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Geochemical Characterization of Waste Rock and Ore
from the Boston Deposit, Hope Bay Project



Geochemical Characterization of Waste Rock and Ore from the Boston Deposit, Hope Bay Project

Prepared for

TMAC Resources Inc.



Prepared by



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1CT022.013
November 2017

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Technical Summary

This report documents the methods and results of geochemical characterization completed to evaluate the metal leaching and acid rock drainage (ML/ARD) potential of waste rock and ore associated with development of the proposed underground mining operations at Boston.

The findings are based on acid-base accounting and mineralogy data obtained from sampling conducted between 1997 and 2001 and between 2009 and 2010, as well as results from humidity cell tests and barrel tests initiated in 2010 on a number of samples from this area. This report contains the most current geochemical database for the Boston deposit and fully supersedes SRK (2009), which was prepared to document the methods and results used in all historic and recent test programs for the Doris, Madrid and Boston deposits.

The most volumetrically significant waste rock lithologies are mafic metavolcanics (1) and sedimentary units (5). The ore is hosted in quartz veins (12q), mafic metavolcanics with sediments (1oj) and mafic metavolcanics (1). Mafic metavolcanics with sediments (1oj), late intermediate dyke (9n) and late gabbro (10a) are volumetrically less significant waste lithologies.

The risk of ARD for Boston is low, with 92 to 96% of the overall sample set classified as non-PAG, 3 to 8% classified as uncertain, and two samples (or 0.3% of the sample set) classified as PAG. Boston ore samples were characterized by higher levels of total sulphur compared to waste.

All the volumetrically significant rock types contained samples with elevated solid-phase arsenic. Compared to the other Hope Bay deposits, arsenic content for mafic metavolcanics from Boston were higher than Madrid South and generally comparable to Madrid North.

In terms of metal leaching, kinetic tests (humidity cells and barrel tests) indicated that arsenic, antimony, cobalt, molybdenum and nickel leaching from waste rock are potential issues at neutral to alkaline pH values. The highest leaching rates for these elements were observed in tests that contained mafic metavolcanics (1) classified as ore/waste, mafic metavolcanics with sediments (1oj) classified as waste, and quartz veins (12q) classified as either waste or ore.

The humidity cell data indicated that arsenic leaching is related to solid-phase arsenic content, and arsenic, antimony, cobalt and nickel leaching is possibly related to the trace occurrence of the sulphide mineral gersdorffite (NiAsS), which requires detailed petrographic examination to identify. There is no practical field technique for segregation of waste rock that contains gersdorffite.

During mine development approximately 45% of Boston waste rock will be placed on surface in a temporary stockpile while the remainder will never be removed from the underground. At closure, all Boston waste rock will have been placed as backfill in the Boston underground. In the event localized ARD is produced, it is anticipated that the high carbonate content in the overall waste rock stockpile would provide sufficient buffering capacity, and that the overall drainage from the stockpile would remain neutral to alkaline. Water quality from the waste rock stockpile will reflect concentrations from a mixture of rock types. Contact water will be collected in a lined collection pond and transferred to the water treatment plant. Source terms for the Project are presented in SRK (2016).

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Change Log

The following table provides an overview of material changes to this report from the previous version issued as Appendix V3-4E as part of the DEIS for Phase 2 of the Hope Bay Project dated December 2016.

Changes by Section

Information Request, Technical Comment, or Other Change	Section	Comments
INAC-IR47	1.3	Waste rock management and conservative source term derivation method preclude the need to breakdown volumes of ore and waste rock by lithology.
INAC-TRC14	3.1.3	Best practice guidelines used for ARD classifications.

1 Introduction

1.1 Scope

The Hope Bay Project (the Project) is a gold mining and milling undertaking of TMAC Resources Inc. The Project is located 705 km northeast of Yellowknife and 153 km southwest of Cambridge Bay in Nunavut Territory, and is situated east of Bathurst Inlet. The Project comprises of three distinct areas of known mineralization plus extensive exploration potential and targets. The three areas that host mineral resources are Doris, Madrid, and Boston.

The Project consists of two phases; Phase 1 (Doris project), which is currently being carried out under an existing Water Licence, and Phase 2 (Madrid-Boston project) which is in the environmental assessment and regulatory stage. Phase 1 includes mining and infrastructure at Doris, while Phase 2 includes mining and infrastructure at Madrid and Boston located approximately 10 and 60 km due south from Doris, respectively (Figure 1-1).

TMAC acquired Hope Bay in early 2013 from Hope Bay Mining Ltd. (HBML), a wholly owned subsidiary of Newmont Mining. The previous owner, HBML, with assistance from SRK Consulting (Canada) Inc., completed a comprehensive geochemical characterization program of waste rock and ore associated with Boston. The characterization work was in support of ongoing feasibility, environmental assessment and permitting studies.

At the request of TMAC, SRK has prepared this report to present the methods and results of the Boston characterization program and to assess the metal leaching and acid rock drainage (ML/ARD) potential of waste rock and ore that would be produced as part of the proposed underground mining activities for the Project. The findings are based on acid-base accounting and mineralogy data obtained from sampling conducted in 2009 and 2010, as well as historic sampling between 1997 and 2001, and results from kinetic tests initiated in 2010, including humidity cell tests and barrel tests. The humidity cell tests operated until 2012. Monitoring of the barrel tests is ongoing and data up until 2015 are presented. Boston source terms for the Project are presented in SRK (2017).



Figure 1-1: Location of the Main Deposits, Hope Bay Project

1.2 Geological Context

The Boston deposit is located near the south end of the belt and consists of three gold-rich mineralized zones within a large iron-rich carbonate altered shear system. Gold is associated with sulphide mineralization within quartz veins and as a halo in the wall rock around the veins.

The geology around the Boston deposit is a bimodal assemblage of mafic and felsic volcanic rocks along with sedimentary rocks, all of which are complexly folded about a large-scale synformal-anticline (Figure 1-2 and Figure 1-3). The core of the anticline is occupied by mafic volcanic rocks that host the Boston deposit and these in turn are overlain by sedimentary rocks. The fold is south plunging.

Several suites of mafic volcanic rocks are recognized in the Boston area, including the Boston and the East and West Spyder suites. Pillow shapes are similar between the three suites and are commonly strongly amygdaloidal, filled with calcite and epidote, which are often weathered out. Interflow sediments are relatively common but volumetrically minor and consist mainly of argillite with lesser chert.

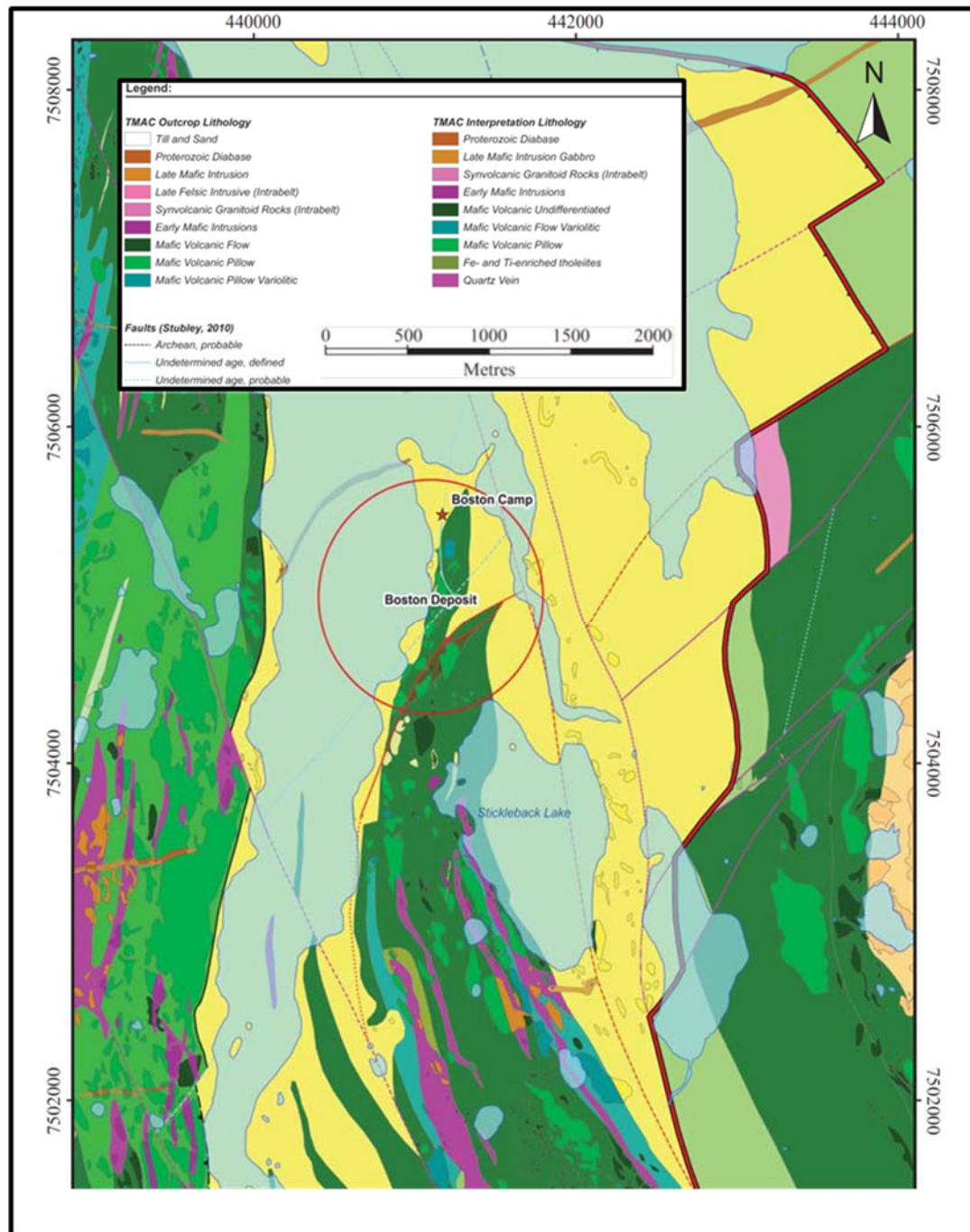


Figure 1-2: Detailed Geology Map of the Boston Area on a Ridge Extending into Aimaokatalok Lake (TMAC, 2016). Quaternary Surficial Sediments are Shown in Yellow.

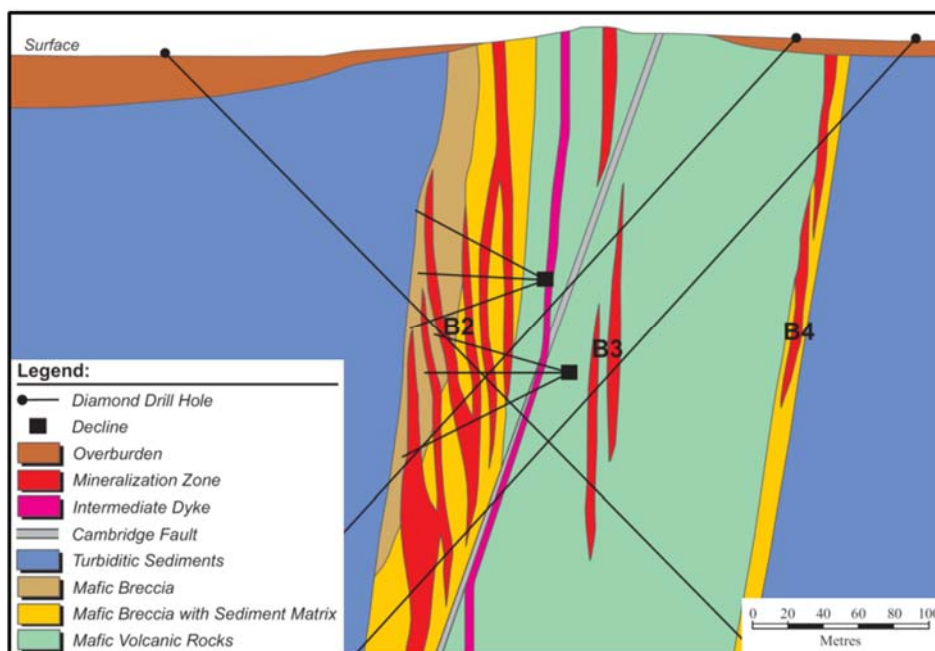


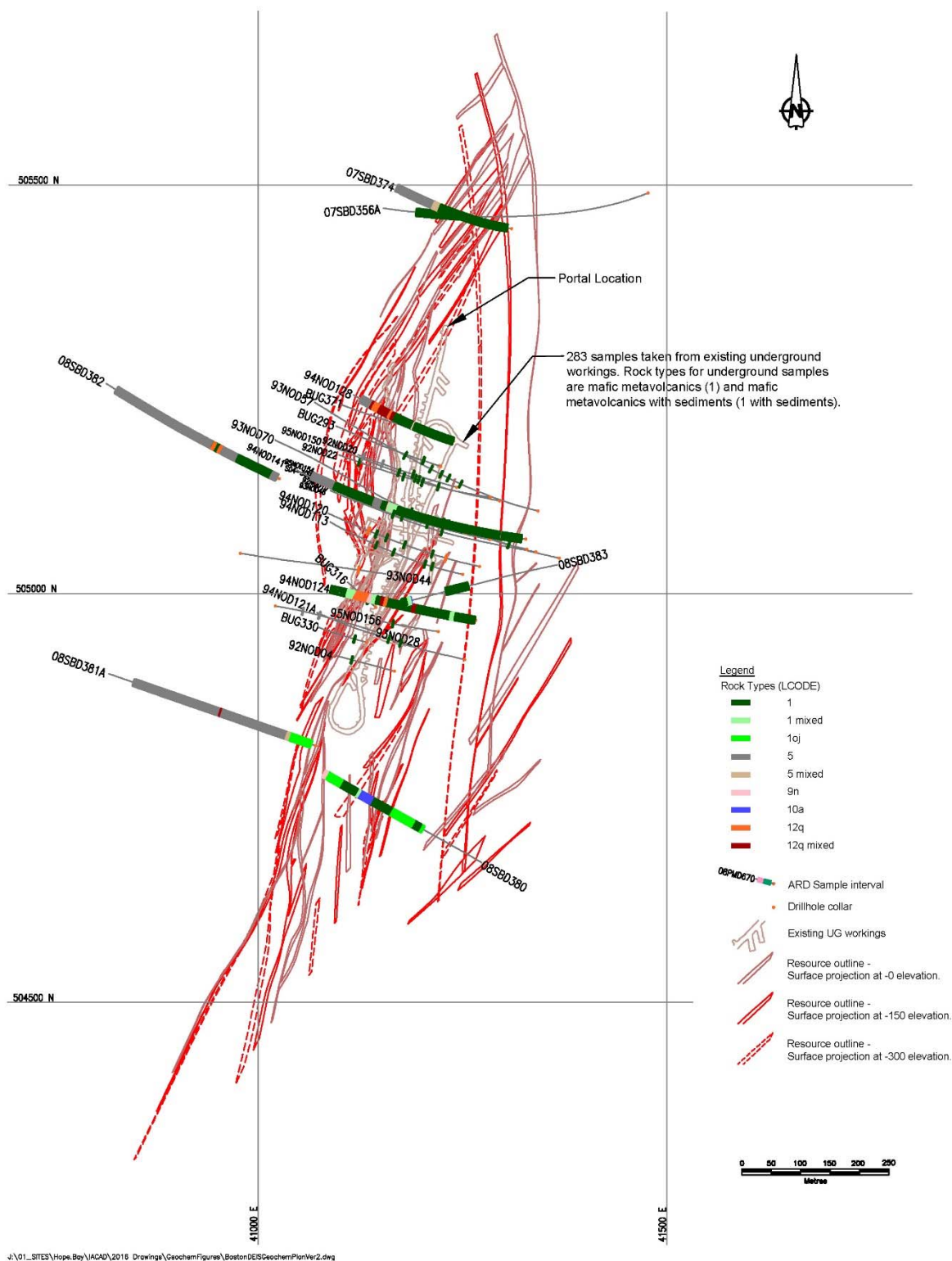
Figure 1-3: Schematic Cross West-East Section of the Boston Mineralisation Hosted Mainly in Transitional Zone Strata Comprising Reworked Mafic-dominated Epiclastic Rocks (TMAC, 2016)

1.3 Development Concept

Figure 1-4 presents the existing portal location and Boston underground mine workings, the surface projection of the ore body at three different depths and the ABA sample set. The existing portal is the proposed portal for the Project. The mining envelope has not yet been defined but will be in the immediate vicinity of the ore zone. Figure 1-4 presents samples collected from drill core. A total of 126 historical samples were collected from the historical underground mine workings and their specific sample locations are not presented in Figure 1-4.

The majority of the development rock is expected to be comprised of mafic metavolcanics (1) and sedimentary units (5). The ore is hosted in mafic metavolcanics (1), mafic metavolcanics with sediments (1oj) and quartz veins (12q). Mafic metavolcanics with sediments (1oj), late intermediate dyke (9n) and late gabbro (10a) are volumetrically less significant waste lithologies that are projected to be intersected by the mine workings.

Detailed mine plans are continuously under development and modification, and given the nature of the deposit will remain in flux throughout the mine life. This is consistent with the mine planning at the existing Doris Mine. However, because the mining method will result in a net backfill deficit situation, all mine waste rock being developed at the project site will ultimately be returned underground. As a result, in lieu of a detailed volumetric breakdown of volumes of ore and waste rock by lithological unit intercepting mine workings, TMAC has developed conservative source loads (SRK 2017) by selecting base case and upper bound values in all cases. All of these source loads are individually developed for each deposit taking into consideration the unique lithological units present in each.



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Figure 1-4: Plan View of Boston ABA Samples

2 Methods

2.1 Static Tests

2.1.1 Sample Sets

There are a total of 596 static test samples in the geochemical database compiled for Boston. Data include samples from a number of historical sources and samples obtained by SRK in 2008 on behalf of Newmont. Details on tests and the testing methods used for each of these programs are discussed below and an overall summary of the available data is provided in Table 2-1.

Historical Samples

Historical data were sourced from Rescan (1997, 1998, 1999, 2001), BHP (1998), and Knight Piesold (2001). Table 2-3 includes an inventory of previous waste rock geochemical characterization programs at Hope Bay, including the type and number of samples, analytical methods and testing laboratories. Most samples were not analyzed for trace metals and only samples sourced from Rescan (1999, 2001) contain sulphate and total inorganic carbon (TIC) data. As noted in the table, a total of 15 samples were not included in the data set for this report. These samples were either duplicates of ABA data analyzed for the purposes of humidity cell tests or lacked sufficient spatial data. A total of 332 historical samples were included in this report. ABA, geological and spatial data for the historic samples included in this report are provided in Appendix A.

SRK Samples

In 2008, SRK completed a comprehensive sampling and testing campaign on waste rock and ore from Boston to address gaps in the spatial and geological coverage (referred to as the SRK Infill Program in Table 2-1). The geochemical characterization program was performed in collaboration with NMS. The scope of the SRK program was to fulfill regulatory and permit requirements whereas the purpose of Newmont's program was to fulfill internal requirements and conduct an economic assessment.

Some additional static tests were also collected as part of a field barrel testing program, as discussed in Section 2.2.1. Samples obtained from the drill core during barrel setup were not included in the ABA geochemical database because exploration pulp samples from the barrel intervals were analyzed as part of the infill program.

Samples for 2008 infill program were characterized by SRK on behalf of HBML. The objective of SRK's waste rock geochemical characterization program was to:

- Expand the spatial coverage provided by existing samples.
- Provide sufficient spatial and geological coverage of the Boston deposit areas based on an earlier open pit mining concept.

A total of 254 ABA samples were selected by SRK (Table 2-1). Data are presented in Appendix B.

Samples were selected by reviewing the spatial distribution of existing samples relative to the pit shells and identify specific drill holes that would improve spatial coverage. This was performed collaboratively by SRK and personnel from Newmont Metallurgical Services (NMS). Selection of holes was limited to those with accessible exploration pulps.

Once holes were selected, samples were chosen by SRK using geological logs and ore/waste classifications (when available). Ore/waste classifications were assigned by HBML geologists based on assays results for individual pulp samples and using a gold cut-off grade of 0.5 g/t. The objective was to select approximately 10 m long sample composites over the entire length of each hole. Gaps sometimes exist where an interval was not sampled during the exploration program. Selection was based primarily on continuity of lithology and ore/waste classifications and secondarily on the continuity of alteration and pyrite content. Intervals classified as ore were composited according to length. Where there was downhole geological continuity over at least three ABA composite samples, SRK analyzed every second interval. The decision to omit intervals from the ABA test work program was based on the assumption that samples with similar geology would be geochemically similar.

The pulps were shipped to Cantest Ltd. (now Maxxam) in Burnaby, BC, where weight-averaged composites were made according to SRK instructions. All samples were analyzed at Cantest for paste pH, total sulphur (Leco), sulphate (HCl leach), total carbon (Leco), total inorganic carbon (TIC), modified Sobek NP (MEND 1991), and trace metals (aqua regia digestion followed by ICP-MS finish).

For 43 samples, TIC was determined by using a Leco furnace to directly measure CO₂ gas evolved from HCl treatment of the sample. TIC was determined by the difference between total carbon and organic carbon (HCl leach and analysis of the solids by Leco) for the remaining 111 samples. This latter method was initially chosen as it is comparable to the method used by NMS, which was also using this data for their internal geochemistry programs. A 250 g split from each of the 254 samples was shipped to NMS in Englewood, Colorado where the mineralogy for each sample was determined using XRD with Rietveld refinement and whole pattern fitting.

Table 2-1: Inventory of Waste Rock Geochemical Characterization Programs

Sample Set	Data Set	Sample Type	# of Samples	Samples Included in Boston Database	Analytical Methods							Details	Lab	Comments		
					Total S	SO ₄	Standard Sobek NP	Modified Sobek NP	TIC	Metals	XRD					
Rescan (1997)	Historical	Blast Round	157	157	✓		✓					Total Sulphur by Leco	Chemex (North Vancouver, BC)			
BHP (1998)	Historical	Drill Core	9	0								--	--	All samples excluded due to insufficient spatial information.		
Rescan (1999)	Historical	Blast Round	126	126	✓		✓					Total Sulphur by Leco	Chemex (North Vancouver, BC)	Report includes data from Rescan (1998).		
	Historical	Drill Core	49	45	✓	✓	✓		✓	✓		Total Sulphur by Leco, Sulphate by HCl leach, TIC by HCl leach with CO ₂ vol. measured in buret; metals by XRF.	Chemex (North Vancouver, BC)	Samples excluded include duplicates (e.g. ABA for HC and residue) and those with insufficient spatial data. For all remaining samples in data set, the complete sample interval was not documented. Samples length was assumed to be 10 cm for the purpose of assigning geological attributes and interpreting data. Metals measured on three samples only.		
Rescan (2001)	Historical	Drill Core	6	4	✓	✓	✓		✓			Total Sulphur by Leco, Sulphate by HCl leach, TIC by HCl leach with CO ₂ vol. measured in buret.	B.C. Research (now CANTEST) (Vancouver, BC)	Samples excluded had insufficient spatial information.		
Knight Piesold (2000)	Historical	--	--	--								--	--	Sample set based on previously reported data.		
Newmont Metallurgical Services	SRK Skipped Intervals ¹	Assay Pulps	10	10							✓	XRD using Rietveld refinement and whole pattern fitting.	Newmont Metallurgical Services (Denver, Colorado)	Mineralogy on SRK skipped intervals only. See text for details.		
SRK Infill Program, 2008	SRK Samples	Assay Pulps	254	254	✓	✓		✓	✓	✓	✓	Total Sulphur by Leco, Sulphate by HCl leach, TIC by Leco or calculated as difference between total carbon and organic carbon, trace metals by aqua regia digestion with ICP finish. Mineralogy by XRD using Rietveld refinement and whole pattern fitting.	Cantest (Burnaby, BC). Mineralogy at NMS (Denver, Colorado).			
Total			611	596												

Source: P:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\Hope Bay MASTER Geochemical Spreadsheet_Rev30_Boston_Rev02_JEM.xlsx]

Notes:

¹In order to meet internal Newmont requirements, NMS completed XRD analysis of intervals that were not selected for ABA testing by SRK. The lithological code and economic classification of these "skipped" intervals were selected based on intervals above and below, which showed continuity in terms of lithology and economic classification.

Newmont Samples

Newmont determined XRD mineralogy for an additional 10 sample intervals that were not geochemically characterized by SRK. As discussed in the previous section, these intervals were omitted from the ABA characterization program based on long intervals of geological continuity that were assumed to also be geochemically consistent. There are no NCV data for these samples. These Newmont mineralogy data are provided in Appendix F.

Summary of Available Testing Data

A summary of the static testing database compiled for use in this report is provided in Table 2-2.

Table 2-2: Summary of Boston Static Geochemical Database

Test	Number of Samples
ABA ¹	586
Elemental Analyses	257
XRD	264

Source: \\van-svr0\projects\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\Hope Bay MASTER Geochemical Spreadsheet_Rev30_Boston_Rev02_JEM.xlsx

Notes:

¹Only 303 samples have TIC and Sulphate data.

2.1.2 Assignment of Geological Attributes and Economic Classifications

For each sample obtained from drill core, the lithology was assigned on a length-averaged basis using HBML's database of geology drill logs. Economic classifications were assigned by HBML using a nominal open pit assay grade cut-off of 0.5 g/t. The lithology and economic classification for each sample are presented in Appendix C. All calculations assumed that the entire sample interval was present. A description of the information and assumptions made when assigning and calculating attributes are described below.

Lithology codes were assigned using HBML's 2008 standard lithology codes (Appendix D). Many samples had one unique lithology whereas others were mixed and contained secondary and sometimes tertiary lithologies. For mixed samples, the proportion of each lithology was calculated for the sample interval. For data interpretation (e.g., graphing), samples are presented according to their dominant lithology. One mixed samples of 1oj and two mixed samples of late granitoid were classified as non-mixed due to low percentage of secondary lithology ($\leq 12\%$) and, in the case of the late granitoid, low sample number.

2.1.3 Data Quality Assurance/Quality Control

Historic Samples

Quality Assurance/ Quality Control (QA/QC) procedures were not applied to samples from the Rescan (1997, 1999, 2001) sample set. SRK accepted the Rescan data as they were received, as there was no option for re-analysis.

Newmont Samples

All NCV results provided by Newmont passed their internal QA/QC screening. SRK accepted XRD data as they were received.

SRK Samples

The quality of ABA data was assessed by SRK using rigorous QA/QC procedures. A number of samples were requested for re-analysis with all re-analyzed data deemed acceptable. All re-analyzed data were included in this report.

2.2 Humidity Cells

The overall objective of the humidity cell testing program was to characterize the significant lithologies representing waste rock and ore. The rock types selected for humidity cell tests represent the dominant rock types based on the distribution of these samples in the ABA sample set, which is assumed to be reasonably representative of the rock intersected by the mine workings.

A total of 11 humidity cell test samples (Table 2-3) were selected from the two ore zones in Boston. Sample intervals and corresponding sample IDs for acid-base accounting (ABA) and barrel tests for the Boston humidity cell tests are listed in Appendix E. The selection criteria for each program were different and are discussed below.

2.2.1 2008 Humidity Cell Test Program

The humidity cell tests initiated for Boston were sub-samples of the barrel tests set up in 2008 at the Hope Bay project site (Table 2-3). Samples were selected using criteria for barrel test sample selection, as presented in Section 2.3.1. As static testing data were not available at the time, barrel test intervals were selected to represent specific lithologies where sufficient lengths of core were easily accessible.

The humidity cell samples were collected during barrel test set-up. Each barrel test core interval was laid out in sequential order and a 3 to 5 kg sub-sample removed. The sub-sample was a composite of small (~10 cm) pieces of core taken from the middle of every third row and submitted to Maxxam Analytics (formerly Cantest Ltd.) for kinetic and static test work. The ABA data was not included in the static database, as discussed in Section 2.1.1. The static test data for the barrel interval was determined using weight-averaged calculations of relevant ABA samples from the static test program (Section 2.1.1). The analytical program is described in detail later in this section.

For HC-10, HC-11 and HC-12, static test data was also generated using samples of archived exploration pulps. The exploration samples consisted of half round core sampled continuously along intervals that were approximately 1 m in length. The pulps were composited by Maxxam into approximately 10 m intervals under the direction of SRK. These samples are part of the SRK 2008 Infill sample set described in Section 2.1.1.

2.2.2 2009 Humidity Cell Test Program

Eight samples from the Boston deposit were selected in 2009 (Table 2-3). The selection was based on an ABA database consisting of 583 samples from the Boston deposit. The sample set was composed of data from various sources including the historic and SRK sample sets.

Selection was performed by SRK based on rock type, economic classification (ore or waste), and the statistical distribution of sulphur, neutralization potential (NP), and total inorganic carbon (TIC). The statistical distribution of specific trace elements (e.g., arsenic) was also a consideration but was secondary to the ABA characteristics. The dominant rock types for the Boston deposits were considered for humidity cell test work and are listed in Table 2-4.

For waste and ore samples of each rock type, the objective was to select samples containing either “typical” or “high” sulphur levels, and “typical” levels of NP, TIC and trace element content. “Typical” was defined as between 40th percentile (P40) and P60 concentrations whereas “high” was between P90 and P95. For NP, TIC and trace element content, the data from each sample set was assessed according to rock type. The statistical assessment of sulphur varied depending on the size of the sample set for each rock type, as described in Table 3-10

Humidity cell samples were sourced from storage at either Maxxam in Burnaby, BC or Newmont Metallurgical Services (NMS) in Englewood, Colorado. Selections without jaw crushed splits in storage were obtained from drill core by HBML geologists under the direction of SRK. Drill core samples collected were either a half- or quarter-round splits of the drill core.

2.2.3 Analytical Program

The design of the analytical program was a collaborative effort between SRK and NMS.

All samples were submitted to Maxxam for static and kinetic test work, as summarized in Table 2-3. ABA methods were the same as the ABA sample set (Section 2.1.1). TIC was determined by using a Leco furnace to directly measure CO₂ gas evolved from HCl treatment of the sample.

Table 2-3: Inventory of Humidity Cell Tests and Test Work Program, Boston

HC #	Lithology Code	Description	Preliminary Economic Classification	SRK Program	Zone	Selection Rationale	Static Testing ^{3,4}				Kinetic Testing	
							XRD	MLA	SEM	Petrography	Date Initiated	Final No. of Cycles
HC-31	1	Ultramafic to Mafic Metavolcanic Rocks	Waste	2009	Nose	Typical S (for Nose)	x	x	x		Jan 2010	57
HC-55	1		Waste	2009	Main	Typical S	x	x	x	x	Apr 2010	126
HC-12	1		Ore/Waste	2008	Nose	Barrel	x	x	x		Feb 2009	104
HC-10	1 mixed ¹	Mixed Mafic Metavolcanics	Waste	2008	Main	Barrel	x	x	x		Feb 2009	104
HC-32	1oj	Mafic Metavolcanics with Sediments	Waste	2009	Main	High S	x	x	x	x	Jan 2010	57
HC-33	1oj		Waste	2009	Main	Typical S	x	x	x		Jan 2010	57
HC-11	5	Early Sedimentary Units (Argillite-Wacke) ²	Waste	2008	Main	Barrel	x	x	x		Feb 2009	155
HC-35	5		Waste	2009	Main	Typical S	x	x	x	x	Jan 2010	108
HC-34	5		Waste	2009	Main	High S	x	x	x		Jan 2010	57
HC-37	12q	Quartz vein	Waste	2009	Main	Typical S	x	x	x		Jan 2010	57
HC-38	12q		Ore	2009	Main	High S	x	x	x		Jan 2010	108

Source: Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\HB_WR_Outcomes.mc.REV14.xlsx]

Notes:

¹Humidity cell test sample HC-10 is mafic metavolcanics (1) mixed with late gabbro (10a)

²Early used in a relative sense only

³See Section 2.2.3 for details. All samples analyzed for ABA.

⁴"x" indicates that data is available

Table 2-4: 2009 Humidity Cell Test Considerations, Boston Deposit

Rock Type	Consideration for Selecting "Typical" and "High" Sulphur Samples
Mafic volcanics (1)	Sample set from Nose area (n=21) of deposit was smaller than that of Boston main deposit (n=346). Distribution of sulphur for the Boston main deposit is higher than in the Nose area. "Typical" sample selected for each of the Nose and Boston main deposit based on statistical distribution of sulphur for each area. "High" sulphur sample selected on distribution of sulphur content for the Boston main deposit. This "high" sulphur sample represents the sulphur end member sulphur for the overall Boston deposit.
Mafic volcanics with sediments (1oj)	All samples (n=88) from Boston main deposit were used, with most samples (n=73) representing blast round material from the underground, ABA sample set is a combination of ore and waste samples. Drill core samples available for humidity cell tests are primarily waste samples. Samples were selected on basis of statistical distribution of sulphur for the waste samples only. No drill core samples available with "high" sulphur content.
Sedimentary units (5)	Nose area samples (n=7) consist of less than 10% of overall sample set (n=90). Overall sample set statistics biased by samples from Boston main deposit. Selection based on statistics for the Boston main zone sample set only.
Quartz vein (12q)	All samples (n=12) were from the Boston main deposit. Selection of samples was based on the available sample set.

Source: Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\HB_WR_Outcomes.mc.REV14.xlsx

Mineralogy was determined at NMS and included XRD mineralogy with Rietveld refinement and whole pattern fitting, as well as mineral liberation analysis (MLA). For samples containing iron carbonate minerals (ferroan dolomite ($\text{Ca}(\text{Fe,Mg})\text{CO}_3$) and magnesium-rich siderite ($(\text{Fe,Mg})\text{CO}_3$), as detected by XRD, the iron content of the carbonates was determined by NMS using a scanning electron microscope (SEM). Three samples (HC-32, HC-35 and HC-55) were submitted to Kathryn Dunne for petrography, in order to characterize the mineralogy with particular emphasis on the occurrence and mineral form of the sulphides and carbonate minerals. The polished thin sections were prepared using the same coarse crush material used for the humidity cell tests.

The humidity cell tests were initiated at Maxxam using the ASTM (2001) method. Table 2-5 outlines the list of analytes and the analytical frequency. Humidity cell data were provided to SRK on a monthly basis and each report underwent QA/QC by SRK.

Table 2-5: Analytical Frequency of SRK Humidity Cell Tests

General Parameters	Frequency
pH, EC, SO_4	weekly
Alkalinity, acidity	weekly
ORP ¹	0, 1, 2, 3 ..., 46, 48, 56, 64 etc.
Metals	
ICP-MS (trace elements)	0, 1, 2, 4, 8, 12, 16 ..., 40, 48, 56 etc.
ICP-OES suite ²	weekly
Hg by CV	0, 1, 2, 4, 8, 12, 16 ..., 40, 48, 56 etc.
Ions and Nutrients	
F, Cl, P, TDS	0, 1, 2, 4, 8, 12, 16 ..., 40, 48, 56 etc.
NO_2 , NO_3 , NH_3	0, 1, 2, 4, 8, 12, 16 ..., 40, 48, 56 etc.

Source: Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\HB_WR_Outcomes.mc.REV14.xlsx]

Notes:

¹Frequency for HCs that began Feb 2009. ORP was measured weekly for all other humidity cells.

²Al, Ca, Cu, Fe, Mg, K, Na, Zn

³HC-55: ICP-OES suite was weekly until week 97, after which it was analyzed in weeks 104, 112, and 120.

2.2.4 Evaluation for Completion of Humidity Cell Tests

The humidity cell tests operated between 57 and 155 cycles (Table 2-3). Results were periodically assessed by SRK to determine whether any of the operating tests could be considered complete. The assessment included evaluating the humidity cell data for stability with respect to sulphate levels, metals loadings, and pH.

In February 2011, 7 of the 11 tests were determined to be complete on the basis of the samples being non-acidic and/or low stable sulphate and metal release rates. The rationale to continue four of the samples varied, and included increasing sulphate or molybdenum release rates and an insufficient operational period. All tests were completed by February 2012, with the exception of HC-55 which continued operating until the middle of September 2012, but with a reduction in the analytical frequency.

Upon completion of each humidity cell test, the remaining material (residue) was geochemically characterized for ABA and trace element content at Maxxam, using the same methods described in Section 2.2.3.

Leachates from sample HC-35 from the last two cycles were analyzed for low level sulphate (detection limit of 0.06 mg/L) at SGS in Lakefield, Ontario. In contrast, the detection limit for sulphate at Maxxam during the last cycles was 0.5 mg/L. The objective of the low level analysis was to determine if sulphate leaching was occurring at levels less than the limit of detection provided by Maxxam. A review of the data determined that the sulphate levels as determined by Lakefield were not below the Maxxam's analytical detection. Accordingly, the sulphate values as determined by Maxxam were maintained in the geochemical database for geochemical interpretations.

2.3 Field Barrel Tests

A barrel test is a large scale kinetic test. Each barrel was loaded with hundreds of kilograms of broken up drill core and allowed to weather under site climatic conditions. Leachate accumulates in a collection bucket and is routinely collected for geochemical analysis.

The Boston barrel tests were set up in 2008 and 2009, and are located in the Boston core area east of the airstrip. There are five barrel test filled with waste rock and one empty barrel that is a test blank (Table 2-6). Each waste rock barrel test corresponds to a specific rock type. As previously mentioned in Section 2.2, kinetic tests (e.g. barrel tests) from the Boston Main and Nose areas are assumed to be interchangeable and representative of the overall Boston deposit for the purpose of water quality predictions. Barrel test sample intervals are presented in Appendix E.

2.3.1 Sample Selection and Geochemical Characterization

2008 Field Barrel Test Program

In October 2008, SRK set-up barrel tests B1, B2 and B3 (Table 2-6). Static testing data were not available at the time of barrel sample selection. Intervals were selected on the basis of specific lithologies with sufficient lengths of core that were easily accessible.

Samples for static and additional kinetic geochemical characterization were obtained from the core boxes by obtaining chip samples along the barrel sample interval. In brief, the analytical test work program included acid-base accounting (ABA), mineralogy and humidity cell tests. Details of the analytical program and data are discussed in Section 2.2.

2009 Field Barrel Test Program

In 2009, additional barrels (B4 and B5) containing waste rock were set up and also a blank barrel test (B6) (Table 2-6). The materials selected for the barrel test work in 2009 represent volumetric significant rock types present in the Boston deposit area, based on the mine plan at that time. Intervals were selected based on obtaining sufficient volumes of material from drillholes characterized as part of SRK's static geochemical program. The objective of the blank barrel test was to quantify background influences (i.e., not associated with waste rock such as from dust or barrel test materials) on the leachate water chemistry.

Samples for static geochemical characterization were obtained from the core boxes for static geochemical characterization by obtaining chip samples along the barrel sample interval. Samples were analyzed for ABA, trace element content and mineralogy by XRD using the same methods and laboratories as discussed in Section 2.2.

2.3.2 Barrel Test Leachate Analytical Program

Leachate accumulates in a collection bucket and is collected approximately once per month between the months of June and September or October.

Field measurements include leachate volume, pH, EC, temperature and oxidation-reduction potential (ORP). Leachates were collected and submitted for analyses at ALS Laboratories in Vancouver, BC for analysis of the following parameters:

- pH, electrical conductivity, alkalinity, sulphate;
- Bromide, chloride, fluoride;
- Ammonia, nitrate, nitrite; and
- Dissolved trace elements by ICP-MS (30 parameter)¹.

After sampling, any excess leachate is removed from the bucket and the bucket rinsed. From 2009 to 2010, buckets were rinsed with reverse osmosis water sourced from Doris camp. In subsequent years, deionized water from ALS Laboratory (ALS) was used.

For each sampling event, the QA/QC program includes one sample duplicate and one sample blank. These samples are in addition to the sampling of the blank barrel test. From 2009 to 2012, the field blank was generated using the deionized water sourced from Doris camp. QA/QC of the data was performed by SRK.

After the sampling event in August 2012, the leachate collection buckets were removed from the barrel tests. Sampling was restarted in August 2015.

