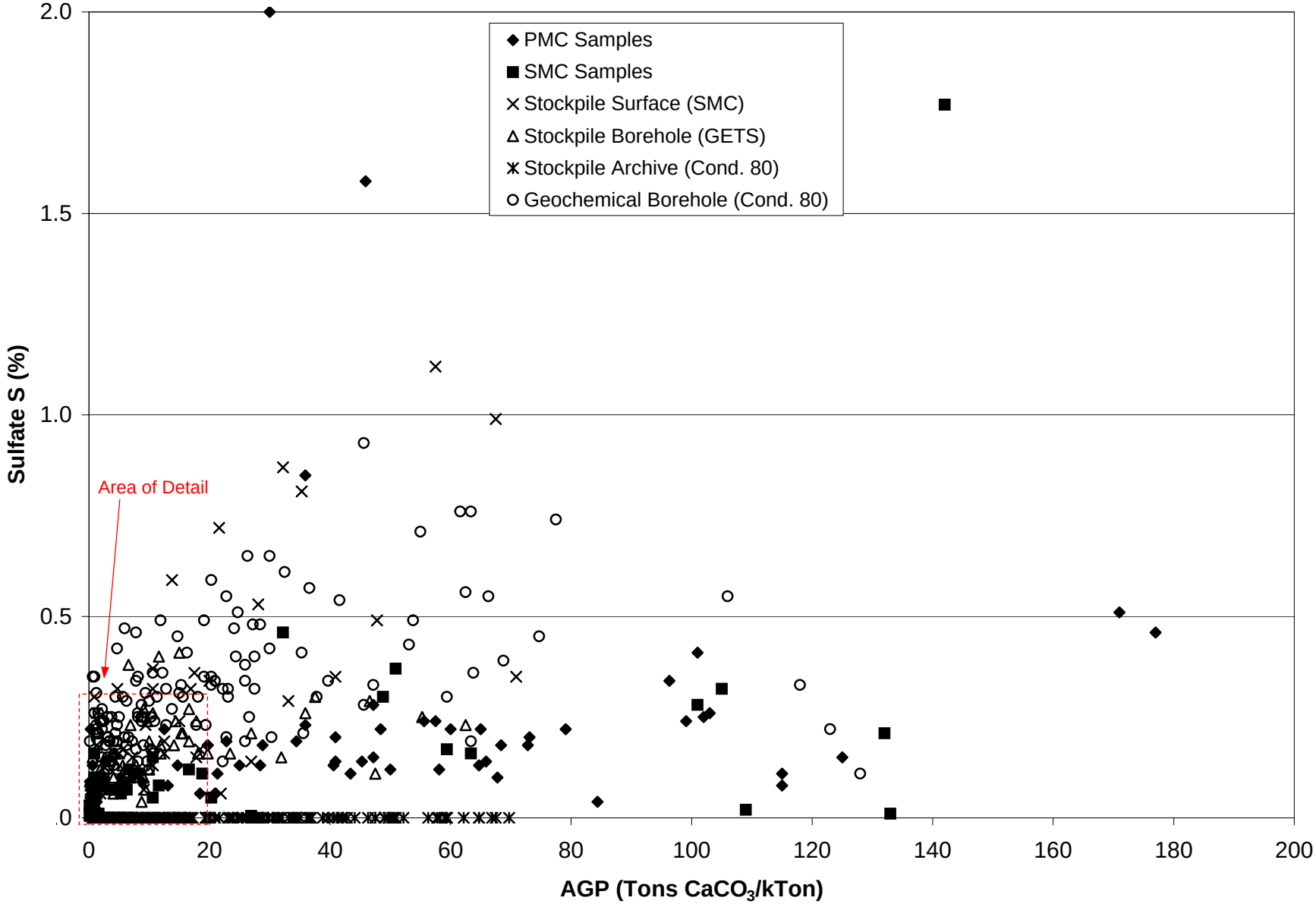
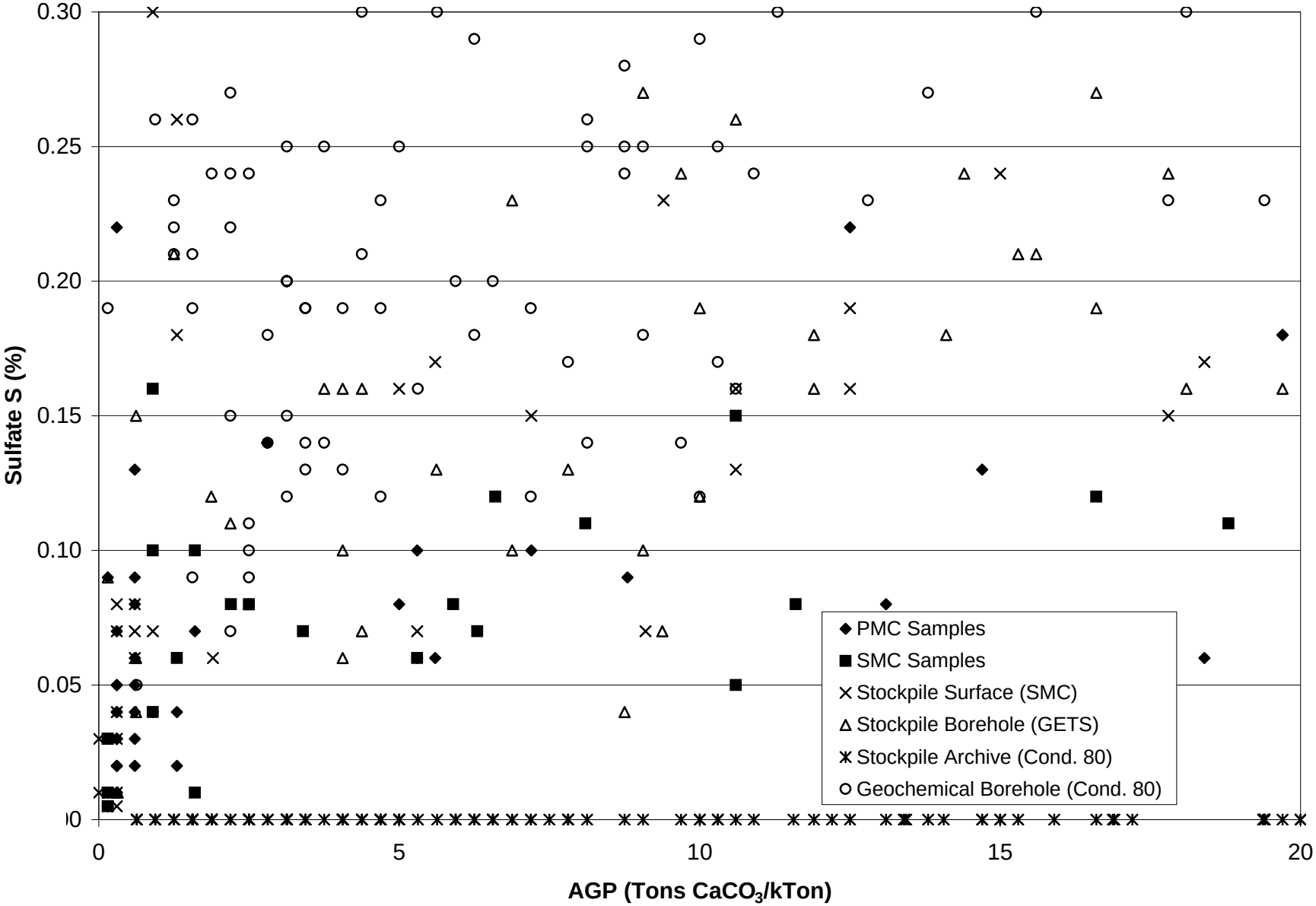


Figure 3.8. Sulfate versus Pyritic AGP - Area of Detail



depth or age of material. Because pH conditions in the stockpiles strongly influences constituent mobility selected MWMP parameters are compared to the pH profile in Sections 3.3.2 through 3.3.5.

3.3.2 EC

The MWMP extract EC profiles are similar to the paste EC profiles. Electrical conductivity in the MWMP extracts ranges from 100 to 7000 µmhos/cm in the waste rock stockpile boreholes. In general, the extract EC values are higher in the leach ore stockpile boreholes, which generally range from 1,000 to 9,000 µmhos/cm. The extract EC generally trends up as the pH trends down, but there is no relationship between EC and material depth or age.

3.3.3 Sulfate

The MWMP extract sulfate concentrations are between 23 and 11,000 milligrams per liter (mg/L) in all samples. The sulfate concentrations are generally higher in the leach ore stockpile samples than in the waste rock stockpile samples. The sulfate concentrations generally track positively with the ABP and sulfide content in the material. There is also a trend in higher sulfate extract concentrations with lower extract pH. However sulfate concentrations do not appear to be related to the material depth or age.

3.3.4 Fluoride

The fluoride concentrations in the MWMP extracts generally range from less than 1 mg/L to 150 mg/L. The concentrations mobilized from waste rock stockpile material are generally lower than concentrations measured in leach ore material extracts. The fluoride

concentrations trend upward with extract EC but does not track pH or sulfate significantly. There is no correlation of fluoride with depth or material age.

3.3.5 Metals

The metals Al, Cu, Fe, Mn, Zn, Cd, Co, Cr, Ni, and Pb were mobilized from the stockpile samples upon contact with meteoric water. Al, Cu, Fe, Mn, and Zn had the highest concentrations in the MWMP extracts which ranged from below detection to over 1,000 mg/L. Most concentrations were in the tens and hundreds mg/L and tended to increase at lower pH.

The metals Cd, Co, Cr, Ni, and Pb evolved relatively lower concentrations in the MWMP extracts. The concentrations ranged from below detection to 10 mg/L. Most concentrations are near or below the detection limit when the extract pH was 6 or higher in the waste rock stockpile samples, and there is a general trend for the metal concentrations to be higher at low pH conditions

The results show that metals are more readily mobilized from materials sampled from leach ore stockpiles than from waste rock stockpiles upon contact with meteoric water. In general, the concentration of metals goes up as the pH of the extracts goes down. There does not appear to be a correlation of metal concentrations with depth which suggests that the metal mobility in older materials is not different from that in younger materials.