Bird nests were found in barrel B3 in September 2009 and in B3 and B4 in July 2010, after which time the barrels were covered with netting. Nests were removed when encountered and droppings were washed carefully from the barrel contents and the collection buckets scrubbed. Data from the B3 leachate taken on September 19, 2009 and October 3, 2010 sampling events exhibited an anomalous spike for a number of critical parameters (e.g. sulphate, conductivity, nitrate, arsenic) as well as nitrate and nitrite (Appendix L4). The data from September 2009 and October 2010 for B3 were removed from the data set for the purpose of interpretation due to possible contamination from bird feces. A similar trend was observed for barrels B1, B2 and B5 in October 2010 and organic material was found in the buckets. These data were considered outliers and removed.

¹ Trace element detection limits are higher than for the humidity cell tests.

Table 2-6: Inventory of Barrels Test for Boston

Barrel ID	Rock Code	Rock Type	Preliminary Economic Classification	Area	Program	Humidity Cell #	Sampling Events	Leachate Available ^{3,4}
B1	1 mixed ¹	Mixed Ultramafic to Mafic Metavolcanic Rocks	Waste	Main	2008	HC-10	11	10
B2	5	Early Sedimentary Units (Argillite-Wacke) ²	Waste	Main	2008	HC-11	11	11*
B3	1	Ultramafic to Mafic Metavolcanic Rocks	Ore/Waste	Nose	2008	HC-12	11	10**
B4	1oj	Mafic Metavolcanic Rocks with Sediments	Waste	Main	2009	-	8	7***
B5	5	Early Sedimentary Units (Argillite-Wacke) ¹	Ore/Waste	Nose	2009	-	9	11*
B6	Blank				2009	-	8	7***

Source: Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\BarrelData.1CHO008-014.graphs.rtc_rev07_Boston.xlsx]

Notes:

¹Sample B1 is mafic metavolcanics (1) mixed with late gabbro (10a).

²Early and late used in a relative sense only.

³Number of sampling events when leachate was available for laboratory analysis.

⁴In July and August 2011, leachate samples from all barrels were sent for laboratory analysis but no field measurements were taken.

**In August 2010, field measurements were taken but there was insufficient leachate for laboratory analysis.

***Insufficient sample in collection bucket for laboratory analyses on four occasions (July and August 2010, August 2011 and June 2012).

3 Results & Discussion

3.1 Static Tests

3.1.1 Dataset

The existing portal location and Boston underground mine workings, the surface projection of the ore body at three different depths and the ABA sample set are shown in Figure 1-4 and the lithologies (rock types) are listed in Table 3-1. The existing portal is the proposed portal for the Project. The mining envelope has not yet been defined but will be in the immediate vicinity of the ore zone.

The majority of samples within the ABA sample set were composed of mafic metavolcanics (1) waste (58%), followed by sedimentary units (5) ore and waste samples (15%) and mafic metavolcanics with sediments (1oj) ore/waste (11%). Mafic metavolcanics (1) ore samples composed approximately 5% of the sample set, while mafic metavolcanics with sediments (1oj) waste samples composed approximately 3% of the sample set. The remaining lithologies had less than or equal to eight samples (or 1.4% of the sample set): mafic metavolcanics (1) ore/waste, mixed mafic metavolcanics (1 mixed), mafic metavolcanics with sediments (1oj) ore/waste, mixed sedimentary units (5 mixed), intermediate dyke (9n), late gabbro (10a), quartz vein (12q) waste and ore, and mixed quartz vein (12q mixed).

For interpretation purposes, only the mafic metavolcanics (1), mafic metavolcanics with sediments (1oj) and quartz vein (12q) were differentiated by economic classification, as these lithologies are ore-containing lithologies in the Boston area. Samples classified as ore were not differentiated from waste samples for sample sets that were either i) mixed lithologies or ii) not typically ore-bearing and contained only a few ore samples. These sample sets are as follows: mafic metavolcanics (1oj), mixed mafic metavolcanics (1 mixed), sedimentary units (5), mixed sedimentary units (5 mixed), late gabbro (10a), and mixed quartz vein (12q mixed). Interpretations will also focus on the rock types most relevant to the mine plan (Section 1.3).

The ABA data for the sub-lithologies from rock type mafic metavolcanics (1) were compared to determine if the samples could be grouped together (e.g., samples of 1a, 1p, 1pd, etc. as "1"). There were no clear differences therefore samples were grouped together for the purposes of data analysis. Similarly, the sedimentary units (5) are comprised of 5, 5a, 5ai, 5aj, 5aw, 5c, 5cj, 5cu, and 5h.

Table 3-1: Description of Samples in the Boston Data Set

Description	Lithology	Lithology Code	Preliminary Economic Classification	No. of ABA Samples	No. of XRD Samples
Ultramafic to Mafic Metavolcanic Rocks	1	1, 1ad, 1i, 1if, 1o, 1p, 1pv	Waste	337	113
			Ore	30	8
			Ore/waste	3	3
Mixed Ultramafic to Mafic Metavolcanic Rocks	1 mixed	1, 1a, 1pv, 9n, 10a, 12q	Various ⁴	7	7
Mafic Metavolcanic Rocks with Sediments	1oj ²	1oj	Waste	20	16
			Ore	67	1
			Ore/waste	1	1
Early Sedimentary Units (Argillite-Wacke) ¹	5	5, 5a, 5ai, 5aj, 5aw, 5c, 5cj, 5cu, 5h	Various ⁵	90	87
Mixed Early Sedimentary Units (Argillite-Wacke) ¹	5 mixed	5aj, 1, 9n, 12q	Various ⁶	2	2
Late Intermediate Dyke ¹	9n ³	9n	Waste	5	5
Late Gabbro ¹	10a	10a	Various ⁷	5	5
Quartz Vein	12q	12q	Waste	4	3
			Ore	8	6
Mixed Quartz Vein	12q mixed	12q, 1, 5, 5c	Various ⁸	7	7
Total				586	264

Source: Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\Hope Bay MASTER Geochemical Spreadsheet_Rev30_Boston_Rev00_JEM.xlsx

Notes:

¹Early and late used in a relative sense only

²One sample of 1oj was logged as mafic metavolcanics with sediments (1oj – 95%) and carbonate vein (12c – 5%). Unmixed and mixed samples were combined because of small overall sample set for this rock type.

³One sample of 9n was logged as late granitoid (9n – 94%) and mafic metavolcanics (1 – 6%), while another sample was logged as late granitoid (9n – 88%) and quartz vein (12q – 12%). Unmixed and mixed samples were combined because of small overall sample set for this rock type.

⁴Lithology 1 mixed is comprised of samples classified as waste (n=6) and ore (n=1).

⁵Lithology 5 is comprised of samples classified as waste (n=90), ore (n=1) and ore/waste (n=1).

⁶Lithology 5 mixed is comprised of samples classified as waste (n=1) and ore (n=1).

⁷Lithology 10a is comprised of samples classified as waste (n=3) and ore (n=2).

⁸Lithology 12q mixed is comprised of samples classified as waste (n=1) and ore (n=6).

3.1.2 Mineralogy

A total of 264 samples were analyzed for mineralogy by XRD (Appendix F). For each rock type, Table 3-2 presents the median concentration of each of the minerals detected by XRD. Table 3-3 provides a summary of the major, carbonate and sulphide minerals.

Figure 3-1 to Figure 3-3 illustrate the distribution of ferroan dolomite, calcite and pyrite, respectively. The stoichiometric formulae for carbonate minerals were determined by SEM for select humidity cell tests are presented in Table 3-4.

Quartz and ferroan dolomite were the dominant minerals and for selected rock types, also chlorite, paragonite and muscovite or muscovite-sericite. Plagioclase, calcite, magnetite and siderite/magnesite were present at median concentrations of at least 5% in selected rock types. From an ARD perspective, carbonate and sulphide minerals are of the greatest importance and the focus of this discussion.

Carbonate minerals identified by XRD in these samples include ferroan dolomite ($\text{Ca}(\text{Fe,Mg})(\text{CO}_3)_2$), calcite (CaCO_3), siderite (FeCO_3), and siderite-magnesite (FeCO_3 - MgCO_3). Ferroan dolomite was the most abundant carbonate mineral with median concentrations ranging from 12 to 51%. Median concentrations of calcite ranged from below detection (<1%) to 7%. Siderite and siderite-magnesite occurred less frequently and were present in significantly lower levels as compared with ferroan dolomite and calcite. Magnesite was detected in one sample of mafic metavolcanics (1).

Some key differences in carbonate concentrations between the significant rock types include:

- Of the samples classified exclusively as waste, mafic metavolcanics with sediments (1oj) and the mafic metavolcanics (1) contained the highest median concentrations of ferroan dolomite (36 and 34%, respectively). The lowest median concentration was found in the quartz vein unit (12q).
- For samples economically classified as ore and ore/waste, mafic metavolcanics with sediments (1oj) contained the highest median concentration of ferroan dolomite (51%), which was also the maximum median value. The remaining ore and ore/waste samples all had median values between 31 and 37%. For ore-bearing rock type, ore samples had higher levels of ferroan dolomite than the waste.
- Median calcite concentrations were below detection for most rock types and economic classifications. Calcite was present in selected samples, including waste samples from rock types mafic metavolcanics (1), mafic metavolcanics with sediments (1oj), sedimentary units (5) and quartz vein (12q) but also ore samples of mafic metavolcanics (1).1oj
- Magnesite median concentrations were below detection for all rock types and economic classifications. From the overall dataset, magnesite was detected in only one sample of mafic metavolcanics (1) at 16%.

- Siderite/magnesite concentrations ranged from below detection (<1%) to 6%. These minerals were found in samples of mafic metavolcanics (1, waste and ore), mafic volcanics mixed with sediments (10j, waste only) sedimentary units (5), late gabbro (10a) and quartz vein (12q, waste and ore).
- SEM analysis of ferroan dolomite mineral grains in the Boston humidity cell test samples (Table 3-4) indicate that the stoichiometric proportion of iron in each sample varies. The sample with the lowest calcium-plus-magnesium content was HC-38 (ore samples of quartz vein, 12q), with the following stoichiometry: $\text{Ca}(\text{Mg}_{0.55}\text{Fe}_{0.45})\text{CO}_3$. Ferroan dolomite was present in all humidity cell test samples, while siderite was detected in selected samples.

Pyrite was the only sulphide mineral detected by XRD (Figure 3-3), with levels ranging from less than detection (<1%) to 9%. 10jOre samples tended to have higher levels than waste, with median levels for the latter group ranging from 3 to 4%. Samples classified as waste had median concentrations of equal to or below detection (<1%).

Table 3-2: Median Mineral Content in Mineral Percentage (%), Boston

Lithology	Description	Preliminary Economic Classification	Sample Count	Amphibole	Ferroan Dolomite	Calcite	Chlorite	Magnesite	Magnetite	Muscovite	Muscovite/Sericite	Paragonite	Plagioclase	Pyrite	Quartz	Rutile	Siderite	Siderite/Magnesite	Tourmaline
1	Ultramafic to Mafic Metavolcanic Rocks	Waste	113	bd	34	bd	15	bd	bd	bd	bd	8	bd	bd	31	1	bd	bd	bd
		Ore	8	bd	37	bd	3	bd	bd	2	bd	8	2	1	35	2	bd	2	bd
		Ore/Waste	3	bd	37	bd	3	bd	bd	bd	2	12	bd	bd	38	1	bd	6	bd
1 mixed	Mixed Ultramafic to Mafic Metavolcanic Rocks	Various ⁴	7	bd	29	bd	21	bd	bd	bd	bd	4	3	bd	32	1	bd	bd	bd
1oj ²	Mafic Metavolcanic Rocks with Sediments	Waste	16	bd	36	bd	17	bd	bd	bd	4	9	bd	bd	31	1	bd	bd	bd
		Ore	1	bd	51	bd	4	bd	bd	bd	bd	7	bd	4	23	1	bd	bd	10
		Ore/Waste	1	bd	31	7	1	bd	bd	bd	bd	17	bd	3	39	1	bd	bd	bd
5	Early Sedimentary Units (Argillite-Wacke) ¹	Various ⁵	87	bd	12	bd	10	bd	bd	bd	17	4	10	bd	36	1	bd	bd	bd
5 mixed	Mixed Early Sedimentary Units (Argillite-Wacke) ¹	Various ⁶	2	bd	28	1	4	bd	bd	bd	9	9	1	3	44	1	bd	2	bd
9n ³	Late Intermediate Dyke ¹	Waste	5	bd	27	bd	9	bd	bd	14	bd	6	6	bd	35	1	bd	bd	bd
10a	Late Gabbro ¹	Various ⁷	5	bd	23	bd	14	bd	22	bd	2	4	bd	bd	29	1	bd	bd	bd
12q	Quartz Vein	Waste	3	bd	13	bd	3	bd	bd	bd	10	5	bd	1	60	2	bd	2	bd
		Ore	6	bd	34	bd	5	bd	bd	10	bd	3	2	3	32	3	bd	bd	bd
12q mixed	Mixed Quartz Vein	Various ⁸	7	bd	38	bd	6	bd	bd	11	bd	bd	bd	1	34	2	bd	1	bd

Source: \\van-svr0\projects\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\Hope Bay MASTER Geochemical Spreadsheet_Rev30_Boston_Rev02_JEM.xlsx]

Notes:

¹Early and late used in a relative sense only

²One sample of 1oj was logged as mafic metavolcanics with sediments (1oj - 95%) and carbonate vein (12c - 5%). Unmixed and mixed samples were combined because of small overall sample set for this rock type.

³One sample of 9n was logged as late granitoid (9n - 94%) and mafic metavolcanics (1 - 6%), while another sample was logged as late granitoid (9n - 88%) and quartz vein (12q - 12%). Unmixed and mixed samples were combined because of small overall sample set for this rock type.

⁴Lithology 1 mixed is comprised of samples classified as waste (n=6) and ore (n=1).

⁵Lithology 5 is comprised of samples classified as waste (n=88), ore (n=1) and ore/waste (n=1).

⁶Lithology 5 mixed is comprised of samples classified as waste (n=1) and ore (n=1).

⁷Lithology 10a is comprised of samples classified as waste (n=3) and ore (n=2).

⁸Lithology 12q mixed is comprised of samples classified as waste (n=1) and ore (n=6).

bd: below detection

Table 3-3: Summary of Mineral Data According to Rock Type in Percentage

Lithology	Description	Preliminary Economic Classification	Sample Count	Dominant Minerals (>5%)						Carbonates																Sulphides							
										Ferroan Dolomite				Calcite				Magnesite				Siderite				Siderite/Magnesite				Pyrite			
				Ferroan Dolomite	Chlorite	Muscovite/Sericite ⁹	Paragonite	Quartz	Other	P25	P50	P75	P95	P25	P50	P75	P95	P25	P50	P75	P95	P25	P50	P75	P95	P25	P50	P75	P90	P25	P50	P75	P95
1	Ultramafic to Mafic Metavolcanic Rocks	Waste	113	x	x		x	x		30	34	37	42	bd	bd	bd	11	bd	bd	bd	bd	bd	bd	bd	bd	bd	3	8	bd	bd	bd	2	
		Ore	8	x			x	x		29	37	39	43	bd	bd	bd	1	bd	bd	bd	bd	bd	bd	bd	bd	2	4	7	1	1	2	3	
		Ore/Waste	3	x			x	x	Siderite/Magnesite	37	37	38	39	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	4	6	7	8	bd	bd	bd	bd
1 mixed	Mixed Ultramafic to Mafic Metavolcanic Rocks	Various ⁴	7	x	x			x		29	29	36	42	bd	bd	2	3	bd	bd	bd	bd	bd	bd	bd	1	bd	bd	4	7	bd	bd	bd	1
1oj ²	Mafic Metavolcanic Rocks with Sediments	Waste	16	x	x		x	x		33	36	40	43	bd	bd	bd	3	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	2	6	bd	bd	1	2
		Ore	1	x			x	x		51	51	51	51	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	4	4	4	4
		Ore/Waste	1	x			x	x	Calcite	31	31	31	31	7	7	7	7	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	3	3	3
5	Early Sedimentary Units (Argillite-Wacke) ¹	Various ⁵	87	x	x	x		x	Plagioclase	9	12	23	33	bd	bd	bd	4	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	5	bd	bd	bd	2
5 mixed	Mixed Early Sedimentary Units (Argillite-Wacke) ¹	Various ⁶	2	x		x	x	x		24	28	32	35	bd	1	1	1	bd	bd	bd	bd	bd	bd	bd	bd	1	2	2	3	2	3	3	4
9n ³	Late Intermediate Dyke ¹	Waste	5	x	x	x	x	x	Plagioclase	27	27	28	29	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	2
10a	Late Gabbro ¹	Various ⁷	5	x	x			x	Magnetite	19	23	27	34	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	13	31	bd	bd	bd	1
12q	Quartz Vein	Waste	3	x		x		x		13	13	25	34	bd	bd	1	1	bd	bd	bd	bd	bd	bd	bd	bd	1	2	2	2	1	1	2	2
		Ore	6	x		x		x		32	34	39	45	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	2	2	3	3	3
12q mixed	Mixed Quartz Vein	Various ⁸	7	x	x	x		x		34	38	42	44	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	1	2	2	1	1	2	2	2

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Notes:

¹Early and late used in a relative sense only

²One sample of 1oj was logged as mafic metavolcanics with sediments (1oj - 95%) and carbonate vein (12c - 5%). Unmixed and mixed samples were combined because of small overall sample set for this rock type.

³One sample of 9n was logged as late granitoid (9n - 94%) and mafic metavolcanics (1 - 6%), while another sample was logged as late granitoid (9n - 88%) and quartz vein (12q - 12%). Unmixed and mixed samples were combined because of small overall sample set for this rock type.

⁴Lithology 1 mixed is comprised of samples classified as waste (n=6) and ore (n=1).

⁵Lithology 5 is comprised of samples classified as waste (n=88), ore (n=1) and ore/waste (n=1).

⁶Lithology 5 mixed is comprised of samples classified as waste (n=1) and ore (n=1).

⁷Lithology 10a is comprised of samples classified as waste (n=3) and ore (n=2).

⁸Lithology 12q mixed is comprised of samples classified as waste (n=1) and ore (n=6).

⁹Muscovite/Sericite includes Muscovite and Muscovite/Sericite measurements.

bd: below detection

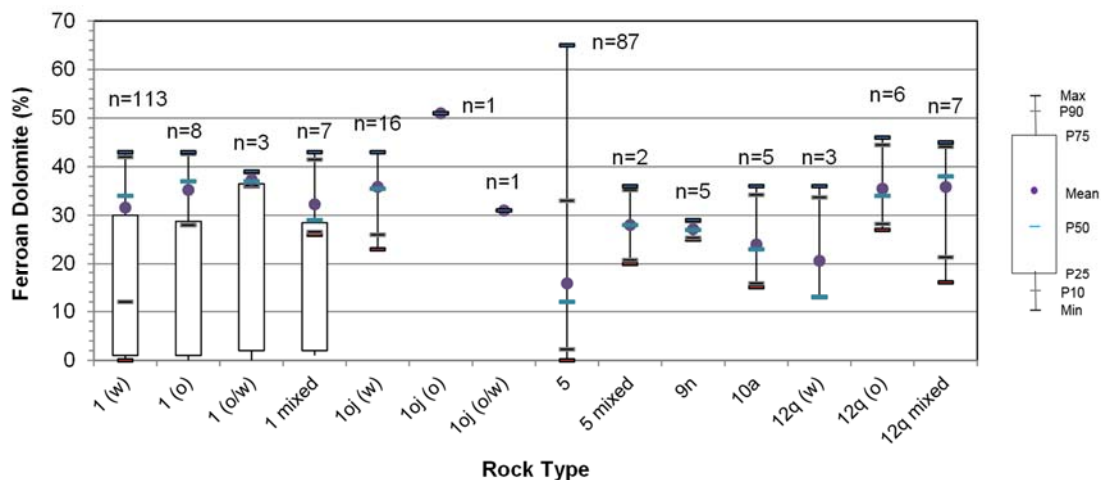


Figure 3-1: Percentile Distribution of Ferroan Dolomite (Ankerite-Dolomite) by Rock Type

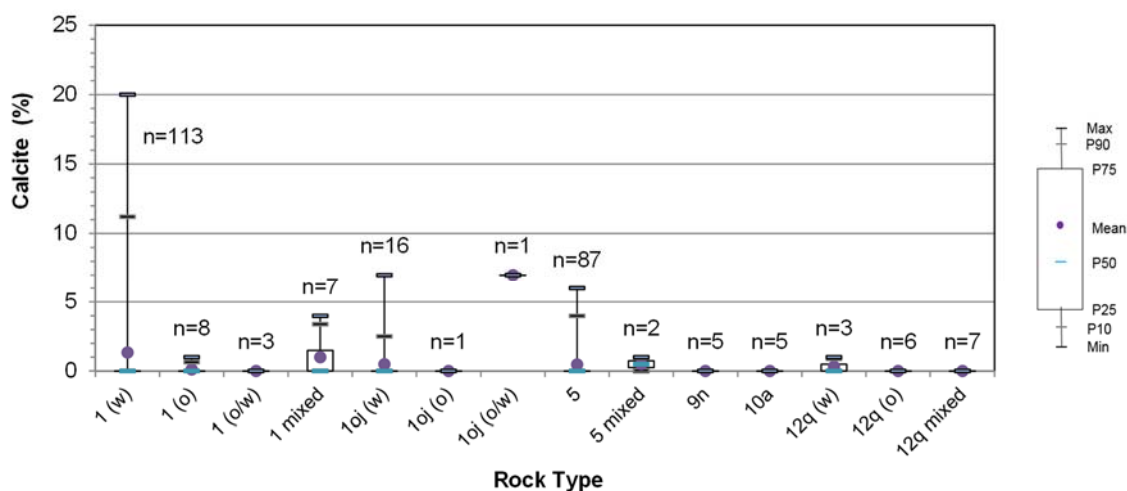
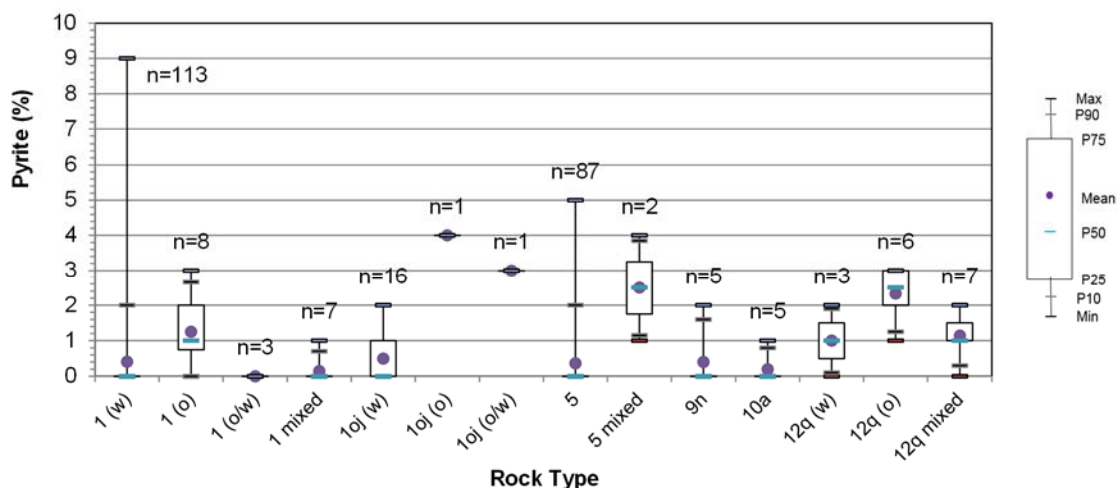


Figure 3-2: Percentile Distribution of Calcite by Rock Type



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Figure 3-3: Percentile Distribution of Pyrite by Rock Type

Table 3-4: Carbonate Mineral Stoichiometric Formulas for Humidity Cell Test Samples

Humidity Cell #	Lithology ¹	Preliminary Economic Classification	Ferroan Dolomite $\text{Ca}(\text{Fe}, \text{Mg})\text{CO}_3$	Siderite FeCO_3
HC-12	1	Ore/Waste	$\text{Ca}(\text{Mg}_{0.67}\text{Fe}_{0.33})\text{CO}_3$	$(\text{Mg}_{0.44}\text{Fe}_{0.56})\text{CO}_3$
HC-31	1	Waste	$\text{Ca}(\text{Mg}_{0.67}\text{Fe}_{0.33})\text{CO}_3$	$(\text{Fe}_{0.58}\text{Mg}_{0.42})\text{CO}_3$
HC-55	1	Waste	$\text{Ca}(\text{Mg}_{0.77}\text{Fe}_{0.23})\text{CO}_3$	-
HC-10	1 mixed	Waste	$\text{Ca}(\text{Mg}_{0.70}\text{Fe}_{0.30})\text{CO}_3$	$(\text{Mg}_{0.49}\text{Fe}_{0.51})\text{CO}_3$
HC-32	1oj	Waste	$\text{Ca}(\text{Mg}_{0.69}\text{Fe}_{0.31})\text{CO}_3$	-
HC-33	1oj	Waste	$\text{Ca}(\text{Mg}_{0.65}\text{Fe}_{0.35})\text{CO}_3$	-
HC-11	5	Waste	$\text{Ca}(\text{Mg}_{0.62}\text{Fe}_{0.38})\text{CO}_3$	$(\text{Mg}_{0.31}\text{Fe}_{0.69})\text{CO}_3$
HC-34	5	Waste	$\text{Ca}(\text{Mg}_{0.74}\text{Fe}_{0.26})\text{CO}_3$	-
HC-35	5	Waste	$\text{Ca}(\text{Mg}_{0.64}\text{Fe}_{0.36})\text{CO}_3$	-
HC-37	12q	Waste	$\text{Ca}(\text{Mg}_{0.62}\text{Fe}_{0.38})\text{CO}_3$	-
HC-38	12q	Ore	$\text{Ca}(\text{Mg}_{0.55}\text{Fe}_{0.45})\text{CO}_3$	$(\text{Fe}_{0.69}\text{Mg}_{0.31})\text{CO}_3$

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Notes:

¹Lithology codes as follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **1oj** = mafic metavolcanics with sediments; **5** = sedimentary units; **12q** = quartz vein

- denotes SEM analyses not conducted due to mineral level below detection, as indicated by either XRD and/or MLA (Table 3-3)

3.1.3 Acid-Base Accounting

ABA data was generated for 586 samples (Appendix G). TIC and sulphate were analyzed for 303 samples. The data are presented according to rock type (lithology) and preliminary economic classification, as appropriate.

Paste pH values were neutral to alkaline (7.8 to 9.9).

Sulphur speciation data indicated that sulphate concentrations were below or near the level of analytical detection (0.01%) and sulphide was the dominant sulphur species. Accordingly, total sulphur is a good approximation of sulphide content and can be used for the calculation of acid potential (AP).

Some key differences in total sulphur between rock types are discussed as follows (Figure 3-4):

- Samples of ore contained higher levels of total sulphur than waste, with 90th percentile levels of 3.6 and 0.71%, respectively.
- Median total sulphur concentrations for waste samples of mafic metavolcanics (1) and sedimentary units (5) were both 0.19%. These lithologies contained most of the waste samples in the Boston sample set. Quartz vein (12q) samples classified as waste higher levels of total sulphur (median of 0.90%).
- Median total sulphur levels for ore samples of mafic metavolcanics (1), mafic metavolcanics with sediments (1oj) and quartz vein (12q) had median sulphur levels greater than 1.5%.

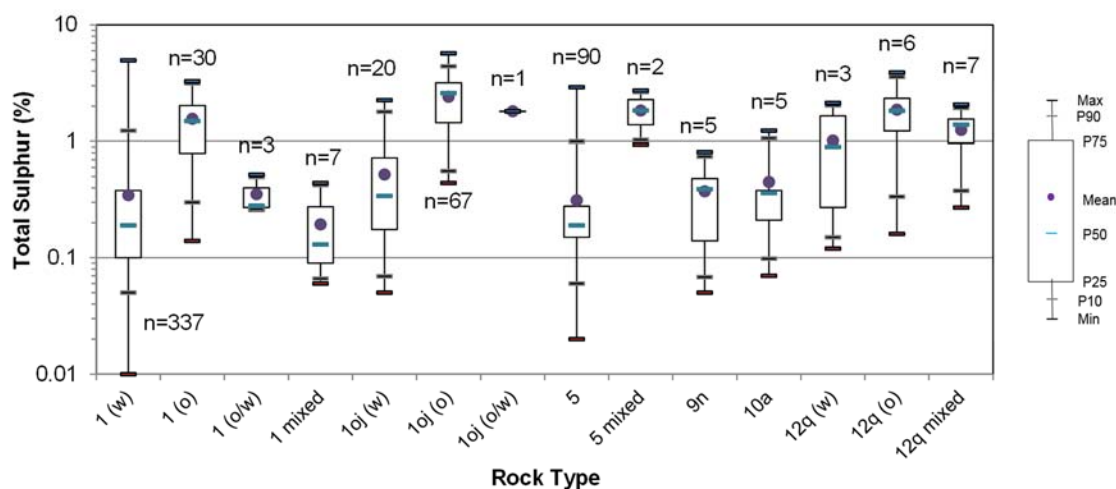
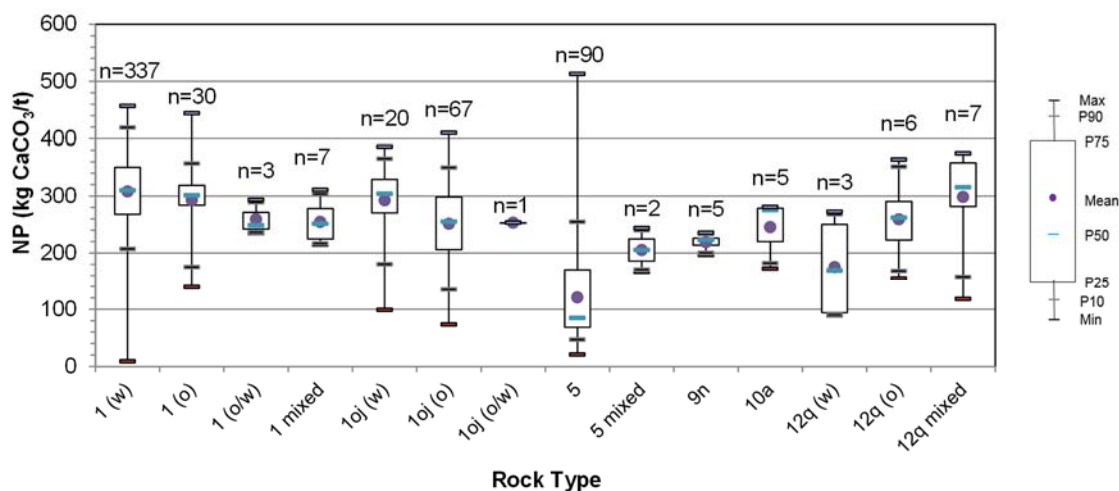


Figure 3-4: Percentile Distribution of Total Sulphur by Rock Type

Figure 3-5 and Figure 3-6 present the distribution of NP and TIC according to rock type, while Figure 3-7 presents the relationship between NP and TIC. Some key observations are discussed as follows:

- There was no clear distinction between samples classified as ore and waste in terms of NP and TIC contents. Median NP and TIC values for all ore samples were 278 and 368 kg CaCO₃/t, respectively. In comparison, median NP and TIC values for all waste samples were 290 and 321 kg CaCO₃/t, respectively.
- All lithologies had NP and TIC values over 200 kg and 260 kg CaCO₃/t, respectively, except the sedimentary units (5) and quartz vein (12q) samples classified as waste.
- The sedimentary units (5) and waste samples of quartz vein (12q) had the lowest levels of buffering, however, NP and TIC values were still quite high. For sedimentary units (5), median NP and TIC values were 85 kg and 169 kg CaCO₃/t, respectively and for waste samples of quartz vein (12q) NP and TIC levels were 142 and 222 kg CaCO₃/t, respectively.

For all lithologies, median TIC values were greater than median NP values. This suggests the presence of iron carbonate minerals in the samples, which results in TIC values that overestimates the amount of carbonate available for buffering.



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Figure 3-5: Percentile Distribution of Neutralization Potential (NP) by Rock Type

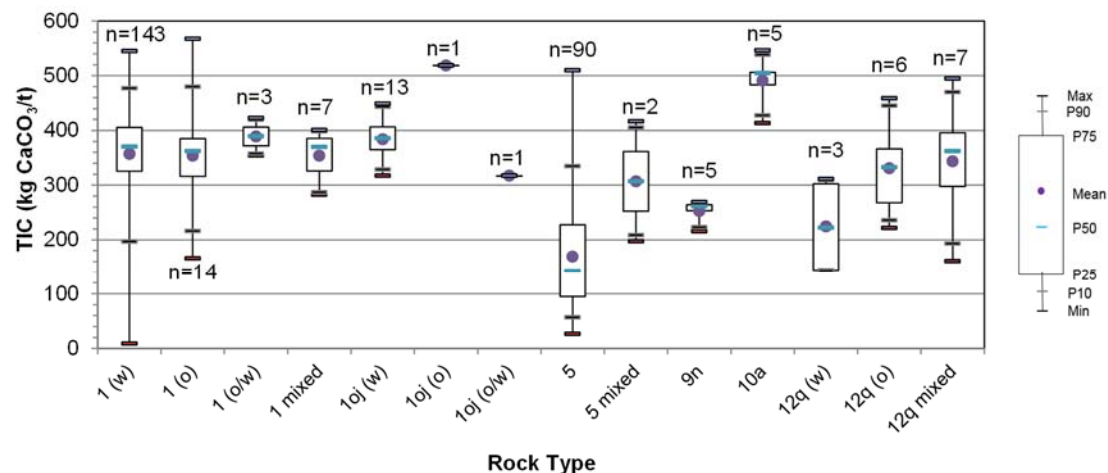


Figure 3-6: Percentile Distribution of Total Inorganic Carbon (TIC) by Rock Type

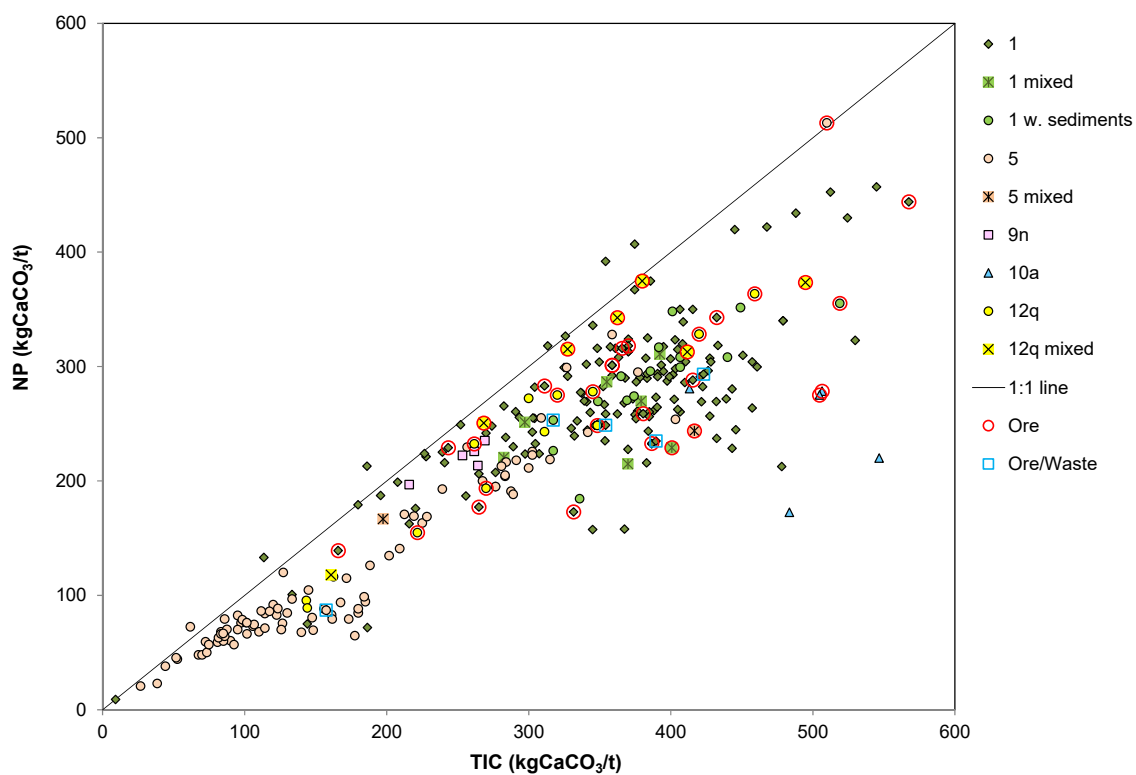


Figure 3-7: Comparison of Neutralization Potential (NP) and Total Inorganic Carbon (TIC)

To account for potential overestimation of buffering measured by TIC due to the presence of NP-neutral iron carbonates, an effective TIC was calculated based on the calcium-plus-magnesium content indicated by SEM (Table 3-4). The effective TIC, or $TIC_{(Ca+Mg)}$, was calculated as follows for Boston:

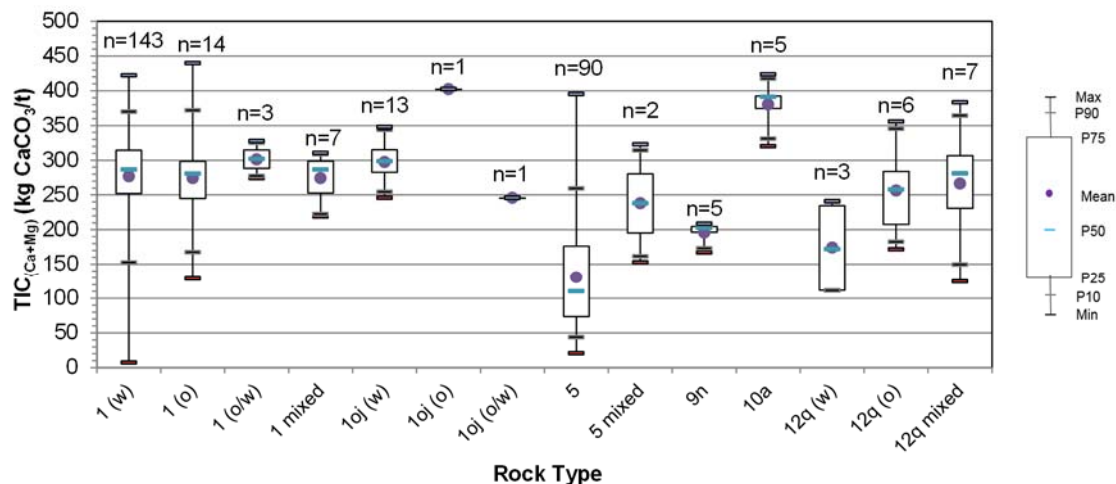
$$TIC_{(Ca+Mg)} = TIC \times 0.78.$$

The factor 0.78 represents the minimum stoichiometric proportion of calcium-plus-magnesium content in ferroan dolomite mineral grains in the Boston humidity cell test sample set (Table 3-4). As previously stated in Section 3.1.2, the sample with the lowest calcium-plus magnesium content was HC-38 (quartz vein unit, 12q), with the following stoichiometry $Ca(Mg_{0.55}Fe_{0.45})CO_3$.

Figure 3-8 presents the distribution of $TIC_{(Ca+Mg)}$ according to rock type (lithology) while Figure 3-9 presents the relationship between NP and $TIC_{(Ca+Mg)}$. Some key observations include:

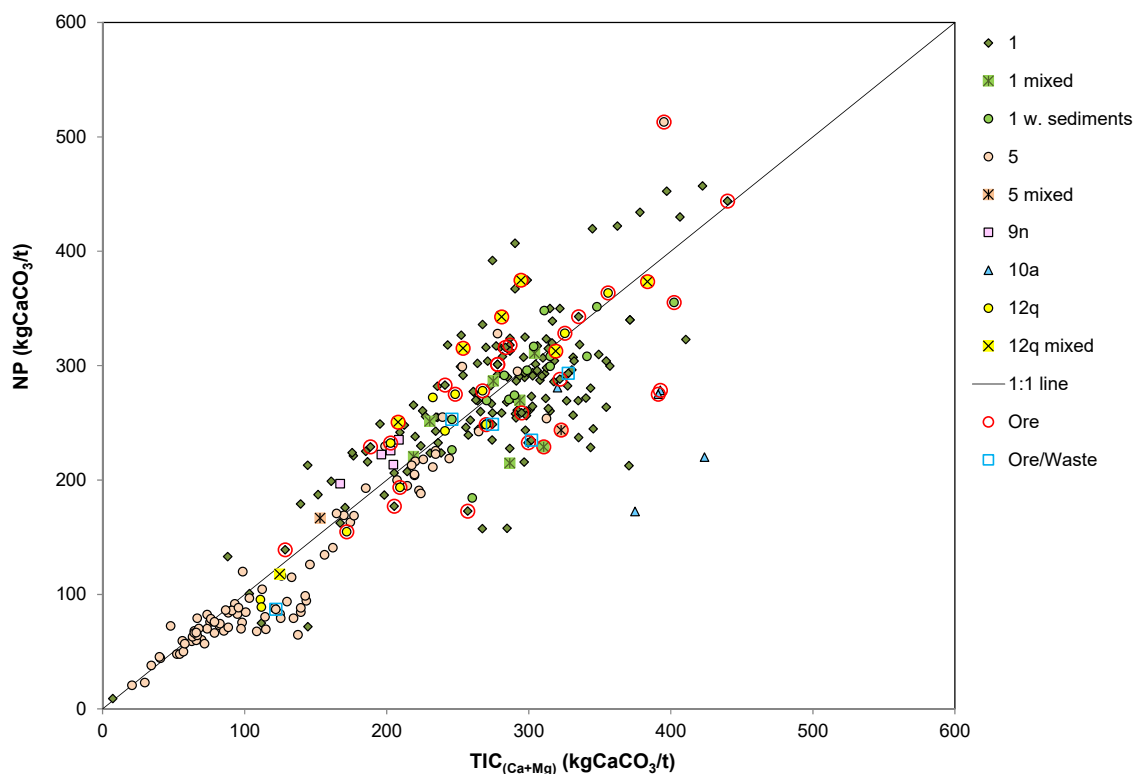
- For all lithologies, the median $TIC_{(Ca+Mg)}$ was greater than 170 kg $CaCO_3$ /t except for the sedimentary units (5) which had a median value of 110 kg $CaCO_3$ /t.
- Levels of $TIC_{(Ca+Mg)}$ were closer to parity with modified NP compared to TIC (Figure 3-9), however the correction also resulted in the underestimation or overestimation of effective TIC due to the variable calcium-plus-magnesium content of ferroan dolomite for each sample compared to HC-38 (Table 3-4), and is described as follows:
 - Approximately half of the samples of mafic metavolcanics (1) and the majority of samples of late intermediate dyke (9n) and mixed quartz vein (12q mixed) were above the 1:1 line. This indicates that the $TIC_{(Ca+Mg)}$ method underestimates the amount of calcium-plus-magnesium content in iron carbonates, and also the buffering capacity of these samples.
 - XRD data (Table 3-3, Appendix F) indicate that 90% of mafic metavolcanic samples have calcite content lower than 2% while samples of late intermediate dyke (9n) and mixed quartz vein (12q mixed) have calcite contents below detection limit (<1%). For samples with very low or undetectable calcite content, the underestimation of buffering capacity may be due to higher calcium-plus-magnesium content in the ferroan dolomite relative to the effective NP correction. Applying the correction to samples with high calcium-plus-magnesium content, and thus low iron content in ferroan dolomite is not warranted; however, it is a conservative approach.
 - Approximately half of the samples of mafic metavolcanics (1) and the majority of the samples of sedimentary units (5) and late gabbro (10a) were below the 1:1 line. For these samples, the $TIC_{(Ca+Mg)}$ method still overestimates the calcium-plus-magnesium content of iron carbonates, and also the buffering capacity. For these samples, modified NP provides a more conservative indication of the buffering capacity.

Depending on the sample, either modified NP or $TIC_{(Ca+Mg)}$ provides the most conservative estimate of buffering capacity. Certain $TIC_{(Ca+Mg)}$ values remain considerably higher than NP values, particularly for late intermediate dyke (9n) and mixed quartz vein (12q mixed) samples, as well as some samples of mafic metavolcanics (1) classified as waste.



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Figure 3-8: Percentile Distribution of Effective TIC ($TIC_{(Ca+Mg)}$) by Rock Type



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Figure 3-9: Comparison of Neutralization Potential (NP) and Effective TIC ($TIC_{(Ca+Mg)}$)

Table 3-5 and Figure 3-10 to Figure 3-15 present ARD classifications according to NP/AP, TIC/AP , $TIC_{(Ca+Mg)}/AP$ classification methods, rock type (lithology), and economic classification.

ARD classifications are not on the basis of total sulphur and fulfill the best practice guidelines outlined in MEND (2009). ARD classifications are summarized as follows:

- Overall, 92 to 96% of the sample set was classified as non-PAG, depending on the classification method. All samples from the following lithologies were classified as non-PAG on the basis of the three classification methods:
 - waste samples of quartz vein (12q);
 - mixed ore/waste samples from the following rock types: mafic metavolcanics (1) and mafic metavolcanics with sediments (1oj); and
 - mixed mafic metavolcanics (1 mixed), late intermediate dyke (9n), late gabbro (10a), , and mixed quartz vein (12q mixed).
- The following lithologies had samples classified as non-PAG and uncertain using the three classification methods, but no samples classified as PAG:
 - ore samples from the following rock types: mafic metavolcanics (1) and quartz veins (12q);
 - waste samples of mafic metavolcanics with sediments (1oj); and
 - mixed sedimentary units (5 mixed).
- Two samples, or 0.3% of the overall sample set, were classified as PAG and are described as follows:
 - One waste sample from mafic metavolcanics (1) was classified as uncertain by NP/AP and TIC/AP and PAG according to $TIC_{(Ca+Mg)}/AP$. This sample had low and equivalent NP and TIC values (9 kg $CaCO_3/t$) suggesting that NP levels approximated TIC, and that the $TIC_{(Ca+Mg)}$ correction resulted in an underestimation of buffering capacity. Furthermore, this sample had anomalously low NP and TIC values for the entire mafic metavolcanics sample set (Figure 3-5 and Figure 3-6) The field notes (SRK 1999) describe the sample as a quartz-carbonate dyke (12q), however the sample was classified as mafic metavolcanics (1) based on geological logging. Accordingly, an uncertain classification is a more realistic classification of this sample, and it is likely not a sample of mafic metavolcanic (1).
 - One sample from the sedimentary units (5) was classified as PAG by all three classification methods. This sample was a relatively short interval (1.87 m) and contained high sulphur content (1.25% or 39 kg $CaCO_3/t$, equivalent to the 99th percentile for sedimentary units) and lower NP (23 to 38 kg $CaCO_3/t$, depending on method). The mineralogy indicated low carbonate content (3% or 6th percentile levels) composed entirely of ferroan dolomite. Accordingly, this sample is considered to be a discrete interval with anomalously high sulphur content and low buffering capacity such that any acidity produced would be sufficiently buffered by the overall mixture of waste rock.
- For rock types with samples classified as uncertain or PAG, classifications using NP were more conservative for all rock types with the following exceptions:

- For ore samples of mafic metavolcanics (1), ARD classifications by the $TIC_{(Ca+Mg)}$ method were more conservative. The sample set was smaller ($n=14$) for TIC compared to NP ($n=30$).
- For ore samples of mafic metavolcanics (1), ARD classifications by the NP and $TIC_{(Ca+Mg)}$ methods were equally conservative.

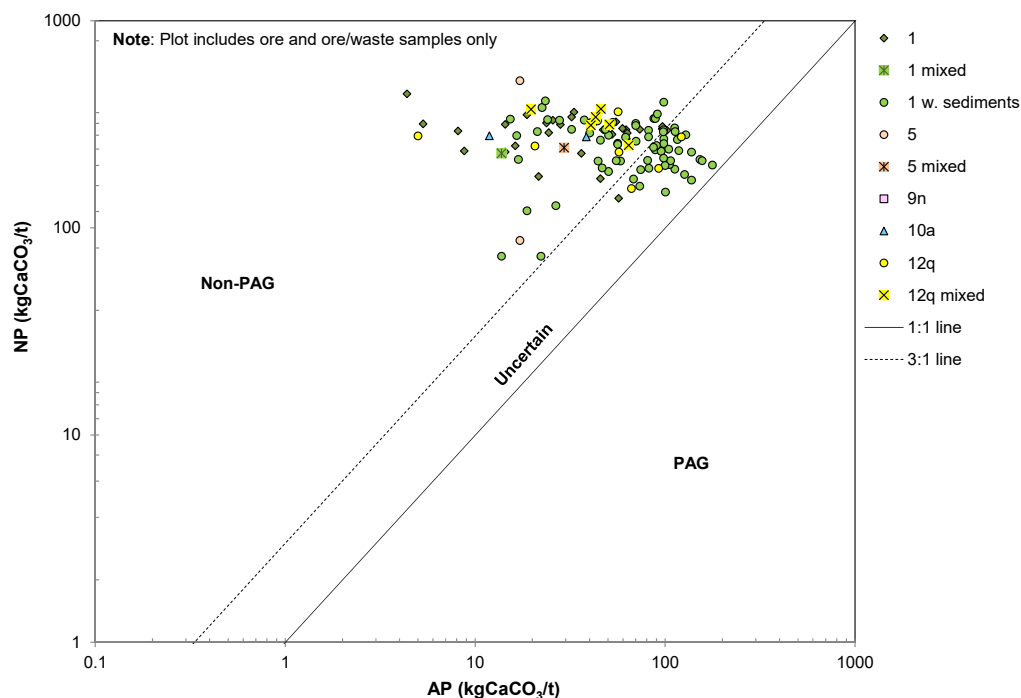
Table 3-5: ARD Classification by Rock Type

Lithology	Description	Preliminary Economic Classification	No. of Samples (NP/AP)	No. of Samples (TIC/AP and TIC _(Ca+Mg) /AP)	ARD Classification (% of Samples)								
					Non-PAG			Uncertain			PAG		
					(NP, TIC, or TIC _(Ca+Mg))/AP >3			1 < (NP, TIC, or TIC _(Ca+Mg))/AP < 3			(NP, TIC, or TIC _(Ca+Mg))/AP < 1		
					NP/AP	TIC/AP	TIC _(Ca+Mg) /AP	NP/AP	TIC/AP	TIC _(Ca+Mg) /AP	NP/AP	TIC/AP	TIC _(Ca+Mg) /AP
1	Ultramafic to Mafic Metavolcanic Rocks	Waste	337	143	99%	97%	97%	1%	3%	2%	0%	0%	1%
		Ore	30	14	93%	93%	79%	7%	7%	21%	0%	0%	0%
		Ore/Waste	3	3	100%	100%	100%	0%	0%	0%	0%	0%	0%
1 mixed	Mixed Ultramafic to Mafic Metavolcanic Rocks	Various ⁴	7	7	100%	100%	100%	0%	0%	0%	0%	0%	0%
1oj ²	Mafic Metavolcanic Rocks with Sediments	Waste	20	13	95%	100%	100%	5%	0%	0%	0%	0%	0%
		Ore	67	1	55%	100%	100%	45%	0%	0%	0%	0%	0%
		Ore/Waste	1	1	100%	100%	100%	0%	0%	0%	0%	0%	0%
5	Early Sedimentary Units (Argillite-Wacke) ¹	Various ⁵	90	90	94%	97%	96%	4%	2%	3%	1%	1%	1%
5 mixed	Mixed Early Sedimentary Units (Argillite-Wacke) ¹	Various ⁶	2	2	50%	50%	50%	50%	50%	50%	0%	0%	0%
9n ³	Late Intermediate Dyke ¹	Waste	5	5	100%	100%	100%	0%	0%	0%	0%	0%	0%
10a	Late Gabbro ¹	Various ⁷	5	5	100%	100%	100%	0%	0%	0%	0%	0%	0%
12q	Quartz Vein	Waste	4	4	100%	100%	100%	0%	0%	0%	0%	0%	0%
		Ore	8	8	63%	75%	63%	38%	25%	38%	0%	0%	0%
12q mixed	Mixed Quartz Vein	Various ⁸	7	7	100%	100%	100%	0%	0%	0%	0%	0%	0%

Sources: Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\Hope Bay MASTER Geochemical Spreadsheet_Rev30_Boston_Rev01_JEM.xlsx

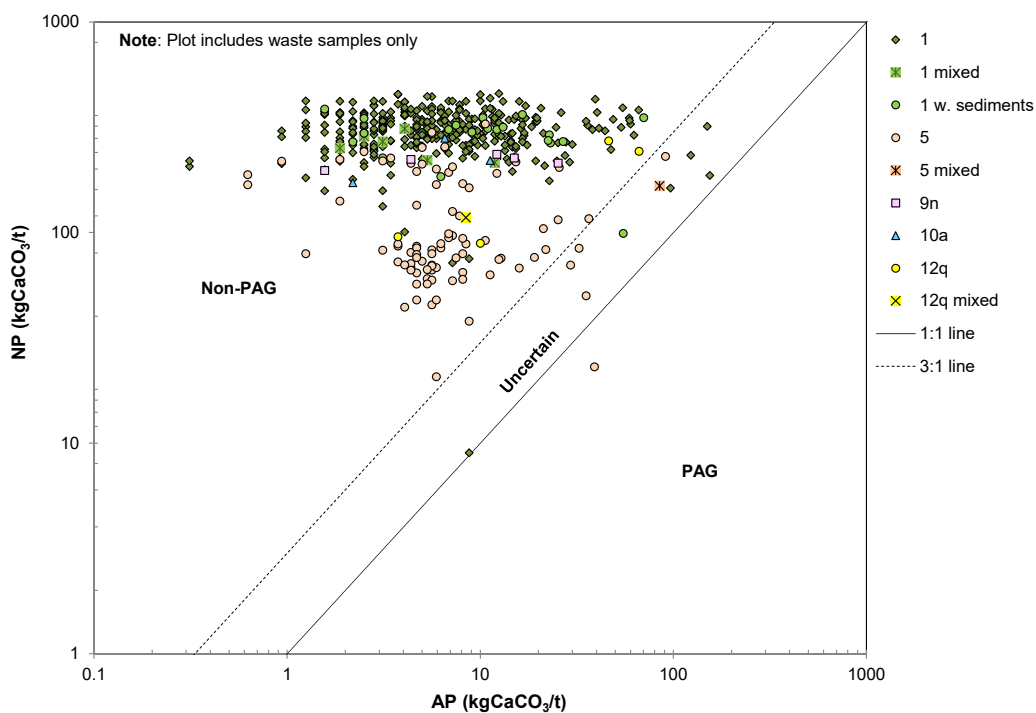
Notes:

- ¹Early and late used in a relative sense only.
- ²One sample of 1oj was logged as mafic metavolcanics with sediments (1oj - 95%) and carbonate vein (12c - 5%). Unmixed and mixed samples were combined because of small overall sample set for this rock type.
- ³One sample of 9n was logged as late granitoid (9n - 94%) and mafic metavolcanics (1 - 6%), while another sample was logged as late granitoid (9n - 88%) and quartz vein (12q - 12%). Unmixed and mixed samples were combined because of small overall sample set for this rock type.
- ⁴Lithology 1 mixed is comprised of samples classified as waste (n=6) and ore (n=1).
- ⁵Lithology 5 is comprised of samples classified as waste (n=88), ore (n=1) and ore/waste (n=1).
- ⁶Lithology 5 mixed is comprised of samples classified as waste (n=1) and ore (n=1).
- ⁷Lithology 10a is comprised of samples classified as waste (n=3) and ore (n=2).
- ⁸Lithology 12q mixed is comprised of samples classified as waste (n=1) and ore (n=6).



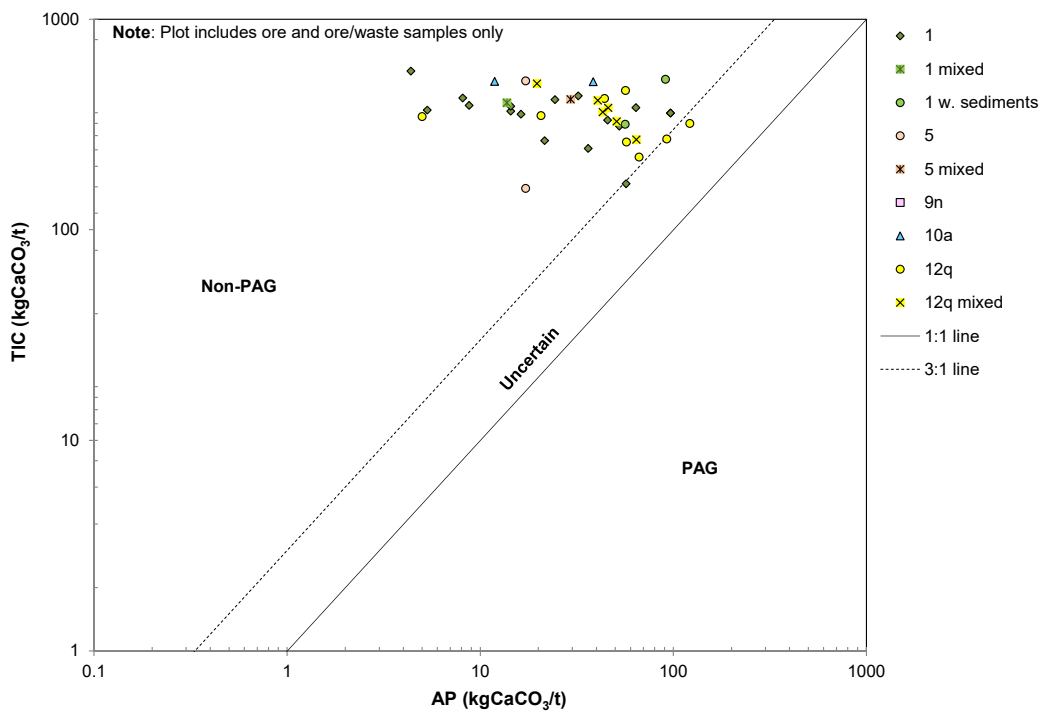
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Figure 3-10: Comparison of Neutralization Potential (NP) and Acid Potential (AP) of Ore and Ore/Waste Samples



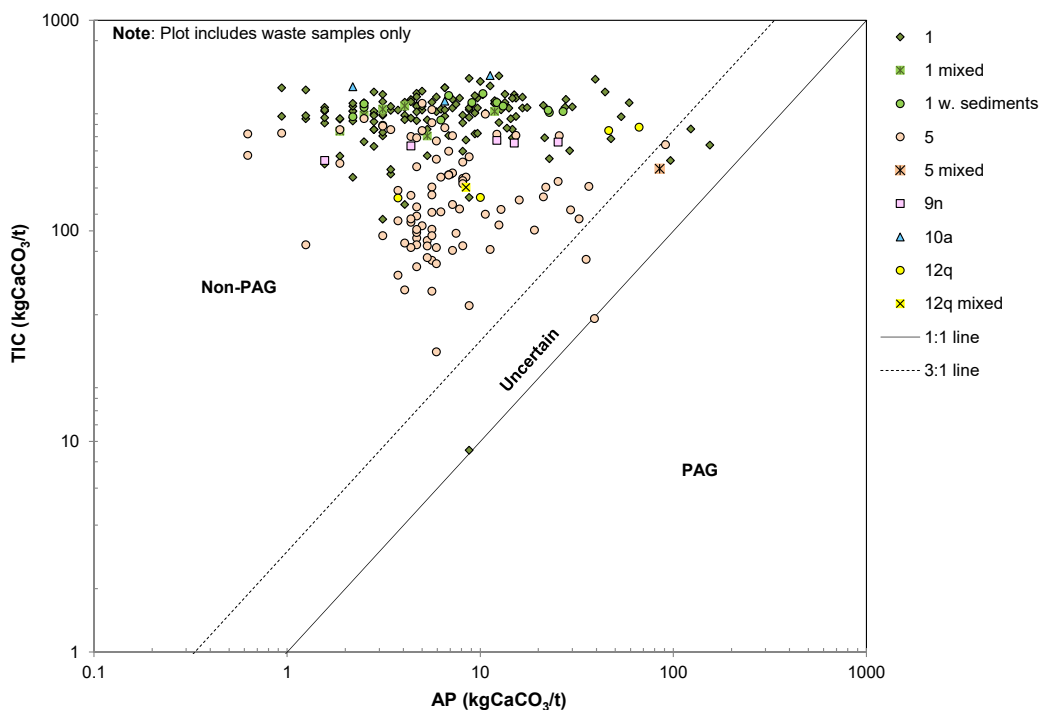
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Figure 3-11: Comparison of Neutralization Potential (NP) and Acid Potential (AP) of Waste Samples



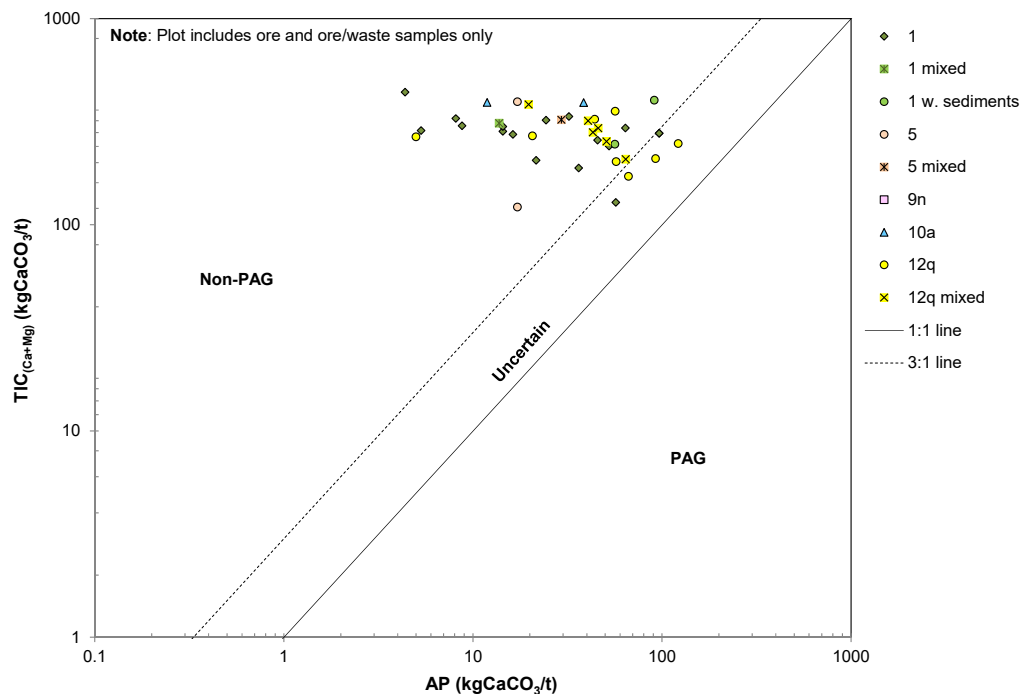
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Figure 3-12: Comparison of Total Inorganic Carbon (TIC) and Acid Potential (AP) of Ore and Ore/Waste Samples



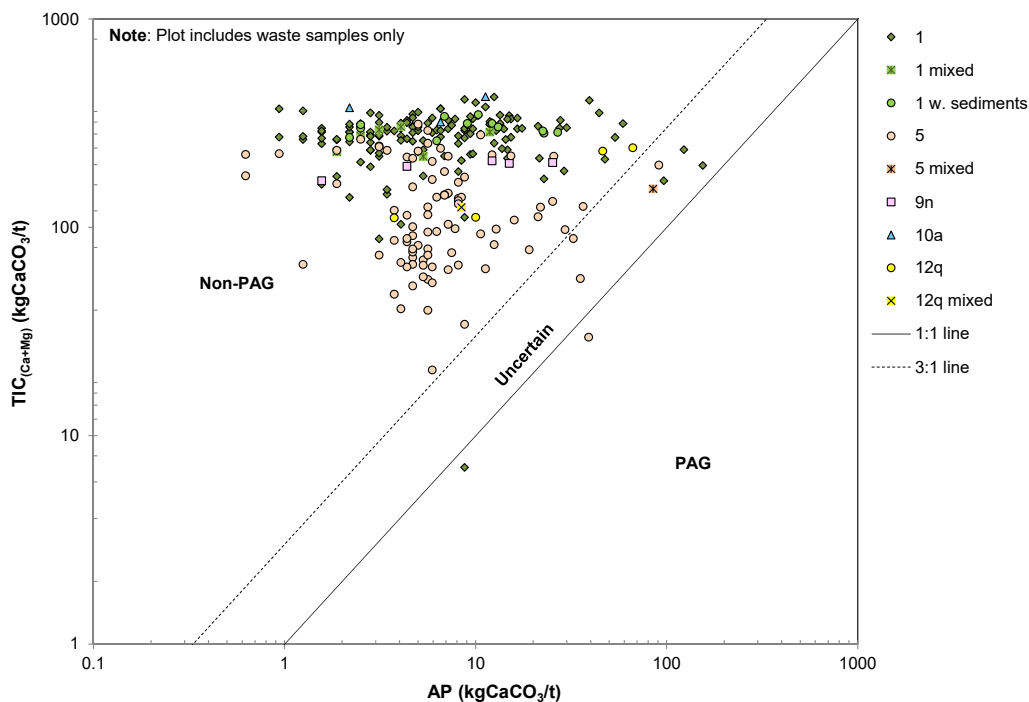
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Figure 3-13: Comparison of Total Inorganic Carbon (TIC) and Acid Potential (AP) of Waste Samples



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Figure 3-14: Comparison of Effective Total Inorganic Carbon ($TIC_{(Ca+Mg)}$) and Acid Potential (AP) of Ore and Ore/Waste Samples



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Figure 3-15: Comparison of Effective Total Inorganic Carbon ($TIC_{(Ca+Mg)}$) and Acid Potential (AP) of Waste Samples

3.1.4 Solid-Phase Elemental Composition

Solid-phase trace elemental data were available for 257 samples (Appendix I). A statistical summary of each element by rock type is presented in (Appendix H).

Parameters were screened by comparing 95th percentile concentrations against ten times the average crustal abundance for basalt (Price 1997) to indicate relative enrichment. Relative enrichment does not indicate that parameters will be mobile under pH-neutral conditions. Table 3-6 presents a summary of elevated parameters according to lithology. Parameters listed in the table that are mobile at neutral pH values include arsenic and selenium. A summary of the findings from Table 3-6 by rock type is as follows:

- Arsenic was elevated for all rock types.
- Selenium is listed in Table 3-6, however the limit of analytical detection for selenium (<0.5 ppm) was the same as the respective levels for crustal abundance. For 70% samples selenium levels were near or below the limit of detection; for these samples selenium could not be assessed. A total of 78 samples had selenium levels sufficiently above the limit of detection (>0.5 ppm), and of these, 63 had elevated levels of selenium, including samples of:
 - mafic metavolcanics waste and ore samples (1),
 - mixed mafic metavolcanics (1 mixed),
 - all economic classifications for mafic metavolcanics with sediments (1oj),
 - both sedimentary unit lithologies (5 and 5 mixed),
 - late gabbro (10a),
 - waste and ore samples from the quartz vein unit (12q) and
 - samples of the mixed quartz vein unit (12q mixed).
- Antimony was enriched in waste samples of mafic metavolcanics (1), ore/waste from mafic metavolcanics with sediments (1oj), mixed sedimentary units (5 mixed) and late gabbro (10a).
- Elevated gold content was present in all rock types except early sedimentary units (5) and late intermediate dyke (9n).
- Elevated sulphur content was present for all rock types. There was no sulphur data for samples of quartz vein (12q) classified as ore or ore/waste.
- Other trace elements that were elevated include lead, silver and tungsten.
- All other elements were below the screening criteria suggesting no appreciable enrichment in the samples.

Table 3-6: Summary of Elevated Solid Phase Elements, Boston

Lithology	Description	Preliminary Economic Classification	No. of Samples ¹⁰	P95 > 10x Crustal Abundance for Basalt
1	Ultramafic to Mafic Metavolcanic Rocks	Waste	110	As, Au, Sb, S, W, Se
		Ore	9	Ag, As, Au, S, W, Se
		Ore/Waste	3	As, Au, S,
1 mixed	Mixed Ultramafic to Mafic Metavolcanic Rocks	Various ⁴	7	As, Au, S, Se
1oj ²	Mafic Metavolcanic Rocks with Sediments	Waste	13	As, Au, S, W, Se
		Ore	1	As, Au, S, W, Se
		Ore/Waste	1	As, Au, Sb, S, Se
5	Early Sedimentary Units (Argillite-Wacke) ¹	Various ⁵	85	As, S, Se
5 mixed	Mixed Early Sedimentary Units (Argillite-Wacke) ¹	Various ⁶	2	As, Au, Sb, S, Se
9n ³	Late Intermediate Dyke ¹	Waste	5	As, S,
10a	Late Gabbro ¹	Various ⁷	5	As, Au, Sb, S, Se
12q	Quartz Vein	Waste ⁸	3	As, Au, S, Se
		Ore ⁸	6	Ag, As, Au, Se
12q mixed	Mixed Quartz Vein	Various ⁹	7	Pb, Ag, As, Au, Se

Source: Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\Hope Bay MASTER Geochemical Spreadsheet_Rev30_Boston_Rev01_JEM.xlsx]

Notes:

- ¹Early and late used in a relative sense only.
- ²One sample of 1oj was logged as mafic metavolcanics with sediments (1oj - 95%) and carbonate vein (12c - 5%). Unmixed and mixed samples were combined because of small overall sample set for this rock type.
- ³One sample of 9n was logged as late granitoid (9n - 94%) and mafic metavolcanics (1 - 6%), while another sample was logged as late granitoid (9n - 88%) and quartz vein (12q - 12%). Unmixed and mixed samples were combined because of small overall sample set for this rock type.
- ⁴Lithology 1 mixed is comprised of samples classified as waste (n=6) and ore (n=1).
- ⁵Lithology 5 is comprised of samples classified as waste (n=88), ore (n=1) and ore/waste (n=1).
- ⁶Lithology 5 mixed is comprised of samples classified as waste (n=1) and ore (n=1).
- ⁷Lithology 10a is comprised of samples classified as waste (n=3) and ore (n=2).
- ⁸There was no sulphur data for samples of quartz vein (12q) classified as ore or ore/waste.
- ⁹Lithology 12q mixed is comprised of samples classified as waste (n=1) and ore (n=6).
- ¹⁰Indicates number of samples analyzed but not number of samples with elevated solid-phase concentrations.

3.2 Humidity Cell Tests

There are 11 humidity cell tests in the Boston sample set.

3.2.1 Pre-Test Sample Characterization

The basic geochemical characteristics of the humidity cell samples included mineralogy, ABA, and trace element composition and are described in the following text. Table 2-3 summarizes available geochemical data for each humidity cell sample. Selected mineralogy data are presented in Table 3-4 and Table 3-7 to Table 3-13 and Appendix I1.

ABA data are presented in Table 3-10 and trace element data are presented in Appendix I2.

Mineralogy

The bulk mineralogical results for the humidity cell tests were similar to the results of the full Boston sample set (Table 3-2 and Table 3-3). The stoichiometric formulae for carbonate minerals determined by SEM are presented in Table 3-4. Specific findings for the humidity cell samples are described as follows (Table 3-7, Table 3-8 and Table 3-9):

- Carbonate contents were above 20% for all samples except for sample HC-35 (sedimentary units, 5), which contained approximately 12% of carbonate minerals. This is consistent with the overall Boston sample set.
- Pyrite (FeS_2) was the dominant sulphide mineral. Chalcopyrite (CuFeS_2) and gersdorffite (NiAsS) were present at trace concentrations ($<0.1\%$). Pyrrhotite ($\text{Fe}_{(1-x)}\text{S}$) and arsenopyrite (FeAsS) were also present at trace levels in selected samples.
- Total sulphur contents indicated by XRD, MLA and ABA were typically comparable with the following exceptions:
 - HC-11 (sedimentary units, 5) had a higher sulphide content indicated by MLA (0.97%) compared to ABA (0.32%). XRD values were below detection ($<1\%$), which is consistent with both the MLA and ABA data. Differences are attributable to differences in methodological detection limits and possibly, but less likely, sample variability.
 - HC-38 (quartz vein, 12q) had a lower sulphide content indicated by XRD (1.6%) compared to MLA and ABA (3.0% each). In quartz vein samples, the distribution of sulphides is typically non-uniform. The variation in sulphide content is likely due to sample variability and methodological, as described for HC-11.
 - For HC-11 and HC-38, the pre-test total sulphur values as determined by ABA have been adopted for the purposes of humidity cell data interpretation.
- Gersdorffite was present at detectable concentrations between 0.013 and 0.070% in the following samples (listed in descending order): HC-37 (quartz vein, 12q), HC-32 (mafic metavolcanics with sediments, 1oj), HC-10 (mixed mafic metavolcanics, 1 mixed), HC-33 (mafic metavolcanics with sediments, 1oj) and HC-55 (mafic metavolcanics, 1).
- Arsenopyrite was detected in sample HC-33 only (mafic metavolcanics with sediments, 1oj) at levels of 0.015%.

Table 3-7: Carbonate Mineralogy by XRD and MLA for Humidity Cell Test Samples

Humidity Cell ID	Lithology ¹	Preliminary Economic Classification	Sample Type ²	Carbonates							
				Ferroan Dolomite		Siderite		Magnesite	Siderite/Magnesite	Calcite	
				Ca(Fe,Mg)CO ₃		FeCO ₃		MgCO ₃	(Fe,Mg)CO ₃	CaCO ₃	
				XRD	MLA	XRD	MLA	XRD	XRD	XRD	MLA
HC-31	1	Waste	Pulp	35	27	bd	3.7	bd	3	bd	0.049
HC-55	1	Waste	Pulp	36	42	bd	0.53	bd	bd	bd	0.072
HC-12	1	Ore/Waste	HCT	38	34	4	4.6	bd	bd	bd	0.057
	1	Ore/Waste	Pulp	39	--	bd	--	bd	4	bd	--
HC-10	1 mixed	Waste	HCT	22	22	2	1.8	bd	bd	8	6.8
	1 mixed	Waste	Pulp	23	--	bd	--	bd	2	6	--
HC-32	1oj	Waste	Pulp	33	29	bd	<0.01	bd	bd	bd	0.012
HC-33	1oj	Waste	Pulp	43	46	bd	1.1	bd	bd	tr	0.024
HC-11	5	Waste	HCT	21	30	bd	2.2	bd	bd	bd	0.078
	5	Waste	Pulp	23	--	bd	--	bd	bd	bd	--
HC-35	5	Waste	Pulp	12	9	bd	0.75	bd	bd	bd	<0.01
HC-34	5	Waste	Pulp	20	12	bd	0.82	bd	bd	bd	<0.01
HC-37	12q	Waste	Pulp	36	30	bd	<0.01	bd	bd	1	0.094
HC-38	12q	Ore	Pulp	32	25	bd	2.1	bd	3	bd	0.10

Source: Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\HB_WR_Outcomes.mc.REV14.xlsx]

Notes:

¹Rock codes as follows: 1 = mafic volcanics; 1oj = mafic volcanics with sediments; 5 = sedimentary rocks; 12q = quartz vein.

²ABA determined on either a split of the humidity cell sample (HCT) or pulp from the exploration program (Pulp).

-- denotes sample not available for characterization

bd: below detection

Table 3-8: Sulphide Mineralogy by XRD and MLA for Humidity Cell Test Samples

Humidity Cell ID	Rock Type ¹	Preliminary Economic Classification	Sample Type	Sulphides								
				Pyrite	Pyrite	Chalcopyrite	Gersdorffite	Pyrrhotite	Arsenopyrite	Total Sulphur		
				FeS ₂	FeS ₂	CuFeS ₂	NiAsS	Fe _(1-x) S	FeAsS	%S		
				XRD	MLA	MLA	MLA	MLA	MLA	XRD	MLA	ABA
HC-31	1	Waste	Pulp	bd	0.14	0.039	<0.01	bd	bd	bd	0.090	0.13
HC-55	1	Waste	Pulp	bd	0.75	0.019	0.013	<0.001	bd	bd	0.41	0.29
HC-12	1	Ore/Waste	HCT	bd	0.15	0.018	<0.01	<0.01	bd	bd	0.098	0.14
	1	Ore/Waste	Pulp	1.0	--	--	--	--	--	0.53	--	0.22
HC-10	1 mixed	Waste	HCT	bd	0.41	0.043	0.020	<0.01	bd	bd	0.24	0.16
	1 mixed	Waste	Pulp	1.0	--	--	--	--	--	0.53	--	0.18
HC-32	1oj	Waste	Pulp	1.0	0.96	0.013	0.034	bd	bd	0.53	0.52	0.86
HC-33	1oj	Waste	Pulp	1.0	0.57	0.015	0.013	<0.001	0.015	0.53	0.32	0.33
HC-11	5	Waste	HCT	bd	1.8	0.057	<0.01	<0.01	bd	bd	0.98	0.32
	5	Waste	Pulp	1.0	--	--	--	--	--	0.53	--	0.27
HC-35	5	Waste	Pulp	bd	0.90	<0.01	<0.01	<0.001	bd	bd	0.49	0.20
HC-34	5	Waste	Pulp	2.0	1.9	0.034	<0.001	0.15	bd	1.1	1.1	0.81
HC-37	12q	Waste	Pulp	2.0	2.1	0.013	0.070	<0.001	<0.001	1.1	1.2	1.5
HC-38	12q	Ore	Pulp	3.0	5.7	0.057	<0.01	<0.01	bd	1.6	3.0	3.0

Source: Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\HB_WR_Outcomes.mc.REV14.xlsx]

Notes:

¹Rock codes as follows: 1 = mafic volcanics; 1oj = mafic volcanics with sediments; 5 = sedimentary rocks; 12q = quartz vein.

²ABA determined on either a split of the humidity cell sample (HCT) or pulp from the exploration program (Pulp).

-- denotes sample not available for characterization.

bd: below detection

Table 3-9: Summary of Carbonate and Sulphide Minerals by Petrography for HC-32, HC-35 and HC-55

Humidity Cell #	Lithology	Preliminary Economic Classification	Sulphide	Carbonate Occurrence
HC-55	1	Waste	- Pyrite (3%) - Chalcopyrite (<1%) - Unknown (rare)	Colorless and cloudy brownish, fine to very fine-grained (50%)
HC-32	1oj	Waste	- Pyrite (3%) - Chalcopyrite (<1%)	Colorless and cloudy brownish, fine to very fine-grained (50%)
HC-35	5	Waste	- Pyrite (1%) - Chalcopyrite (rare)	Colorless and cloudy brownish, medium fine to very fine-grained (25%)

Source: \\VAN-SVR01\Projects\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\HB_WR_Outcomes.mc.REV14.xlsx]

Notes:

¹Rock codes as follows: **1** = mafic volcanics; **1oj** = mafic volcanics with sediments; **5** = sedimentary rocks

Acid-Base Accounting

ABA data for the humidity cell samples is presented in Table 3-10. ABA data were determined on the pulp samples that were characterized as part of the initial static program (Section 2.1.1) with the exceptions of HC-10, HC-11 and HC-12. For these samples, ABA was determined on pulp samples and also on a split of drill core that was sampled during barrel setup (and represents the humidity cell tests and barrel samples, Section 2.3.1).

For the aforementioned humidity cell samples that have two sets of data, total sulphur data were roughly equivalent for both sample types (HC-10, HC-11 and HC-12). The greatest variation was found for HC-12 (mafic metavolcanics (1) classified as ore/waste) with differences in sulphur levels likely attributable to the different sampling methods. NP and TIC contents were comparable among sample types, with TIC showing slightly higher variation.

Table 3-10 also presents the percentile rank of the ABA parameters for each humidity cell test as compared to the complete Boston data set. Data were compared to the rock type and preliminary economic classification. Overall the humidity cell samples were consistent with the overall Boston data set (Section 3.1.3).

Quartz vein (12q) samples classified as ore or waste contained relatively few samples in the database ($n \leq 8$) for a meaningful statistical comparison. Data was presented for completion.

All samples were classified as non-PAG according to NP/AP, TIC/AP and $TIC_{(Ca+Mg)}/AP$, except for HC-38 (quartz vein, ore, 12q) which was classified as uncertain.