Table 3.9. Statistical Summary for Selected MWMP Results

Parameter (units)	TBGC-1		TBGC-2		TBGC-3		TBGC-4		TBGC-5		TBGC-6		TBGC-7		TBGC-7A	
	No. 3B Stockpile		No. 1 Leach Stockpile		No. 1 Leach Stockpile		No. 1 Leach Stockpile		No. 1C Stockpile		East Main Stockpile		No. 2 Leach Stockpile		No. 2A Leach Stockpile	
	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev*	Mean	*Std. Dev.*
pH (su)	4.97	*1.17*	3.61	*0.36*	4.02	*0.32*	3.76	*0.34*	4.86	*0.98*	3.81	*0.69*	3.35	*0.39*	3.57	*0.35*
EC (µmhos/cm)	1,835	*2,341*	4,169	*1,217*	3,286	*737*	2,504	*1,085*	1,840	*1,507*	2,896	*978*	5,102	*1,478*	4,697	*1,412*
Acidity (mg/L)	1,205	*2,339*	2,202	*998*	1,191	*484*	980	*642*	477	*870*	1,259	*1,042*	3,076	*1,405*	3,070	*1,554*
SO_4 (mg/L)	1,791	*2,860*	3,942	*1,576*	2,640	*755*	2,047	*1,103*	1,376	*1,537*	2,489	*1,199*	5,047	*1,965*	4,925	*1,969*
F (mg/L)	11.9	*32.0*	27.5	*10.2*	15.4	*5.25*	11.5	*7.92*	8.02	*8.49*	27.5	*21.8*	55.0	*21.0*	61.4	*25.9*
Al (mg/L)	149	*294*	196	*152*	87.8	*58.4*	92.8	*65.2*	46.0	*95.6*	170	*150*	361	*211*	374	*199*
Cu (mg/L)	310	*646*	449	*427*	336	*146*	208	*124*	115	*178*	282	*217*	233	*303*	205	*209*
Fe (mg/L)	10.9	*24.3*	19.2	*40.3*	1.70	*4.16*	4.42	*6.76*	0.88	*2.71*	21.6	*25.7*	62.1	*63.2*	55.6	*60.9*
Mn (mg/L)	27.1	*53.0*	186	*73.0*	178	*89.1*	79.4	*47.4*	48.1	*70.5*	64.6	*42.9*	135	*62.8*	130	*66.0*
Zn (mg/L)	39.8	*123*	110	*44.4*	73.7	*34.9*	40.4	*25.9*	21.1	*32.4*	116	*48.5*	162	*67.0*	176	*77.4*
Cd (mg/L)	0.230	*0.685*	0.467	*0.322*	0.103	*0.046*	0.079	*0.083*	0.228	*0.337*	1.23	*0.679*	1.42	*0.607*	1.48	*0.713*
Co (mg/L)	0.806	*1.40*	2.19	*1.51*	2.13	*0.954*	1.01	*0.597*	0.871	*1.26*	1.12	*0.611*	2.83	*1.86*	2.09	*0.816*
Cr (mg/L)	0.014	*0.026*	0.063	*0.092*	ND	*ND*	ND	*ND*	ND	*ND*	0.033	*0.037*	0.080	*0.074*	0.046	*0.032*
Ni (mg/L)	0.259	*0.413*	0.677	*0.263*	0.727	*.315*	0.383	*0.210*	0.174	*0.208*	0.352	*0.274*	0.604	*0.230*	0.929	*0.359*
Pb (mg/L)	0.096	*0.181*	0.055	*0.035*	0.051	*0.032*	0.021	*0.008*	0.021	*0.029*	0.113	*0.107*	0.078	*0.081*	0.040	*0.062*

Notes:

MWMP = Meteoric Water Mobility Procedure
Std. Dev. = Standard Deviation
EC = Electrical Conductivity
ND = Not Detected, a value of half the detection limit was assumed for calculation of statistics

3.4 XRD MINERALOGY

Table 3.10 provides a statistical summary of the quantitative XRD mineralogy results from the stockpile geochemical characterization boreholes. Quartz, muscovite (illite), potassium feldspar (K-feldspar) and plagioclase feldspar are the predominant minerals in the stockpile samples and occur in abundances greater than 1 weight percent (wt pct). Geophysical logging and reflectance spectroscopy also confirm that illite is the predominant clay mineral. After illite, kaolinite is the second most common clay mineral reported in these samples and its average abundance ranges from 1 to 19 pct. The minerals pyrite and jarosite were detected in most samples at average concentrations ranging between 0.1 and 3.1 pct. The presence of these minerals is an indicator of acid generation within the stockpiles.

The relative percentages of major minerals in the stockpile borehole samples is similar to the percentages determined on selected rock core and stockpile samples analyzed for the PMC, SMC and GETS Reports. However, jarosite was detected in most of the stockpile borehole samples analyzed for Condition 80 and as part of the GETS, but was only identified in one sample of fresh rock (leached cap material) analyzed as part of the SMC. This suggests that jarosite is forming in the stockpiles as a result of weathering and leaching reactions.

Selected borehole mineralogical profiles of the geochemical characterization boreholes are also presented in Appendix C along with a complete tabulation of the XRD data. The depth trend with respect to K-feldspar, plagioclase, muscovite (illite) and kaolinite are shown in these profiles. The amount of total feldspar is highly variable and ranges between 5 and 65 pct (K-feldspar and plagioclase). There is no overarching trend with depth in these profiles. In some profiles feldspars diminish with depth and in others the amount does not change or it increases with depth. This indicates that the feldspar content is controlled by the character of the material as it was emplaced on the stockpiles and not by post depositional alteration of feldspars to clay. Similarly there is no

systematic increase or decrease in the amount of muscovite and kaolinite with depth. There is a weak trend for muscovite and kaolinite to increase as feldspars decrease. The abundance of these minerals appears to be controlled by the degree of hydrothermal alteration that occurred during the time of mineralization. Muscovite (illite) is formed under conditions of hydrothermal alteration and is not a product of stockpile weathering and leaching. Kaolinite can form under weathering conditions but the downhole trends seen in these boreholes do not appear to be related to progressive weathering of stockpile material.

The depth trends with respect to amorphous clay, goethite, jarosite and pyrite are also shown in Appendix E. The amorphous clay contents in the boreholes range from 0 to 20 percent, and these profiles do not indicate that the amount of amorphous clay in the stockpile samples is correlated to depth (material age). There is also no evidence for a correlation of amorphous clay abundance with pyrite or jarosite contents. Furthermore, the amorphous content in the waste rock stockpile samples (TBGC-1 and TBCG-5) range as high as those found in leach ore stockpiles. This suggests that acidic conditions and leaching reactions are not resulting in breakdown of the rock to amorphous clay components.

Table 3.10. Statistical Summary of XRD Mineralogy Results

Mineral (wt %)	TBGC-1 No. 3B Stockpile		TBGC-2 No. 1 Leach Stockpile		TBGC-3 No. 1 Leach Stockpile		TBGC-4 No. 1 Leach Stockpile		TBGC-5 No. 1C Stockpile		TBGC-6 East Main Stockpile		TBGC-7 No. 2 Leach Stockpile		TBGC-7A No. 2A Leach Stockpile	
	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*
Quartz	41.6	*7.7*	38.1	*4.9*	36.3	*3.6*	42.4	*7.5*	32.3	*6.3*	36.8	*8.1*	34.2	*6.6*	40.6	*7.5*
K-feldspar	7.5	*4.4*	14.5	*3.9*	15.6	*2.8*	12.1	*2.7*	17.5	*5.3*	9.6	*4.5*	14.1	*5.0*	10.4	*5.9*
Plagioclase	6.8	*6.4*	8.3	*3.0*	8.0	*3.4*	6.8	*3.5*	19.5	*7.7*	9.8	*9.4*	18.3	*13.5*	6.3	*4.7*
Muscovite	17.5	*3.2*	21.1	*3.8*	20.9	*2.6*	21.6	*2.2*	14.1	*5.6*	17.8	*4.2*	18.8	*7.2*	19.2	*6.1*
Chlorite	0.5	*0.4*	1.1	*0.5*	0.9	*0.3*	0.8	*0.2*	0.8	*0.4*	0.7	*0.6*	0.9	*0.5*	1.6	*2.6*
Epidote	1.2	*0.4*	0.8	*0.1*	0.9	*0.2*	0.9	*0.3*	1.1	*0.5*	1.8	*0.4*	1.5	*0.3*	1.9	*0.6*
Pyrite	0.4	*0.3*	0.7	*0.4*	0.3	*0.1*	0.2	*0.1*	0.2	*0.1*	0.8	*0.5*	0.5	*0.3*	1.6	*1.2*
Chalcopyrite	0.2	*0.1*	0.1	*0.1*	0.1	*0*	0.1	*0.04*	0.2	*0.1*	0.2	*0.03*	0.2	*0.1*	0.2	*0.1*
Jarosite	1.1	*0.5*	1.3	*0.6*	1.0	*0.3*	1.4	*0.6*	1.1	*0.4*	1.3	*0.7*	1.4	*0.7*	1.5	*0.6*
Alunite	2.3	*1.3*	0.3	*0.1*	0.3	*0.1*	0.5	*0.3*	0.5	*0.3*	0.9	*0.6*	0.6	*0.5*	1.8	*2.3*
Kaolinite	3.0	*1.6*	4.1	*0.8*	5.3	*1.1*	4.4	*1.6*	4.4	*3.0*	3.2	*1.3*	4.5	*1.8*	2.3	*1.0*
Pyrophyllite	ND	*ND*	0.1	*0.2*	0.1	*0.2*	0.2	*0.4*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*
Hematite	0.2	*0.1*	0.1	*0.1*	0.04	*0.1*	0.02	*0.04*	0.2	*0.1*	ND	*ND*	0.1	*0.1*	0.1	*0.2*
Goethite	0.1	*0.2*	0.2	*0.2*	0.3	*0.3*	0.2	*0.2*	0.1	*0.1*	ND	*ND*	0.2	*0.2*	0.03	*0.1*
Magnetite	0.4	*0.1*	0.3	*0.1*	0.3	*0.1*	0.3	*0.1*	0.4	*0.1*	0.2	*0.1*	0.4	*0.1*	0.3	*0.2*
Gypsum	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	0.1	*0.1*	0.1	*0.1*
Talc	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	0.1	*0.1*	ND	*ND*	0.003	*0.02*	0.004	*0.02*
Amorphous	17.3	*3.0*	9.0	*2.5*	9.7	*2.1*	8.2	*3.0*	7.5	*5.9*	17.0	*2.8*	4.4	*4.3*	12.2	*5.3*

Notes:

All units in weight percent (wt %)
XRD = X-Ray Diffraction
Std. Dev = Standard Deviation
ND = Not detected

3.5 XRF BULK COMPOSITION

A statistical summary of the quantitative XRF bulk composition results from the stockpile geochemical characterization boreholes are provided in Table 3.11. In general, the average concentrations of constituents in these stockpile samples is similar in magnitude to the whole rock metal concentrations determined in the PMC (Table 7) and SMC (Table 3) for each mineral assemblages when compared to the predominant mineral assemblage type in each borehole. One exception is the concentration of Al_2O_3 which was not dissolved completely in the acid digestion method reported in the PMC and SMC. The average Al concentrations (after conversion of Al_2O_3 to Al) determined by XRF are higher than the Al concentrations reported in the PMC and SMC. Some of the PMC and SMC fresh rock samples were reanalyzed by XRF and reported in the Preliminary Report (Appendix G). The elemental concentrations in the stockpile geochemical characterization samples are within the range of concentrations determined in the reanalyzed fresh rock samples.