Table 3-10: ABA Data for Humidity Cell Test Samples and Percentile Ranks for Total Sulphur, NP and TIC

Humidity Cell #	Lithology	Description	Preliminary Economic Classification	Sample Type ²	Selection Rationale	Total Sulphur ³			NP ^{3,4}			TIC ³			TIC _(Ca+Mg)	NP/AP	TIC/AP	TIC _(Ca+Mg) /AP
						n	%S	% Rank	n	kgCaCO ₃ /t	% Rank	n	kgCaCO ₃ /t	% Rank				
HC-31	1	Ultramafic to Mafic Metavolcanic Rocks	Waste	Pulp	Typical S (for Nose)	337	0.13	32%	337	256	18%	148	385	61%	298	63	95	73
HC-55			Waste	Pulp	Typical S	337	0.29	67%	337	307	48%	148	400	70%	310	34	44	34
HC-12			Ore/Waste	HCT	Barrel	370	0.14	33%	370	281	32%	165	438	89%	339	64	100	78
			Ore/Waste	Pulp	Barrel	370	0.22	52%	370	271	27%	165	397	70%	308	39	57	44
HC-10	1 mixed	Mixed Mafic Metavolcanics	Waste	HCT	Barrel	337	0.16	41%	337	240	13%	148	302	20%	234	48	60	47
			Waste	Pulp	Barrel	337	0.18	47%	337	240	13%	148	283	16%	219	43	51	39
HC-32	1oj	Mafic Metavolcanics with Sediments	Waste	Pulp	High S	20	0.86	89%	20	270	26%	14	369	33%	286	10	14	11
HC-33			Waste	Pulp	Typical S	20	0.33	47%	20	351	89%	14	449	100%	348	34	44	34
HC-11	5	Early Sedimentary Units (Argillite-Wacke) ¹	Waste	HCT	Barrel	90	0.32	77%	90	146	71%	92	216	72%	167	15	22	17
			Waste	Pulp	Barrel	90	0.27	74%	90	157	72%	92	222	74%	172	19	26	20
HC-35			Waste	Pulp	Typical S	90	0.20	55%	90	89	57%	92	123	43%	96	14	20	15
HC-34			Waste	Pulp	High S	90	0.81	92%	90	115	65%	92	172	61%	133	5	7	5
HC-37	12q	Quartz vein	Waste	Pulp	Typical S	4	1.5	67%	4	272	100%	4	300	67%	232	6	6	5
HC-38			Ore	Pulp	High S	8	3.0	86%	8	194	14%	8	270	67%	209	2	3	2

Source: \\van-svr0\projects\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\HB_WR_Outcomes.mc.REV14.xlsx

Notes:

¹Early and late used in a relative sense only

²ABA determined on either a split of the humidity cell sample (HCT), or pulp from the exploration program (Pulp).

³HCT and pulp samples of lithologies 1 (waste), 1 w. sediments and 12q were compared to samples of their respective lithologies and economic classification from the overall Boston sample set (Section 3.1.3). Due to limited sample set ore/waste samples of lithology 1 (HC-12) were compared to entire sample set of lithology 1 (irrespective of economic classification), while samples of lithology 1 mixed (HC-10) were compared to 1 (waste) samples. HCT and pulp samples of lithology 5 were compared to samples of the same lithology irrespective of economic classification.

Trace Elements

Trace element data for the humidity cell samples are presented in Appendix I3. Trace element data are available for the complete Boston sample set, as discussed in 3.1.4 (Appendix I).

Overall the humidity cell samples were consistent with the overall Boston data set (Section 3.1.4).

In terms of their respective rock types and economic classifications, arsenic levels for all samples were between the 24th and 92nd percentile, with the exception of sample HC-38 (quartz vein, ore, 12q), which was equal to the minimum value in the dataset, and HC-37 (quartz vein, waste, 12q), which was at the maximum value. The quartz vein (12q) waste and ore sample sets had relatively few samples (<8) in the database, therefore the statistics were not meaningful.

Table 3-11: Percentile Rank of Arsenic for Boston Humidity Cell Tests

Humidity Cell #	Lithology	Description	Preliminary Economic Classification	Sample Type ²	No. of Samples ³	Arsenic	
						ppm	% Rank
HC-31	1	Ultramafic to Mafic Metavolcanic Rocks	Waste	Pulp	110	84	40%
HC-55			Waste	Pulp	110	140	61%
HC-12			Ore/Waste	HCT	122	160	62%
			Ore/Waste	Pulp	122	190	67%
HC-10	1 mixed	Mixed Mafic Metavolcanics	Waste	HCT	110	110	49%
			Waste	Pulp	110	81	38%
HC-32	1oj	Mafic Metavolcanics with Sediments	Waste	Pulp	13	290	75%
HC-33			Waste	Pulp	13	370	92%
HC-11	5	Early Sedimentary Units (Argillite-Wacke) ¹	Waste	HCT	85	28	24%
			Waste	Pulp	85	30	26%
HC-35			Waste	Pulp	85	56	54%
HC-34			Waste	Pulp	85	74	65%
HC-37	12q	Quartz vein	Waste	Pulp	3	550	100%
HC-38			Ore	Pulp	6	230	0%

Source: \\van-svr0\projects\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\HB_WR_Outcomes.mc.REV14.xlsx]

Notes:

¹Early and late used in a relative sense only

²ABA determined on either a split of the humidity cell sample (HCT), or pulp from the exploration program (Pulp).

³HCT and pulp samples of lithologies 1 (waste), 1 w. sediments and 12q were compared to samples of their respective lithologies and economic classification from the overall Boston sample set (Section 3.1.3). Due to limited sample set ore/waste samples of lithology 1 (HC-12) were compared to entire sample set of lithology 1 (irrespective of economic classification), while samples of lithology 1 mixed (HC-10) were compared to 1 (waste) samples. HCT and pulp samples of lithology 5 were compared to samples of the same lithology irrespective of economic classification.

3.2.2 Humidity Cell Data

Table 2-5 presents the analytical program for the tests. Appendix I5 presents the humidity cell test results, including summaries of key data, stable release rates of selected parameters and depletion calculations. Figures showing trends and the raw data for the humidity cell tests are provided in Appendix K.

Release Rates and Trends

Maximum leaching (release) rates and pH values were typically highest during the initial weeks of the tests, after which they decreased with time and levelled out. pH values were neutral to alkaline (7.3 to 9.7) for the duration of all tests (Figure 3-16).

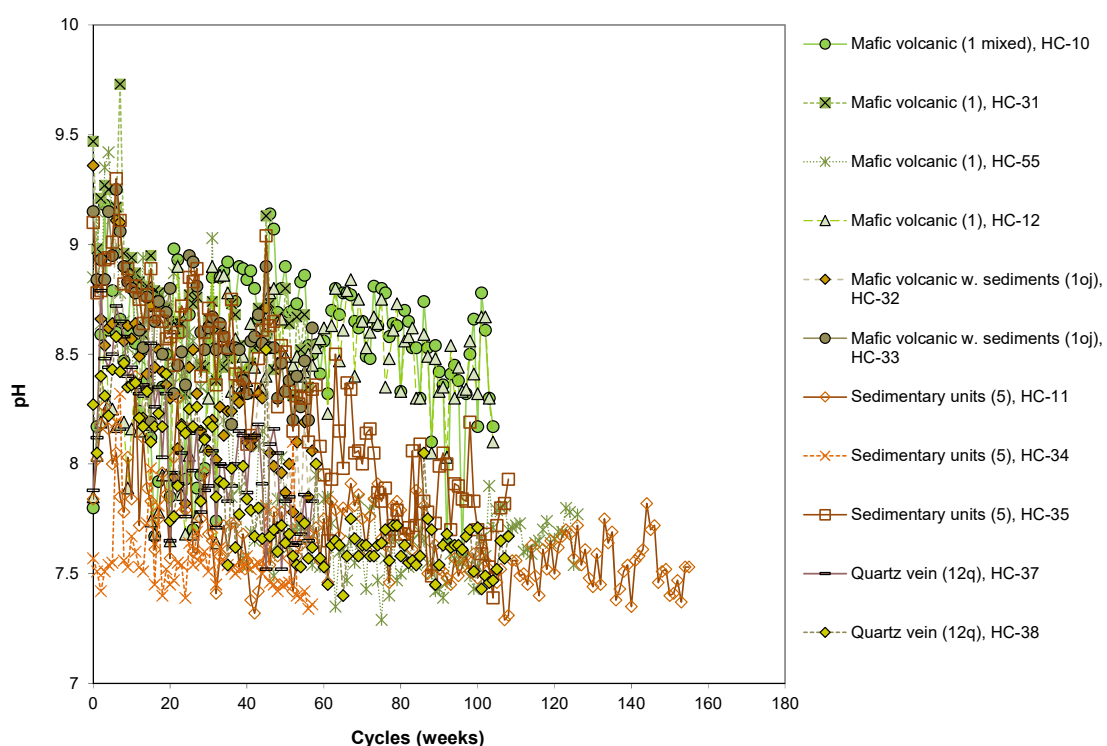
Elements that exhibited noteworthy trends in leaching rates included arsenic (As), cobalt (Co), molybdenum (Mo), nickel (Ni) and antimony (Sb). The stable² leaching rates of these parameters as observed in the humidity cell tests and sulphate are discussed as follows:

- Sulphate (Figure 3-17)
 - Sulphate release rates were initially 10 mg/kg/week for all tests except for the sedimentary units (5) HC-34, which had an initial rate of about 180 mg/kg/week.
 - Sulphate release rates reached stability for all samples. The highest stable release rates were from HC-38 (quartz vein, ore, 12q) and HC-11 (sedimentary units, 5) at 14 and 12 mg/kg/week, respectively (Table 3-12).
 - There is a relationship between sulphate release rate and total sulphur content, indicating that sulphide oxidation rates are related to sulphide content (Figure 3-18). Only sample HC-11 (sedimentary units, 5) deviates from this trend, as it contained a lower sulphur content (0.32%) relative to its stable sulphate release rate (12 mg/kg/week). Nevertheless, this sulphur content represented typical (P60) sulphur concentrations for the sedimentary unit's rock type. There was no relationship between sulphate release rate and gersdorffite content.
- Arsenic (Figure 3-19)
 - Stable leaching rates from humidity cells tests varied over three orders of magnitude and ranged from 0.0002 to 0.18 mg/kg/week (Table 3-12).
 - Arsenic leaching rates were highest for rock types mafic metavolcanics with sediments (1oj, HC-32 and HC-33), and quartz vein classified as waste (12q, HC-37). Rates for these samples ranged from rates of 0.13 and 0.18 mg/kg/week.
 - There was a positive relationship between solid-phase arsenic content and arsenic release rate (Figure 3-20). Samples with higher arsenic release contained detectable concentrations of the trace mineral gersdorffite (NiAsS) (Table 3-12). There was no clear relationship between total sulphur and arsenic release rates.

² Assessed based on the assessment of the stability of sulphate release.

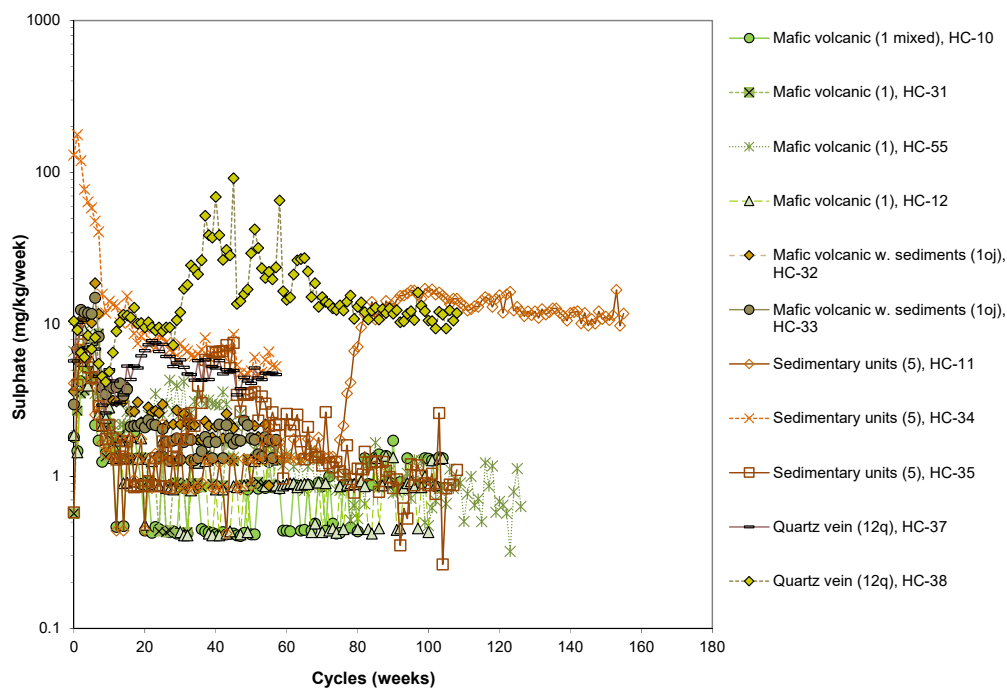
- The lowest arsenic release rates were observed for sedimentary units (5, HC-11, HC-34 and HC-35) and quartz vein classified as ore (HC-38).
- Antimony (Figure 3-21)
 - Stable leaching rates from humidity cell tests ranged from 0.00012 and 0.0026 mg/kg/week (Table 3-12).
 - Leaching rates were highest for rock types quartz vein classified as ore (12q, ore, HC-37) and mafic metavolcanics with sediments (1oj, HC-33). Rates for these samples ranged from 0.0011 to 0.0026 mg/kg/week.
 - The lowest release rate was observed for the sedimentary units (5) sample HC-11.
 - Samples with higher antimony release contained detectable concentrations of the trace mineral gersdorffite. Although this is an arsenic bearing mineral, trace amounts of antimony are often substituted for the arsenic in gersdorffite. There was no clear relationship between antimony release rate and solid-phase content for antimony or total sulphur.
- Cobalt (Figure 3-22)
 - Stable leaching rates from humidity cell tests ranged from 0.000027 and 0.00083 mg/kg/week (Table 3-12).
 - Leaching rates were highest for rock types quartz vein classified as waste (12q, waste, HC-37) and mafic metavolcanics (1, ore/waste, HC-12) at 0.00083 and 0.00065 mg/kg/week, respectively.
 - The lowest cobalt release rates was observed for sedimentary units (5, HC-11).
 - There was no clear relationship between cobalt release rate and solid-phase content for cobalt or total sulphur. Selected samples with higher cobalt release rates, specifically HC-37 (quartz vein, waste, 12q) and HC-32 (mafic metavolcanics with sediments, waste, 1oj) also contained higher gersdorffite contents. Gersdorffite forms a solid solution series with cobaltite, and likely contains minor amounts of cobalt.
- Molybdenum (Figure 3-23)
 - Stable leaching rates from humidity cell tests varied over two orders of magnitude, ranging from 0.000039 to 0.0019 mg/kg/week (Table 3-12).
 - Leaching rates were highest for sedimentary units (5, HC-34 and HC-35) at 0.0019 and 0.0017 mg/kg/week, respectively.
 - The lowest molybdenum release rates were observed for rock types mixed mafic metavolcanics (1 mixed), mafic metavolcanics (1, waste and ore/waste), and mafic metavolcanics with sediments (1oj, waste).
 - There was no clear relationship between molybdenum release rate and solid-phase content for molybdenum or total sulphur.

- Nickel (Figure 3-24)
 - Stable leaching rates from humidity cell tests varied over two orders of magnitude, from 0.000062 to 0.0023 mg/kg/week (Table 3-12).
 - Nickel leaching rate was highest for the quartz vein classified as waste (12q, HC-37) at 0.0023 mg/kg/week.
 - The lowest nickel release rates was observed for sedimentary units (5, HC-11).
 - Samples with higher nickel release rate tended to have detectable levels of gersdorffite. There was no clear relationship between nickel release rates and solid-phase nickel or total sulphur content.



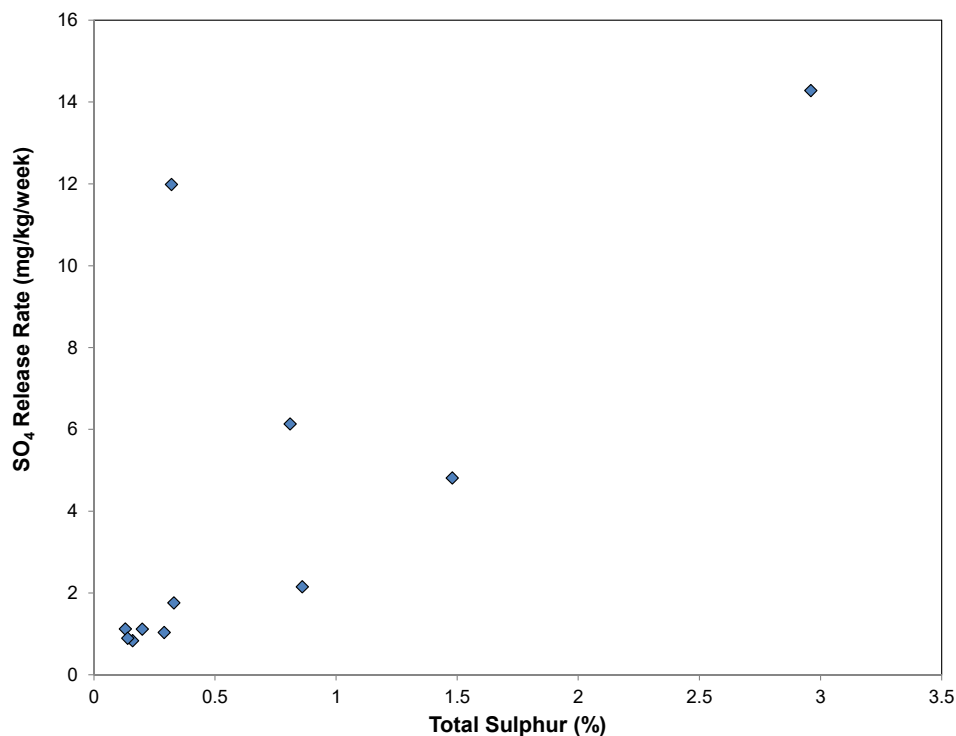
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Figure 3-16: Humidity Cell Test pH Trends



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Figure 3-17: Humidity Cell Test Sulphate Trends



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Figure 3-18: Relationship between Total Sulphur and Sulphate Release Rate

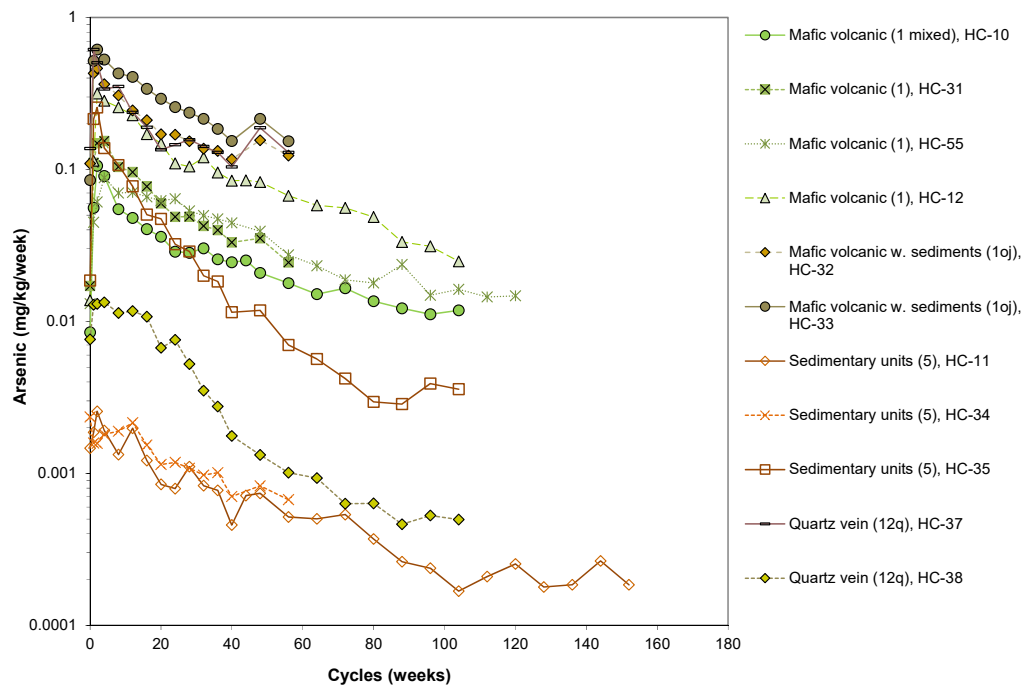
Table 3-12: Selected Humidity Cell Test Release Rates and Static Data

Humidity Cell ID	Lithology	Description	Preliminary Economic Classification	Total Sulphur		Sulphate	Arsenic		Cobalt		Molybdenum		Nickel		Antimony		Gersdorffite (NiAsS)
				%	% Rank ²	mg/kg/week	ppm	mg/kg/week	ppm	mg/kg/week	ppm	mg/kg/week	ppm	mg/kg/week	ppm	mg/kg/week	%
HC-31	1	Ultramafic to Mafic Metavolcanic Rocks	Waste	0.13	32%	1.1	84	0.032	37	0.00031	0.2	0.000046	65	0.00018	0.2	0.00033	bd
HC-55				0.29	67%	1	140	0.023	47	0.00027	0.8	0.000087	230	0.00042	0.3	0.0006	0.013
HC-12			Ore/Waste	0.14	33%	0.9	160	0.08	45	0.00065	0.8	0.000041	93	0.00059	0.5	0.00062	bd
HC-10	1 mixed	Mixed Mafic Metavolcanics	Waste	0.16	41%	0.84	110	0.023	56	0.000078	0.5	0.000039	160	0.0003	0.4	0.00087	0.02
HC-32	1oj	Mafic Metavolcanics with Sediments	Waste	0.86	89%	2.2	290	0.13	53	0.00055	0.4	0.000076	220	0.00085	0.2	0.00083	0.034
HC-33				0.33	47%	1.8	370	0.18	51	0.0006	0.1	0.000058	220	0.00089	0.3	0.0011	0.013
HC-11	5	Early Sedimentary Units (Argillite-Wacke) ¹	Waste	0.32	77%	12	28	0.0002	25	0.000027	2.4	0.00027	19	0.000062	0.8	0.00012	bd
HC-34				0.81	92%	6.1	74	0.00081	15	0.00012	1.4	0.0019	29	0.00029	1.6	0.00071	bd
HC-35				0.20	55%	1.1	56	0.0063	17	0.00017	0.9	0.0017	38	0.00026	0.2	0.00034	bd
HC-37	12q	Quartz vein	Waste	1.5	67%	4.8	550	0.14	49	0.00083	1.4	0.00019	210	0.0023	0.4	0.0026	0.070
HC-38			Ore	3.0	86%	14	230	0.0012	35	0.00017	2.6	0.00018	37	0.00029	0.2	0.00014	bd

Source: \\van-svr0\projects\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\HB_WR_Outcomes.mc.REV14.xlsx]

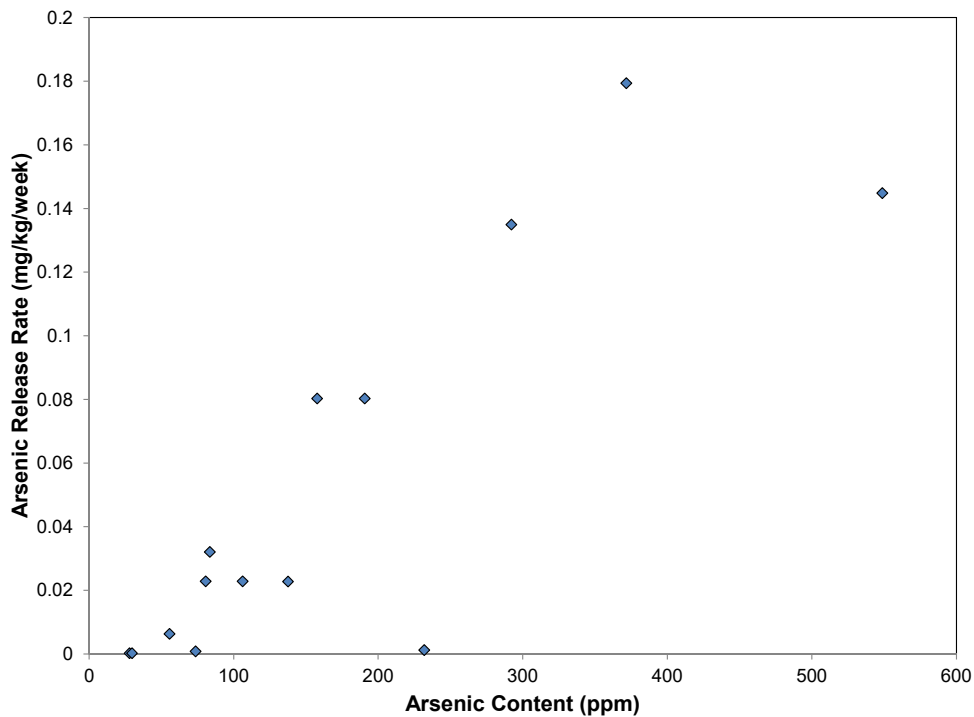
Notes:

- ¹Early and late used in a relative sense only
- ²HCT and pulp samples of lithologies 1 (waste), 1 w. sediments and 12q were compared to samples of their respective lithologies and economic classification from the overall Boston sample set (Section 3.1.3). Due to limited sample set ore/waste samples of lithology 1 (HC-12) were compared to entire sample set of lithology 1 (irrespective of economic classification), while samples of lithology 1 mixed (HC-10) were compared to 1 (waste) samples. HCT and pulp samples of lithology 5 were compared to samples of the same lithology irrespective of economic classification.
- bd: below detection



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Figure 3-19: Humidity Cell Test Arsenic Trends



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Figure 3-20: Relationship between Arsenic Content and Arsenic Release Rate

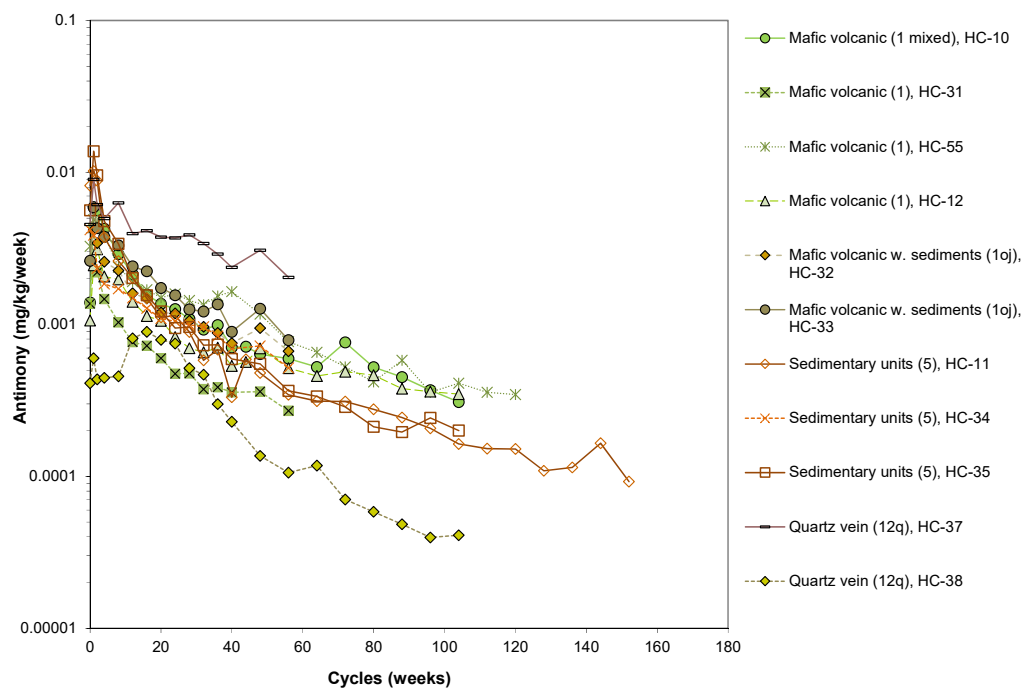


Figure 3-21: Humidity Cell Test Antimony Trends

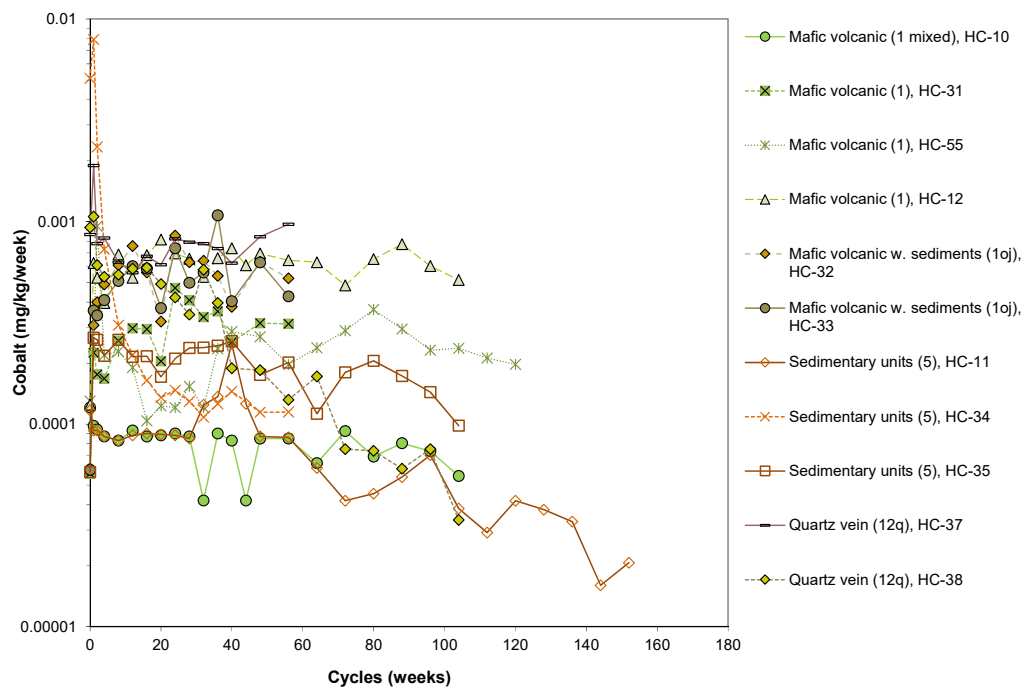


Figure 3-22: Humidity Cell Test Cobalt Trends

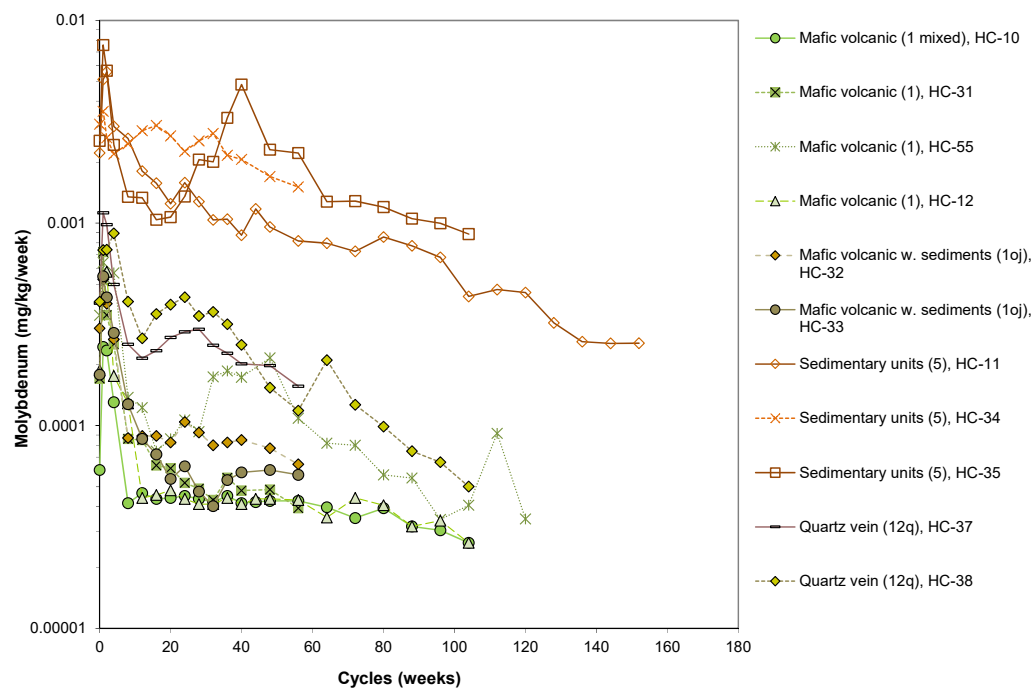


Figure 3-23: Humidity Cell Test Molybdenum Trends

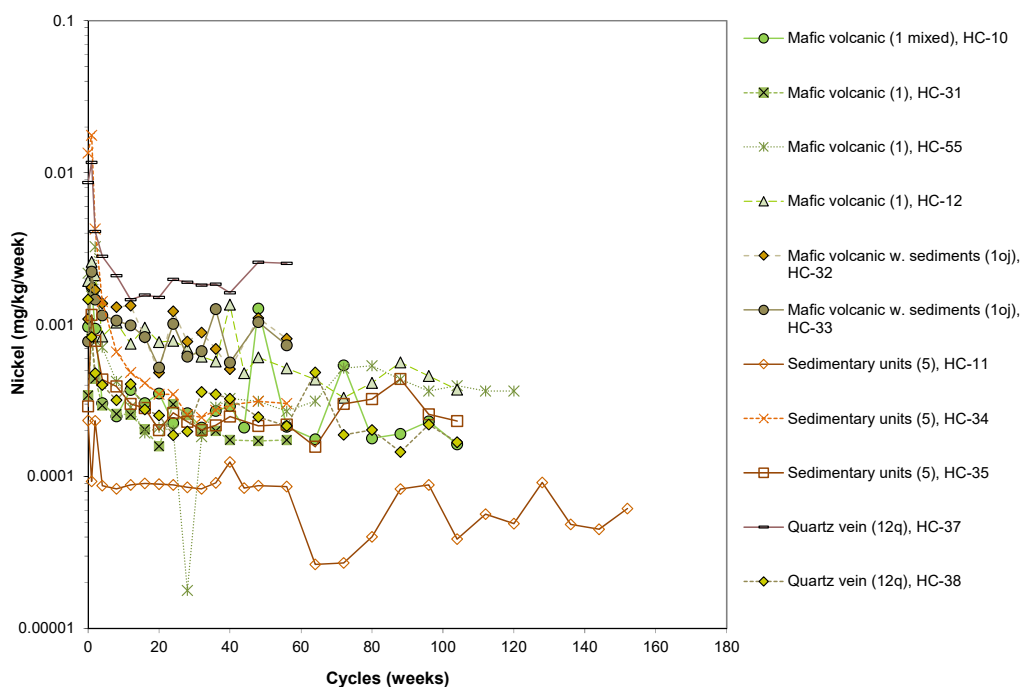


Figure 3-24: Humidity Cell Test Nickel Trends

Depletion Calculations

Depletion calculations are presented in Appendix J4. Depletion calculations based on stable release rates suggest that all of the humidity cell tests are projected to remain neutral with the exception of HC-38 (12q, ore) which can theoretically become acidic in approximately 100 years under laboratory conditions.

3.2.3 Post-Test Sample Characterization

After completion of the humidity cell tests, the remaining residues were geochemically analyzed for ABA and trace element content. Appendix J2 and Appendix J3 presents the ABA and trace element data for the humidity cell tests, respectively.

Acid-Base Accounting

The ABA data from the humidity cell test residues (post-HCT) are presented in Appendix I2. The ABA data for the material loaded into the tests prior to operation (pre-HCT and Section 3.2.1) are also presented for comparison.

Nine out of eleven humidity cell tests showed higher sulphur, NP and/or TIC values in the post-test samples. Most of these higher post-test values were within analytical uncertainty (<20% relative percent difference for measurements higher than ten times the detection limit), with the following exceptions:

- Total sulphur values for HC-55 (mafic metavolcanic waste, 1) and HC-35 (sedimentary units, 5);
- NP value for HC-38 (quartz vein, ore, 12q); and
- TIC value for HC-37 (quartz vein, waste, 12q).

Higher values of the aforementioned parameters in post-HCT residue could be an artefact of heterogeneity in the humidity cell residue. Nonetheless, the results show that there was negligible depletion of these parameters over the course of the test.

The ARD classification of the post-HCT residues was generally consistent with the initial classifications, with the exception of HC-38 (quartz vein, ore, 12q). This sample was initially classified as uncertain but reclassified as non-PAG in the residues.

Solid-Phase Elemental Composition

Solid-phase trace elemental data for the humidity cell test residues are presented in Appendix I3.

Compared to the pre-test material, trace element contents for selected parameters were slightly higher but within analytical uncertainty for six out of the eleven post-test samples with the exception of arsenic, cobalt, and/or nickel for the following samples: HC-12 (mafic metavolcanics, ore/waste, 1), HC-10 (mixed mafic metavolcanics, 1 mixed), HC-32 (mafic metavolcanics with sediments, waste, 1oj), HC-11 (sedimentary units, 5), HC-37 (quartz vein, waste, 12q) and HC-38

(quartz vein, ore, 12q). As with the ABA data, higher values in post-HCT residue could be an artefact of heterogeneity in the humidity cell sample.

3.3 Barrel Tests

There are five Boston barrel tests and also a blank barrel test.

3.3.1 Pre-Test Sample Characterization

The basic geochemical characteristics of the barrel samples, including mineralogy, ABA and trace element composition are described in the following text.

Mineralogy and ABA data are presented in Table 3-13 and Table 3-14, respectively. Appendix L presents the bulk mineralogy and trace element composition data.

For barrels B1, B2 and B3 there are ABA data for two different sample types. Samples denoted as “barrel” were chip samples obtained along the barrel interval during the test set-up (Section 2.2.4). The samples described as pulp are part of the initial ABA characterization program and represent continuous sampling of the barrel interval using exploration pulps (Section 2.1.1). For the remaining barrels (B4 and B5), the barrel intervals were characterized during test set-up but not using the exploration pulps.

Mineralogy

A summary of the carbonate and sulphide minerals by XRD for the barrel samples is presented in Table 3-13. The bulk mineralogical results for the barrel tests were comparable to the results of the overall Boston sample set (Table 3-2 and Table 3-3).

Table 3-13: Carbonate and Sulphide Mineralogy by XRD, Barrel Test Samples

Barrel ID	Lithology	Description	Preliminary Economic Classification	Sample Type	Carbonates				Sulphides			
					Ferroan Dolomite	Calcite	Siderite	Siderite/Magnesite	Pyrite	Sulphide		
					Ca(Fe,Mg)(CO ₃) ₂	CaCO ₃	FeCO ₃	(Fe,Mg)CO ₃	FeS ₂	XRD	ABA	MLA
					mineral %				mineral %	%S		
B3	1	Ultramafic to Mafic Metavolcanic Rocks	Ore/Waste	barrel	38	bd	4.0	bd	bd	bd	0.14	-
				pulp	39	bd	bd	4.4	1.0	0.27	0.22	0.098
B1	1 mixed	Mixed Ultramafic to Mafic Metavolcanic Rocks	Waste	barrel	22	8.0	2.0	bd	bd	bd	0.16	-
				pulp	23	6.4	bd	1.7	1.0	0.27	0.18	0.24
B4	1oj	Mafic Metavolcanic Rocks with Sediments	Waste	barrel	31	bd	2.8	bd	1.2	0.32	0.59	-
B2	5	Early Sedimentary Units (Argillite-Wacke) ¹	Waste	barrel	21	bd	bd	bd	bd	bd	0.32	-
				pulp	23	bd	bd	bd	1.0	0.27	0.27	0.98
B5	5	Early Sedimentary Units (Argillite-Wacke) ¹	Ore/Waste	barrel	34	2.3	bd	bd	bd	bd	0.26	-

Source: Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\BarrelData.1CHO008-014.graphs.rtc_rev07_Boston.xlsx]

Notes:

¹Early and late used in a relative sense only

"-" denotes sample not available for characterization

Acid-Base Accounting

ABA data and the percentile rank for the barrel tests are presented in Table 3-14. The ABA data for the barrel samples were consistent with the overall Boston sample set. Sulphur ranged from the 14th to 60th percentiles compared to their respective rock types. NP ranged from the 13th to 93rd percentiles, while TIC ranged from the 16th to 95th percentiles. All samples were classified as non-PAG on the basis of NP/AP, TIC/AP and TIC_(Ca+Mg)/AP.

Trace Elements

Trace element data for the barrel test samples are presented in Appendix L1. Trace element content of the barrel tests was comparable to the overall Boston sample set (Section 3.1.4).

Table 3-14: ABA Data and Percentile Rank of Total Sulphur, NP and TIC, Barrel Test Samples

Barrel ID	Humidity Cell ID	Lithology	Description	Sample Type	Preliminary Economic Classification	Total Sulphur ²			NP ²			TIC ²			TIC _(Ca+Mg)	NP/AP	TIC/AP	TIC _{(Ca+Mg)/AP}
						n	%S	% Rank	n	kgCaCO ₃ /t	% Rank	n	kgCaCO ₃ /t	% Rank				
B3	- HC-12	1	Ultramafic to Mafic Metavolcanic Rocks	barrel pulp	Ore/Waste	370	0.14	33%	370	281	32%	165	438	89%	339	64	100	78
						370	0.22	52%	370	271	27%	165	397	70%	308	39	57	44
B1	- HC-10	1 mixed	Ultramafic to Mafic Metavolcanic Rocks	barrel pulp	Waste	337	0.16	41%	337	240	13%	148	302	20%	234	48	60	47
						337	0.18	47%	337	240	13%	148	283	16%	219	43	51	39
B4	-	1oj	Mafic Metavolcanic Rocks with Sediments	barrel	Waste	20	0.60	70%	20	262	15%	14	366	27%	284	14	20	15
B2	- HC-11	5	Early Sedimentary Units (Argillite-Wacke) ¹	barrel pulp	Waste	90	0.32	77%	90	146	71%	92	216	72%	167	15	22	17
						90	0.27	74%	90	157	72%	92	222	74%	172	19	26	20
B5	-	5	Early Sedimentary Units (Argillite-Wacke) ¹	barrel	Ore/Waste	90	0.26	69%	90	244	93%	92	335	95%	260	30	41	32

Source: \\van-svr0\projects\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\BarrelData.1CHO008-014.graphs.rtc_rev07_Boston.xlsx]

Notes:

¹Early and late used in a relative sense only

²Barrel and pulp samples of lithology 1 w. sediments (B4) were compared to samples of the same lithology and economic classification in the overall Boston sample set. Barrel and pulp samples of lithologies 1 mixed (B1) was compared to sample set of 1 (waste) and lithology 1 (o/w) (B3) was compared to all samples of lithology 1 due to limited number of samples of 1 mixed and 1 (o/w). Lithology 5 (B2 and B5) were compared to samples of the same lithology irrespective of economic classification.

Table 3-15: Percentile Rank of Arsenic Content, Barrel Test Samples

Barrel ID	Humidity Cell ID	Lithology	Description	Sample Type	Preliminary Economic Classification	No. of Samples ²	As	
							ppm	% Rank ³
B3	- HC-12	1	Ultramafic to Mafic Metavolcanic Rocks	barrel pulp	Ore/Waste	119	160	62%
						119	190	67%
B1	- HC-10	1 mixed	Ultramafic to Mafic Metavolcanic Rocks	barrel pulp	Waste	342	110	47%
						342	81	40%
B4	-	1oj	Mafic Metavolcanic Rocks with Sediments	barrel	Waste	23	140	62%
B2	- HC-11	5	Early Sedimentary Units (Argillite-Wacke) ¹	barrel pulp	Waste	85	28	24%
						85	30	26%
B5	-	5	Early Sedimentary Units (Argillite-Wacke) ¹	barrel	Ore/Waste	85	120	91%

Source: \\van-svr0\projects\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\BarrelData.1CHO008-014.graphs.rtc_rev07_Boston.xlsx]

Notes:

¹Early and late used in a relative sense only

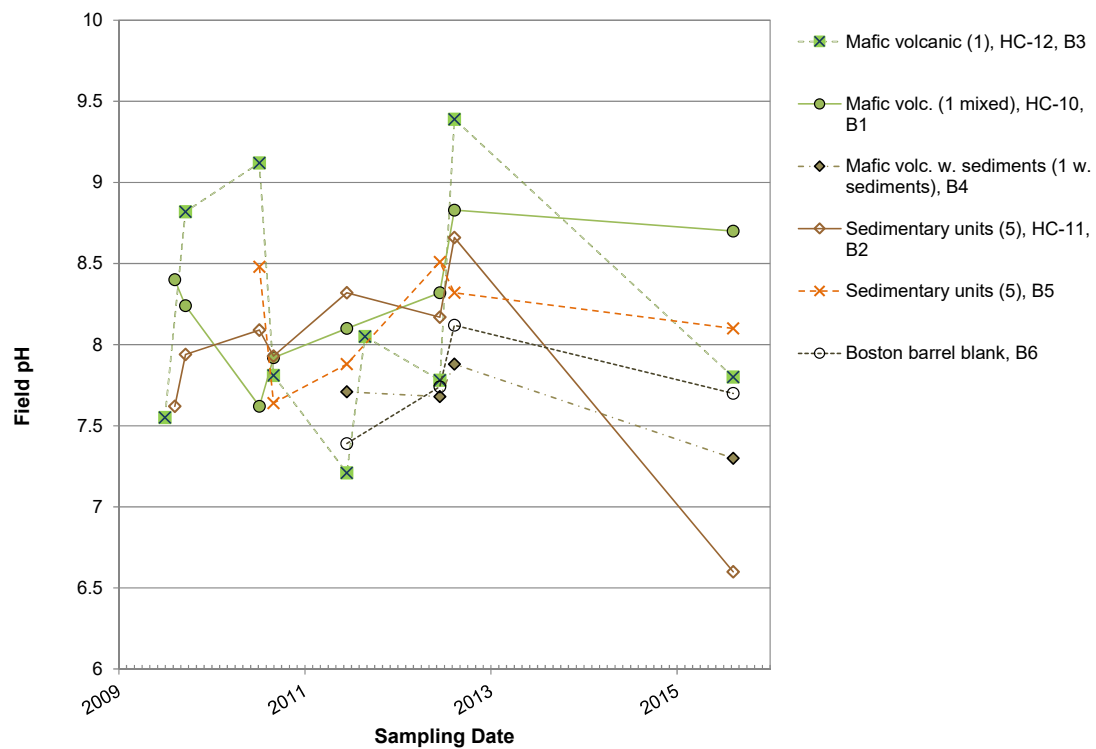
²Barrel and pulp samples of lithology 1 w. sediments (B4) were compared to samples of the same lithology and economic classification in the overall Boston sample set. Barrel and pulp samples of lithologies 1 mixed (B1) was compared to sample set of 1 (waste) and lithology 1 (o/w) (B3) was compared to all samples of lithology 1 due to limited number of samples of 1 mixed and 1 (o/w). Lithology 5 (B2 and B5) were compared to samples of the same lithology irrespective of economic classification.

3.3.2 Barrel Test Data

This section discusses the barrel test monitoring data. Boston source terms for the Project are presented in SRK (2016). Between 2008 and 2015, the barrel tests were inspected for leachate on eight and eleven occasions, however leachate was not available each time (Table 2-6). The raw data and figures showing trends for the Boston barrel tests and the barrel blank are provided in Appendix L3 and Appendix L4.

The pH values for all tests were circumneutral to alkaline (7.2 to 9.4). Arsenic, cobalt and nickel release rates were identified as having noteworthy trends (Figure 3-26). Average rates are presented in Table 3-16 and trends for these aforementioned parameters and sulphate are discussed as follows:

- Sulphate
 - Sulphate leaching rates showed annual variations, with barrels B2 (sedimentary units, 5) and B4 (mafic volcanics with sediments, 1oj) yielding the highest rates overall (Figure 3-26). Sulphate release rates were generally below 0.2 mg/kg/week (Table 3-16).
- Arsenic
 - Release rates for B3 (mafic metavolcanics ore/waste, 1), and to a lesser degree B1 (mixed mafic metavolcanics, 1 mixed) and B5 (sedimentary units, 5), were higher compared to the other samples. Average arsenic release rates for these aforementioned barrels were within an order of magnitude or at least one order of magnitude higher. Release rates were lowest for B2 (sedimentary units, 5).
 - Figure 3-27 suggests there is a relationship between higher average arsenic release rates and higher arsenic content for samples of mafic metavolcanics (1) and sedimentary units (5), but not for the samples of mafic metavolcanics with sediments (1oj).
- Cobalt
 - Average release rates were highest for B4 (mafic metavolcanics mixed with sediments, 1oj) by approximately one or more orders of magnitude. The release rate was lowest for B2 (sedimentary units, 5).
 - There was no clear relationship between cobalt solid-phase content and cobalt release rates.
- Nickel
 - Average release rates were highest for B4 (mafic metavolcanics mixed with sediments, 1oj) and B3 (mafic metavolcanics ore/waste, 1). Average nickel release rates for these barrels were within an order of magnitude or at least one order of magnitude higher than those of the remaining samples. The release rate was lowest for B2 (sedimentary units, 5).
 - There was no clear relationship between nickel solid-phase content and nickel release rates.



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Figure 3-25: Leachate pH for Boston Barrel Tests

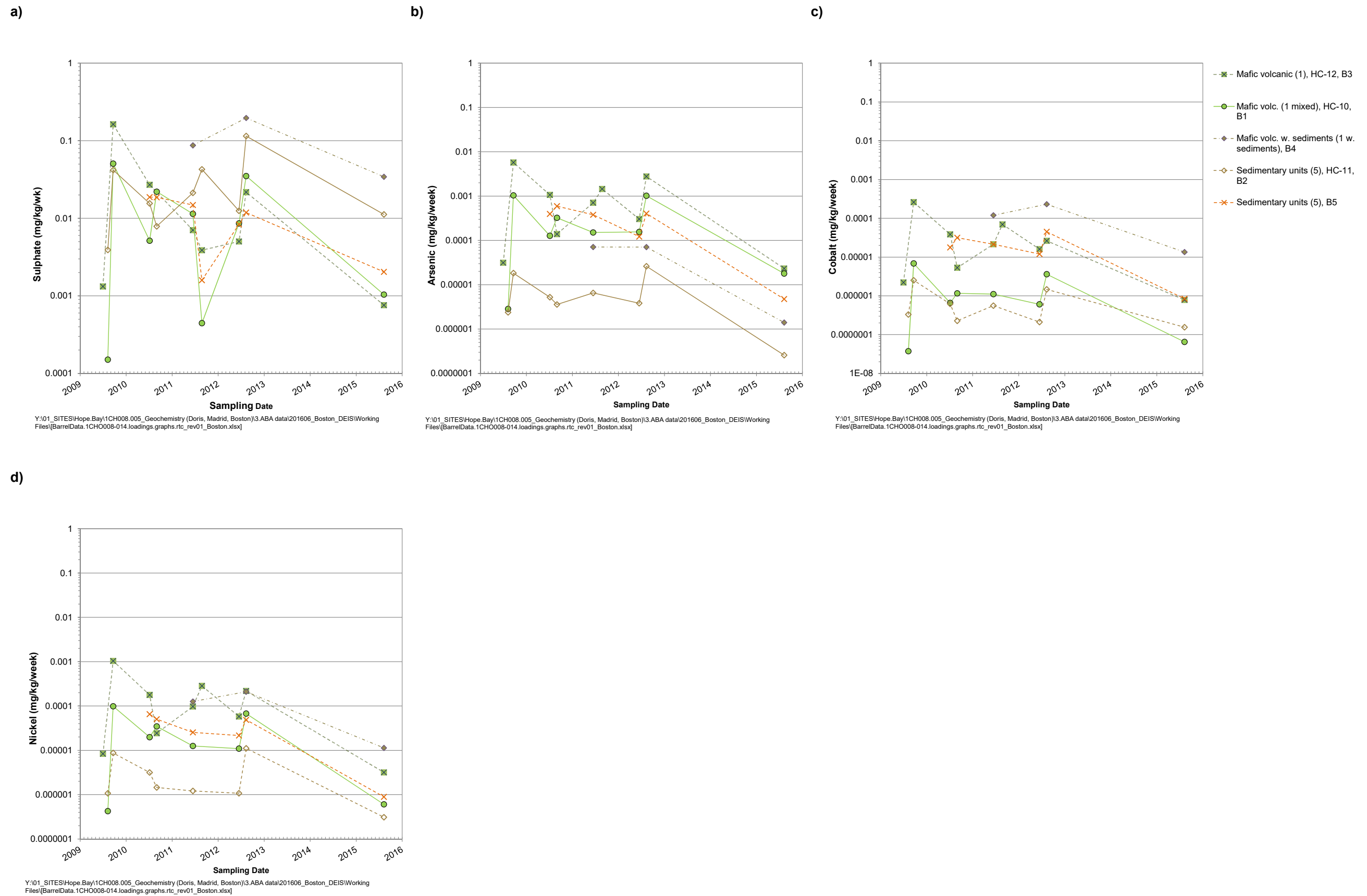
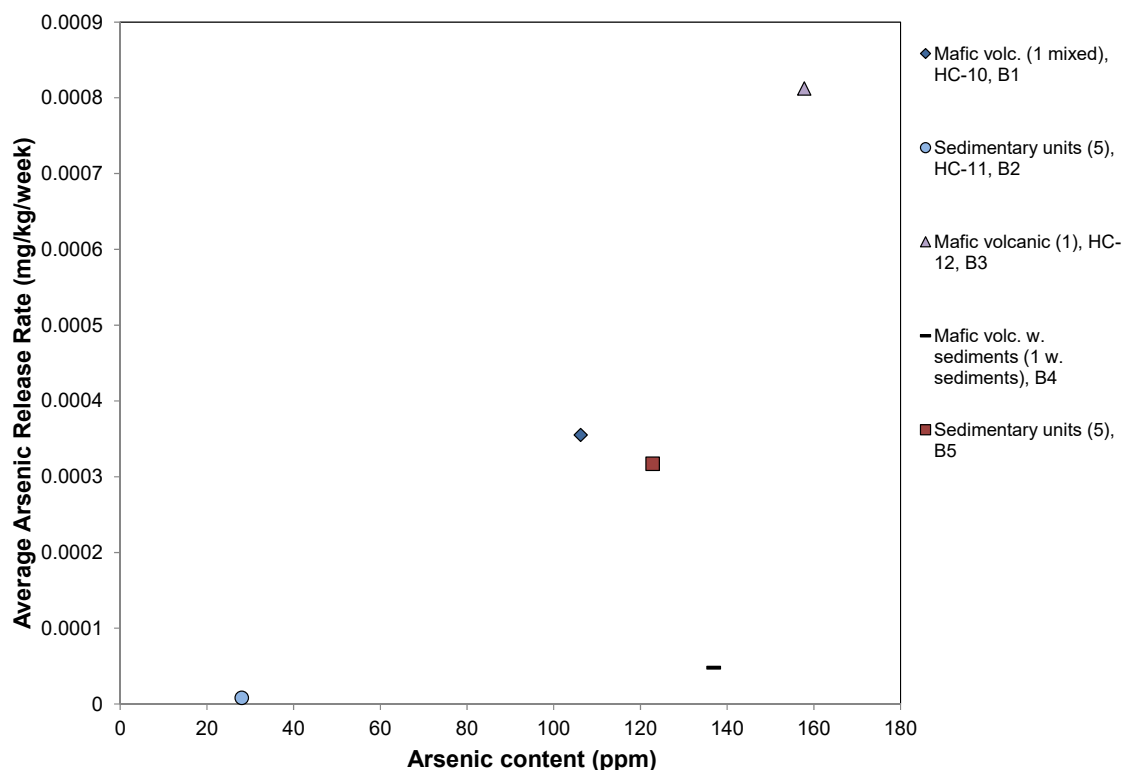


Figure 3-26: pH Trends and Sulphate, Arsenic, Cobalt and Nickel Release Rates, Barrel Test Leachates



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Figure 3-27: Comparison of Average Arsenic Release Rates and Arsenic Content, Barrel Tests

3.3.3 Comparison of Humidity Cell Tests and Barrel Tests Release Rates

Table 3-16 compares the average release rates from the humidity cell tests (HCTs) and barrel tests for sulphate and trace elements that were identified as having noteworthy trends (Sections 3.2.2 and 3.3.2). In general, higher rates are expected from the humidity cell tests due to higher temperatures and smaller grain size. Additionally, for parameters where there are geochemical controls on concentrations, leach rates are generally expected to be higher in the smaller scale tests. Key points are discussed below for each parameter.

- Sulphate release rates from HCTs were generally one to three orders of magnitude higher than those of the barrel tests.
- Antimony release rates from HCTs ranged from the same order of magnitude and up to two orders of magnitude higher than those of the barrel tests.
- Arsenic humidity cell tests release rates were one to four orders of magnitude higher than those of barrel tests, with the exception of B4 (sedimentary units, 5, ore/waste). The arsenic release rate from B4 was twice as high as that of the waste sample HC-11 (sedimentary units, 5). It was however one to two orders of magnitude lower than those of the remaining sedimentary units (5) humidity cell tests (HC-34 and HC-35).

- Cobalt release rates from HCTs were within an order of magnitude and up to two orders of magnitude higher than those of barrels. The cobalt release rate from B4 (sedimentary units, 5, ore/waste) was comparable to HC-11 (sedimentary units, 5, waste)
- Nickel release rates from HCTs were most comparable to those of the barrels. Release rates from B3 (mafic metavolcanics, 1, ore/waste), B5 (sedimentary units, 5, ore/waste), and B4 (mafic metavolcanics with sediments, 1oj, waste) were within the same order of magnitude as HCTs of the same rock types. For all other barrel samples, release rates were up to two orders of magnitude lower.
- Humidity cell samples HC-10 (mixed mafic metavolcanics, 1 mixed), HC-11 (sedimentary units, 5) and HC-12 (mafic metavolcanics, ore/waste, 1) were collected from the same drill core interval as barrel samples B1, B2 and B3, respectively. Concentrations from these humidity cell tests were generally one to orders of magnitude higher than those of their corresponding barrel tests, with the exception of nickel concentration for HC-12 (mafic metavolcanics, ore/waste, 1), which was within an order of magnitude of B3.

Table 3-16: Comparison of Release Rates from Humidity Cell Tests (HCTs) and Barrel Tests, Boston

Rock Type	Description	Humidity Cell/ Barrel ID	Preliminary Economic Classification	Release Rate ¹					
				Sulphate	Antimony	Arsenic	Cobalt	Molybdenum	Nickel
				mg/kg/week					
1	Ultramafic to Mafic Metavolcanic Rocks	HC-31	Waste	1.1	0.00033	0.032	0.00031	0.000046	0.00018
		HC-55	Waste	1	0.0006	0.023	0.00027	0.000087	0.00042
		HC-12	Ore/Waste	0.9	0.00062	0.08	0.00065	0.000041	0.00059
		B3	Ore/Waste	0.074	0.000042	0.00081	0.000023	0.0000034	0.00011
1 mixed	Mixed Mafic Metavolcanics	HC-10	Waste	0.84	0.00087	0.023	0.000078	0.000039	0.0003
		B1	Waste	0.056	0.000013	0.00036	0.0000018	0.0000024	0.000031
1oj	Mafic Metavolcanics with Sediments	HC-32	Waste	2.2	0.00083	0.13	0.00055	0.000076	0.00085
		HC-33	Waste	1.8	0.0011	0.18	0.0006	0.000058	0.00089
		B4	Waste	0.11	0.0000058	0.000048	0.00012	0.0000011	0.00012
5	Early Sedimentary Units (Argillite- Wacke)	HC-11	Waste	12	0.00012	0.0002	0.000027	0.00027	0.000062
		HC-34	Waste	6.1	0.00071	0.00081	0.00012	0.0019	0.00029
		HC-35	Waste	1.1	0.00034	0.0063	0.00017	0.0017	0.00026
		B2	Waste	0.11	0.0000073	0.0000083	7.6E-07	0.0000041	0.0000035
		B5	Ore/Waste	0.032	0.000031	0.00032	0.000021	0.0000062	0.000035

Source: \\VAN-SVR0\Projects\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\HB_WR_Outcomes.mc.REV14.xlsx

Notes:

¹Rate is average for barrel tests and stable rate for humidity cell test (HCT).

No barrels were set up for lithology 12q (quartz vein).

4 Conclusions

The most volumetrically significant waste rock lithologies are mafic metavolcanics (1) and sedimentary units (5). The ore is hosted in quartz veins (12q), mafic metavolcanics with sediments (1oj) and mafic metavolcanics (1). Mafic metavolcanics with sediments (1oj), late intermediate dyke (9n) and late gabbro (10a) are volumetrically less significant waste lithologies.

The risk of ARD for Boston is low, with 92 to 96% of the overall sample set classified as non-PAG, 3 to 8% classified as uncertain, and two samples (or 0.3% of the sample set) classified as PAG. Boston ore samples were characterized by higher levels of total sulphur compared to waste, with 90th percentiles of 3.6 and 0.71% for ore and waste, respectively. Sulphur levels for Boston (75th percentiles of 0.38%) were higher than Doris, Madrid North, and Madrid South (0.26, 0.28 and 0.11%, respectively).

NP and TIC values were high (median values for all rock types greater than 85 kg CaCO₃ eq./t). The overestimation of neutralization potential due to the presence of NP-neutral iron carbonates was assessed by calculating an effective TIC (TIC_(Ca+Mg)) based on the lowest calcium-plus-magnesium content of 78% in the Boston humidity cell test samples.

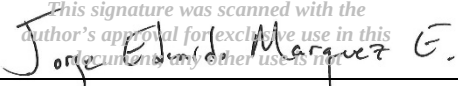
All the volumetrically significant rock types contained samples with elevated solid-phase arsenic. Compared to the other Hope Bay deposits, arsenic content for mafic metavolcanics from Boston were higher than Madrid South and generally comparable to Madrid North.

The eleven humidity cell tests and five barrel tests maintained neutral to alkaline pH values. Higher leaching rates for these elements are expected from mafic metavolcanics (1) classified as ore/waste, mafic metavolcanics with sediments (1oj) classified as waste, and quartz vein (12q) classified as either waste or ore.

The humidity cell tests data indicated that arsenic leaching is related to solid-phase arsenic content, and arsenic, antimony, cobalt and nickel leaching is possibly related to the trace occurrence of the sulphide mineral gersdorffite (NiAsS), which requires detailed petrographic examination to identify. Gersdorffite forms a solids solution with cobaltite (CoAsS) and antimony readily substitutes for arsenic, therefore gersdorffite likely contains some cobalt and arsenic. There is no practical field technique for segregation of waste rock that contains gersdorffite.

During mine development approximately 45% of Boston waste rock will be placed on surface in a temporary stockpile while the remainder will never be removed from the underground. At closure, all Boston waste rock will have been placed as backfill in the Boston underground. In the event localized ARD is produced, it is anticipated that the high carbonate content in the overall waste rock stockpile would provide sufficient buffering capacity, and that the overall drainage from the stockpile would remain neutral to alkaline. Water quality from the waste rock stockpile will reflect concentrations from a mixture of rock types. Contact water will be collected in a lined collection pond and transferred to the water treatment plant. Source terms for the Project are presented in SRK (2017).

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All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

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Appendices

Appendix A – Historical Samples, Acid-Base Accounting and Trace Element
Data, Boston

Appendix A: Historical Samples, Acid-Base Accounting Data

Sample ID	SRK Serial Number	Data Reference	Lithology ¹	Preliminary Economic Classification	Paste pH	Total S	Sulphate	TIC (Direct)_Leco	Sobek NP	Fizz
						(Wt.%)	(Wt.%)	(Wt.%CO ₂)	kgCaCO ₃ /t	
97 OD 119	730	Rescan (1999)	1	W	9.2	0.13			417	Strong
97 OD 121	731	Rescan (1999)	1	W	8.3	0.09			366	Strong
97 OD 123	732	Rescan (1999)	1	W	8.4	0.25			404	Strong
97 OD-125	733	Rescan (1999)	1	W	9.0	0.09			403	Moderate
97 OD-127	734	Rescan (1999)	1	W	8.7	0.15			379	Moderate
97 OD-129	735	Rescan (1999)	1	W	8.6	0.08			370	Moderate
97 OD-131	736	Rescan (1999)	1	W	8.8	0.2			381	Moderate
97 OD-133	737	Rescan (1999)	1	W	9.4	0.22			421	Moderate
97 OD-135	738	Rescan (1999)	1	W	9.2	0.27			420	Moderate
97OD-137	739	Rescan (1999)	1	W	8.8	0.45			343	Moderate
97OD-139	740	Rescan (1999)	1	W	8.1	0.38			332	Moderate
97OD-141	741	Rescan (1999)	1	W	9.3	0.18			397	Moderate
97-OD-143	742	Rescan (1999)	1	W	8.9	0.23			421	Moderate
97-OD-145	743	Rescan (1999)	1	W	8.9	0.16			398	Moderate
97-OD-147	744	Rescan (1999)	1	W	8.8	0.2			391	Moderate
97-OD-149	745	Rescan (1999)	1	W	8.6	0.41			361	Moderate
97-OD-151	746	Rescan (1999)	1	W	8.2	0.59			318	Moderate
9700-153 ABA	747	Rescan (1999)	1	W	8.1	0.34			302	Moderate
9700-155 ABA	748	Rescan (1999)	1	W	8.3	0.13			373	Moderate
9700-157 ABA	749	Rescan (1999)	1	W	8.2	0.34			387	Moderate
97 OD 159	750	Rescan (1999)	1	W	9.1	0.12			452	Moderate
97 OD 161	751	Rescan (1999)	1	W	8.0	0.2			339	Moderate
97 OD 163	752	Rescan (1999)	1	W	9.1	0.04			363	Moderate
97 OD 165	753	Rescan (1999)	1	W	8.8	0.18			442	Moderate
97OD-167	754	Rescan (1999)	1	W	8.0	0.55			399	Moderate
97OD-169	755	Rescan (1999)	1	W	8.0	0.37			355	Moderate
97-OD-171 (ABA)	756	Rescan (1999)	1	W	8.1	1.2			323	Moderate
97-OD-173 (ABA)	757	Rescan (1999)	1	W	8.8	1.3			372	Moderate
97 OD 175 ABA	758	Rescan (1999)	1	W	8.5	0.33			361	Moderate
97 OD 177 ABA	759	Rescan (1999)	1	W	7.9	0.16			345	Moderate
97 OD 179 ABA	760	Rescan (1999)	1	W	8.4	0.46			294	Moderate
97 OD 181 ABA	761	Rescan (1999)	1	W	8.0	0.39			294	Moderate
97 OD 183 ABA	762	Rescan (1999)	1	W	8.4	0.81			267	Moderate
97 OD 185 ABA	763	Rescan (1999)	1	W	7.8	0.39			303	Moderate
97 OD 187 ABA	764	Rescan (1999)	1	W	8.0	0.25			337	Moderate
97 OD 189 ABA	765	Rescan (1999)	1	W	8.5	0.14			369	Moderate
97OD 191 ABA	766	Rescan (1999)	1	W	8.2	0.54			354	Moderate
97OD 193 ABA	767	Rescan (1999)	1	W	8.1	0.16			336	Moderate
97OD 195 ABA	768	Rescan (1999)	1	W	8.3	0.38			328	Moderate
97OD 197 ABA	769	Rescan (1999)	1	W	8.3	0.23			327	Moderate
97OD 199 ABA	770	Rescan (1999)	1	W	8.2	0.22			325	Moderate
97OD-201 ABA	771	Rescan (1999)	1	W	7.8	0.21			324	Moderate
97OD-203 ABA	772	Rescan (1999)	1	W	8.1	0.23			303	Moderate
97OD-205 ABA	773	Rescan (1999)	1	W	8.0	0.17			332	Moderate
97OD-207 ABA	774	Rescan (1999)	1	W	7.9	0.33			342	Moderate
97OD-209 ABA	775	Rescan (1999)	1	W	8.0	0.25			299	Moderate
97OD-211 ABA	776	Rescan (1999)	1	W	8.0	0.15			352	Moderate
97OD-213 ABA	777	Rescan (1999)	1	W	8.1	0.15			343	Moderate
97OD-215 ABA	778	Rescan (1999)	1	W	8.3	0.13			417	Strong
97OD-217 ABA	779	Rescan (1999)	1	W	8.7	1.2			308	Moderate
97OD-219 ABA	780	Rescan (1999)	1	W	8.6	0.32			422	Strong
97OD-221 ABA	781	Rescan (1999)	1	W	8.7	0.2			371	Moderate
97OD-223 ABA	782	Rescan (1999)	1	W	8.5	0.24			341	Moderate
97OD-225 ABA	783	Rescan (1999)	1	W	8.7	0.38			340	Moderate
97OD-227 ABA	784	Rescan (1999)	1	W	9.1	0.18			339	Moderate
97OD-229 ABA	785	Rescan (1999)	1	W	8.6	0.15			326	Moderate
97OD-231 ABA	786	Rescan (1999)	1	W	9.4	0.39			224	Moderate
97OD-233 ABA	787	Rescan (1999)	1	W	9.3	0.79			316	Moderate
97OD-235 ABA	788	Rescan (1999)	1	W	8.4	0.24			275	Moderate
97-OD-237 ABA	789	Rescan (1999)	1	W	8.8	0.21			289	Moderate
97-OD-239 ABA	790	Rescan (1999)	1	W	9.3	0.18			302	Moderate
97-OD-241 ABA	791	Rescan (1999)	1	W	9.5	0.22			374	Moderate
97-OD-243 ABA	792	Rescan (1999)	1	W	9.5	0.15			280	Moderate
97-OD-245 ABA	793	Rescan (1999)	1	W	9.1	0.29			268	Moderate
97-OD-249 ABA	794	Rescan (1999)	1	W	8.5	0.17			320	Moderate
97-OD-251 ABA	795	Rescan (1999)	1	W	9.6	0.11			350	Moderate
97-OD-254 ABA	796	Rescan (1999)	1	W	9.3	0.29			293	Moderate
97-OD-255 ABA	797	Rescan (1999)	1	W	9.2	0.09			399	Moderate
97OD 257 ABA	798	Rescan (1999)	1	W	8.4	0.13			358	Strong
97OD 259 ABA	799	Rescan (1999)	1	W	8.4	0.06			218	Strong
97OD 261 ABA	800	Rescan (1999)	1	W	8.5	0.05			226	Strong
97OD 263 ABA	801	Rescan (1999)	1	W	8.5	0.08			215	Strong
97OD 265 ABA	802	Rescan (1999)	1	W	8.4	0.06			272	Strong
97OD 267 ABA	803	Rescan (1999)	1	W	8.5	0.22			296	Strong
97OD 269 ABA	804	Rescan (1999)	1	W	8.7	0.09			257	Strong
97OD 271 ABA	805	Rescan (1999)	1	W	9.1	0.07			416	Strong
97OD 273 ABA	806	Rescan (1999)	1	W	8.6	0.05			249	Strong
97OD 275 ABA	807	Rescan (1999)	1	W	8.7	0.1			309	Strong
97OD 277 ABA	808	Rescan (1999)	1	W	8.3	0.21			357	Strong
97OD 279 ABA	809	Rescan (1999)	1	W	8.5	0.42			419	Strong
97OD 281 ABA	810	Rescan (1999)	1	W	8.3	0.13			384	Moderate
9 OD 283 ABA	811	Rescan (1999)	1	W	9.0	0.17			378	Moderate
97OD 285 ABA	812	Rescan (1999)	1	W	8.4	0.1			353	Moderate
97OD-287 ABA	813	Rescan (1999)	1	W	8.7	0.08			367	Moderate
97OD-289 ABA	814	Rescan (1999)	1	W	8.4	0.22			278	Moderate
97OD-291 ABA	815	Rescan (1999)	1	W	8.5	0.29			346	Moderate
97OD 293	816	Rescan (1999)	1	W	8.6	0.04			182	Moderate
97OD-295-ABA	817	Rescan (1999)	1	W	8.4	0.01			206	Moderate
97OD-297-ABA	818	Rescan (1999)	1	W	8.6	0.1			331	Moderate
97OD-301 ABA	819	Rescan (1999)	1	W	8.9	0.18			386	Moderate
97OD-303 ABA	820	Rescan (1999)	1	W	8.4	0.25			387	Moderate
97OD-305 ABA	821	Rescan (1999)	1	W	8.9	0.33			324	Moderate
97OD-307 ABA	822	Rescan (1999)	1	W	8.8	0.4			332	Moderate
97OD-309 ABA	823	Rescan (1999)	1	W	9.2	0.21			298	Moderate
97OD 311 ABA	824	Rescan (1999)	1	W	8.4	0.19			279	Moderate
97OD 313 ABA	825	Rescan (1999)	1	W	8.6	0.11			339	Moderate
97OD 315 ABA	826	Rescan (1999)	1	W	8.7	0.18			366	Moderate
97OD 317	827	Rescan (1999)	1	W	9.0	0.52			312	Moderate
97OD319 ABA	828	Rescan (1999)	1	W	8.1	0.24			360	Moderate
97OD 321	829	Rescan (1999)	1	W	8.6	0.1			323	Moderate
97OD-323 ABA	830	Rescan (1999)	1	W	8.2	0.21			292	Strong
97OD-325 ABA	831	Rescan (1999)	1	W	8.5	0.62			336	Moderate
97OD-327 ABA	832	Rescan (1999)	1	W	8.8	1.8			391	Moderate
97OD-329 ABA	833	Rescan (1999)	1	W	9.0	0.63			339	Moderate
97OD-331 ABA	834	Rescan (1999)	1	W	9.3	0.4			368	Moderate
97OD-333 ABA	835	Rescan (1999)	1	W	8.6	0.63			337	Moderate
97OD-335 ABA	836	Rescan (1999)	1	W	8.3	0.11			327	Moderate
97OD-337 ABA	837	Rescan (1999)	1	W	9.2	0.04			318	Strong
97-OD-341 ABA	838	Rescan (1999)	1	W	8.0	0.25			383	Moderate
97-OD-343 ABA	839	Rescan (1999)	1	W	9.0	0.07			340	Moderate
97-OD-345 ABA	840	Rescan (1999)	1	W	8.5	0.1			302	Moderate
97-OD-347 ABA	841	Rescan (1999)	1	W	9.0	0.07			319	Moderate
97-OD-349 ABA	842	Rescan (1999)	1	W	8.4	0.17			305	Moderate
97OD-351ABA	843	Rescan (1999)	1	W	8.5	0.18			322	Moderate
353 ABA	844	Rescan (1999)	1	W	8.2	0.17			288	Moderate
97OD 355 ABA	845	Rescan (1999)	1	W	8.7	0.19			308	Moderate