The major components (greater than 1 weight percent) in the stockpile materials are SiO_2, Al_2O_3, K_2O, and Fe_2O_3. Sulfur is also a major component in some stockpile intervals. Minor components (generally between 0.1 and 1.0 weight percent) include Na_2O, MgO, TiO_2, P_2O_5, CaO, BaO, and MnO in some intervals. Other constituents occur in trace amounts (generally less than 0.1 weight percent). The observed concentrations of major and minor elements are consistent with intermediate igneous rock types that have been subject to hypogene and supergene alteration and porphyry copper mineralization.

Selected constituents are shown in the bulk stockpile sample compositions profiles provided in Appendix D. The complete XRF dataset is also included in the Appendix. The concentration profiles shown in Appendix D include Al_2O_3, Fe_2O_3, MnO and S. These profiles illustrate major and minor COC trends in the stockpiles. Al_2O_3 is a major component of the aluminosilicate minerals such as feldspars and illite that make up the host rock matrix. The concentration of Al_2O_3 is fairly consistent with depth in each

stockpile profile and ranges between 10 and 20 percent. No significant trends in enrichment or depletion of Al_2O_3 were detected from examination of the profiles. This indicates that aluminum rich clays are not forming preferentially at depth in the stockpiles owing to progressive weathering and leaching reactions.

The Fe_2O_3, MnO and S profiles are also shown in Appendix D. Fe_2O_3 occurs in abundances between 3 and 10 wt pct and MnO occurs at concentrations between 0.01 and 0.35 wt pct. The concentration of S occurs in abundances between 0.2 and 4 wt pct. There is no distinct correlation of the Fe_2O_3, MnO and S concentrations in these profiles. There is also no distinct trend with depth which indicates that these constituents are not being heavily mobilized and accumulating preferentially within the stockpile.

Most metals are present in the stockpile materials in concentrations that are similar to unmineralized igneous rocks. In general most metal concentrations are less than 100 parts per million. The most important trace metals that are also COCs that were detected in these rocks at high levels are copper, zinc and lead. The profiles shown in Appendix D show that the concentrations of these base metals are variable and range from several hundred to several thousand parts per million (ppm). There is no distinct correlation of these metals with the sulfur concentration in the rock. In addition there are no significant trends with respect to depth which indicates that these metals are not being mobilized and concentrated at lower levels within the stockpiles. Stockpile whole rock compositions were also analyzed as part of the GETS and showed no evidence for preferential metal concentration within stockpile profiles.

The geochemical characterization borehole samples were analyzed for rare earth elements (REE) (Ce, La, Tm, Er, Ho, Dy, Tb, Gd, Pr, and Nd) but are not summarized in Table 3.11 or in Appendix D because most are below the detection limit of the XRF analysis technique. REE's are considered to be relatively immobile under a wide range of geochemical conditions. Therefore, elevated concentrations of these elements in the stockpile materials might indicate that preferential leaching of other constituents is

occurring. Because most rare earth elements are below the detection limit of the XRF analysis no residual concentration processes are detected. Some rare earths occurred above the detection limit including Ce, La, Dy and Nd. The concentrations measured are typical of igneous rocks which indicates that preferential enrichment through leaching is not occurring.

3.6 STOCKPILE MONITORING

Stockpile temperature and pore gas composition monitoring has been conducted at the Tyrone Mine and the preliminary results were presented in the Preliminary Report. The average temperature, O_2 concentration and CO_2 concentration profiles from the quarterly monitoring events beginning in late 2004 (October and December) through 2005 (March, June/July, and November) are provided in Appendix E. Average borehole temperatures range between approximately 15 and 40 degrees Celsius. The mean maximum air temperature is approximately 30 degrees Celsius (DBS&A, 1999), and average stockpile temperatures at or above that value must be attributed to internal heating from the exothermic sulfide oxidation reaction. Elevated temperatures occur in the lower intervals of TBGC-1, and in the upper to mid range intervals of TBGC-7 and TBGC-7A. The higher temperature intervals in TBGC-1 and TBGC-7A, where temperatures exceed 30 degrees Celsius, are associated with relatively low ABP materials that are below -40 $TCaCO_3$/kT. This indicates that the oxidation of sulfides is generating heat that raises the internal temperatures of these stockpiles.

The average oxygen concentrations in pore gas are generally between 4 and 21 percent by volume in most intervals, although concentrations fall below detection in some intervals. Oxygen depleted zones occur in TBGC-5, TBGC-7 and TBGC-7A. These zones may correspond with relatively stagnant areas in the stockpile where air flow is reduced.

Table 3.11. Statistical Summary of XRF Bulk Composition Results

Chemical Composition (units)	TBGC-1		TBGC-2		TBGC-3		TBGC-4		TBGC-5		TBGC-6		TBGC-7		TBGC-7A	
	No. 3B Stockpile		No. 1 Leach Stockpile		No. 1 Leach Stockpile		No. 1 Leach Stockpile		No. 1C Stockpile		East Main Stockpile		No. 2 Leach Stockpile		No. 2A Leach Stockpile	
	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*
Na_2O (wt %)	0.66	*0.64*	0.65	*0.33*	0.77	*0.32*	0.84	*0.43*	1.83	*0.87*	1.08	*1.05*	1.76	*1.34*	0.52	*0.47*
MgO (wt %)	0.78	*0.14*	0.93	*0.14*	0.82	*0.07*	0.88	*0.10*	0.78	*0.27*	0.93	*0.18*	0.85	*0.12*	1.15	*0.83*
Al_2O_3 (wt %)	16.8	*1.6*	17.8	*1.4*	17.8	*0.9*	17.5	*0.6*	17.2	*1.0*	18.1	*1.0*	18.1	*0.8*	16.8	*1.7*
SiO_2 (wt %)	68.7	*2.7*	62.3	*2.4*	63.2	*2.7*	62.7	*2.0*	66.2	*1.8*	66.7	*3.9*	65.3	*33*	67.0	*4.2*
P_2O_5 (wt %)	0.17	*0.05*	0.63	*0.26*	0.22	*0.05*	0.45	*0.14*	0.18	*0.03*	0.25	*0.12*	0.20	*0.04*	0.26	*0.18*
S (wt %)	0.83	*0.38*	0.21	*0.05*	0.35	*0.09*	0.21	*0.03*	0.42	*0.23*	0.77	*0.27*	0.67	*0.29*	1.61	*0.81*
Cl (wt %)	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*
K_2O (wt %)	4.38	*0.48*	4.83	*0.13*	4.99	*0.31*	4.76	*0.13*	4.60	*0.62*	4.73	*0.42*	4.45	*0.69*	4.91	*0.80*
CaO (wt %)	0.19	*0.22*	0.20	*0.07*	0.20	*0.05*	0.22	*0.12*	0.49	*0.22*	0.13	*0.09*	0.47	*0.42*	0.26	*0.21*
TiO_2 (wt %)	0.33	*0.06*	0.39	*0.05*	0.37	*0.03*	0.37	*0.03*	0.36	*0.05*	0.40	*0.09*	0.39	*0.05*	0.45	*0.20*
MnO (wt %)	0.05	*0.04*	0.13	*0.10*	0.12	*0.07*	0.16	*0.17*	0.04	*0.03*	0.05	*0.01*	0.05	*0.03*	0.09	*0.08*
Fe_2O_3 (wt %)	4.53	*0.98*	4.85	*0.77*	4.60	*0.79*	4.56	*0.33*	3.63	*0.65*	3.19	*1.16*	3.95	*1.07*	5.01	*2.07*
BaO (wt %)	0.07	*0.02*	0.10	*0.01*	0.11	*0.01*	0.08	*0.02*	0.09	*0.01*	0.09	*0.02*	0.09	*0.01*	0.08	*0.02*
V (mg/kg)	32	*9*	46	*20*	37	*3*	37	*1*	40	*7*	43	*26*	37	*5*	55	*54*
Cr (mg/kg)	26	*10*	19	*9*	26	*9*	19	*6*	28	*5*	25	*11*	25	*9*	35	*11*
Co (mg/kg)	6	*3*	8	*4*	12	*11*	10	*6*	9	*4*	7	*4*	15	*9*	14	*7*
Ni (mg/kg)	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	41	*83*	6	*3*
W (mg/kg)	7	*3*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	6	*3*
Cu (mg/kg)	835	*775*	1,967	*936*	2,617	*643*	1,877	*477*	1,079	*423*	2,661	*2,239*	2,148	*1,830*	1,354	*705*
Zn (mg/kg)	326	*434*	975	*296*	545	*196*	497	*221*	318	*244*	690	*287*	636	*200*	867	*780*