Appendix A: Historical Samples, Acid-Base Accounting Data

Sample ID	SRK Serial Number	Data Reference	Lithology ¹	Preliminary Economic Classification	Paste pH	Total S	Sulphate	TIC (Direct)_Leco	Sobek NP	Fizz
						(Wt.%)		(Wt.%CO2)		
97OD-357 ABA	846	Rescan (1999)	1	W	8.2	0.54			289	Moderate
97OD-359 ABA	847	Rescan (1999)	1	W	8.3	0.32			294	Moderate
97 OD 361 ABA	848	Rescan (1999)	1	W	8.2	0.18			279	Moderate
97 OD 363 ABA	849	Rescan (1999)	1	W	8.3	0.54			297	Moderate
97 OD 365 ABA	850	Rescan (1999)	1	W	8.3	0.46			273	Moderate
97 OD 367 ABA	851	Rescan (1999)	1	W	8.1	1.1			338	Moderate
97-OD-369 ABA	852	Rescan (1999)	1	W	8.7	0.2			333	Moderate
97-OD-371 ABA	853	Rescan (1999)	1	W	8.4	0.53			342	Moderate
97-OD-373 ABA	854	Rescan (1999)	1	W	8.3	0.26			316	Moderate
97-OD-375 ABA	855	Rescan (1999)	1	W	8.2	0.1			343	Moderate
92NOD22 185	856	Rescan (1999)	1	W	9.6	0.17	0.01	13	282	Moderate
92NOD04 75	857	Rescan (1999)	1	W	9.2	0.36	0.01	22	434	Moderate
93NOD57 195	859	Rescan (1999)	1	W	9.6	0.07	0.01	16	313	Moderate
93NOD48 128	860	Rescan (1999)	1	W	9.6	0.09	0.01	16	292	Moderate
93NOD48 195	861	Rescan (1999)	1	W	8.7	0.04	0.01	21	422	Moderate
93NOD70 130	862	Rescan (1999)	1	W	9.5	0.22	0.01	13	236	Moderate
93NOD70 290	863	Rescan (1999)	1	W	9.5	0.3	0.01	16	308	Strong
95NOD150 210	864	Rescan (1999)	1	W	9.5	0.1	0.01	14	318	Moderate
92NOD22 150	865	Rescan (1999)	1	W	8.5	0.11	0.01	8.2	213	Strong
93NOD57 230	866	Rescan (1999)	1	W	9.0	0.05	0.01	16	324	Moderate
93NOD57 280	867	Rescan (1999)	1	W	8.8	0.09	0.01	11	249	Strong
95NOD154 260	868	Rescan (1999)	1	W	9.0	0.12	0.01	17	407	Strong
95NOD150 168	869	Rescan (1999)	1	W	9.7	0.13	0.01	16	392	Strong
95NOD150 175	870	Rescan (1999)	1	W	9.1	0.1	0.01	5	133	Strong
92NOD22 120	871	Rescan (1999)	1	W	9.6	0.03	0.01	15	304	Moderate
93NOD57 210	872	Rescan (1999)	1	W	9.3	0.18	0.01	18	339	Moderate
95NOD156 110	873	Rescan (1999)	1	W	9.5	0.07	0.01	15	336	Strong
92NOD22 265	874	Rescan (1999)	1	W	9.3	0.93	0.01	11	216	Moderate
94NOD120 190	875	Rescan (1999)	1	O	9.0	1.8	0.01	7.3	139	Moderate
94NOD120 225	876	Rescan (1999)	12q	W	9.1	2.1	0.01	14	243	Strong
93NOD44 220	877	Rescan (1999)	12q	O	9.5	0.16	0.01	15	278	Moderate
94NOD113 180	878	Rescan (1999)	1	O	9.0	1.7	0.01	14	263	Strong
94NOD120 210	879	Rescan (1999)	1	O	8.8	3.1	0.01	16	301	Strong
93NOD57 170	880	Rescan (1999)	1	W	9.5	0.21	0.01	21	340	Moderate
94NOD113 80	881	Rescan (1999)	1	W	9.3	0.38	0.01	18	350	Moderate
94NOD121A 165	882	Rescan (1999)	1	W	9.5	1.9	0.01	18	350	Strong
94NOD113 65	883	Rescan (1999)	1	O	9.6	0.17	0.01	16	318	Moderate
94NOD 120 100	884	Rescan (1999)	1	W	9.3	0.53	0.01	17	325	Moderate
94NOD141 225	885	Rescan (1999)	1	W	9.3	0.4	0.01	24	457	Moderate
94NOD121A 140	886	Rescan (1999)	1	O	9.0	0.14	0.01	25	444	Moderate
94NOD120 72	887	Rescan (1999)	12q	O	8.8	3.9	0.01	14	275	Moderate
93NOD70 245	888	Rescan (1999)	1	W	9.6	0.04	0.01	15	302	Moderate
93NOD70 278	889	Rescan (1999)	1	W	9.4	1.3	0.01	23	430	Moderate
94NOD113 145	890	Rescan (1999)	1	W	9.0	0.19	0.01	16	290	Strong
92NOD20 90	891	Rescan (1999)	1	W	9.3	0.34	0.01	16	316	Moderate
93NOD48 178	892	Rescan (1999)	1	W	8.6	0.28	0.01	0.4	9	None
94NOD120 155	893	Rescan (1999)	1	W	9.1	0.73	0.01	9.7	176	Moderate
92NOD20 150	894	Rescan (1999)	5	W	9.3	0.18	0.01	17	295	Moderate
92NOD20 185	895	Rescan (1999)	5	W	8.7	0.7	0.01	7.1	83	Slight
92NOD10 160	896	Rescan (1999)	5	W	9.5	0.21	0.01	14	255	Moderate
93NOD28 50	897	Rescan (1999)	5	W	8.4	0.25	0.01	5.6	120	Moderate
93NOD28 80	898	Rescan (1999)	5	W	9.5	0.34	0.01	16	328	Moderate
93NOD57 195	899	Rescan (1999)	1	W	9.6	0.07	0.02	16	313	Strong
94NOD120 210	901	Rescan (1999)	1	O	8.8	3.1	0.01	16	301	Strong
93NOD57 170	903	Rescan (1999)	1	W	9.5	0.21	0.01	21	340	Moderate
96B2N02	914	Rescan (1997)	1q	O	8.6	4.4			170	
96B2N04	915	Rescan (1997)	1q	O	8.5	3.6			192	
96B2N06	916	Rescan (1997)	1q	O	8.8	3.2			269	
96B2N08	917	Rescan (1997)	1q	O	8.7	3.2			255	
96B2N10	918	Rescan (1997)	1q	O	8.2	4.9			214	
96B2N12	919	Rescan (1997)	1q	O	8.6	3.8			236	
96B2N14	920	Rescan (1997)	1q	O	8.5	2.8			238	
96B2N16	921	Rescan (1997)	1q	O	8.4	4.1			281	
96B2N18	922	Rescan (1997)	1q	O	8.4	2.2			319	
96B2N20	923	Rescan (1997)	1q	O	8.3	3.3			240	
96B2N22	924	Rescan (1997)	1q	O	8.3	3.1			234	
96B2N24	925	Rescan (1997)	1q	O	8.0	3.4			202	
96B2N26	926	Rescan (1997)	1q	O	8.3	2.6			194	
96B2N28	927	Rescan (1997)	1q	O	8.2	1.5			265	
96B2N30	928	Rescan (1997)	1q	O	8.2	1.8			256	
96B2N32	929	Rescan (1997)	1q	O	8.2	1.7			323	
96B2N34	930	Rescan (1997)	1q	O	8.7	0.72			381	
96B2N36	931	Rescan (1997)	1q	O	8.6	2.2			312	
96B2N38	932	Rescan (1997)	1q	O	8.6	0.49			335	
96B2N40	933	Rescan (1997)	1q	O	8.6	0.75			410	
96B2N42	934	Rescan (1997)	1q	O	8.6	1.6			280	
96B2N44	935	Rescan (1997)	1q	O	8.6	0.54			214	
96B2N46	936	Rescan (1997)	1q	O	8.5	0.53			279	
96B2N48	937	Rescan (1997)	1q	O	8.3	1.2			332	
96B2N50	938	Rescan (1997)	1q	O	8.4	0.68			292	
96B2N52	939	Rescan (1997)	1q	O	8.5	1.3			323	
96B2N54	940	Rescan (1997)	1q	O	8.7	0.77			333	
96B2N56	941	Rescan (1997)	1q	O	8.8	0.89			331	
96B2N58	942	Rescan (1997)	1q	O	8.9	1			299	
96B2N60	943	Rescan (1997)	1q	O	8.5	1.6			299	
96B2N62	944	Rescan (1997)	1q	O	8.6	2.8			337	
96B2N64	945	Rescan (1997)	1q	O	8.5	5			211	
96B2N66	946	Rescan (1997)	1q	O	8.4	3.4			211	
96B2N68	947	Rescan (1997)	1q	O	8.5	3.2			404	
96B2N70	948	Rescan (1997)	1q	O	8.8	2.9			250	
96B2N72	949	Rescan (1997)	1q	O	8.1	0.71			73	
96B2N74	950	Rescan (1997)	1q	O	8.3	1.9			210	
96B2N76	951	Rescan (1997)	1q	O	8.2	3.1			297	
96B2N78	952	Rescan (1997)	1q	O	8.3	3.1			217	
96B2N84	953	Rescan (1997)	1q	O	8.8	0.44			73	
96B2N88	954	Rescan (1997)	1q	O	8.7	1.8			211	
96B2NR1+2	955	Rescan (1997)	1q	O	8.4	3.6			304	
96B2NR3+4	956	Rescan (1997)	1q	O	8.3	2.8			337	
96B2NR5+6	957	Rescan (1997)	1q	O	8.2	2.4			191	
96B2NR7+8	958	Rescan (1997)	1q	O	8.6	2.6			296	
96B2S02	959	Rescan (1997)	1q	O	8.4	4.1			181	
96B2S04	960	Rescan (1997)	1q	O	8.6	2.6			275	
96B2S06	961	Rescan (1997)	1q	O	8.6	3.1			291	
96B2S08	962	Rescan (1997)	1q	O	8.2	2.3			262	
96B2S10	963	Rescan (1997)	1q	O	8.6	3.6			292	
96B2S12	964	Rescan (1997)	1q	O	8.7	4.4			232	
96B2S14	965	Rescan (1997)	1q	O	8.7	3.2			200	
96B2S16	966	Rescan (1997)	1q	O	8.6	2.4			159	
96B2S18	967	Rescan (1997)	1q	O	8.8	1.6			187	
96B2S20	968	Rescan (1997)	1q	O	8.8	1.4			210	
96B2S22	969	Rescan (1997)	1q	O	8.9	1.3			287	
96B2S24	970	Rescan (1997)	1q	O	8.9	2			274	
96B2S26	971	Rescan (1997)	1q	O	9.0	2.6			212	
96B2S28	972	Rescan (1997)	1q	O	8.5	2.8			245	
96B2SR3/4	973	Rescan (1997)	1q	O	8.7	2.2			172	
96B2SR5/6	974	Rescan (1997)	1q	O	8.5	3.2			149	

Appendix A: Historical Samples, Acid-Base Accounting Data

Sample ID	SRK Serial Number	Data Reference	Lithology ¹	Preliminary Economic Classification	Paste pH	Total S	Sulphate	TIC (Direct)_Leco	Sobek NP	Fizz
						(Wt.%)				
96B2SR7/8	975	Rescan (1997)	1qj	O	8.7	3.7			267	
96B2SR9	976	Rescan (1997)	1qj	O	8.7	5.7			201	
96B3N02	977	Rescan (1997)	1	O	8.6	3.2			301	
96B3N04	978	Rescan (1997)	1	O	9.2	0.9			315	
96B3N05	979	Rescan (1997)	1	O	8.9	2.4			299	
96B3N06	980	Rescan (1997)	1	O	8.6	2			270	
96B3N80	981	Rescan (1997)	1qj	O	9.1	0.6			121	
96B3N82	982	Rescan (1997)	1qj	O	8.7	1.5			195	
96B3N86	983	Rescan (1997)	1qj	O	8.7	0.85			128	
96B3NR-3+4	984	Rescan (1997)	1	O	8.1	1.5			297	
96B3NR-5+6	985	Rescan (1997)	1	O	8.6	0.82			331	
96B3NR-7+8	986	Rescan (1997)	1	O	8.4	0.76			321	
96B3S02	987	Rescan (1997)	1	O	8.6	3.1			309	
96B3S04	988	Rescan (1997)	1	O	8.9	1.4			319	
96B3S05	989	Rescan (1997)	1	O	8.6	2			298	
96B3S06	990	Rescan (1997)	1	O	8.8	2			287	
96B3S08	991	Rescan (1997)	1	O	9.0	3.3			296	
96B3S10	992	Rescan (1997)	1	O	9.0	1.8			325	
96B3S12	993	Rescan (1997)	1	O	9.3	0.6			351	
96B3S14	994	Rescan (1997)	1	O	9.3	1.1			362	
96B3SR-1&2	995	Rescan (1997)	1	O	8.9	1.9			302	
96CX-3-3	996	Rescan (1997)	1	W	9.0	0.37			384	
96CX-3-4	997	Rescan (1997)	1	W	9.1	0.36			389	
96CX2-10	998	Rescan (1997)	1qj	W	9.1	2.3			351	
96CX2-12	999	Rescan (1997)	1qj	W	9.3	0.35			312	
96CX2-14	1000	Rescan (1997)	1qj	W	9.0	0.24			323	
96CX2-4	1001	Rescan (1997)	1qj	W	9.0	0.53			364	
96CX2-6	1002	Rescan (1997)	1qj	W	8.9	1.8			99	
96CX2-8	1003	Rescan (1997)	1qj	W	8.6	0.74			266	
96CX2/3-2	1004	Rescan (1997)	1qj	W	8.9	0.05			386	
96CX3-10	1005	Rescan (1997)	1	W	9.2	1.6			345	
96CX3-12	1006	Rescan (1997)	1	W	8.5	1.3			313	
96CX3-14A	1007	Rescan (1997)	1	W	9.1	1.9			327	
96CX3-14B	1008	Rescan (1997)	1	W	9.0	2			290	
96CX3-6	1009	Rescan (1997)	1	W	8.8	4.8			319	
96CX3-8	1010	Rescan (1997)	1	W	9.4	1.9			341	
96OD02	1011	Rescan (1997)	1	W	8.9	0.17			312	
96OD03	1012	Rescan (1997)	1	W	8.9	0.1			338	
96OD04	1013	Rescan (1997)	1	W	8.9	0.27			368	
96OD05	1014	Rescan (1997)	1	W	9.0	0.33			326	
96OD06	1015	Rescan (1997)	1	W	9.1	0.28			345	
96OD07	1016	Rescan (1997)	1	W	9.1	0.62			353	
96OD08	1017	Rescan (1997)	1	W	8.9	0.27			260	
96OD09	1018	Rescan (1997)	1	W	9.1	0.06			363	
96OD10	1019	Rescan (1997)	1	W	9.2	0.06			301	
96OD100	1020	Rescan (1997)	1	W	8.5	0.55			350	
96OD102	1021	Rescan (1997)	1	W	9.2	0.63			350	
96OD104	1022	Rescan (1997)	1	W	9.0	0.13			362	
96OD106	1023	Rescan (1997)	1	W	9.1	0.1			368	
96OD11	1024	Rescan (1997)	1	W	9.0	0.04			331	
96OD12	1025	Rescan (1997)	1	W	8.3	0.42			319	
96OD13	1026	Rescan (1997)	1	W	8.2	0.06			372	
96OD14	1027	Rescan (1997)	1	W	8.8	0.05			364	
96OD15	1028	Rescan (1997)	1	W	8.5	0.07			376	
96OD16	1029	Rescan (1997)	1	W	8.5	0.11			374	
96OD18	1030	Rescan (1997)	1	W	8.4	0.51			419	
96OD20	1031	Rescan (1997)	1	W	8.9	0.48			344	
96OD22	1032	Rescan (1997)	1	W	8.6	0.49			358	
96OD24	1033	Rescan (1997)	1	W	8.7	0.06			336	
96OD26	1034	Rescan (1997)	1	W	8.4	0.08			251	
96OD28	1035	Rescan (1997)	1	W	8.6	0.06			282	
96OD30	1036	Rescan (1997)	1	W	8.2	0.07			270	
96OD32	1037	Rescan (1997)	1	W	9.0	0.07			272	
96OD34	1038	Rescan (1997)	1	W	8.5	0.07			272	
96OD36	1039	Rescan (1997)	1	W	8.9	0.07			260	
96OD38	1040	Rescan (1997)	1	W	8.3	0.08			280	
96OD40	1041	Rescan (1997)	1	W	8.3	0.03			285	
96OD42	1042	Rescan (1997)	1	W	8.3	0.01			219	
96OD44	1043	Rescan (1997)	1	W	8.3	0.05			242	
96OD46	1044	Rescan (1997)	1	W	8.2	0.08			330	
96OD48	1045	Rescan (1997)	1	W	8.6	0.09			304	
96OD50	1046	Rescan (1997)	1	W	8.8	0.08			360	
96OD52	1047	Rescan (1997)	1	W	8.7	0.17			312	
96OD54	1048	Rescan (1997)	1	W	8.6	0.08			317	
96OD56	1049	Rescan (1997)	1	W	8.6	0.09			311	
96OD58	1050	Rescan (1997)	1	W	8.6	0.06			368	
96OD60	1051	Rescan (1997)	1	W	8.9	0.09			335	
96OD62	1052	Rescan (1997)	1	W	9.4	0.17			336	
96OD64	1053	Rescan (1997)	1	W	9.3	0.8			219	
96OD66	1054	Rescan (1997)	1	W	8.8	0.27			309	
96OD68	1055	Rescan (1997)	1	W	8.8	0.09			422	
96OD70	1056	Rescan (1997)	1	W	9.0	0.22			262	
96OD72	1057	Rescan (1997)	1	W	8.9	0.3			347	
96OD74	1058	Rescan (1997)	1	W	8.4	0.17			443	
96OD76	1059	Rescan (1997)	1	W	9.5	0.53			280	
96OD78	1060	Rescan (1997)	1	W	8.7	0.09			333	
96OD80	1061	Rescan (1997)	1	W	9.1	0.15			285	
96OD82	1062	Rescan (1997)	1	W	9.1	0.05			375	
96OD84	1063	Rescan (1997)	1	W	8.9	0.62			219	
96OD86	1064	Rescan (1997)	1	W	9.1	0.06			420	
96OD88	1065	Rescan (1997)	1	W	9.1	0.12			454	
96OD90	1066	Rescan (1997)	1	W	8.9	0.13			362	
96OD92	1067	Rescan (1997)	1	W	9.1	0.84			371	
96OD94	1068	Rescan (1997)	1	W	8.7	0.14			386	
96OD96	1069	Rescan (1997)	1	W	9.0	2.1			382	
96OD98	1070	Rescan (1997)	1	W	8.5	0.66			390	
Boston #1	1190	Rescan (2001)	1	W	9.3	0.1	0.01	20	420	Moderate
Boston #3	1192	Rescan (2001)	1	W	9.0	0.05	0.01	17	375	Moderate
Boston #5	1194	Rescan (2001)	1	W	9.1	0.32	0.01	23	452	Moderate
Boston #6	1195	Rescan (2001)	1	W	9.2	0.05	0.01	17	367	Moderate

¹Lithology codes as follows: 1 = mafic metavolcanics; 1 mixed = mixed mafic metavolcanics; 1qj = mafic metavolcanics with sediments; 5 = sedimentary units; 5 mixed = mixed sedimentary units; 9n = late intermediate dyke; 1
 *Samples without drillhole information are operational sample collected from underground blast rounds.

Appendix A: Historical Samples, Solid-Phase Trace Element Data

Sample ID	SRK Serial Number	Data Reference	Lithology ¹	Preliminary Economic Classification	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Sr	Cd	Sb	Bi	V	Ca	P	Cr	Mg	Ba	Ti	Al	Na	K	W	Hg	Be
					ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	%	ppm	%	%	%	%	%	%	%	ppm
94NOD120 210	879	Rescan (1999)	1	O	<1	176	2	156	1.6	38	32	1435	7.69	320	98	0.5	1.8	4	209	6.66	0.026	165	2.24	90	0.15	4.83	0.89	0.59	<10	<10	0.5
93NOD57 170	880	Rescan (1999)	1	W	<1	27	2	64	0.4	576	80	995	6.33	760	97	0.5	19.6	2	137	2.83	0.002	1240	9.56	60	0.03	3.96	0.78	0.37	<10	<10	<0.5
93NOD57 195	899	Rescan (1999)	1	W	<1	74	2	70	<0.2	258	58	1100	5.94	128	92	<0.5	2.4	<2	170	6.16	0.015	629	4.26	80	0.1	4.9	0.86	0.27	<10	<10	<0.5

¹Lithology codes as follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **1oj** = mafic metavolcanics with sediments; **5** = sedimentary units; **5 mixed** = mixed sedimentary units; **9n** = late intermediate dyke; **10a** = late gabbro; **12q** = quartz vein; **12q mixed** = mixed quartz vein
Elements that have no been presented were not analyzed.

Appendix B – SRK (2008) Acid-Base Accounting and Trace Element Data,
Boston

Appendix B: SRK Samples (2008), Acid-Base Accounting Data

SRK Serial Number	Sample ID	Lithology ¹	Preliminary Economic Classification	Paste pH	Total S	Sulphate	Total C	TOC (measured)	TIC (Calc'd)	TIC (Direct)_Coul	TIC (Direct)_Leco	Modified NP	Fizz
					(Wt.%)	(Wt.%)	wt%_C	wt%_C	wt%_C	(Wt%C)	(Wt.%CO2)	kgCaCO3/t	
1373	118424	1	W	9.04	0.24	0.01	4.2	0.03	4.2	3.5		230	Strong
1374	118425	1	W	9.15	0.14	0.01	4.6	0.02	4.6	3.7		255	Strong
1375	118426	1	W	9.22	0.23	0.01	4.4	0.04	4.4			259	Strong
1376	118427	1	W	9.13	0.61	0.01	4.6	0.04	4.5			261	Strong
1377	118428	1	W	9.05	0.1	0.01	5.4	0.03	5.4			310	Strong
1378	118429	1 mixed	W	9.24	0.04	0.01	4.6	0.03	4.6			270	Strong
1379	118430	1	W	9.46	0.12	0.01	4	0.03	4			246	Strong
1380	118431	1	W	9.55	0.14	0.01	4.6	0.06	4.5	3.6		224	Strong
1381	118432	1	W	9.09	0.28	0.01	5.3	0.02	5.3			229	Strong
1382	118433	1	W	9.45	0.13	0.01	4.6	0.01	4.6			244	Strong
1383	118434	1	W	9.47	0.19	0.01	4.6	<0.01	4.6			232	Strong
1384	118435	1	W	9.2	0.18	0.01	4.5	0.02	4.5	3.5		260	Strong
1385	118436	1	W	9.4	0.15	0.01	5	0.06	4.9			286	Strong
1386	118437	1	W	9.42	0.19	0.01	5.4	0.03	5.4			245	Strong
1387	118438	12q mixed	O	9.18	0.23	0.01	4.2	0.05	4.1	3.2		251	Strong
1388	118439	1	W	9.52	0.81	0.01	5.2	0.01	5.2			237	Strong
1389	118440	1	W	9.38	1.2	0.01	5.1	0.01	5.1			307	Strong
1390	118441	1	W	9.37	0.47	0.01	4.8	0.03	4.8			287	Strong
1391	118442	1	W	9.23	0.69	0.01	4.6	0.03	4.6			290	Strong
1392	118443	1	W	9.51	3.9	0.01	4.9	0.05	4.8			293	Strong
1393	118444	1	W	9.28	5	0.02	4.2	0.01	4.2			249	Strong
1394	118445	12q	O	8.93	3.1	0.01	4.2	<0.01	4.2			249	Strong
1395	118446	1	W	9.39	0.13	0.01	4.1	<0.01	4.1			260	Strong
1396	118447	12q mixed	O	9.08	0.15	0.01	5.7	<0.01	5.7	4.6		375	Strong
1397	118448	1	W	9.28	0.12	0.01	4.6	0.02	4.6			294	Strong
1398	118450	1 mixed	W	9.38	0.12	0.01	3.4	0.02	3.4			221	Strong
1399	118451	9n	W	9.25	0.22	0.01	3.7	<0.01	3.7	3		222	Strong
1400	118452	12q	O	8.6	0.22	0.01	3.8	0.06	3.8	3.1		232	Strong
1401	118453	12q	W	9.25	0.12	0.01	4.4	0.05	4.3	3.6		272	Strong
1402	118454	12q	O	8.7	0.23	0.01	2.7	0.02	2.7			155	Strong
1403	118455	12q	O	8.9	0.32	0.01	4	0.05	4	3.2		194	Strong
1404	118456	1 mixed	W	9.4	0.28	0.01	4.5	0.01	4.4			215	Strong
1405	118457	1	W	9.47	0.2	0.01	3.7	0.04	3.7			224	Strong
1406	118458	1	W	9.52	0.27	0.01	4.3	0.02	4.3			259	Strong
1407	118459	1	W	9.48	0.26	0.01	4.3	0.02	4.2			267	Strong
1408	118460	1	W	9.23	0.26	0.01	4.6	<0.01	4.6			307	Strong
1409	118461	1	W	8.94	0.51	0.01	4.9	0.01	4.9			315	Strong
1410	118462	1	W	9.26	0.14	0.01	4.8	0.02	4.8			307	Strong
1411	118463	1	W	9.34	0.15	0.01	4.6	0.02	4.5			290	Strong
1412	118464	1	W	8.97	1.3	0.01	3.9	0.01	3.9			299	Strong
1413	118465	1	W	8.71	0.26	0.01	3.2	0.04	3.2			206	Strong
1414	118466	1	W	8.94	0.36	0.01	4.8	0.03	4.7			317	Strong
1415	118467	1	W	9.16	0.18	0.01	4.9	0.03	4.9			320	Strong
1416	118468	9n	W	9.64	0.2	0.01	3.1	0.01	3.1	2.6		197	Strong
1417	118469	1	O	9.24	1.1	0.01	5.3	0.03	5.2	4.4		316	Strong
1418	118470	1	W	9.34	0.4	0.01	5.2	<0.01	5.2			319	Strong
1419	118471	1	W	9.33	0.15	0.01	4.8	0.03	4.8			291	Strong
1420	118472	1	W	9.32	0.68	0.01	5.1	0.03	5.1			282	Strong
1421	118473	12q mixed	O	9.11	0.18	0.01	6	0.05	5.9			374	Strong
1422	118474	12q	O	9.13	0.55	0.01	5.6	0.04	5.5			364	Strong
1423	118476	12q mixed	O	8.99	0.15	0.01	5	0.07	4.9			313	Strong
1424	118477	12q mixed	O	9.09	0.14	0.01	5.4	0.05	5.3	4.4		343	Strong
1425	118478	12q	O	9.04	0.13	0.01	5.1	0.04	5			328	Strong
1426	118479	12q mixed	O	8.91	0.17	0.01	4	0.04	3.9			315	Strong
1427	118480	5	W	9.22	0.17	0.01	4.2	0.04	4.1	3.4		216	Strong
1428	118481	5	W	8.63	0.15	0.01	3.5	0.12	3.4			204	Strong
1429	118482	1	O	9.15	0.07	0.01	3.6	0.04	3.5	2.9		229	Strong
1430	118483	1	W	9.3	0.14	0.01	3.9	0.03	3.9	3.3		248	Strong
1431	118484	1	W	9.47	0.06	0.01	3.9	0.02	3.9			327	Strong
1432	118485	1	W	9.24	0.04	0.01	4.2	0.04	4.2			250	Strong
1433	118486	5	W	7.96	0.13	0.01	4.9	0.91	3.9	3.1		230	Strong
1434	118487	1	W	9.07	0.47	0.01	3.9	0.02	3.9	3.2		242	Strong
1435	118488	1	W	9.47	0.08	0.01	3.6	<0.01	3.6			243	Strong
1436	118489	1	W	9.37	0.09	0.01	4.4	<0.01	4.4			158	Strong
1437	118490	1	W	9.35	0.16	0.01	4	0.01	4			252	Strong
1438	118491	1	W	9.41	0.07	0.01	4.1	0.01	4.1	3.4		265	Strong
1439	118492	1	W	9.43	0.05	0.01	4.1	<0.01	4.1			277	Strong
1440	118493	1	W	9.47	0.08	0.01	4.1	<0.01	4.1			269	Strong
1441	118494	1	W	9.48	0.94	0.01	4.3	<0.01	4.3			317	Strong
1442	118495	1	W	9.51	0.16	0.01	5.1	<0.01	5.1			269	Strong
1443	118496	1	W	9.56	0.16	0.01	4.9	<0.01	4.9				

SRK Serial Number	Sample ID	Lithology ¹	Preliminary Economic Classification	Paste pH	Total S	Sulphate	Total C	TOC (measured)	TIC (Calc'd)	TIC (Direct)_Coul	TIC (Direct)_Leco	Modified NP	Fizz
					(Wt.%)	(Wt.%)	wt%_C	wt%_C	wt%_C	(Wt%C)	(Wt.%CO2)	kgCaCO3/t	
1668	08SBD382-SRK-WR-238	5	W	9.4			1.1	0.08	1			64	Moderate
1669	08SBD382-SRK-WR-240	5	W	9.4			1.9	0.15	1.7			105	Strong
1670	08SBD382-SRK-WR-241	5	W	9.6			2.1				6.5	70	Strong
1671	08SBD382-SRK-WR-242	5	mixed	9.4			2.2				6.9	87	Strong
1672	08SBD382-SRK-WR-243	5	W	9.4			1.3				4.3	79	Moderate
1673	08SBD382-SRK-WR-244	5	W	9.4			1.1				3.7	66	Moderate
1674	08SBD382-SRK-WR-245	5	W	9.5			1.2				3.9	70	Moderate
1675	08SBD382-SRK-WR-246	5	W	9.4			1				3.3	57	Moderate
1676	08SBD382-SRK-WR-247	5	W	9.4			1.1				3.7	67	Moderate
1677	08SBD382-SRK-WR-248	5	W	9.5			1.3				4.5	76	Moderate
1710	07SBD374-SRK-WR-281	1	W	9.1			4.7	0.02	4.7			294	Strong
1711	07SBD374-SRK-WR-282	1	W	9.2			5.1	0.01	5.1			291	Strong
1712	07SBD374-SRK-WR-283	1	W	8.9			4.1	0.03	4.1			270	Strong
1713	07SBD374-SRK-WR-284	1	W	9.1			4.3	0.03	4.2			283	Strong
1714	07SBD374-SRK-WR-285	1	W	9.5			4.7	0.07	4.6			256	Strong
1715	07SBD374-SRK-WR-286	1	W	9.5			5.2	0.1	5.1		19	296	Strong
1716	07SBD374-SRK-WR-287	1	W	9.4			4.9	0.06	4.9			283	Strong
1717	07SBD374-SRK-WR-288	1	W	9.5			5.5	0.05	5.5			264	Strong
1718	07SBD374-SRK-WR-289	1	W	9.3			4.7	0.02	4.7			291	Strong
1719	07SBD374-SRK-WR-290	1	W	9.2			4.9	0.01	4.8			298	Strong
1720	07SBD374-SRK-WR-291	1	W	9.1			4.2	0.02	4.1			158	Strong
1721	07SBD374-SRK-WR-292	1	W	9.5			4.8	0.06	4.7			301	Strong
1722	07SBD374-SRK-WR-293	5 mixed	O	9.4			5	0.02	5			244	Strong
1723	07SBD374-SRK-WR-294	5	W	9.2			4.9	0.01	4.8			254	Strong
1724	07SBD374-SRK-WR-295	5	W	8.7			3.6	0.03	3.6			211	Strong
1725	07SBD374-SRK-WR-296	5	W	8.3			4.2	0.07	4.1			243	Strong
1726	07SBD374-SRK-WR-297	5	W	8.5			3.8	0.04	3.8			219	Strong
1727	07SBD374-SRK-WR-298	5	W	8.5			3.4	0.06	3.3			195	Strong
1728	07SBD374-SRK-WR-299	5	W	9.3			3.5	0.06	3.4			205	Strong
1729	07SBD374-SRK-WR-302	5	W	9.5			3.3	0.12	3.2			200	Strong
1783	08SBD381A-NMS-WR-356	5	W	9.41			2.7	<0.01	2.7			169	Strong
1784	08SBD381A-NMS-WR-357	5	W	9.25			2	0.49	1.5			70	Strong
1815	08SBD380-SRK-WR-388	9n	W	9.63			3.3	0.09	3.2			213	Strong
1816	08SBD380-SRK-WR-389	10j	W	9.07			4.5	0.06	4.4			270	Strong
1817	08SBD380-SRK-WR-390	10j	W	8.92			4.5	0.14	4.4			291	Strong
1818	08SBD380-SRK-WR-391	10j	W	9.01			5.5	0.07	5.4			351	Strong
1819	08SBD380-SRK-WR-392	10j	O	8.9			6.3	0.02	6.2			355	Strong
1820	08SBD380-SRK-WR-393	10j	W	9.08			4.8	0.1	4.5			274	Strong
1821	08SBD380-SRK-WR-394	1	W	9.44			4.5	0.04	4.5			272	Strong
1822	08SBD380-SRK-WR-395	1	W	9.45			4.6	0.04	4.5			287	Strong
1823	08SBD380-SRK-WR-396	1	W	9.32			4.2	0.03	4.2			250	Strong
1824	08SBD380-SRK-WR-397	1	mixed	9.5			4.4	0.1	4.3			249	Strong
1825	08SBD380-SRK-WR-398	1	W	9.12			4.9	0.04	4.8			271	Strong
1826	08SBD380-SRK-WR-399	1 mixed	O	9.13			4.8	0.03	4.8			229	Strong
1827	08SBD380-SRK-WR-400	10a	W	9.22			6.6	0.07	6.6		21	173	Strong
1828	08SBD380-SRK-WR-401	10a	O	8.97			6.1	0.04	6.1			278	Strong
1829	08SBD380-SRK-WR-402	10a	O	9.18			7	0.05	7		22	275	Strong
1830	08SBD380-SRK-WR-403	10a	W	9.32			7.6	0.04	7.5		24	220	Strong
1831	08SBD380-SRK-WR-404	1	W	9.48			5.3	0.03	5.3			272	Strong
1832	08SBD380-SRK-WR-405	1	W	9.52			4.5	0.04	4.4			228	Strong
1833	08SBD380-SRK-WR-406	1	W	9.51			5.5				19	269	Strong
1834	08SBD380-SRK-WR-407	1	O	9.15			4.9				17	259	Strong
1835	08SBD380-SRK-WR-408	1	W	9.49			4.8				17	216	Strong
1836	08SBD380-SRK-WR-409	1	W	9.24			4.3				16	235	Strong
1837	08SBD380-SRK-WR-410	1	W	9.27			4.3				15	244	Strong
1838	08SBD380-SRK-WR-411	10j	W	9.47			4.8				17	296	Strong
1839	08SBD380-SRK-WR-412	10j	W	9.35			4.1				14	226	Strong
1840	08SBD380-SRK-WR-413	10j	W	9.32			4.5				15	270	Strong
1841	08SBD380-SRK-WR-414	10j	W	9.46			5.4				18	348	Strong
1873	08SBD380-SRK-WR-415	1	W	9.42			5.2				18	323	Strong
1874	08SBD380-SRK-WR-416	1	W	9.39			5.4				18	313	Strong
1875	08SBD380-SRK-WR-417	10j	mixed	9.12			4.2				14	253	Strong
1878	07SBD356A-SRK-WR-451	1	mixed	9.56			5				17	235	Strong
1879	07SBD356A-SRK-WR-452	1	mixed	9.55			5.4				19	293	Strong
1880	07SBD356A-SRK-WR-453	1	O	9.57			5.2				18	288	Strong
1881	07SBD356A-SRK-WR-454	1	W	9.51			5				17	273	Strong
1882	07SBD356A-SRK-WR-455	1	W	9.61			5.4				18	304	Strong
1883	07SBD356A-SRK-WR-456	1	W	9.57			5				17	264	Strong
1884	07SBD356A-SRK-WR-457	1	W	9.28			5				17	254	Strong
1885	07SBD356A-SRK-WR-458	1	W	9.47			4.8				16	268	Strong
1886	07SBD356A-SRK-WR-459	1	W	9.56			4.3				15	239	Strong
2041	08SBD383-SRK-WR-548	1	W	9.9			5.3				17	296	Strong
2042	08SBD383-SRK-WR-549	1 mixed	W	9.83			5.4				17	311	Strong
2043	08SBD383-SRK-WR-550	10a	W	9.86			5.6				18	281	Strong
2044	08SBD383-SRK-WR-551	1	W	9.72			4.2				13	255	Strong
2045	08SBD383-SRK-WR-552	1	W	8.91			2.7				9.2	199	Strong
2046	08SBD383-SRK-WR-553	1	W	9.05			2.5				7.9	179	Strong
2047	08SBD383-SRK-WR-554	1	W	9.1			2.7				8.6	187	Strong
2048	08SBD383-SRK-WR-555	1	W	9.56			4.2				13	256	Strong

s follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **10j** = mafic metavolcanics with sediments; **5** = sedimentary units; **5 mixed** = mixed sedimentary units; **9n** = late intermediate dyke; **10a** = late gabbro; **12q** = quartz vein; **12q mixed** = mixed quartz vein

Appendix B: SRK Samples (2008), Trace Element Data

SRK Serial Number	Sample ID	Lithology ¹	Preliminary Economic Classification	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se
				ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	%	%	%	%	%	%	ppm	ppb	ppm	ppm	%	ppm
1373	118424	1	W	1.1	100	14	65	0.2	94	44	1600	6.4	150	<0.1	160	0.2	31	<0.1	0.6	0.6	48	5.7	0.021	<1	120	2.5	9	<0.001	<20	1	0.068	0.04	0.1	<10	14	<0.1		3	<0.5
1374	118425	1	W	1.2	93	4.8	56	0.3	110	50	1600	6.1	150	<0.1	260	0.2	37	<0.1	0.3	0.2	41	6.2	0.025	<1	120	2.9	11	<0.001	<20	0.89	0.083	0.05	0.1	<10	16	<0.1		2	<0.5
1375	118426	1	W	0.9	99	2.1	59	0.1	81	43	1700	6.4	78	<0.1	5.5	0.2	23	0.1	0.5	<0.1	62	6.6	0.02	<1	130	2.6	7	<0.001	<20	1.5	0.052	0.03	<0.1	<10	14	<0.1		4	<0.5
1376	118427	1	W	0.9	91	1.9	56	<0.1	76	39	1700	6.4	64	<0.1	15	0.2	21	<0.1	0.4	<0.1	59	6.6	0.021	<1	120	2.6	6	<0.001	<20	1.4	0.047	0.03	<0.1	<10	13	<0.1		4	<0.5
1377	118428	1	W	1.1	97	1.4	50	<0.1	77	38	1800	6	120	<0.1	30	0.2	26	<0.1	0.3	<0.1	43	8.5	0.022	<1	88	2.8	6	<0.001	<20	0.83	0.048	0.03	1	<10	14	<0.1		2	<0.5
1378	118429	1 mixed	W	0.8	100	0.7	55	<0.1	89	41	1500	5.5	49	<0.1	4.4	0.2	23	0.1	0.3	<0.1	57	6.9	0.02	<1	140	2.7	7	<0.001	<20	1.3	0.046	0.03	<0.1	<10	14	<0.1		3	<0.5
1379	118430	1	W	0.8	100	1	50	<0.1	120	51	1100	4.9	45	<0.1	2.7	0.2	24	<0.1	0.2	<0.1	57	6.3	0.024	<1	160	2.4	9	<0.001	<20	1.2	0.063	0.03	<0.1	<10	14	<0.1		3	<0.5
1380	118431	1	W	0.9	96	1	57	<0.1	78	37	1100	5.9	37	<0.1	48	0.2	49	<0.1	0.2	<0.1	55	5.9	0.024	<1	150	3.4	10	<0.001	<20	1.2	0.071	0.03	<0.1	<10	17	<0.1		3	<0.5
1381	118432	1	W	0.9	65	1.2	53	<0.1	340	64	1400	6.5	310	<0.1	220	0.2	66	0.1	0.8	<0.1	71	5.8	0.014	<1	590	5.9	6	0.001	<20	2	0.028	0.02	<0.1	<10	17	<0.1		4	0.6
1382	118433	1	W	0.8	89	1	49	0.7	180	50	1400	6.1	150	<0.1	2400	0.2	35	<0.1	0.2	<0.1	38	5.8	0.022	<1	160	3	13	<0.001	<20	0.84	0.07	0.03	<0.1	<10	14	<0.1		2	<0.5
1383	118434	1	W	0.7	84	1.2	54	<0.1	120	45	1400	6.5	71	<0.1	72	0.2	35	<0.1	0.3	<0.1	42	6.2	0.019	<1	160	2.8	10	<0.001	<20	0.98	0.076	0.03	<0.1	<10	15	<0.1		3	0.7
1384	118435	1	W	0.7	80	1.4	51	0.2	190	45	1300	5.8	35	<0.1	290	0.2	65	<0.1	0.2	<0.1	68	6	0.019	<1	480	4.3	9	0.001	<20	1.9	0.044	0.02	<0.1	<10	15	<0.1		4	<0.5
1385	118436	1	W	0.9	83	1.6	55	<0.1	200	51	1700	7.1	120	<0.1	43	0.2	42	<0.1	0.4	<0.1	38	6.9	0.017	<1	180	3	14	<0.001	<20	0.83	0.063	0.03	<0.1	<10	13	<0.1		2	<0.5
1386	118437	1	W	1	88	3.8	50	0.2	140	47	2000	7.9	360	<0.1	73	0.2	42	0.1	0.2	<0.1	15	6.2	0.019	<1	57	2.9	17	<0.001	<20	0.23	0.068	0.04	<0.1	<10	13	<0.1	<1		0.8
1387	118438	12q mixed	O	2.5	79	190	150	1.6	140	35	900	4.6	690	<0.1	1900	0.2	58	0.6	1.6	<0.1	16	5.9	0.012	<1	120	3	16	<0.001	<20	0.23	0.036	0.03	0.2	<10	8.8	<0.1	<1		0.5
1388	118439	1	W	0.9	91	2.2	54	<0.1	340	61	1600	7.3	340	<0.1	63	0.2	46	<0.1	1.2	<0.1	48	6.9	0.016	<1	310	3.2	17	<0.001	<20	1.2	0.056	0.04	<0.1	<10	13	<0.1		3	<0.5
1389	118440	1	W	0.8	86	1.2	51	<0.1	180	51	1600	6.4	130	<0.1	7.7	0.2	50	<0.1	0.4	<0.1	52	8	0.014	<1	280	3.2	13	<0.001	<20	1.3	0.052	0.03	<0.1	<10	13	<0.1		3	<0.5
1390	118441	1	W	1	88	1.2	54	<0.1	240	56	1500	6.5	290	<0.1	260	0.2	47	<0.1	0.6	<0.1	58	7.1	0.016	<1	320	3.1	11	<0.001	<20	1.4	0.056	0.03	<0.1	<10	13	<0.1		4	<0.5
1391	118442	1	W	1	80	1.4	61	<0.1	230	53	1600	7	170	<0.1	44	0.2	50	<0.1	0.3	<0.1	76	7.4	0.01	<1	380	3.4	10	<0.001	<20	1.9	0.047	0.02	7.2	<10	14	<0.1		5	<0.5
1392	118443	1	W	0.7	80	1.1	52	<0.1	190	49	1400	6.2	250	<0.1	110	0.2	59	<0.1	0.3	<0.1	51	7.3	0.017	<1	270	3.4	13	<0.001	<20	1.2	0.066	0.03	0.8	<10	13	<0.1		3	<0.5
1393	118444	1	W	0.9	93	1.8	68	0.1	260	56	1600	8.1	230	<0.1	110	0.1	63	0.2	0.4	<0.1	97	6.7	0.013	<1	500	3.4	11	<0.001	<20	2.2	0.045	0.02	<0.1	<10	14	<0.1		5	<0.5
1394	118445	12q	O	1.2	140	2.2	68	0.1	300	63	1800	9.8	240	<0.1	18	0.2	52	0.1	0.4	<0.1	100	6.9	0.008	<1	510	3.1	11	<0.001	<20	2.2	0.047	0.03	<0.1	<10	14	<0.1		6	0.7
1395	118446	1	W	1.1	97	1.1	64	<0.1	270	56	1700	7.3	180	<0.1	11	0.2	48	<0.1	0.4	<0.1	90	7.1	0.016	<1	440	3.1	11	<0.001	<20	2	0.049	0.03	<0.1	<10	13	<0.1		5	<0.5
1396	118447	12q mixed	O	1.7	79	1.8	55	0.8	170	39	2300	9.9	360	<0.1	2900	0.1	56	0.1	0.3	<0.1	57	9.7	0.007	<1	250	3.6	10	<0.001	<20	1	0.039	0.02	0.1	<10	12	<0.1		3	0.8
1397	118448	1	W	1	120	1.2	72	<0.1	280	62	2300	9.4	200	<0.1	25	0.2	35	0.1	0.6	<0.1	90	7.9	0.014	<1	410	3.2	14	<0.001	<20	1.9	0.042	0.03	<0.1	<10	13	<0.1		5	<0.5
1398	118450	1 mixed	W	0.9	110	1.4	63	0.1	310	73	1500	7.4	190	<0.1	7.3	0.3	30	<0.1	0.6	<0.1	95	5.8	0.021	<1	420	2.5	43	<0.001	<20	2.2	0.052	0.04	<0.1	<10	14	<0.1		6	<0.5
1399	118451	9n	W	0.9	120	1.4	110	0.2	81	39	1900	11	100	<0.1	34	0.2	30	<0.1	0.3	<0.1	120	6.3	0.028	<1	110	2.4	10	<0.001	<20	2.8	0.046	0.05	<0.1	<10	16	<0.1		8	0.5
1400	118452	12q	O	2.5	120	5.3	350	1.2	120	35	1600	5.1	560	<0.1	980	0.2	32	1.5	0.8	<0.1	14	6.6	0.012	<1	75	2.1	12	<0.001	<20	0.21	0.041	0.06	0.4	10	5.7	<0.1	<1		1.4
1401	118453	12q	W	1.4	120	2.3	54	0.4	210	49	1600	6.2	550	<0.1	140	0.2	38	0.2	0.4	<0.1	24	7.4	0.013	<1	74	2.3	12	<0.001	<20	0.37	0.047	0.06	0.2	<10	7.7	0.2	<1		0.9
1402	118454	12q	O	3.4	100	2.1	75	1.5	51	24	1200	4.2	300	<0.1	5500	0.2	21	0.3	0.4	<0.1	9	4.3	0.012	<1	99	1.3	11	<0.001	<20	0.13	0.032	0.05	0.3	<10	4.2	<0.1	<1		1.8
1403	118455	12q	O	2.6	130	2.1	78	0.6	37	35	1800	9.8	230	<0.1	4400	0.4	36	0.2	0.2	<0.1	26	6.2	0.044	2	63	1.7	12	<0.001	<20	0.31	0.054	0.04	0.1	<10	8.8	<0.1		1	2.1
1404	118456	1 mixed	W	1.2	160	1.8	140	0.1	44	51	2100	10	120	<0.1	5.5	0.6	37	0.2	0.2	<0.1	66	6.2	0.06	3	31	2.1	11	<0.001	<20	0.92	0.067	0.04	<0.1	<10	13	<0.1		3	0.7
1405	118457	1	W	2.1	150	3.3	160	<0.1	46	40	1500	6.8	57	<0.1	3.3	0.4	36	0.2	0.7	<0.1	74	6.3	0.045	2	56	1.9	12	<0.001	<20	1.3	0.064	0.04	<0.1	<10	13	<0.1		4	0.7
1406	118458	1	W	0.8	95	1.8	65	<0.1	160	53	1600	5.9	230	<0.1	21	0.2	51	<0.1	0.4	<0.1	52	7.4	0.02	<1	170	2.7	14	<0.001	<20	1.1	0.062	0.04	<0.1	<10	13	<0.1		3	0.7
1407	118459	1	W	1.1	100	0.9	70	<0.1	120	39	2100	7.3	62	<0.1	8	0.2	65	<0.1	0.1	<0.1	92	7.5	0.021	<1	190	3.3	14	<0.001	<20	2.1	0.05	0.04	<0.1	<10	15	<0.1		5	0.5