Table 3.11. Statistical Summary of XRF Bulk Composition Results

Chemical Composition (units)	**TBGC-1**		**TBGC-2**		**TBGC-3**		**TBGC-4**		**TBGC-5**		**TBGC-6**		**TBGC-7**		**TBGC-7A**	
	No. 3B Stockpile		No. 1 Leach Stockpile		No. 1 Leach Stockpile		No. 1 Leach Stockpile		No. 1C Stockpile		East Main Stockpile		No. 2 Leach Stockpile		No. 2A Leach Stockpile	
	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*
As (mg/kg)	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	ND	*ND*	11	*4*	ND	*ND*	10	*2*
Sn (mg/kg)	55	*26*	85	*15*	73	*14*	72	*9*	38	*16*	37	*21*	47	*22*	58	*30*
Pb (mg/kg)	207	*125*	448	*502*	160	*75*	213	*92*	125	*111*	257	*166*	126	*99*	244	*185*
Mo (mg/kg)	70	*63*	84	*37*	135	*70*	156	*53*	100	*36*	23	*20*	85	*48*	91	*140*
Sr (mg/kg)	292	*169*	270	*63*	322	*50*	333	*52*	436	*96*	235	*104*	464	*163*	219	*116*
U (mg/kg)	7	*6*	6	*2*	5	*1*	ND	*ND*	ND	*ND*	14	*6*	25	*9*	11	*7*
Th (mg/kg)	15	*18*	9	*9*	ND	*ND*	7	*3*	ND	*ND*	44	*19*	7	*4*	12	*10*
Nb (mg/kg)	11	*5*	ND	*ND*	ND	*ND*	6	*2*	ND	*ND*	9	*4*	ND	*ND*	9	*5*
Zr (mg/kg)	163	*45*	110	*9*	108	*6*	117	*9*	117	*11*	147	*37*	109	*10*	165	*45*
Rb (mg/kg)	158	*22*	160	*24*	147	*15*	152	*17*	126	*16*	171	*27*	135	*29*	174	*33*
Y (mg/kg)	37	*25*	21	*14*	16	*5*	18	*8*	17	*8*	40	*29*	21	*9*	42	*17*

Notes:

XRF = X-Ray Fluorescence
Std. Dev. Standard Deviation
wt % = Weight percent
mg/kg = milligrams per kilogram
ND = Not Detected, a value of half the detection limit was assumed for calculation of statistics

However, in most borehole intervals the O_2 content is relatively high and will support pyrite oxidation.

Carbon dioxide concentrations are generally lower than 1 percent in most intervals. However in some intervals the levels of CO_2 climb to several percent and as high as 12 percent near the base of the stockpiles.

3.7 STOCKPILE WEATHERING AND LEACHING

The effects of stockpile weathering and leaching were investigated by examination of material characteristic trends as a function of stockpile age. The age of the stockpile materials was determined from the stockpile depositional sequences provided in the form of stockpile cross sections in the Preliminary Report for Condition 80 (Appendix A). The cross sections provided in Appendix F show the stockpile depositional sequences that are intersected by the boreholes and the ages of deposition. The No. 1 Stockpile sequences are not shown but that stockpile material was deposited between 1967 and 1975.

The charts provided in Appendix G show the paste pH, ABP, pyritic sulfur fraction, sulfate fraction, and MWMP extract parameters acidity, EC, Al, Cu, Fe and SO_4, plotted as a function of stockpile material age. The maximum pyritic sulfur fraction diminishes with age of the stockpile material. This indicates that pyrite is reacting in the stockpiles and is being depleted as they age. No other distinct trends in these parameters could be discerned as a function of age. In other words, the apparent variability of a particular age group can be almost as high as the variability of the entire span of samples. Therefore, the variability among different material types probably accounts for the variability in the sample population across the age distributions.

4.0 DISCUSSION

This section presents a discussion of the data analysis presented in Section 3.0 above and integrates them with the results presented in the Interim and Preliminary reports. Relevant results from other studies are also discussed where applicable. A brief overview of the most relevant findings is provided below. Sections 4.1 and 4.2 discuss implications with respect to stockpile seepage quality and geochemical stability, respectively.

The results of paste pH and ABA testing show that all of the stockpiles and stockpile complexes sampled have the potential to generate acidity and are generating acidity. However, the levels of acidity generated are low because of the relatively low sulfide contents. The ABA and sulfate trends suggest that acid generation is occurring in the stockpiles owing to sulfide oxidation and that the ANP present in the as-mined ore and waste is consumed in the process. Sulfate minerals are being produced as a result of the sulfide oxidation reactions, which increase the sulfate content in the stockpile samples as compared to the freshly mined materials. The results of humidity cell testing reported in the GETS show that the sulfate production from the Tyrone materials is low and ranges from less than 1 to 16 milligrams per kilogram per week. The pH of rinsates from the all tests remained above 5 for the duration of the tests which indicates that the rate of acid production is relatively low owing to the relatively low sulfide contents in the rocks.

Stockpile temperature and pore gas composition monitoring has been conducted for approximately one year at the Tyrone Mine. Borehole temperatures are elevated in sulfide rich zones due to the heat of reaction generated by sulfide oxidation. Oxygen concentrations measured within the stockpiles are generally sufficient to support pyrite oxidation. Pyrite oxidation appears to be occurring at a rate such that pyrite is partially depleted in the stockpiles as they age.

Researchers who have monitored the interior temperature of stockpiles show that heating tends to be greatest near the top of stockpiles with some regions showing elevated temperatures as deep as 15 meters from the surface. The heating is caused by high rates of pyrite oxidation owing to diffusion of oxygen from the surface into the interior (Harries and Ritchie, 1980 and 1985).

4.1 STOCKPILE SEEPAGE QUALITY

Table 3.9 provides the average pH and concentrations of constituents in MWMP effluents with respect to COCs at Tyrone. The average pH and most constituent concentrations in the effluents are above New Mexico Water Quality Control Commission (WQCC) standards (WQCC, 2001) in a majority of the boreholes. However, stockpile seepage mixes with larger volumes of surface and groundwater where it exits the stockpile at toe collection impoundments and at the base of the stockpile, respectively. Therefore the water quality of the resulting discharge may or may not meet WQCC standards depending upon the mixing ratio.

4.2 STOCKPILE GEOCHEMICAL STABILITY

Geochemical stability relates to the reactivity of both gangue silicate minerals and sulfide minerals in the stockpile. Chemical weathering can have at least two qualitatively different influences on materials stability (McLemore et. al, 2005). First, dissolution of silicate minerals by acidic solutions can result in reduction of grain size and generation of clay minerals. Secondly precipitates that form as a result of weathering can cement particles and increase cohesion. Silicates react according to the general equation:

> Primary silicate + H_2O + H_2SO_4 = ions in solution (Na^+, K^+, Ca_2^+, Mg^{2+}, H_4SiO_4, SO_4^{2-}) + weathering products + mineral precipitates (i.e. clays and sulfates)

According to the relative reactions rates provided in Table 5.2.1-1 in Morin and Hutt (1997), the Tyrone stockpile's primary matrix silicate minerals are weathered over relatively long time frames.

Pyrite is present in all stockpiles and is reacting with oxygen to produce acidity, sulfate and iron. The general pyrite oxidation equations are:

$$FeS_2 + 15/4O_2 + 7/2H_2O = Fe(OH)_3 + 2SO4^{2-} + 4\ H^+$$

$$FeS_2 + 14Fe^{3+} + H_2O = 15Fe^{2+} + 2SO4^{2-} + 16H^+$$

The precipitate $Fe(OH)_2$ can form cementations along with sulfate mineral precipitates.

The pyrite content in the Tyrone stockpiles is relatively low and pH conditions are generally between 3 and 6 according to paste pH and MWMP results. These pH conditions do not promote rapid hydrolysis of silicate minerals in the rock matrix.

Petrographic analysis of rock core samples was performed as part of the PMC. The examinations showed evidence for pervasive alteration of fresh host rocks as a result of supergene and hypogene alteration. Feldspars and mafic minerals such as biotite are highly altered to clay assemblages as a result of hydrothermal alteration. Therefore, continued weathering in the stockpile is slowed by the presence of clays that are geochemically stable under weathering conditions. Petrographic analysis was also performed on stockpile samples as part of the GETS and additional characterization of stockpile materials by SEM analysis was undertaken as part of Condition 80. In the stockpile samples, feldspars to a large extent are altered to sericite as a result of hydrothermal alteration. The sulfide minerals pyrite, chalcopyrite, bornite, covellite, chalcocite sphalerite, galena and molybdenite have also been identified. Pyrite is mostly present in leach ore stockpiles whereas iron oxide weathering products are present in

waste rock stockpiles. However, the petrographic examinations showed no evidence for partial pyrite oxidation where that mineral present in the stockpile samples. Pyrite oxidation in the current stockpiles is probably occurring at a rate that does not produce obvious reaction rims since the time of deposition. However jarosite and natrojarosite, both sulfate minerals that are the products of acid generation, were observed in the stockpile samples. These sulfate minerals can cement particles and increase cohesion within the stockpiles.

Few studies on stockpile weathering and geochemical stability are available in the literature. Two weathering studies at sites located in southwestern Montana and northern New Mexico are summarized below. A study of a waste rock stockpile was conducted at the Golden Sunlight Mine, located in southwestern Montana, to determine the extent of weathering, characterize its geochemical variations, and correlate the extent of weathering with physical waste rock characteristics (Outlaw and Dollhopf, 1997). Material was first emplaced on the stockpile in the late 1980s. The primary rock types deposited are hydrothermally altered and mineralized shale and latite. These rocks contain an average of 8 percent sulfur mostly in the form of pyrite. The study showed that weathering is more intense where the waste rock interface comes into contact with air and water at the surfaces of the waste rock. The extent of weathering is less deeper within the pile although the deepest and oldest portions of the stockpile showed the highest degree of weathering. This indicates that weathering continues even in areas where air and water access are limited. Paste extracts from the most weathered rocks have the lowest sample pH and highest titratable acidity, soluble SO_4, Fe, and Al. These weathering trends were not discerned from analysis of the Tyrone stockpile geochemical results. It is inferred that the altered shale and latite at Golden Sunlight are more geochemically reactive than the altered quartz monzonite porphyry and granitic host rocks at Tyrone.

Detailed weathering studies are being conducted on Molycorp's stockpiles located in northern New Mexico (McLemore et al., 2005). The work conducted thus far shows that

paste pH increases with distance from the outer, oxidized zone towards the interior, which suggests that oxygen diffusion from the surface is supporting pyrite oxidation. The interior pyrite is reacting more slowly owing to less oxygen. The Molycorp's studies are in progress and additional findings with respect to stockpile weathering processes are forthcoming.

5.0 CONCLUSIONS

Tyrone mine materials characterization data has been reported in three principal reports as part of the 2001 CCP Plan and in three reports for DP-1341, Condition 80. Other supporting studies also provide additional information on mine materials. This information has been compiled into an Access materials database containing information on approximately 740 samples of fresh rock and stockpile materials from Tyrone. This database provides a sufficient repository of information on the character the materials at Tyrone for the purposes of closure and closeout planning.

Comparisons of data of fresh mine materials with those of stockpile materials of various ages shows that the materials properties are highly variable and that the variability of stockpile material properties is similar to that of the fresh mine materials. The sulfate content in the stockpile materials is significantly higher than that of fresh mine materials owing to the effects of pyrite oxidation.

Sulfate is stored in the stockpiles in the form of jarosite and other sulfate minerals which occur in significantly greater abundances in the stockpile materials as compared to fresh mine materials. Jarosite is a source of stored acidity and metals that is released upon contact with meteoric water. This reaction accounts for the release of sulfate, acidity and metals concentrations found in MWMP extracts from stockpile samples. The leach ore stockpiles appear to be more reactive and release higher concentrations of constituents than waste rock stockpiles. Constituent concentrations are higher than WQCC standards for the COCs at the Tyrone Mine. However the relative impacts on water quality are dependent upon the mixing proportions of stockpile seepage with surface and ground water.

The stockpile materials at Tyrone are geochemically stable with respect to silicate matrix mineral reaction with water, air and acidity. The levels of acidity produced in the stockpiles are relatively low and most paste pH results are 4 and above. These conditions

do not result in pervasive weathering and leaching of the primary rock forming minerals at Tyrone. The materials have been subject to hypogene and supergene alteration as part of the ore forming processes that have occurred over the course of millions of years and significant alteration from their present state in the stockpiles will take very long periods of time.

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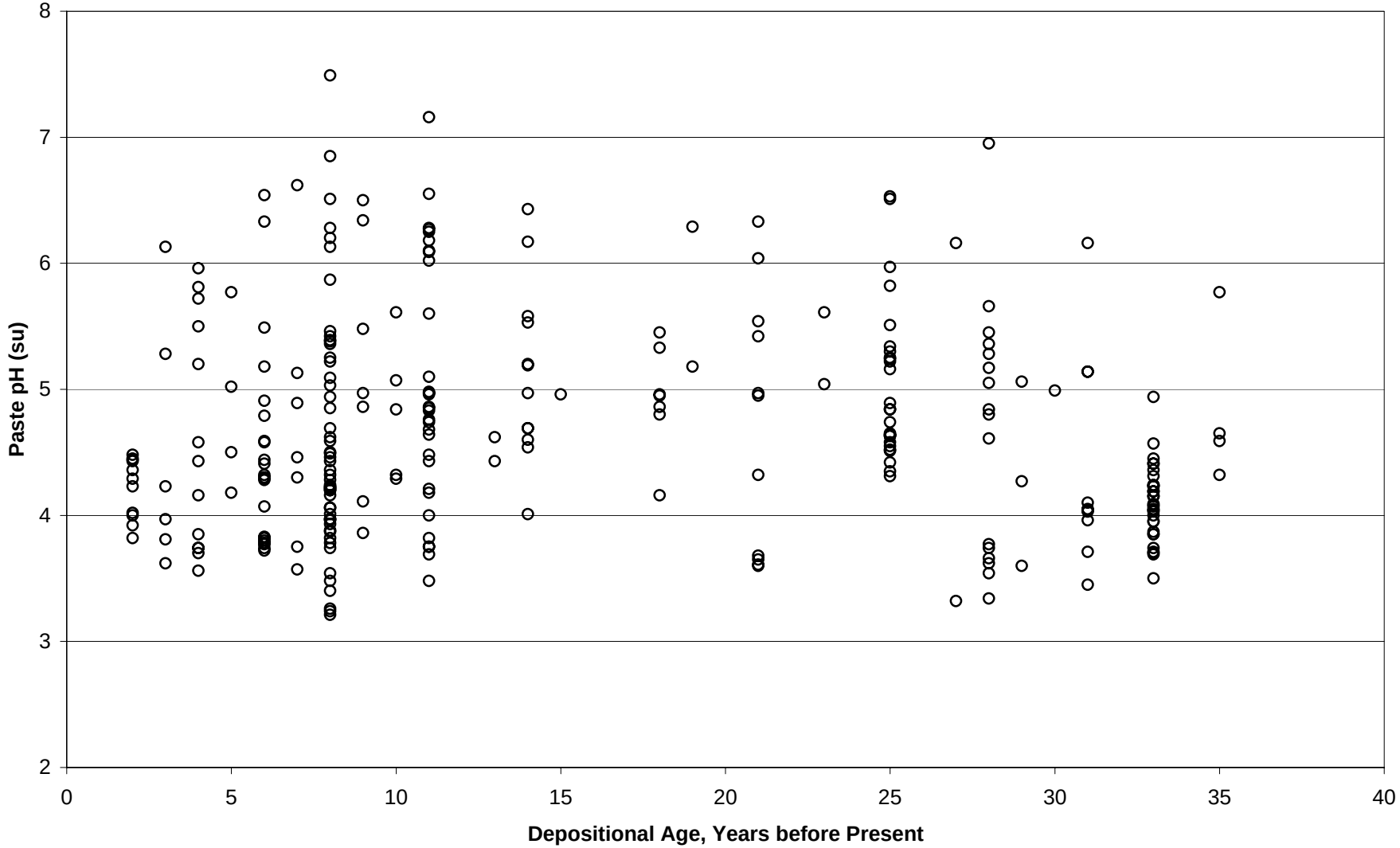
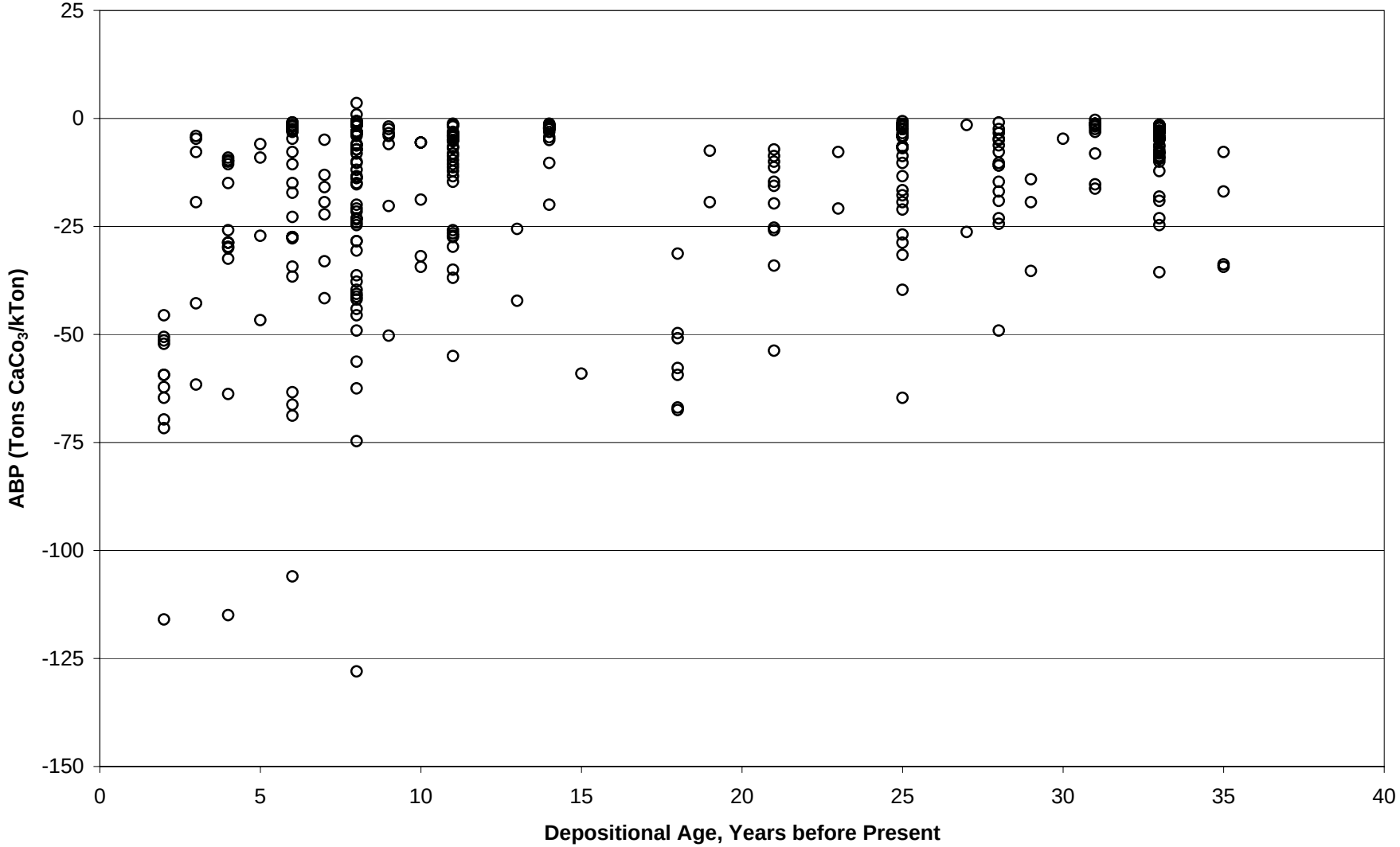
APPENDIX G