SRK Serial Number	Sample ID	Lithology ¹	Preliminary Economic Classification	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se
				ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppb	ppm	ppm	%
1480	08SBD381A-SRK-WR-171	5	W	0.9	66	3.8	190	0.2	11	8.8	370	1.8	25	0.3	<0.5	2.5	66	0.4	0.9	0.2	3	2.4	0.079	17	2	0.93	47	<0.001	<20	0.57	0.057	0.15	<0.1	<10	1.1	0.1	0.39	1	<0.5
1481	08SBD381A-SRK-WR-172	5	W	2.8	44	3.2	99	0.1	11	21	1100	4	37	0.6	6.9	3.5	73	0.2	0.9	0.2	22	4.1	0.13	24	3	1.7	16	<0.001	<20	1.5	0.096	0.06	<0.1	<10	3.9	0.1	0.21	4	<0.5
1482	08SBD381A-SRK-WR-173	5	W	0.7	26	1.9	68	<0.1	14	26	1100	5.3	48	0.2	13	1.4	62	<0.1	0.6	<0.1	40	4.2	0.089	9	2	1.4	16	<0.001	<20	1.6	0.11	0.06	<0.1	<10	6.3	<0.1	0.17	5	<0.5
1483	08SBD381A-SRK-WR-174	5	W	0.5	27	0.8	68	<0.1	18	30	1400	7	32	<0.1	9.3	0.3	81	<0.1	0.2	<0.1	54	5.3	0.069	2	2	1.9	21	0.001	<20	1.9	0.1	0.06	<0.1	<10	9.9	<0.1	0.11	6	<0.5
1484	08SBD381A-SRK-WR-175	5	W	0.6	47	0.8	94	<0.1	16	34	2200	7.3	14	<0.1	1.6	0.4	82	0.1	0.4	<0.1	54	5.4	0.073	5	1	1.6	24	0.001	<20	2	0.1	0.05	<0.1	<10	8.2	<0.1	<0.05	7	<0.5
1485	08SBD381A-SRK-WR-176	5	W	0.7	45	1.4	86	<0.1	22	39	2200	7.1	14	<0.1	1.1	0.4	120	0.1	0.4	<0.1	47	5.5	0.074	4	1	1.5	33	0.002	<20	1.7	0.11	0.05	<0.1	<10	8.1	<0.1	<0.05	6	<0.5
1486	08SBD381A-SRK-WR-177	5	W	0.5	38	1	79	<0.1	17	35	2000	6.4	13	<0.1	<0.5	0.3	130	0.1	0.4	<0.1	45	5.6	0.074	4	<1	1.7	36	0.001	<20	1.7	0.097	0.05	<0.1	<10	8.6	<0.1	<0.05	6	<0.5
1487	08SBD381A-SRK-WR-178	5	W	0.5	30	1.2	42	<0.1	12	28	1800	4.7	28	<0.1	<0.5	0.4	70	<0.1	1.4	<0.1	37	5.2	0.076	4	<1	1.4	27	0.001	<20	1.3	0.085	0.04	<0.1	<10	6.2	<0.1	<0.05	4	<0.5
1488	08SBD381A-SRK-WR-179	5	W	0.5	47	1.1	50	<0.1	11	29	1600	3.8	41	0.1	<0.5	0.6	40	0.1	1.8	<0.1	43	3.8	0.087	4	<1	1.5	12	0.001	<20	1.7	0.065	0.03	<0.1	<10	6.3	<0.1	<0.05	4	<0.5
1489	08SBD381A-SRK-WR-180	5	W	0.9	43	2.2	42	<0.1	21	18	780	3	39	0.5	0.8	3.3	50	0.1	0.7	0.2	15	3.7	0.055	8	10	1.2	25	<0.001	<20	0.89	0.097	0.06	<0.1	<10	3.6	<0.1	0.10	2	<0.5
1490	08SBD381A-SRK-WR-181	5	W	1.7	58	3.9	64	<0.1	41	19	770	4	68	1.5	24	5.5	140	0.2	0.3	0.2	12	5.1	0.43	14	23	1.3	43	0.002	<20	1	0.11	0.14	<0.1	<10	3.6	<0.1	0.20	3	<0.5
1491	08SBD381A-SRK-WR-182	5	W	1.5	45	8.4	63	<0.1	42	17	700	4.1	61	1.6	4.3	5.4	94	0.2	0.3	0.2	15	3.3	0.045	11	30	1.1	43	0.001	<20	1.3	0.098	0.16	<0.1	<10	3.6	<0.1	0.24	4	<0.5
1492	08SBD381A-SRK-WR-183	5	W	1.8	67	16	91	0.1	73	27	660	5.3	85	1.4	1.1	6.1	100	0.1	0.3	0.4	27	2.1	0.063	18	43	1.4	54	0.002	<20	2.4	0.098	0.21	<0.1	<10	4.7	<0.1	0.17	7	<0.5
1493	08SBD381A-SRK-WR-184	5	W	0.9	47	14	71	<0.1	43	17	550	4.1	28	1.5	1.3	5.9	93	0.1	0.4	0.2	23	2	0.058	18	40	1.2	59	0.002	<20	1.9	0.071	0.23	<0.1	<10	3.5	<0.1	0.13	6	<0.5
1494	08SBD381A-SRK-WR-185	5	W	1.4	54	14	90	0.1	54	22	750	4.5	93	1.4	7.3	5.6	170	0.2	0.3	0.2	17	2.4	0.051	17	29	1.3	59	0.002	<20	1.5	0.085	0.15	<0.1	<10	3.7	<0.1	0.20	4	<0.5
1495	08SBD381A-SRK-WR-186	12q mixed	W	0.9	36	17	75	0.2	36	14	660	3.1	97	1.6	4.9	5.7	210	0.3	0.3	0.2	9	2.8	0.047	15	22	1.2	42	<0.001	<20	0.73	0.067	0.15	<0.1	<10	2.4	<0.1	0.22	2	<0.5
1496	08SBD381A-SRK-WR-187		W	0.9	43	18	90	0.1	44	18	540	4	330	1.2	10	5.2	160	0.2	0.4	0.3	17	2.3	0.086	15	28	1.4	49	0.002	<20	1.5	0.056	0.16	<0.1	<10	3.1	<0.1	0.36	5	<0.5
1497	08SBD381A-SRK-WR-188		W	1.1	52	11	98	0.1	49	21	560	4.4	180	1.3	2.2	5.7	110	0.1	0.5	0.3	27	1.9	0.063	19	46	1.3	63	0.002	<20	1.9	0.075	0.19	<0.1	<10	3.9	<0.1	0.20	7	<0.5
1498	08SBD381A-SRK-WR-189		W	1.1	52	7.6	83	<0.1	49	21	520	3.8	38	1.1	2.4	5.3	85	0.1	0.3	0.2	24	1.7	0.058	18	47	1.3	56	0.002	<20	1.9	0.073	0.17	<0.1	<10	3.2	<0.1	0.17	7	<0.5
1499	08SBD381A-SRK-WR-190		W	1.4	59	14	84	<0.1	43	19	600	3.4	12	1.8	7	6.7	65	<0.1	0.3	0.3	28	1.5	0.057	23	52	1.3	69	0.003	<20	2	0.083	0.19	<0.1	<10	3.4	<0.1	0.15	8	<0.5
1500	08SBD381A-SRK-WR-191		W	0.9	49	15	76	<0.1	39	19	460	3	23	1.7	2.1	6.4	65	0.1	0.4	0.3	21	1.5	0.05	25	42	1.2	73	0.003	<20	1.8	0.085	0.22	<0.1	<10	2.9	<0.1	0.14	7	<0.5
1501	08SBD381A-SRK-WR-192		W	0.9	52	17	77	0.1	47	20	560	3.6	31	1.6	2.4	6.7	88	0.1	0.4	0.3	23	1.6	0.059	23	42	1.2	78	0.002	<20	1.9	0.07	0.22	0.1	<10	3	<0.1	0.17	7	<0.5
1502	08SBD381A-SRK-WR-193		W	2.5	53	10																																	

SRK Serial Number	Sample ID	Lithology ¹	Preliminary Economic Classification	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se
				ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppb	ppm	ppm	%	ppm	ppm
1824	08SBD380-SRK-WR-397	1	mixed	0.2	110	0.9	34	<0.1	68	35	1300	5.2	75	<0.1	290	<0.1	34	<0.1	0.3	<0.1	33	6.6	0.021	<1	98	2.2	11	<0.001	<20	0.57	0.085	0.04	0.2	<10	12	<0.1	0.52	2	<0.5
1825	08SBD380-SRK-WR-398	1	W	0.2	95	0.9	70	<0.1	150	47	2000	7.8	200	<0.1	170	<0.1	39	<0.1	0.3	<0.1	58	7	0.017	<1	220	3.1	12	<0.001	<20	1.5	0.055	0.05	0.2	<10	13	<0.1	0.37	4	<0.5
1826	08SBD380-SRK-WR-399	1 mixed	O	0.2	83	1.1	62	<0.1	270	56	2200	7.6	370	<0.1	300	<0.1	64	<0.1	0.5	<0.1	69	6.4	0.016	<1	440	4.2	14	<0.001	<20	2	0.039	0.06	2.2	<10	14	<0.1	0.46	4	0.6
1827	08SBD380-SRK-WR-400	10a	W	0.2	45	1.2	45	0.3	470	65	1100	6	440	<0.1	61	<0.1	110	<0.1	7.8	<0.1	67	3.2	0.011	<1	770	8.7	4	0.001	<20	1.5	0.021	0.02	0.2	<10	14	<0.1	<0.05	4	<0.5
1828	08SBD380-SRK-WR-401	10a	O	0.2	33	3.4	64	0.6	510	64	1600	5.9	700	<0.1	260	<0.1	190	0.1	5.4	<0.1	64	5.4	0.008	<1	820	7.9	4	0.001	<20	1.6	0.015	0.01	0.2	<10	14	<0.1	0.39	4	0.8
1829	08SBD380-SRK-WR-402	10a	O	0.3	35	3.1	32	0.5	500	61	1300	6	880	<0.1	1300	<0.1	130	0.1	3.8	<0.1	23	5.9	0.006	<1	340	6.8	9	<0.001	<20	0.35	0.035	0.04	0.5	<10	11	<0.1	1.3	<1	0.6
1830	08SBD380-SRK-WR-403	10a	W	0.2	15	2.8	70	0.1	670	84	1600	7.9	1100	<0.1	140	<0.1	97	<0.1	1.7	<0.1	60	4.1	0.012	<1	760	9.6	9	<0.001	<20	1.3	0.036	0.05	0.3	<10	16	<0.1	0.43	3	0.6
1831	08SBD380-SRK-WR-404	1	W	0.2	58	1.4	55	0.1	200	45	1300	6	290	<0.1	73	<0.1	73	0.1	0.3	<0.1	52	6.4	0.018	<1	310	4.8	7	<0.001	<20	1.2	0.081	0.04	0.4	<10	16	<0.1	0.33	3	<0.5
1832	08SBD380-SRK-WR-405	1	W	0.1	99	1.3	64	<0.1	180	51	1700	6.8	160	<0.1	9.1	<0.1	50	<0.1	0.5	<0.1	66	6.2	0.02	<1	240	3.2	14	<0.001	<20	1.6	0.082	0.04	0.8	<10	17	<0.1	0.11	4	<0.5
1833	08SBD380-SRK-WR-406	1	W	0.2	90	1.4	47	0.1	180	49	1900	7.2	330	<0.1	130	<0.1	53	0.1	0.3	<0.1	25	6.7	0.018	<1	98	3.1	16	<0.001	<20	0.53	0.081	0.06	0.1	<10	14	<0.1	0.53	1	0.8
1834	08SBD380-SRK-WR-407	1	O	0.3	100	2	36	1	220	56	1800	6.9	330	<0.1	2500	<0.1	50	<0.1	1.3	<0.1	17	7.4	0.021	<1	120	2.7	14	<0.001	<20	0.3	0.073	0.05	19	<10	12	<0.1	2.1	<1	1
1835	08SBD380-SRK-WR-408	1	W	0.2	96	1.4	48	0.1	230	60	1600	6.2	330	<0.1	120	<0.1	48	<0.1	0.6	<0.1	30	6.2	0.017	<1	140	2.8	16	<0.001	<20	0.7	0.086	0.05	0.1	<10	13	<0.1	0.43	1	<0.5
1836	08SBD380-SRK-WR-409	1	W	0.2	100	0.7	63	0.1	160	57	1800	6.6	71	<0.1	5.4	<0.1	59	<0.1	0.3	<0.1	71	6.9	0.019	<1	200	2.7	15	<0.001	<20	1.6	0.075	0.03	<0.1	<10	15	<0.1	0.11	4	<0.5
1837	08SBD380-SRK-WR-410	1	W	0.2	100	0.7	66	<0.1	160	55	1700	6.8	46	<0.1	2.7	<0.1	41	<0.1	0.4	<0.1	83	6.8	0.019	<1	290	2.7	11	<0.001	<20	1.9	0.063	0.03	<0.1	<10	15	<0.1	0.09	5	<0.5
1838	08SBD380-SRK-WR-411	10j	W	0.2	99	0.8	49	<0.1	170	48	1700	5.6	68	<0.1	33	<0.1	41	0.1	0.5	<0.1	57	8	0.024	<1	220	2.7	11	<0.001	<20	1.1	0.084	0.03	<0.1	<10	13	<0.1	0.08	3	<0.5
1839	08SBD380-SRK-WR-412	10j	W	0.3	120	0.8	74	<0.1	190	64	1900	7	83	<0.1	5.4	0.1	34	<0.1	0.5	<0.1	86	6.9	0.021	<1	330	2.4	12	<0.001	<20	1.9	0.081	0.03	<0.1	<10	14	<0.1	0.12	5	<0.5
1840	08SBD380-SRK-WR-413	10j	W	0.2	99	0.7	79	0.1	140	52	1900	7.4	49	<0.1	140	<0.1	43	<0.1	0.2	<0.1	98	7.7	0.019	<1	290	3	14	<0.001	<20	2.2	0.074	0.03	<0.1	<10	17	<0.1	0.07	6	<0.5
1841	08SBD380-SRK-WR-414	10j	W	0.2	86	0.8	58	<0.1	200	51	1600	6	86	<0.1	12	<0.1	39	<0.1	0.2	<0.1	57	10	0.02	<1	220	2.8	12	<0.001	<20	1.1	0.084	0.03	28	<10	13	<0.1	0.08	3	<0.5
1873	08SBD380-SRK-WR-415	1	W	0.2	92	0.6	64	<0.1	150	45	1600	6	66	<0.1	63	<0.1	39	0.1	0.2	<0.1	63	9.3	0.023	<1	200	2.9	8	<0.001	<20	1.2	0.079	0.02	55	<10	14	<0.1	0.09	3	<0.5
1874	08SBD380-SRK-WR-416	1	W	0.2	87	0.6	64	<0.1	120	44	1500	5.9	87	<0.1	11	<0.1	34	0.1	0.2	<0.1	45	8.9	0.019	<1	130	2.7	8	<0.001	<20	0.87	0.072	0.02	10	<10	13	<0.1	0.09	2	<0.5
1875	08SBD380-SRK-WR-417	10j	mixed	0.6	130	4.4	210	0.4	140	54	1300	5.5	190	<0.1	110	<0.1	35	0.5	2.2	<0.1	13	7.7	0.071	<1	77	1.5	8	<0.001	<20	0.27	0.06	0.03	0.6	10	9.2	0.1	1.8	<1	1.1
1878	07SBD356A-SRK-WR-451	1	mixed	0.2	110	11	58	0.2	72	37	1000	6.4	390	<0.1	710	<0.1	48	0.1	0.1	<0.1	21	5.7	0.023	<1	75	2.5	12	<0.001	<20	0.3	0.087	0.04	0.3	<10	11	<0.1	0.31	<1	<0.5
1879	07SBD356A-SRK-WR-452	1	mixed	0.2	110	1.5	65	0.1	77	39	1200	5.9	190	<0.1	330	<0.1	53	0.1	0.2	<0.1	29	6.7	0.017	<1	99	3.3	8	<0.001	<20	0.58	0.067	0.03	0.2	<10	12	<0.1	0.27	2	<0.5
1880	07SBD356A-SRK-WR-453	1	O	0.3	93	1.6	61	0.4	77	39	1300	6.2	480	<0.1	2500	<0.1	53	<0.1	0.3	<0.1	24	6.8	0.017	<1	97	2.8	10	<0.001	<20	0.37	0.077	0.04	0.2	<10	11	<0.1	0.8	<1	1
1881	07SBD356A-SRK-WR-454	1	W	0.2	97	1.2	65	<0.1	80	39	1400	6.3	120	<0.1	130	<0.1	53	0.1	0.1	<0.1	61	6.8	0.02	<1	180	3.3	9	0.001	<20	1.4	0.084	0.03	<0.1	<10	15	<0.1	0.16	3	0.6
1882	07SBD356A-SRK-WR-455	1	W	0.3	90	1.3	64	<0.1	90	39	1500	6.2	140	<0.1	51	<0.1	58	0.1	0.2	<0.1	41	6.9	0.018	<1	110	3.2	9	0.001	<20	0.84	0.071	0.03	<0.1	<10	13	<0.1	0.13	2	<0.5
1883	07SBD356A-SRK-WR-456	1	W	0.2	110	1.1	79	<0.1	100	42	1800	7.1	87	<0.1	6.3	<0.1	42	<0.1	0.2	<0.1	63	6.7	0.02	<1	160	2.9	8	0.001	<20	1.3	0.068	0.02	<0.1	<10	14	<0.1	0.12	4	<0.5
1884	07SBD356A-SRK-WR-457	1	W	0.2	110	1.4	110	<0.1	100	46	2400	9.3	84	<0.1	7.2	<0.1	35	<0.1	0.5	<0.1	80	6	0.019	<1	190	2.9	6	0.001	<20	1.8	0.052	0.02	0.6	<10	15	<0.1	0.2	5	0.9
1885	07SBD356A-SRK-WR-458	1	W	0.2	95	1	73	<0.1	110	46	1700	6.9	88	<0.1	180	<0.1	39	0.1	0.2	<0.1	69	6.7	0.021	<1	180	2.6	8	0.001	<20	1.5	0.063	0.02	<0.1	<10	13	<0.1	0.1	4	<0.5
1886	07SBD356A-SRK-WR-459	1	W	0.2	100	1.2	74	<0.1	110	47	1700	6.3	82	<0.1	72	<0.1	40	0.1	0.2	<0.1	70	6.3	0.019	<1	170	2.5	11	0.001	<20	1.6	0.058	0.02	<0.1	<10	13	<0.1	0.1	5	<0.5
2041	08SBD383-SRK-WR-548	1	W	0.1	88	0.9	47	0.1	210	49	1500	6.4	370	<0.1	120	<0.1	52	<0.1	0.4	<0.1	47	6.7	0.02	<1	170	3	16	<0.001	<20	1	0.15	0.04	23	<10	13	<0.1	0.63	2	<0.5
2042	08SBD383-SRK-WR-549	1 mixed	W	0.1	85	0.7	51	<0.1	220	50	1400	6.2	120	<0.1	48	<0.1	51	0.1	0.4	<0.1	71	7	0.018	<1	300	3.7	11	0.001	<20	1.6	0.11	0.03	<0.1	<10	15	<0.1	0.13	4	<0.5
2043	08SBD383-SRK-WR-550	10a	W	0.1	89	0.7	41	<0.1	200	52	1600	6.9	260	<0.1	4.9	<0.1	50	0.1	1	<0.1	33	6.4	0.018	<1	110	3.2	22	<0.001	<20	0.72	0.14	0.06	<0.1	<10	14	<0.1	0.2	2	<0.5
2044	08SBD383-SRK-WR-551	1	W	0.1	94	0.6	70	<0.1	130	46	1600	6.2	14	<0.1	3.1	<0.1	37	0.1	0.3	<0.1	100	6	0.023	<1	260														

Appendix C – Spatial Location, Geological Attributes and Economic Classification

Appendix C: Geological Attributes and Economic Classification of Static Database

SRK Serial Number	Lab ID	Sample Set	Drill Hole ID	Depth From	Depth To	Length	Preliminary Economic Classification	Lithology ¹	
				(m)	(m)			Primary	Summary (if additional lithologies) (proportion in parentheses)
730	97 OD 119	Historic					W	1	1
731	97 OD 121	Historic					W	1	1
732	97 OD 123	Historic					W	1	1
733	97 OD-125	Historic					W	1	1
734	97 OD-127	Historic					W	1	1
735	97 OD-129	Historic					W	1	1
736	97 OD-131	Historic					W	1	1
737	97 OD-133	Historic					W	1	1
738	97 OD-135	Historic					W	1	1
739	970D-137	Historic					W	1	1
740	970D-139	Historic					W	1	1
741	970D-141	Historic					W	1	1
742	97-OD-143	Historic					W	1	1
743	97-OD-145	Historic					W	1	1
744	97-OD-147	Historic					W	1	1
745	97-OD-149	Historic					W	1	1
746	97-OD-151	Historic					W	1	1
747	9700-153 ABA	Historic					W	1	1
748	9700-155 ABA	Historic					W	1	1
749	9700-157 ABA	Historic					W	1	1
750	97 OD 159	Historic					W	1	1
751	97 OD 161	Historic					W	1	1
752	97 DO 163	Historic					W	1	1
753	97 OD 165	Historic					W	1	1
754	97OD-167	Historic					W	1	1
755	97OD-169	Historic					W	1	1
756	97-OD-171(ABA)	Historic					W	1	1
757	97-OD-173 (ABA)	Historic					W	1	1
758	97 OD 175 ABA	Historic					W	1	1
759	97 OD 177 ABA	Historic					W	1	1
760	97 OD 179 ABA	Historic					W	1	1
761	97 OD 181 ABA	Historic					W	1	1
762	97 OD 183 ABA	Historic					W	1	1
763	97 OD 185 ABA	Historic					W	1	1
764	97 OD 187 ABA	Historic					W	1	1
765	97 OD 189 ABA	Historic					W	1	1
766	970D 191 ABA	Historic					W	1	1
767	970D 193 ABA	Historic					W	1	1
768	970D 195 ABA	Historic					W	1	1
769	970D 197 ABA	Historic					W	1	1
770	970D 199 ABA	Historic					W	1	1
771	970D-201 ABA	Historic					W	1	1
772	970D-203 ABA	Historic					W	1	1
773	970D-205 ABA	Historic					W	1	1
774	970D-207 ABA	Historic					W	1	1
775	970D-209 ABA	Historic					W	1	1
776	970D-211 ABA	Historic					W	1	1
777	970D-213 ABA	Historic					W	1	1
778	970D-215 ABA	Historic					W	1	1
779	970D-217 ABA	Historic					W	1	1
780	970D-219 ABA	Historic					W	1	1
781	970D-221 ABA	Historic					W	1	1
782	970D-223 ABA	Historic					W	1	1
783	970D-225 ABA	Historic					W	1	1
784	970D-227 ABA	Historic					W	1	1
785	970D-229 ABA	Historic					W	1	1
786	970D-231 ABA	Historic					W	1	1
787	970D-233 ABA	Historic					W	1	1
788	970D-235 ABA	Historic					W	1	1
789	97-0D-237 ABA	Historic					W	1	1
790	97-0D-239 ABA	Historic					W	1	1
791	97-0D-241 ABA	Historic					W	1	1
792	97-0D-243 ABA	Historic					W	1	1
793	97-0D-245 ABA	Historic					W	1	1
794	97-OD-249 ABA	Historic					W	1	1
795	97-OD-251 ABA	Historic					W	1	1
796	97-OD-254 ABA	Historic					W	1	1
797	97-OD-255 ABA	Historic					W	1	1
798	97OD 257 ABA	Historic					W	1	1
799	97OD 259 ABA	Historic					W	1	1
800	97OD 261 ABA	Historic					W	1	1
801	97OD 263 ABA	Historic					W	1	1
802	97OD 265 ABA	Historic					W	1	1
803	97OD 267 ABA	Historic					W	1	1
804	97OD 269 ABA	Historic					W	1	1
805	97OD 271 ABA	Historic					W	1	1
806	97OD 273 ABA	Historic					W	1	1
807	97OD 275 ABA	Historic					W	1	1
808	97OD 277 ABA	Historic					W	1	1
809	97OD 279 ABA	Historic					W	1	1
810	97OD 281 ABA	Historic					W	1	1
811	9 OD 283 ABA	Historic					W	1	1
812	97OD 285 ABA	Historic					W	1	1
813	97OD-287 ABA	Historic					W	1	1
814	97OD-289 ABA	Historic					W	1	1
815	97OD-291 ABA	Historic					W	1	1
816	97OD 293	Historic					W	1	1
817	97OD-295-ABA	Historic					W	1	1
818	97OD-297-ABA	Historic					W	1	1
819	97OD-301 ABA	Historic					W	1	1
820	97OD-303 ABA	Historic					W	1	1
821	97OD-305 ABA	Historic					W	1	1
822	97OD-307 ABA	Historic					W	1	1
823	97OD-309 ABA	Historic					W	1	1
824	97OD 311 ABA	Historic					W	1	1
825	97OD 313 ABA	Historic					W	1	1
826	97OD 315 ABA	Historic					W	1	1
827	97OD 317	Historic					W	1	1
828	97OD319 ABA	Historic					W	1	1
829	97OD 321	Historic					W	1	1
830	97OD-323 ABA	Historic					W	1	1
831	97OD-325 ABA	Historic					W	1	1
832	97OD-327 ABA	Historic					W	1	1
833	97OD-329 ABA	Historic					W	1	1
834	97OD-331 ABA	Historic					W	1	1
835	97OD-333 ABA	Historic					W	1	1
836	97OD-335 ABA	Historic					W	1	1
837	97OD-337 ABA	Historic					W	1	1
838	97-OD-341 ABA	Historic					W	1	1
839	97-OD-343 ABA	Historic					W	1	1
840	97-OD-345 ABA	Historic					W	1	1
841	97-OD-347 ABA	Historic					W	1	1
842	97-OD-349 ABA	Historic					W	1	1
843	97OD-351ABA	Historic					W	1	1
844	353 ABA	Historic					W	1	1
845	97OD 355 ABA	Historic					W	1	1
846	97OD-357 ABA	Historic					W	1	1
847	97OD-359 ABA	Historic					W	1	1
848	97 OD 361 ABA	Historic					W	1	1
849	97 OD 363 ABA	Historic					W	1	1
850	97 OD 365 ABA	Historic					W	1	1
851	97 OD 367 ABA	Historic					W	1	1
852	97-OD-369 ABA	Historic					W	1	1
853	97-OD-371 ABA	Historic					W	1	1
854	97-OD-373 ABA	Historic					W	1	1
855	97-OD-375 ABA	Historic					W	1	1
856	92NOD22 185	Historic	92NOD22	185	185.1	0.1	W	1	1
857	92NOD04 75	Historic	92NOD04	75	75.1	0.1	W	1	1
859	93NOD57 195	Historic	93NOD57	195	195.1	0.1	W	1	1
860	93NOD46 128	Historic	93NOD46	128	128.1	0.1	W	1	1
861	93NOD46 195	Historic	93NOD46	195	195.1	0.1	W	1	1
862	93NOD70 130	Historic	93NOD70	130	130.1	0.1	W	1	1
863	93NOD70 290	Historic	93NOD70	290	290.1	0.1	W	1	1
864	95NOD150 210	Historic	95NOD150	210	210.1	0.1	W	1	1
865	92NOD22 150	Historic	92NOD22	150	150.1	0.1	W	1	1
866	93NOD57 230	Historic	93NOD57	230	230.1	0.1	W	1	1
867	93NOD57 280	Historic	93NOD57	280	280.1	0.1	W	1	1
868	95NOD154 260	Historic	95NOD154	260	260.1	0.1	W	1	1
869	95NOD150 168	Historic	95NOD150	168	168.1	0.1	W	1	1
870	95NOD150 175	Historic	95NOD150	175	175.1	0.1	W	1	1
871	92NOD22 120	Historic	92NOD22	120	120.1	0.1	W	1	1
872	93NOD57 210	Historic	93NOD57	210	210.1	0.1	W	1	1
873	95NOD156 110	Historic	95NOD156	110	110.1	0.1	W	1	1
874	92NOD22 265	Historic	92NOD22	265	265.1	0.1	W	1	1
875	94NOD120 190	Historic	93NOD57	170	170.1	0.1	W	1	1
876	94NOD120 225	Historic	94NOD113	80	80.1	0.1	W	1	1
877	93NOD44 220	Historic	94NOD121A	165	165.1	0.1	W	1	1
878	94NOD113 180	Historic	94NOD120	100	100.1	0.1	W	1	1
879	94NOD120 210	Historic	94NOD141	225	225.1	0.1	W	1	1if
880	93NOD57 170	Historic	93NOD70	245	245.1	0.1	W	1	1if
881	94NOD113 80	Historic	93NOD70	278	278.1	0.1	W	1	1if

SRK Serial Number	Lab ID	Sample Set	Drill Hole ID	Depth From (m)	Depth To (m)	Length (m)	Preliminary Economic Classification	Lithology ¹	
								Primary	Summary (if additional lithologies) (proportion in parentheses)
882	94NOD121A 165	Historic	94NOD113	145	145.1	0.1	W	1	1lf
883	94NOD113 65	Historic	92NOD20	90	90.1	0.1	W	1	1
884	94NOD 120 100	Historic	93NOD46	178	178.1	0.1	W	1	1
885	94NOD141 225	Historic	94NOD120	155	155.1	0.1	W	1	1
886	94NOD121A 140	Historic	93NOD57	195	195.1	0.1	W	1	1
887	94NOD120 72	Historic	93NOD57	170	170.1	0.1	W	1	1
888	93NOD70 245	Historic					W	1	1
889	93NOD70 278	Historic					W	1	1
890	94NOD113 145	Historic					W	1	1
891	92NOD20 90	Historic					W	1	1
892	93NOD46 178	Historic					W	1	1
893	94NOD120 155	Historic					W	1	1
894	92NOD20 150	Historic					W	1	1
895	92NOD20 185	Historic					W	1	1
896	92NOD10 160	Historic					W	1	1
897	93NOD28 50	Historic					W	1	1
898	93NOD28 80	Historic					W	1	1
899	93NOD57 195	Historic					W	1	1
901	94NOD120 210	Historic					W	1	1
903	93NOD57 170	Historic					W	1	1
914		Historic					W	1	1
915		Historic					W	1	1
916		Historic					W	1	1
917		Historic					W	1	1
918		Historic					W	1	1
919		Historic					W	1	1
920		Historic					W	1	1
921		Historic					W	1	1
922		Historic					W	1	1
923		Historic					W	1	1
924		Historic					W	1	1
925		Historic					W	1	1
926		Historic					W	1	1
927		Historic					W	1	1
928		Historic					W	1	1
929		Historic					W	1	1
930		Historic					W	1	1
931		Historic					W	1	1
932		Historic					W	1	1
933		Historic					W	1	1
934		Historic					W	1	1
935		Historic					W	1	1
936		Historic					W	1	1
937		Historic					W	1	1
938		Historic					W	1	1
939		Historic					W	1	1
940		Historic					W	1	1
941		Historic					W	1	1
942		Historic					W	1	1
943		Historic					W	1	1
944		Historic					W	1	1
945		Historic					W	1	1
946		Historic					W	1	1
947		Historic					W	1	1
948		Historic					W	1	1
949		Historic					W	1	1
950		Historic					W	1	1
951		Historic					W	1	1
952		Historic					W	1	1
953		Historic					W	1	1
954		Historic					W	1	1
955		Historic					W	1	1
956		Historic					W	1	1
957		Historic					W	1	1
958		Historic					W	1	1
959		Historic					W	1	1
960		Historic					W	1	1
961		Historic					W	1	1
962		Historic					W	1	1
963		Historic					W	1	1
964		Historic					W	1	1
965		Historic					W	1	1
966		Historic					W	1	1
967		Historic					W	1	1
968		Historic	BUG330	22.8	23.3	0.5	W	1	1
969		Historic	BUG316	14.75	15.25	0.5	W	1	1
970		Historic	BUG293	29.9	30.55	0.65	W	1	1
971		Historic	BUG371	24.7	25.45	0.75	W	1	1
972		Historic	94NOD124	3	11.7	8.7	W	1	1
973		Historic	94NOD124	11.7	19.6	7.9	W	1	1
974		Historic	94NOD124	19.6	28	8.4	W	1	1
975		Historic	94NOD124	28	38	10	W	1	1
976		Historic	94NOD124	38	50	12	W	1	1
977		Historic	94NOD124	61	68	7	W	1	1
978		Historic	94NOD124	68	82	14	W	1	1lf (0.76), 1 (0.24)
979		Historic	94NOD124	82	92	10	W	1	1lf
980		Historic	94NOD124	92	102	10	W	1	1 (0.97), 1lf (0.03)
981		Historic	94NOD124	102	108	6	W	1	1
982		Historic	94NOD124	108	119	11	W	1	1 (0.62), 1lf (0.38)
983		Historic	94NOD124	119	132	13	W	1	1
984		Historic	94NOD124	132	141	9	W	1	1
985		Historic	94NOD124	150	160	10	W	1	1
986		Historic	94NOD124	160	170	10	W	1	1
987		Historic	94NOD124	170	180	10	W	1	1
988		Historic	94NOD124	180	188.3	8.3	W	1	1
989		Historic	94NOD124	188.3	200	11.7	W	1	1
990		Historic	94NOD124	200	210.5	10.5	W	1	1
991		Historic	94NOD124	212.2	218.5	6.3	W	1	1
992		Historic	94NOD124	219.63	230	10.37	W	1	1
993		Historic	94NOD124	293	305	12	W	1	1
994		Historic	94NOD124	305	320	15	W	1	1
995		Historic	94NOD124	320	328.88	8.88	W	1	1
996		Historic	94NOD128	2	12	10	W	1	1
997		Historic	94NOD128	12	20.7	8.7	W	1	1
998		Historic	94NOD128	20.7	30	9.3	W	1	1
999		Historic	94NOD128	30	41	11	W	1	1
1000		Historic	94NOD128	41	51	10	W	1	1
1001		Historic	94NOD128	51	61	10	W	1	1
1002		Historic	94NOD128	61	71	10	W	1	1
1003		Historic	94NOD128	71	85.4	14.4	W	1	1
1004		Historic	94NOD128	101	111	10	W	1	1
1005		Historic	94NOD128	111	121	10	W	1	1
1006		Historic	94NOD128	121	127.3	6.3	W	1	1
1007		Historic	S04-309	24.19	33	8.81	W	1	1ad
1008		Historic	S04-309	34	45	11	W	1	1ad
1009		Historic	S04-309	45	55	10	W	1	1ad
1010		Historic	S04-309	55.9	63.71	7.81	W	1	1ad
1011		Historic	S04-309	63.71	74	10.29	W	1	1ad
1012		Historic	S04-309	77.67	86	8.33	W	1	1ad
1013		Historic	S04-309	88	101	13	W	1	1ad
1014		Historic	S04-309	101	110	9	W	1	1p
1015		Historic	S04-309	110	119	9	W	1	1p
1016		Historic	S04-309	123.3	133	9.7	W	1	1
1017		Historic	S04-309	136.06	145.63	9.57	W	1	1
1018		Historic	S04-309	145.63	155	9.37	W	1	1
1019		Historic	S04-309	155	166	11	W	1	1
1020		Historic	S04-309	166	177.9	11.9	W	1	1
1021		Historic	S04-309	177.9	182	4.1	W	1	1
1022		Historic	S04-309	193.7	203	9.3	W	1	1
1023		Historic	S04-309	203	212	9	W	1	1
1024		Historic	S04-309	212	222	10	W	1	1
1025		Historic	S04-309	237.8	243.97	6.17	W	1	1pv (0.99), 1 (0.01)
1026		Historic	S04-309	248.6	262	13.4	W	1	1pv
1027		Historic	S04-309	262	274	12	W	1	1pv
1028		Historic	S04-309	274	283.4	9.4	W	1	1pv
1029		Historic	S04-309	306.62	313.5	6.88	W	1	1
1030		Historic	S04-309	328.9	337.4	8.5	W	1	1
1031		Historic	S04-309	337.4	344.3	6.9	W	1	1
1032		Historic	S04-309	344.3	354	9.7	W	1	1
1033		Historic	S04-309	354	366.2	12.2	W	1	1 (0.78), 1ad (0.22)
1034		Historic	S04-309	382	395.29	13.29	W	1	1
1035		Historic	S04-309	395.29	404.2	8.91	W	1	1
1036		Historic	08SBD382	19.7	30.5	10.8	W	1	1o
1037		Historic	08SBD382	41	51.5	10.5	W	1	1o
1038		Historic	08SBD382	51.5	62	10.27	W	1	1o
1039		Historic	08SBD382	62	69.5	7.5	W	1	1o
1040		Historic	08SBD382	78.5	87.5	9	W	1	1o
1041		Historic	08SBD382	96.5	109.39	12.89	W	1	1o
1042		Historic	08SBD382	154.13	166.42	12.1	W	1	1a
1043		Historic	08SBD382	168.67	169	0.33	W	1	1a
1044		Historic	07SBD374	11	23	12	W	1	1
1045		Historic	07SBD374	23	35	12	W	1	1
1046		Historic	07SBD374	35	47	12	W	1	1