Age Analysis - Paste pH



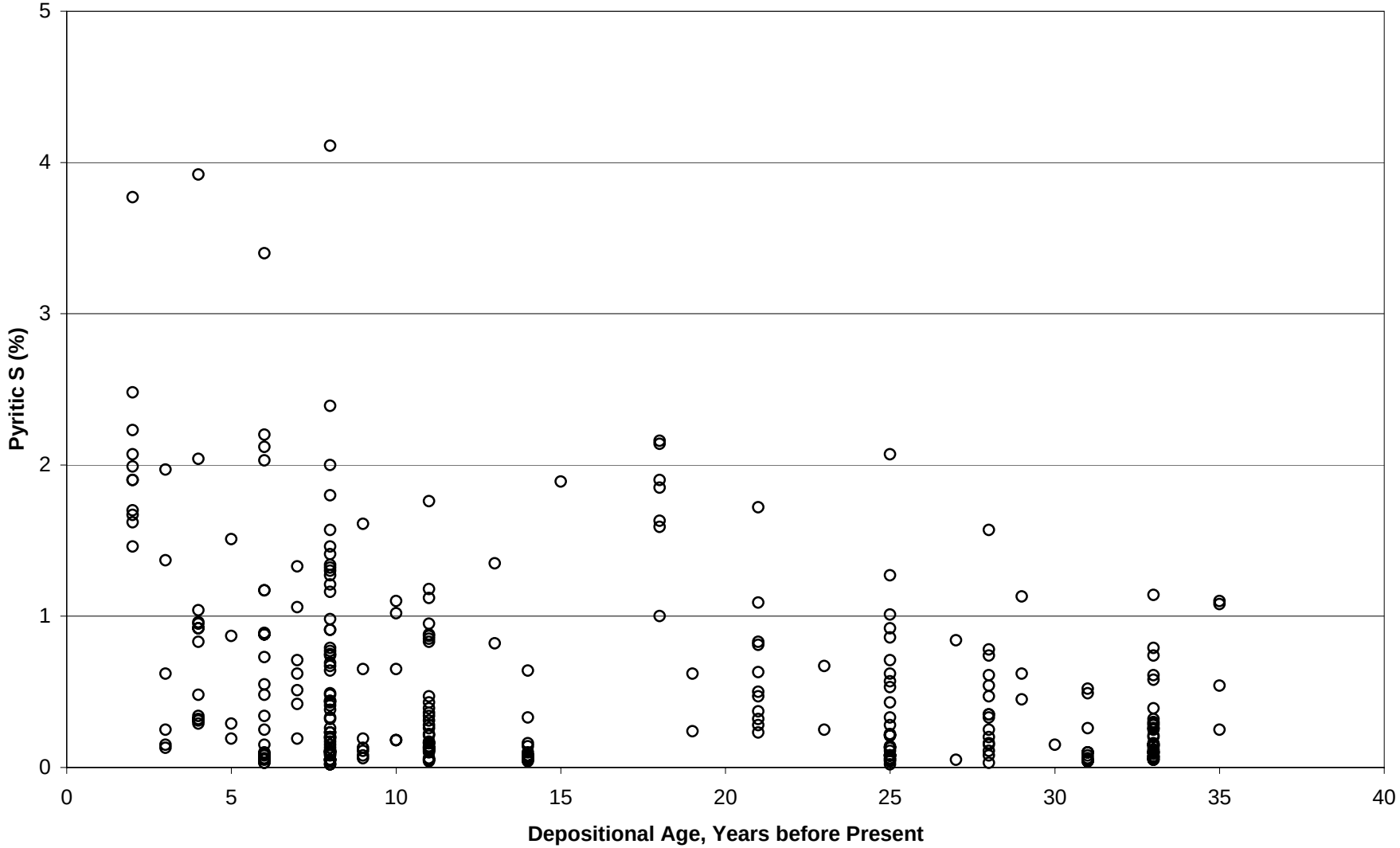
EnviroGroup Limited 2005

Age Analysis - Acid Base Potenial



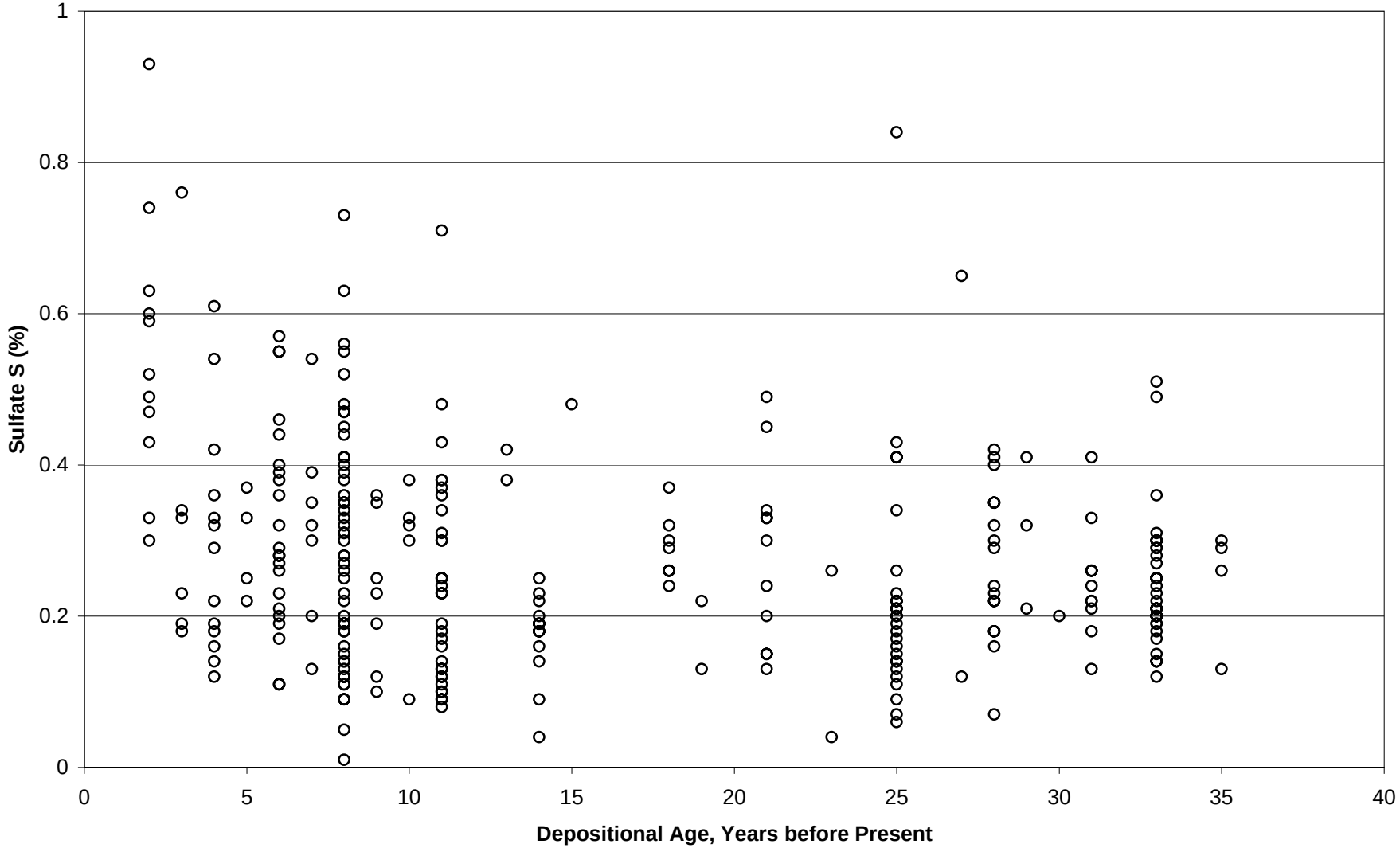
EnviroGroup Limited 2005

Age Analysis - Sulfide Fraction



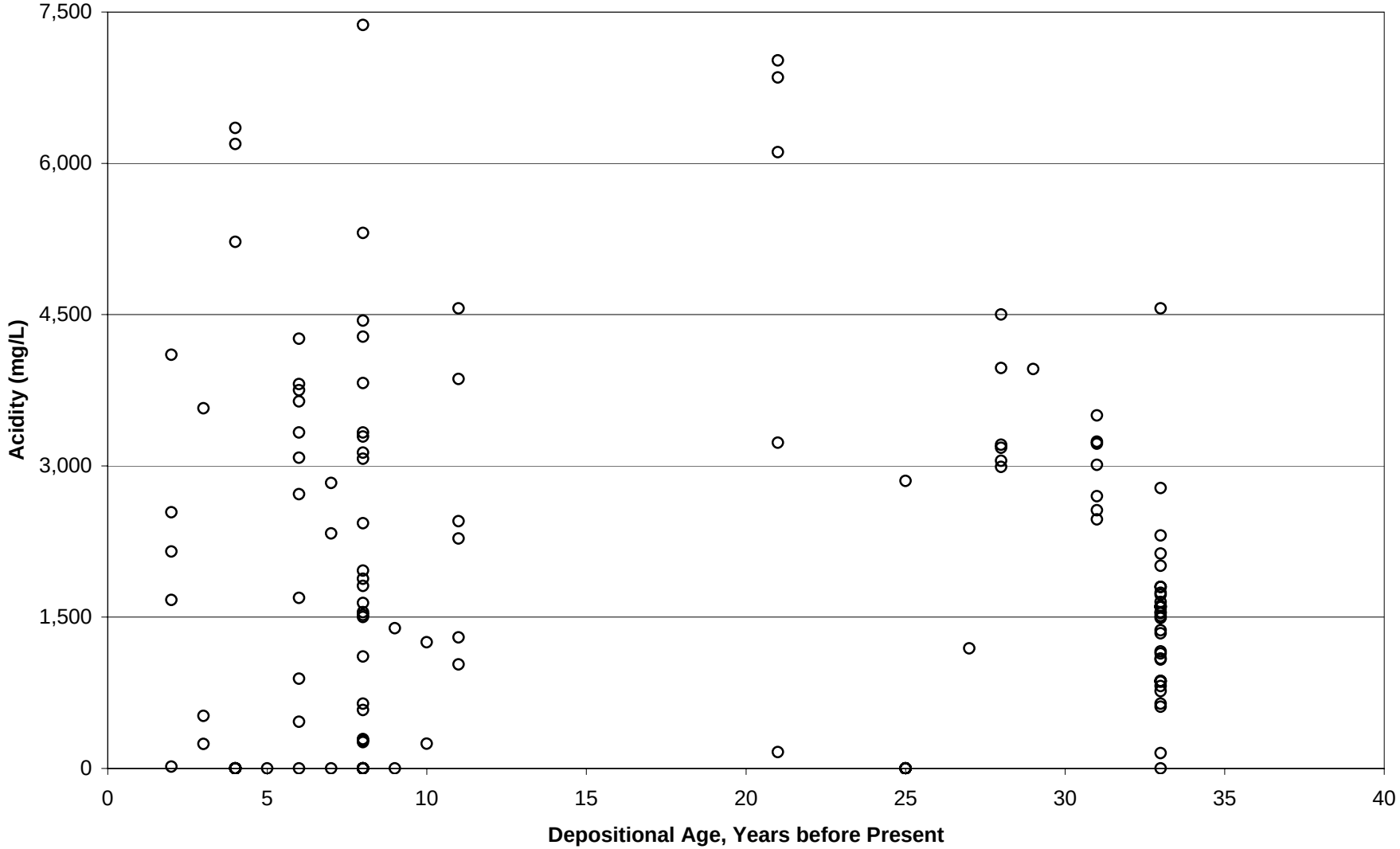
EnviroGroup Limited 2005

Age Analysis - Sulfate Fraction



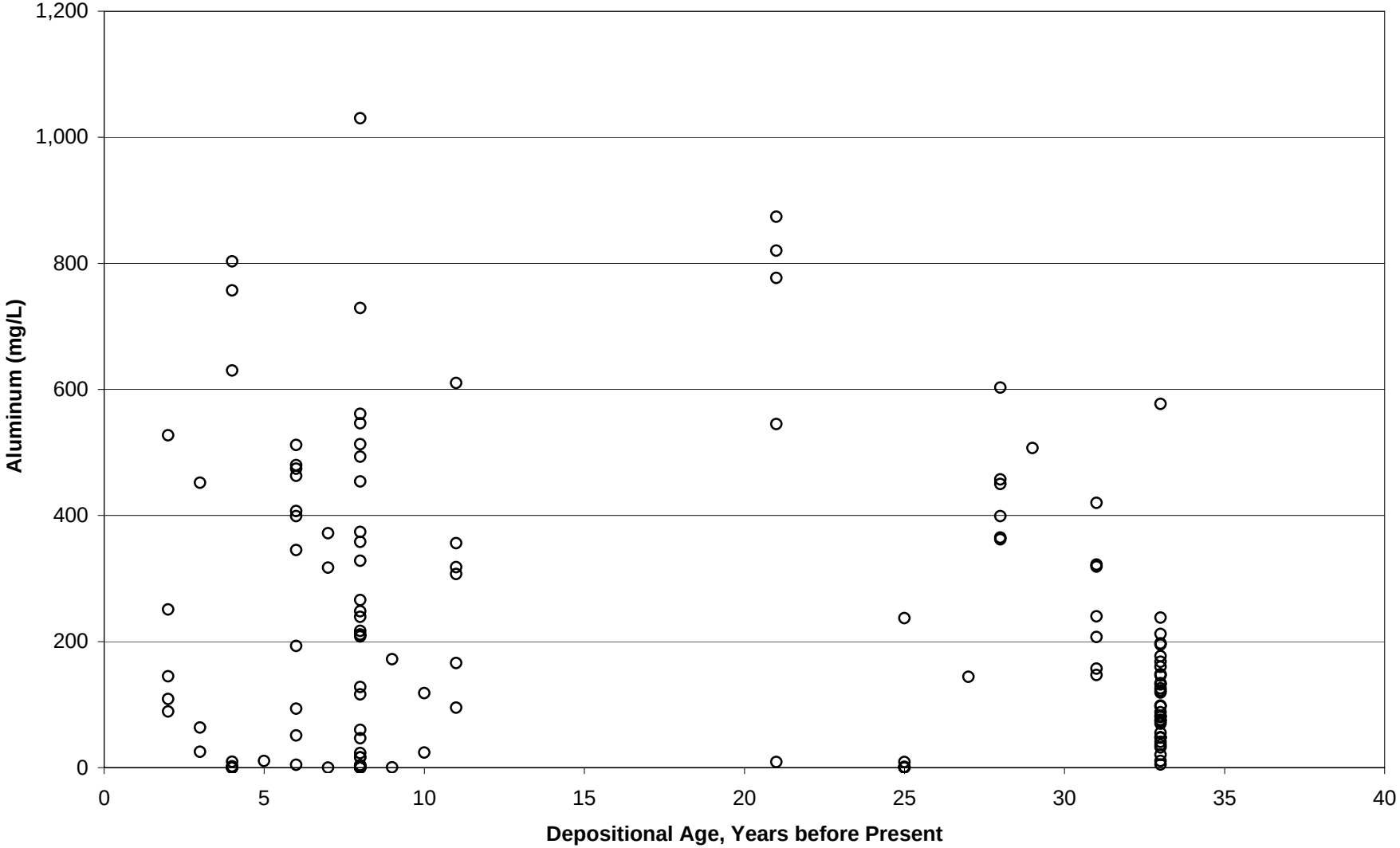
EnviroGroup Limited 2005

Age Analysis - MWMP Acidity



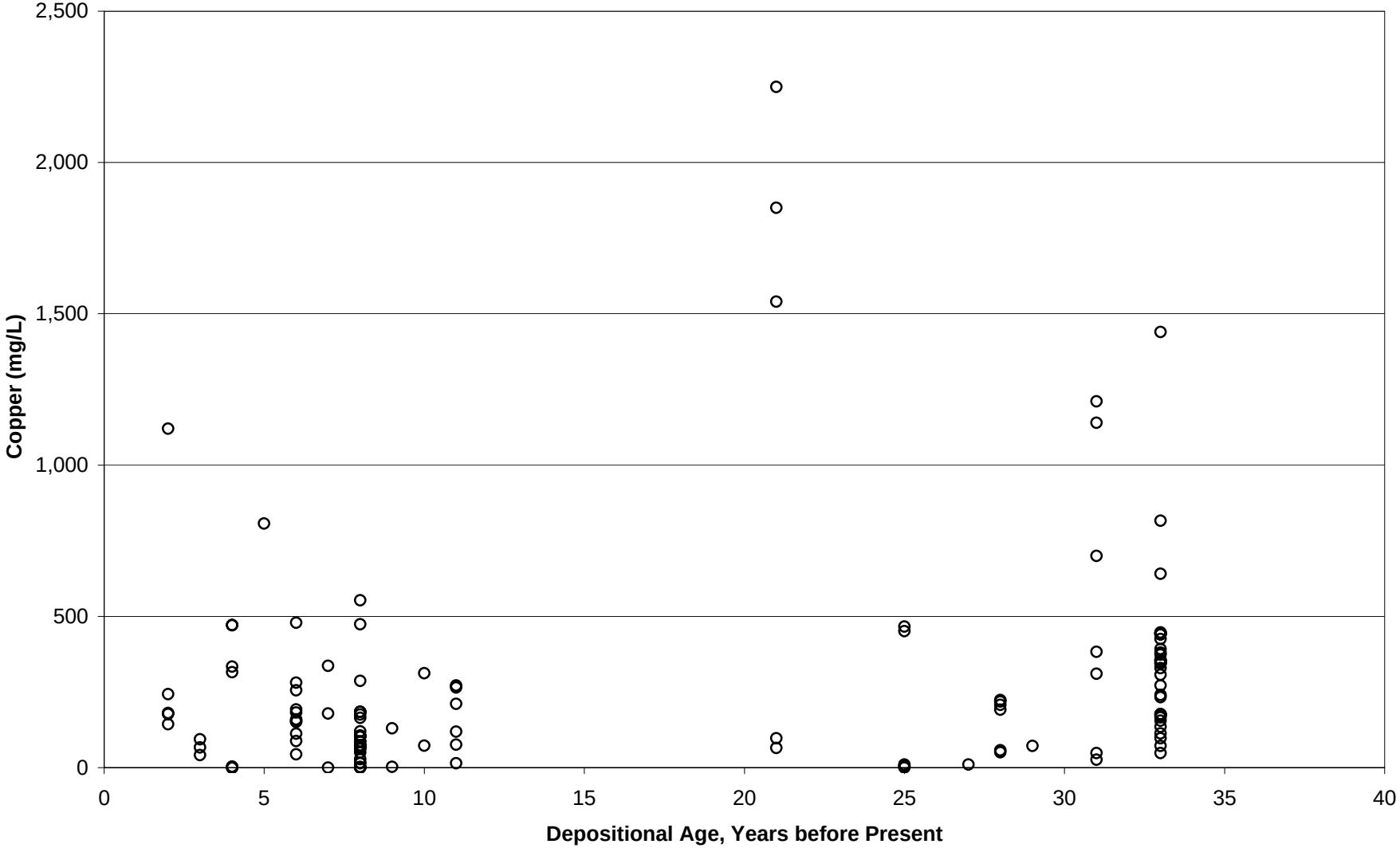
EnviroGroup Limited 2005

Age Analysis - MWMP Aluminum



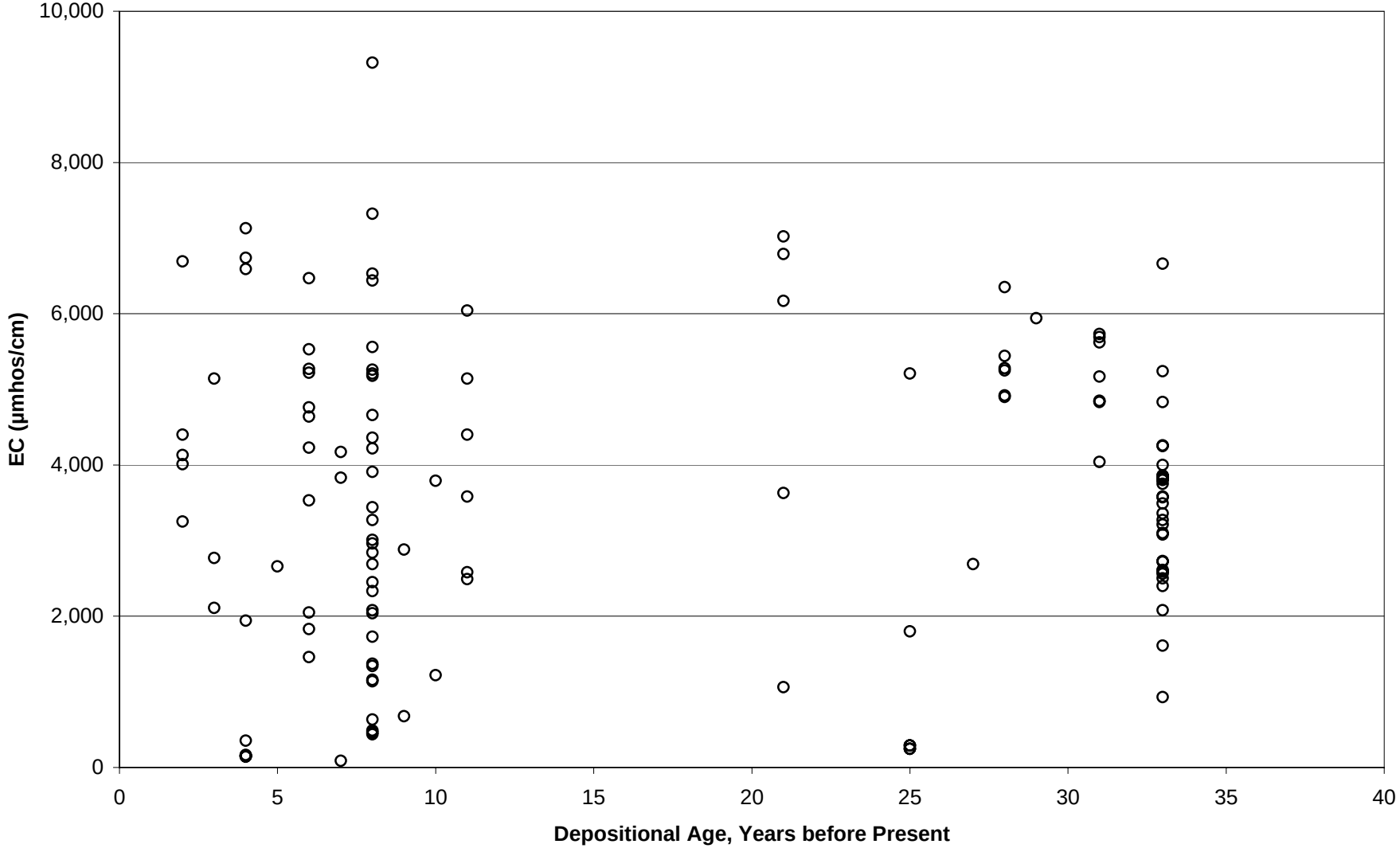
EnviroGroup Limited 2005

Age Analysis - MWMP Copper



EnviroGroup Limited 2005

Age Analysis - MWMP Electrical Conductivity



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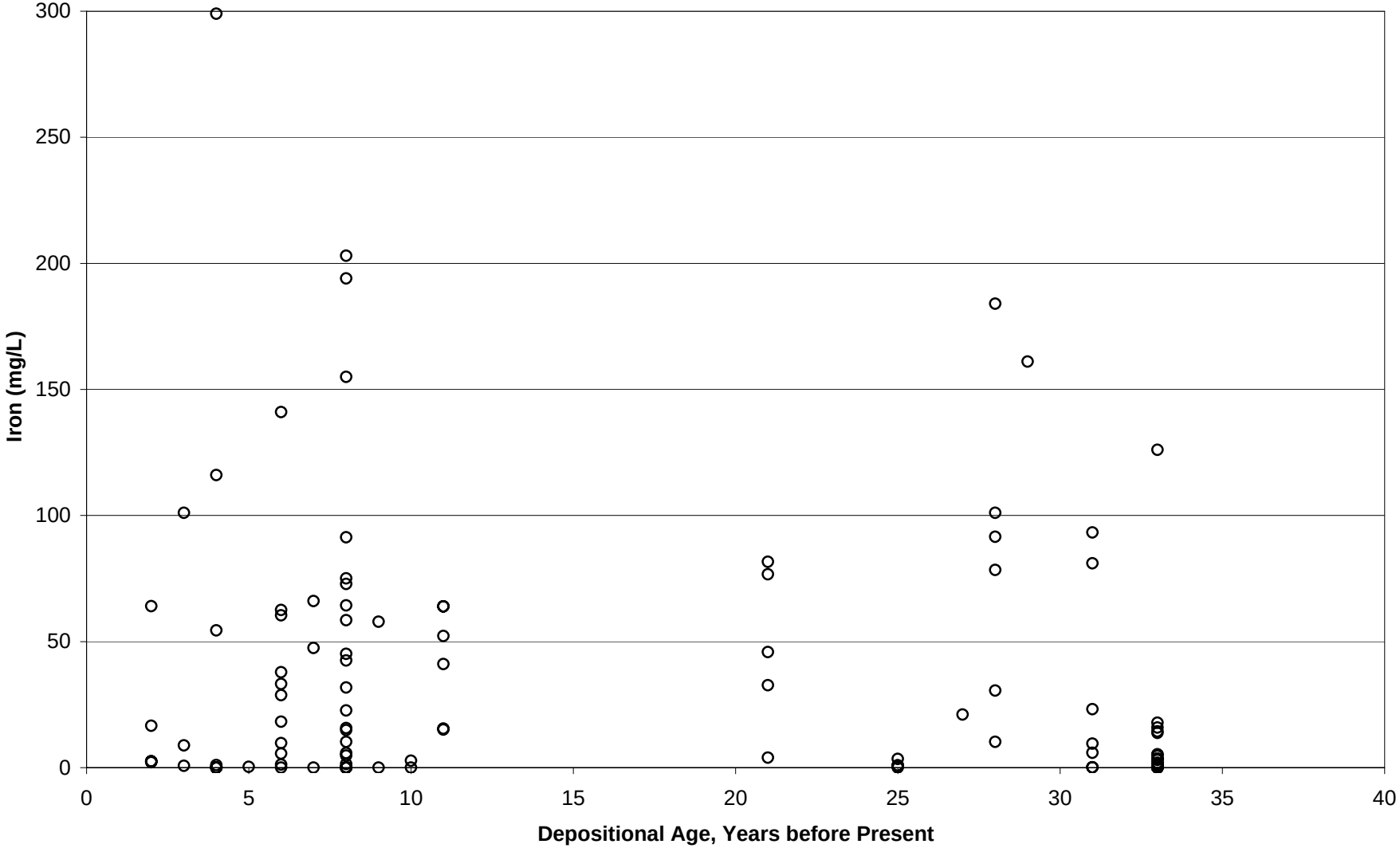
Age Analysis - MWMP Iron



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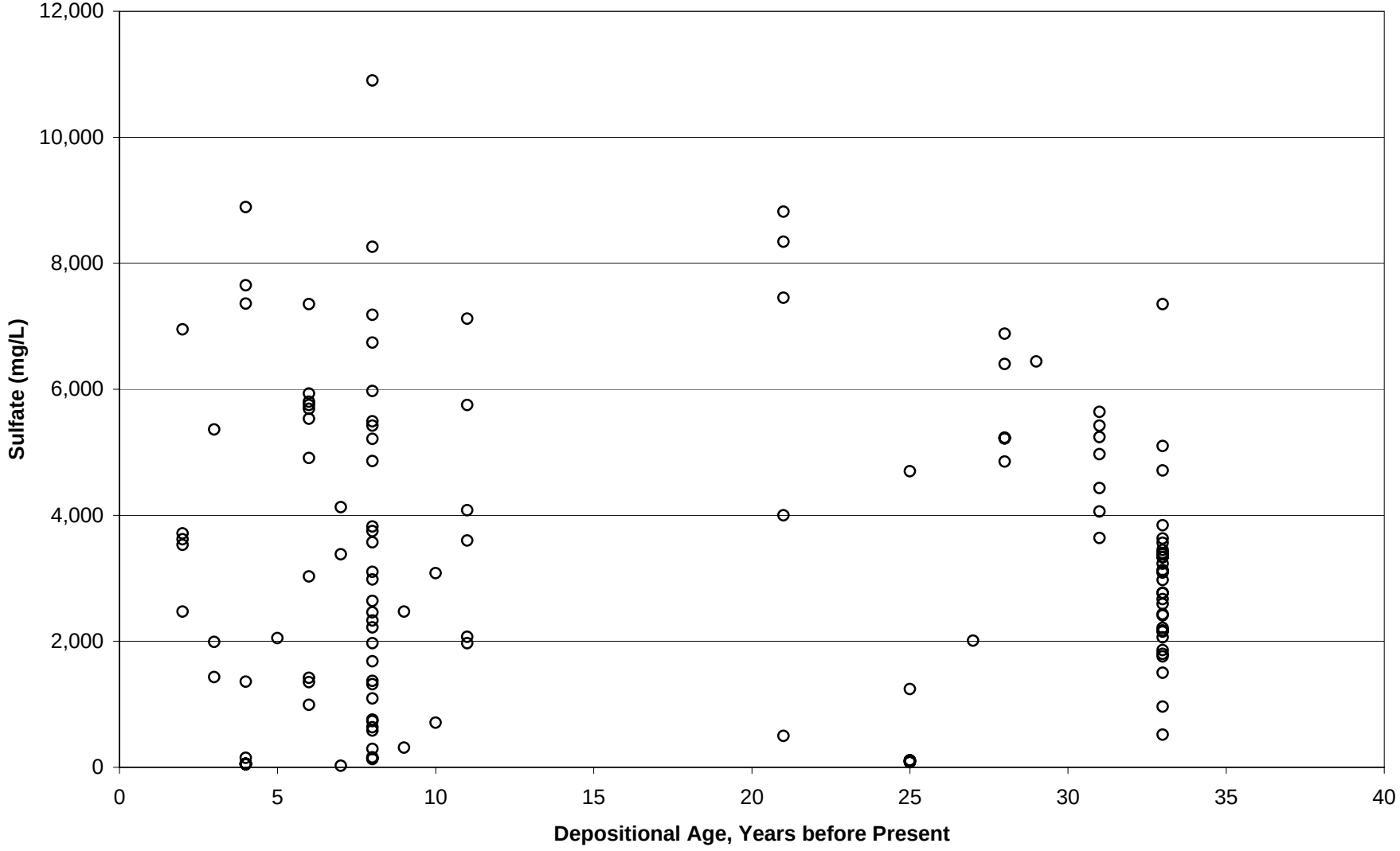
Age Analysis - MWMP Sulfate



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