SRK Serial Number	Lab ID	Sample Set	Drill Hole ID	Depth From (m)	Depth To (m)	Length (m)	Preliminary Economic Classification	Lithology ¹		
								Primary	Summary (if additional lithologies) (proportion in parentheses)	
1047	Boston #1	Historic	07SBD374	47	53.4	6.4	W	1	1if	
1048		Historic	07SBD374	53.4	64.5	11.1	W	1	1	
1049		Historic	07SBD374	75	85.5	10.5	W	1	1	
1050		Historic	07SBD374	85.5	96	10.5	W	1	1	
1051		Historic	07SBD374	106.5	117	10.5	W	1	1	
1052		Historic	07SBD374	117	124.5	7.5	W	1	1	
1053		Historic	07SBD374	124.5	132	7.5	W	1	1	
1054		Historic	07SBD374	132	135.6	3.6	W	1	1if	
1055		Historic	07SBD374	135.6	149	13.4	W	1	1	
1056		Historic	08SBD380	47.6	56	8.4	W	1	1i	
1057		Historic	08SBD380	56	65	9	W	1	1i	
1058		Historic	08SBD380	65	72.6	7.39	W	1	1i	
1059		Historic	08SBD380	78.5	89	10.5	W	1	1a	
1060		Historic	08SBD380	128	133	5	W	1	1a	
1061		Historic	08SBD380	133	141.5	8.5	W	1	1a	
1062		Historic	08SBD380	141.5	149	7.5	W	1	1a	
1063		Historic	08SBD380	153.5	161	7.5	W	1	1a	
1064		Historic	08SBD380	161	168.5	7.5	W	1	1a	
1065		Historic	08SBD380	168.5	176.3	7.56	W	1	1a	
1066		Historic	08SBD380	232.5	241.5	9	W	1	1a	
1067		Historic	08SBD380	241.5	250	8.5	W	1	1a	
1068		Historic	07SBD356A	419.00	430.98	11.98	W	1	1p	
1069		Historic	07SBD356A	430.98	440.50	9.52	W	1	1pv	
1070		Historic	07SBD356A	440.50	449.50	9	W	1	1pv	
1190		Historic	07SBD356A	449.50	458.50	9	W	1	1pv	
1192		Boston #3	Historic	07SBD356A	458.50	467.50	9	W	1	1pv
1194		Boston #5	Historic	07SBD356A	467.50	477.83	10.33	W	1	1pv
1195		Boston #6	Historic	08SBD383	29.00	38.00	9.00	W	1	1pv
1373		118424	SRK	08SBD383	130.50	140.00	8.50	W	1	1pv (0.66), 1a (0.34)
1374		118425	SRK	08SBD383	140.00	150.50	10.5	W	1	1pv
1375		118426	SRK	08SBD383	150.50	159.00	8.5	W	1	1pv
1376		118427	SRK	08SBD383	159.00	169.50	10.5	W	1	1pv
1377		118428	SRK	08SBD383	169.50	177.50	8	W	1	1pv (0.81), 1ov (0.19)
1378		118429	SRK	08SBD382	30.50	41.00	10.5	W	1	
1379		118430	SRK	08SBD382	69.50	78.50	9	W	1	
1380		118431	SRK	08SBD382	87.50	96.50	9	W	1	
1381		118432	SRK	07SBD374	64.50	75.00	10.5	W	1	
1382		118433	SRK	07SBD374	96.00	106.50	10.5	W	1	
1383		118434	SRK	94NOD120	190	190.1	0.1	O	1	1
1384	118435	SRK	94NOD113	180	180.1	0.1	O	1	1	
1385	118436	SRK	94NOD120	210	210.1	0.1	O	1	1	
1386	118437	SRK	94NOD113	65	65.1	0.1	O	1	1	
1387	118438	SRK	94NOD121A	140	140.1	0.1	O	1	1if	
1388	118439	SRK	94NOD120	210	210.1	0.1	O	1	1	
1389	118440	SRK					O	1	1	
1390	118441	SRK					O	1	1	
1391	118442	SRK					O	1	1	
1392	118443	SRK					O	1	1	
1393	118444	SRK					O	1	1	
1394	118445	SRK					O	1	1	
1395	118446	SRK					O	1	1	
1396	118447	SRK					O	1	1	
1397	118448	SRK					O	1	1	
1398	118450	SRK					O	1	1	
1399	118451	SRK					O	1	1	
1400	118452	SRK					O	1	1	
1401	118453	SRK					O	1	1	
1402	118454	SRK					O	1	1	
1403	118455	SRK					O	1	1	
1404	118456	SRK					O	1	1	
1405	118457	SRK	94NOD128	87.7	101	13.3	O	1	1	
1406	118458	SRK	S04-309	10.8	23.76	12.96	O	1	1ad	
1407	118459	SRK	S04-309	182.34	193.7	11.36	O	1	1	
1408	118460	SRK	S04-309	222	237.8	15.8	O	1	1	
1409	118461	SRK	S04-309	366.2	376	9.8	O	1	1	
1410	118462	SRK	S04-309	376	382	6	O	1	1	
1411	118463	SRK	08SBD380	149	153.5	4.5	O	1	1a	
1412	118464	SRK	07SBD356A	415.60	419.00	3.4	O	1	1p	
1413	118465	SRK	08SBD380	72.6	78.5	5.9	mixed	1	1a	
1414	118466	SRK	07SBD356A	396.00	406.10	10.1	mixed	1	1p	
1415	118467	SRK	07SBD356A	406.10	415.60	9.5	mixed	1	1p	
1416	118468	SRK	94NOD124	50	61	11	W	1 mixed	1 (0.91), 9n (0.09)	
1417	118469	SRK	94NOD124	230	245	15	W	1 mixed	1 (0.8), 9n (0.2)	
1418	118470	SRK	94NOD124	280	293	13	W	1 mixed	1 (0.9), 12q (0.1)	
1419	118471	SRK	S04-309	283.4	291.3	7.9	W	1 mixed	1 (0.99), 1pv (0.01), 9n (0)	
1420	118472	SRK	S04-309	293.4	299.61	6.21	W	1 mixed	1 (0.99), 9n (0.01)	
1421	118473	SRK	08SBD383	38.00	47.50	9.5	W	1 mixed	1pv (0.95), 10a (0.05)	
1422	118474	SRK	08SBD380	89	96	6	O	1 mixed	1a (0.71), 10a (0.29)	
1423	118476	SRK					W	1oj	1oj	
1424	118477	SRK					W	1oj	1oj	
1425	118478	SRK					W	1oj	1oj	
1426	118479	SRK					W	1oj	1oj	
1427	118480	SRK					W	1oj	1oj	
1428	118481	SRK					W	1oj	1oj	
1429	118482	SRK					W	1oj	1oj	
1430	118483	SRK	08SBD381A	11.19	23	11.81	W	1oj	1oj	
1431	118484	SRK	08SBD381A	33.5	44	10.5	W	1oj	1oj	
1432	118485	SRK	08SBD381A	44	47	3	W	1oj	1oj	
1433	118486	SRK	08SBD381A	47	54	7	W	1oj	1oj	
1434	118487	SRK	08SBD381A	54	61.15	7.15	W	1oj	1oj	
1435	118488	SRK	08SBD380	7.2	14	6.53	W	1oj	1oj	
1436	118489	SRK	08SBD380	14	23	9	W	1oj	1oj	
1437	118490	SRK	08SBD380	23	33.5	10.5	W	1oj	1oj	
1438	118491	SRK	08SBD380	39.5	47.6	7.8	W	1oj	1oj (0.95), 12c (0.05)	
1439	118492	SRK	08SBD380	176.3	185.5	9.2	W	1oj	1oj	
1440	118493	SRK	08SBD380	185.5	194.5	9	W	1oj	1oj	
1441	118494	SRK	08SBD380	203.5	214	10.5	W	1oj	1oj	
1442	118495	SRK	08SBD380	223	232.5	8	W	1oj	1oj	
1443	118496	SRK	08SBD380	194.50	203.50	18	W	1oj	1oj	
1444	118497	SRK	08SBD380	214.00	223.00	18	W	1oj	1oj	
1445	118498	SRK	08SBD381A	23.00	33.50	10.5	W	1oj	1oj	
1446	118499	SRK					O	1oj	1oj	
1447	118500	SRK					O	1oj	1oj	
1448	118501	SRK					O	1oj	1oj	
1449	118503	SRK					O	1oj	1oj	
1450	118504	SRK					O	1oj	1oj	
1451	118505	SRK					O	1oj	1oj	
1452	118506	SRK					O	1oj	1oj	
1453	118507	SRK					O	1oj	1oj	
1454	118508	SRK					O	1oj	1oj	
1455	118509	SRK					O	1oj	1oj	
1456	118510	SRK					O	1oj	1oj	
1457	118511	SRK					O	1oj	1oj	
1458	118512	SRK					O	1oj	1oj	
1459	118513	SRK					O	1oj	1oj	
1460	118514	SRK					O	1oj	1oj	
1461	118515	SRK					O	1oj	1oj	
1462	118516	SRK					O	1oj	1oj	
1463	118517	SRK					O	1oj	1oj	
1464	118518	SRK					O	1oj	1oj	
1465	118519	SRK					O	1oj	1oj	
1466	118520	SRK					O	1oj	1oj	
1467	118521	SRK					O	1oj	1oj	
1468	118522	SRK					O	1oj	1oj	
1469	118523	SRK					O	1oj	1oj	
1470	118524	SRK					O	1oj	1oj	
1471	11									

SRK Serial Number	Lab ID	Sample Set	Drill Hole ID	Depth From (m)	Depth To (m)	Length (m)	Preliminary Economic Classification	Lithology ¹	
								Primary	Summary (if additional lithologies) (proportion in parentheses)
1498	08SBD381A-SRK-WR-189	SRK					O	1oj	1oj
1499	08SBD381A-SRK-WR-190	SRK					O	1oj	1oj
1500	08SBD381A-SRK-WR-191	SRK					O	1oj	1oj
1501	08SBD381A-SRK-WR-192	SRK					O	1oj	1oj
1502	08SBD381A-SRK-WR-193	SRK					O	1oj	1oj
1503	08SBD381A-SRK-WR-194	SRK					O	1oj	1oj
1504	08SBD381A-SRK-WR-195	SRK					O	1oj	1oj
1505	08SBD381A-SRK-WR-196	SRK					O	1oj	1oj
1506	08SBD381A-SRK-WR-197	SRK					O	1oj	1oj
1507	08SBD381A-SRK-WR-198	SRK					O	1oj	1oj
1508	08SBD381A-SRK-WR-199	SRK					O	1oj	1oj
1509	08SBD381A-SRK-WR-200	SRK					O	1oj	1oj
1510	08SBD381A-SRK-WR-201	SRK					O	1oj	1oj
1511	08SBD381A-SRK-WR-202	SRK					O	1oj	1oj
1512	08SBD381A-SRK-WR-203	SRK	08SBD380	33.5	39.5	6	O	1oj	1oj
1513	08SBD381A-SRK-WR-204	SRK	08SBD380	250	258	8	mixed	1oj	1oj
1514	08SBD381A-SRK-WR-205	SRK	92NOD20	150	150.1	0.1	W	5	5
1515	08SBD381A-SRK-WR-206	SRK	92NOD20	185	185.1	0.1	W	5	5
1516	08SBD381A-SRK-WR-207	SRK	92NOD10	160	160.1	0.1	W	5	5
1637	08SBD382-SRK-WR-208	SRK	93NOD28	50	50.1	0.1	W	5	5
1638	08SBD382-SRK-WR-209	SRK	93NOD28	80	80.1	0.1	W	5	5
1639	08SBD382-SRK-WR-210	SRK	94NOD128	176.5	189	12.5	W	5	5
1640	08SBD382-SRK-WR-211	SRK	94NOD128	189	198.4	9.4	W	5	5
1641	08SBD382-SRK-WR-212	SRK	S04-309	55	55.9	0.9	W	5	5ai
1642	08SBD382-SRK-WR-213	SRK	S04-309	316.24	328.9	12.66	W	5	5aj
1643	08SBD382-SRK-WR-214	SRK	S04-309	416	429	13	W	5	5aj
1644	08SBD382-SRK-WR-215	SRK	S04-309	429	436.66	7.66	W	5	5aj
1645	08SBD382-SRK-WR-216	SRK	S04-309	436.68	446	9.32	W	5	5aj
1646	08SBD382-SRK-WR-217	SRK	08SBD381A	63.5	74	10.5	W	5	5aj
1647	08SBD382-SRK-WR-218	SRK	08SBD381A	84.5	94.7	10.2	W	5	5aj
1648	08SBD382-SRK-WR-219	SRK	08SBD381A	94.7	98.2	3.5	W	5	5cu
1649	08SBD382-SRK-WR-220	SRK	08SBD381A	98.2	108.5	10.3	W	5	5c
1650	08SBD382-SRK-WR-221	SRK	08SBD381A	108.5	117.5	9	W	5	5c
1651	08SBD382-SRK-WR-222	SRK	08SBD381A	126.5	137	10.5	W	5	5c
1652	08SBD382-SRK-WR-223	SRK	08SBD381A	137	146	9	W	5	5c
1653	08SBD382-SRK-WR-224	SRK	08SBD381A	146	151.05	5.05	W	5	5c
1654	08SBD382-SRK-WR-225	SRK	08SBD381A	151.05	156	4.95	W	5	5cj
1655	08SBD382-SRK-WR-226	SRK	08SBD381A	156	165.5	9.5	W	5	5cu
1656	08SBD382-SRK-WR-227	SRK	08SBD381A	165.5	170.95	5.45	W	5	5cj (0.87), 5c (0.13)
1657	08SBD382-SRK-WR-228	SRK	08SBD381A	170.95	173.55	2.6	W	5	5a
1658	08SBD382-SRK-WR-229	SRK	08SBD381A	173.55	176.6	3.05	W	5	5c
1659	08SBD382-SRK-WR-230	SRK	08SBD381A	176.6	183.85	7.25	W	5	5a
1660	08SBD382-SRK-WR-231	SRK	08SBD381A	183.85	191	7.15	W	5	5cu
1661	08SBD382-SRK-WR-232	SRK	08SBD381A	191	197.8	6.8	W	5	5cu
1662	08SBD382-SRK-WR-233	SRK	08SBD381A	201.85	204.5	2.65	W	5	5cu
1663	08SBD382-SRK-WR-234	SRK	08SBD381A	204.5	212	7.5	W	5	5cu
1664	08SBD382-SRK-WR-235	SRK	08SBD381A	212	218	6	W	5	5cu (0.92), 5c (0.08)
1665	08SBD382-SRK-WR-236	SRK	08SBD381A	218	224.95	6.95	W	5	5c
1666	08SBD382-SRK-WR-237	SRK	08SBD381A	224.95	233	8.05	W	5	5c (0.56), 5cu (0.44)
1667	08SBD382-SRK-WR-238	SRK	08SBD381A	233	237.5	4.5	W	5	5aw (0.93), 5c (0.07)
1668	08SBD382-SRK-WR-239	SRK	08SBD381A	237.5	248.2	10.7	W	5	5aw
1669	08SBD382-SRK-WR-240	SRK	08SBD381A	248.2	252.7	4.25	W	5	5h
1670	08SBD382-SRK-WR-241	SRK	08SBD381A	252.7	258.55	5.85	W	5	5c
1671	08SBD382-SRK-WR-242	SRK	08SBD381A	258.55	262.6	4.05	W	5	5h (0.47), 5a (0.41), 5c (0.12)
1672	08SBD382-SRK-WR-243	SRK	08SBD381A	262.6	268.4	5.54	W	5	5c
1673	08SBD382-SRK-WR-244	SRK	08SBD381A	268.4	273.1	4.7	W	5	5c (0.73), 5a (0.17), 5h (0.1)
1674	08SBD382-SRK-WR-245	SRK	08SBD381A	273.1	284.93	11.61	W	5	5c
1675	08SBD382-SRK-WR-246	SRK	08SBD381A	284.93	296.9	11.97	W	5	5c
1676	08SBD382-SRK-WR-247	SRK	08SBD381A	296.9	305	8.1	W	5	5c (0.7), 5a (0.3)
1677	08SBD382-SRK-WR-248	SRK	08SBD381A	305	312	7	W	5	5c
1710	07SBD374-SRK-WR-281	SRK	08SBD381A	312	316.3	4.09	W	5	5a (0.85), 5c (0.15)
1711	07SBD374-SRK-WR-282	SRK	08SBD381A	316.3	326	9.7	W	5	5c
1712	07SBD374-SRK-WR-283	SRK	08SBD381A	333.5	344	10.5	W	5	5c
1713	07SBD374-SRK-WR-284	SRK	08SBD381A	344	347.3	3.3	W	5	5cu
1714	07SBD374-SRK-WR-285	SRK	08SBD381A	347.3	359	11.44	W	5	5a
1715	07SBD374-SRK-WR-286	SRK	08SBD382	7.43	12.82	4.29	W	5	5aj
1716	07SBD374-SRK-WR-287	SRK	08SBD382	14	19.7	5.7	W	5	5aj
1717	07SBD374-SRK-WR-288	SRK	08SBD382	109.39	121	11.38	W	5	5cj
1718	07SBD374-SRK-WR-289	SRK	08SBD382	121	132.84	11.84	W	5	5cj
1719	07SBD374-SRK-WR-290	SRK	08SBD382	132.84	139.8	6.96	W	5	5c
1720	07SBD374-SRK-WR-291	SRK	08SBD382	139.8	146	6.2	W	5	5c
1721	07SBD374-SRK-WR-292	SRK	08SBD382	146	153.23	7.23	W	5	5c
1722	07SBD374-SRK-WR-293	SRK	08SBD382	169	181.14	12.14	W	5	5c
1723	07SBD374-SRK-WR-294	SRK	08SBD382	181.14	190.48	9.09	W	5	5c (0.81), 5cu (0.19)
1724	07SBD374-SRK-WR-295	SRK	08SBD382	190.48	197	6.52	W	5	5cu
1725	07SBD374-SRK-WR-296	SRK	08SBD382	204.5	214.54	10.04	W	5	5cu
1726	07SBD374-SRK-WR-297	SRK	08SBD382	214.54	222.12	7.33	W	5	5cu
1727	07SBD374-SRK-WR-298	SRK	08SBD382	222.12	228.43	6.31	W	5	5cu
1728	07SBD374-SRK-WR-299	SRK	08SBD382	228.43	239.38	10.95	W	5	5c
1729	07SBD374-SRK-WR-302	SRK	08SBD382	239.38	241.25	1.87	W	5	5a
1783	08SBD381A-NMS-WR-356	SRK	08SBD382	241.25	250.5	8.93	W	5	5c
1784	08SBD381A-NMS-WR-357	SRK	08SBD382	250.5	258.5	8	W	5	5c
1815	08SBD380-SRK-WR-388	SRK	08SBD382	258.5	267.5	9	W	5	5c
1816	08SBD380-SRK-WR-389	SRK	08SBD382	267.5	277.5	9.69	W	5	5c
1817	08SBD380-SRK-WR-390	SRK	08SBD382	277.5	284.25	6.75	W	5	5a (0.57), 5cu (0.43)
1818	08SBD380-SRK-WR-391	SRK	08SBD382	284.25	291.5	7.25	W	5	5c
1819	08SBD380-SRK-WR-392	SRK	08SBD382	291.5	305.65	14.15	W	5	5c
1820	08SBD380-SRK-WR-393	SRK	08SBD382	305.65	315.65	9.74	W	5	5cu
1821	08SBD380-SRK-WR-394	SRK	08SBD382	315.65	323	7.35	W	5	5cu (0.68), 5a (0.32)
1822	08SBD380-SRK-WR-395	SRK	08SBD382	327.5	336.5	9	W	5	5cu
1823	08SBD380-SRK-WR-396	SRK	08SBD382	336.5	345.5	9	W	5	5cu
1824	08SBD380-SRK-WR-397	SRK	08SBD382	345.5	353.2	7.7	W	5	5cu
1825	08SBD380-SRK-WR-398	SRK	08SBD382	353.2	361.3	8.1	W	5	5c (0.7), 5a (0.3)
1826	08SBD380-SRK-WR-399	SRK	08SBD382	361.3	369.7	8.4	W	5	5c (0.8), 5a (0.2)
1827	08SBD380-SRK-WR-400	SRK	08SBD382	369.7	381.5	11.8	W	5	5cu
1828	08SBD380-SRK-WR-401	SRK	07SBD374	161	171	10	W	5	5aj
1829	08SBD380-SRK-WR-402	SRK	07SBD374	171	181.5	10.5	W	5	5aj
1830	08SBD380-SRK-WR-403	SRK	07SBD374	181.5	192	10.5	W	5	5aj
1831	08SBD380-SRK-WR-404	SRK	07SBD374	192	202.5	10.5	W	5	5aj
1832	08SBD380-SRK-WR-405	SRK	07SBD374	202.5	213	10.5	W	5	5aj
1833	08SBD380-SRK-WR-406	SRK	07SBD374	213	222.5	9.5	W	5	5aj
1834	08SBD380-SRK-WR-407	SRK	07SBD374	226.37	230	3.63	W	5	5aj
1835	08SBD380-SRK-WR-408	SRK	08SBD381A	117.5	126.5	9	W	5	5c
1836	08SBD380-SRK-WR-409	SRK	08SBD381A	74	84.5	10.5	W	5	5aj
1837	08SBD380-SRK-WR-410	SRK	08SBD381A	326.00	333.50	7.5	W	5	
1838	08SBD380-SRK-WR-411	SRK	08SBD382	197.00	204.50	7.5	W	5	
1839	08SBD380-SRK-WR-412	SRK	S04-309	404.2	416	11.8	O	5	
1840	08SBD380-SRK-WR-413	SRK	08SBD382	323	327.5	4.5	mixed	5	5aj 5cu
1841	08SBD380-SRK-WR-414	SRK	08SBD381A	61.15	63.5	2.35	W	5 mixed	5aj (0.88), 12q (0.12)
1873	08SBD380-SRK-WR-415	SRK	07SBD374	149	161	12	O	5 mixed	5aj (0.56), 1 (0.32), 9n (0.13)
1874	08SBD380-SRK-WR-416	SRK	94NOD124	245	248	3	W	9n	9n (0.88), 12q (0.12)
1875	08SBD380-SRK-WR-417	SRK	94NOD128	85.4	87.7	2.3	W	9n	9n
1878	07SBD356A-SRK-WR-451	SRK	S04-309	291.3	293.4	2.1	W	9n	9n
1879	07SBD356A-SRK-WR-452	SRK	S04-309	299.61	302.3	2.69	W	9n	9n (0.94), 1 (0.06)
1880	07SBD356A-SRK-WR-453	SRK	08SBD380	2.77	7.2	4.23	W	9n	9n
1881	07SBD356A-SRK-WR-454	SRK	08SBD380	96	105.4	9.09	W	10a	10a
1882	07SBD356A-SRK-WR-455	SRK	08SBD380	123.3	128	4.7	W	10a	10a
1883	07SBD356A-SRK-WR-456	SRK	08SBD383	47.50	50.00	2.5	W	10a	10a
1884	07SBD356A-SRK-WR-457	SRK	08SBD380	105.4	114.5	9.1	O	10a	10a
1885	07SBD356A-SRK-WR-458	SRK	08SBD380	114.5	123.3	8.48	O	10a	10a
1886	07SBD356A-SRK-WR-459	SRK	94NOD124	225	225.1	0.1	W	12q	12q
2041	08SBD383-SRK-WR-548	SRK	94NOD124						

Appendix D – HBML Standard Lithology Codes

LEGEND
Outcrop Lithologies

Proterozoic Rocks

13

Proterozoic Sandstones

11

a Franklin diabase
b MacKenzie diabase
c diabase (unsubdivided)

Archean Rocks

10

Late* Mafic-Ultramafic Intrusive Rocks

- a gabbro
b fine- to medium-grained mafic dyke
c fine- to medium-grained ultramafic dyke
d diorite
f feldspar-phynic
h hornblende-phynic
p hypabyssal porphyritic rock
i xenolithic mafic-ultramafic intrusion

9

Late* Granitoid Rocks (mainly post-volcanic)

- a granite
b syenite
c granodiorite
d monzonite and quartz monzonite
e monzodiorite and quartz monzodiorite
g granitic gneiss and migmatite
f feldspar-phynic granitoid
q quartz-phynic granitoid
l xenolithic granitoid and intrusion breccia
- p porphyritic hypabyssal granitoid
t granitoid with less than 50% wallrock xenoliths (transitional to country rock)**
k fine-grained felsic dyke
n fine-grained intermediate dyke

8

Early* Granitoid Rocks (mainly synvolcanic)

- a tonalite
b trondhemite
c granodiorite
d diorite and quartz diorite
e monzodiorite and quartz monzodiorite
f feldspar-phynic granitoid
g tonalitic gneiss and migmatite
q quartz-phynic granitoid
l xenolithic granitoid and intrusion breccia
- p porphyritic hypabyssal granitoid
i fine-grained massive intermediate to felsic rock, may be equivalent to 3i, 4i****
t granitoid with less than 50% wallrock xenoliths (transitional to country rock)**

7

Early* Mafic and Ultramafic Intrusive Rocks (mainly synvolcanic)

- a gabbro
b leucogabbro
c melanogabbro
d diorite
h anorthosite
f feldspar-phynic gabbroic (includes glomeroporphyritic texture)
i fine-grained massive mafic/ultramafic rock, may be equivalent to 7i****
q quartz-bearing gabbroic rock
- m magnetite-ilmenite bearing mafic-ultramafic rock
o pyroxenite
r peridotite (includes serpentinite)
t gabbroic rock containing less than 50% granitoid dykes**
l xenolithic gabbroic to ultramafic intrusive rock
s (bdc)-chlorite schist
- u ultramafic intrusive rock (composition not specified)

6

Late* Sedimentary Rocks of the Conglomerate-Arenite facies (postvolcanic)

- a argillite
b siltstone
c arenite
d conglomerate
e biotite hornfels or schist (amphibolite facies)
f feldspathic arenite
l lithic arenite
q quartzose arenite
g iron formation
m magnetite bearing clastic rock
p granitoid clasts
- o polymictic (otherwise monomictic)***
k thick bedded (>30cm)
n thin bedded (<30cm)
r limestone/marble
s metasedimentary schist
t metasedimentary rock cut by less than 50% granitoid**

5

Early* Sedimentary Rocks of Wacke-Mudstone Facies (syn- to post volcanic)

- a argillite
b siltstone
c wacke
d conglomerate
e porphyroblastic biotite schist (amphibolite facies)
f feldspathic wacke
l lithic wacke
q quartzose wacke
s biotite schist
g iron formation
m magnetite-bearing wacke
- o polymictic (otherwise monomictic)***
k thick bedded (>30 cm)
n thin bedded (<30 cm)
r biotite migmatite less than 50% leucosome
v volcanic sandstone and conglomerate (may be equivalent to 4j)
t metasedimentary rock cut by less than 50% granitoid*
- s metasedimentary schist

4

Felsic Metavolcanic Rocks

- a flow
b tuff
c lapilli-(stone)
d breccia
e quartz-albite-biotite schist (amphibolite facies)
q quartz-phynic (includes glomeroporphyritic rocks)
i fine- to medium-grained massive felsic rock, may be equivalent to 8i****
- j felsic volcanic sandstone, pebbly sandstone and conglomerate
k thick bedded (>30 cm)
n thin bedded (<30cm)
o heterolithic fragmental rock (otherwise monolithic)**
s quartz-sericite schist
- t felsic metavolcanic rock containing less than 50% granitoid dykes**
w flow banded structure
y amygdaloidal/vesicular

3

Intermediate to Felsic Metavolcanic Rocks

- a flow
b tuff
c lapilli-(stone)
d breccia
e quartz-plagioclase-actinolite schist (amphibolite facies)
f feldspar-phynic (includes glomeroporphyritic rocks)
i fine- to medium-grained massive intermediate to felsic rock, may be equivalent to 8i****
- j intermediate to felsic volcanic sandstone, pebbly sandstone and conglomerate
k thick bedded (>30cm)
n thin bedded (<30cm)
o heterolithic fragmental rock (otherwise monolithic)**
q quartz-phynic
- s quartz-chlorite-sericite schist
t felsic to intermediate volcanic rock containing less than 50% granitoid dykes**
y amygdaloidal/vesicular structure

2

Intermediate Metavolcanic Rocks

- a flow
b tuff
c lapilli-(stone)
d breccia
e epidote-plagioclase amphibolite (amphibolite facies)
f feldspar-phynic (includes glomeroporphyritic rocks)
h hornblende-phynic
- i fine- to medium-grained massive intermediate rock, may be equivalent to 7i****
j interflow chert/argillite/sandstone
k thick pillow selvages (>2cm)
n thin pillow selvages (<2cm)
- o heterolithic fragmental rock (otherwise monolithic)
p pillowed flow
s chlorite schist
t intermediate volcanic rock containing less than 50% granitoid dykes**
v variolitic flow
y amygdaloidal/vesicular flow

1

Ultramafic to Mafic Metavolcanic Rocks

- a flow
b tuff
c lapilli-(stone)
d breccia
e amphibolite (amphibolite facies)
f feldspar-phynic (includes glomeroporphyritic rocks)
i fine- to medium-grained massive mafic rock, may be equivalent to 7i****
- j interflow chert/argillite/sandstone
k thick pillow selvages (>2cm)
n thin pillow selvages (<2cm)
o heterolithic fragmental rock (otherwise monolithic)**
p pillowed flow
r polystrured flow
s chlorite schist
- t mafic metavolcanic rock containing less than 50% granitoid dykes**
u ultramafic volcanic rock
v variolitic
w white- to light-weathering mafic metavolcanic (quartz-epidote alteration)
x spirifex-textured flow
y amygdaloidal/vesicular flow

Generic Codes: Z - unmapped or questionable lithology, C - Calc alkaline, M - Magnesian Tholeiite, T - Tholeiite, F - Iron Tholeiite, B - Basaltic Komatiite, K - Komatiite

NOTES:
*early and late used in a relative sense only ** suffix "T" should only be used for transition from supracrustal to adjacent intrusions, rock type chosen on dominant (>50%) lithology.
*** suffix "o" separates heterolithic from monolithic volcanic fragmental rocks and polymictic from monomictic sedimentary rocks. No suffix required for rocks with single clast population.
**** may be fine- (coarse) -grained equivalents of rocktypes shown in brackets: eg. fine-grained gabbro versus coarse-grained basalt.

Hope Bay Mining Lithology Codes (2008 lithology coding standard)				
CODE	CODEDESC	Colour	RGB	VL Colour Code
1	Mafic to Ultramafic Volcanic		0,153,102	6723840
2	Intermediate Volcanic		204,255,204	13434828
3	Intermediate to Felsic Volcanic		192,192,64	4243648
4	Felsic Metavolcanic rocks		255,255,0	65535
5	Sedimentary Rocks		192,192,192	12632256
6	Post Volcanic Sedimentary Rocks		153,102,0	26265
7	Early Mafic / UM Intrusions		102,0,204	13369446
8	Synvolcanic Granitoid Rocks		255,153,153	10066431
9	Late Felsic Intrusive		255,153,204	13408767
10	Late Mafic Intrusion		0,0,128	8388608
11	Diabase		4,4,4	263172
12	Vein >30cm or Zone of >70% Single Vein Event		255,128,0	33023
13	Significant Structure		204,0,0	204
14	Missing Core		220,220,182	11984092
15	Casing		220,220,182	11984092

Appendix E – Summary of Humidity Cell and Field Barrel Test Sample Intervals,
Boston

Appendix E: List of Humidity Cell Test and Barrel Test Drill Core Intervals, Boston

Humidity Cell ID	Barrel Test ID	Lithology ¹	Preliminary Economic Classification	Drill Hole	From	To	Length	Barrel Test	
								Mass (kg)	Set-up Year
HC-12	B3	1	Ore/Waste	07SBD356A	395.25	475.06	79.81	214.0	2008
HC-31	-	1	Waste	07SBD374	53.4	64.5	11.1	-	-
HC-55	-	1	Waste	94NOD128	20.7	30	9.3	-	-
HC-10	B1	1 mixed	Waste	08SBD383	28.66	47.5	18.84	229.8	2008
				08SBD383	131.66	133.7	2.04	-	-
				08SBD383	133.7	176.83	43.13	-	-
				08SBD383	47.5	49.42	1.92	-	-
HC-32	-	10j	Waste	08SBD380	7.2	14	6.8	-	-
HC-33	-	10j	Waste	08SBD380	23	33.5	10.5	-	-
-	B4	10j	Waste	08SBD381	14.8	36.62	21.82	253.5	2009
-			-	08SBD381A	14.8	61.15	46.35	-	-
HC-35	-	5	Waste	08SBD382	267.5	276.52	9.02	-	-
HC-34	-	5	Waste	08SBD382	7.43	12.82	5.39	-	-
HC-11	B2	5	Waste	08SBD381A	100	139.54	39.54	238.7	2008
-	B5	5	Ore/Waste	08SBD381A	67.2	92.73	25.53	-	-
				07SBD374	157.2	225.09	67.89	175.4	2009
HC-37	-	12q	Waste	94NOD124	259	263.5	4.5	-	-
HC-38	-	12q	Ore/Waste	94NOD124	277.5	280	2.5	-	-

¹Lithology codes as follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **10j** = mafic metavolcanics with sediments; **5** = sedimentary units; **5 mixed** = mixed sedimentary units; **9n** = late intermediate dyke; **10a** = late gabbro; **12q** = quartz vein; **12q mixed** = mixed

Appendix F – Semi-quantitative XRD Mineralogy Data, Boston

Appendix F: Semi-Quantitative XRD Mineralogy Data, Boston

SRK Serial Number	Sample ID	Preliminary Economic Classification	Lithology ¹	Ferroan Dolomite	Calcite	Chlorite	Chloritoid	Magnesite	Magnetite	Muscovite	Muscovite/Sericite	Paragonite	Plagioclase	Pyrite	Quartz	Rutile	Siderite	Siderite/Magnesite	Sum
				Ca(Fe,Mg)(CO ₃) ₂	CaCO ₃	(Mg,Fe,Al) ₂ (Al,Si) ₂ O ₁₀ (OH) ₂	(Fe,Mg,Mn) ₂ Al ₂ Si ₂ O ₁₀ (OH) ₂	MgCO ₃	Fe ₃ O ₄	KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂	NaAl ₃ Si ₃ O ₁₀ (OH) ₂	(Ca,Na)(Al,Si)AlSi ₂ O ₈	FeS ₂	SiO ₂	TiO ₂	FeCO ₃	(Fe _{0.3x} Mg _{0.7x})CO ₃		
				%	%	%	%	%	%	%	%	%	%	%	%	%	%		
1373	118424	W	1	37	-	16	-	-	-	-	-	5	9	-	32	1	-	-	100
1374	118425	W	1	37	-	19	-	-	-	-	-	6	9	-	28	1	-	-	100
1375	118426	W	1	37	-	18	-	-	-	3	-	3	5	-	31	3	-	-	100
1376	118427	W	1	34	-	20	-	-	-	-	-	9	4	-	31	2	-	-	100
1377	118428	W	1	43	1	8	-	-	-	4	-	6	5	-	27	3	-	-	100
1378	118429	W	1	38	1	14	-	-	-	-	-	4	3	-	34	3	-	-	100
1379	118430	W	1	32	1	15	-	-	-	-	-	5	10	-	36	1	-	-	100
1380	118431	W	1	31	-	13	-	-	-	-	-	5	9	-	36	1	-	5	100
1381	118432	W	1	26	-	18	-	-	-	-	-	18	-	-	29	tr	-	8	99
1382	118433	W	1	25	tr	7	-	-	-	9	-	19	7	-	27	1	-	4	99
1383	118434	O	1	34	-	12	-	-	-	-	-	9	9	1	34	1	-	-	100
1384	118435	O	1	34	-	22	-	-	-	2	-	7	-	-	31	3	-	2	100
1385	118436	O	1	33	-	7	-	-	-	9	-	8	7	-	30	1	-	4	99
1386	118437	O	1	30	-	-	-	-	-	15	-	6	9	tr	30	2	-	8	100
1387	118438	O	1	34	-	4	-	-	-	8	-	5	-	2	45	3	-	-	100
1388	118439	O	1	38	-	13	-	-	-	7	-	5	-	-	30	3	-	4	100
1389	118440	O	1	42	-	15	-	-	-	-	-	6	2	-	32	3	-	1	100
1390	118441	O	1	34	-	16	-	-	-	4	-	7	3	-	31	1	-	-	100
1391	118442	O	1	32	1	17	-	-	-	2	-	17	5	-	25	1	-	-	100
1392	118443	O	1	37	-	13	-	-	-	-	-	5	11	-	31	1	-	2	100
1393	118444	O	1	33	1	24	-	-	-	-	-	6	6	-	29	1	-	-	100
1394	118445	O	1	32	-	24	-	-	-	-	-	7	7	1	26	3	-	-	100
1395	118446	O	1	29	-	18	-	-	-	4	-	18	2	-	26	3	-	-	100
1396	118447	O	1	45	-	11	-	-	-	4	-	5	4	1	28	1	-	-	99
1397	118448	O	1	36	-	18	-	-	-	4	-	5	5	-	30	1	-	1	100
1398	118450	O	1	28	2	24	-	-	-	-	-	5	4	-	33	3	-	-	99
1399	118451	O	1	29	-	25	-	-	-	6	-	7	6	-	26	1	-	-	100
1400	118452	O	1	36	-	3	-	-	-	9	-	3	1	3	42	3	-	-	100
1401	118453	O	1	36	1	7	-	-	-	8	-	5	6	2	32	3	-	-	100
1402	118454	O	1	27	-	-	-	-	-	7	-	3	-	3	57	3	-	-	100
1403	118455	O	1	32	-	2	-	-	-	11	-	7	3	3	35	3	-	3	99
1404	118456	O	1	29	-	7	-	-	-	-	-	18	5	-	25	3	-	6	99
1405	118457	O	1	31	-	12	-	-	-	31	-	19	3	-	32	3	-	-	100
1406	118458	O	1	29	-	9	-	-	-	11	-	16	5	-	29	1	-	-	100
1407	118459	O	1	34	-	20	-	-	-	4	-	8	-	-	31	3	-	-	100
1408	118460	O	1	37	-	16	-	-	-	-	-	5	8	-	33	1	-	-	100
1409	118461	O	1	41	-	20	-	-	-	-	-	6	-	-	31	1	-	-	99
1410	118462	O	1	36	-	18	-	-	-	2	-	7	3	-	30	3	-	-	99
1411	118463	O	1	33	-	18	-	-	-	4	-	8	5	-	29	2	-	1	100
1412	118464	O	1	27	7	25	-	-	-	2	-	4	6	-	26	3	-	-	100
1413	118465	mixed	1	13	16	39	-	-	-	-	-	-	6	-	25	1	-	-	100
1414	118466	mixed	1	29	10	21	-	-	-	1	-	5	7	-	27	1	-	-	100
1415	118467	mixed	1	38	2	15	-	-	-	4	-	5	3	-	29	3	-	-	99
1416	118468	W	1 mixed	27	-	10	-	-	-	14	-	5	8	-	36	1	-	-	100
1417	118469	W	1 mixed	37	-	12	-	-	-	3	-	20	-	-	25	3	-	-	100
1418	118470	W	1 mixed	42	-	10	-	-	-	8	-	6	5	-	29	1	-	-	100
1419	118471	W	1 mixed	33	-	11	-	-	-	11	-	18	2	-	24	3	-	-	99
1420	118472	W	1 mixed	36	-	12	-	-	-	11	-	5	5	-	23	3	-	5	100
1421	118473	W	1 mixed	42	-	15	-	-	-	15	-	15	1	3	24	3	-	-	100
1422	118474	O	1 mixed	46	-	7	-	-	-	12	-	-	2	2	28	3	-	-	100
1423	118476	W	1oj	38	-	10	-	-	-	11	-	-	1	1	34	2	-	2	99
1424	118477	W	1oj	42	-	6	-	-	-	16	-	-	-	1	30	3	-	-	100
1425	118478	W	1oj	40	-	10	-	-	-	16	-	-	-	2	28	3	-	-	99
1426	118479	W	1oj	34	-	7	-	-	-	11	-	-	-	2	44	2	-	tr	100
1427	118480	W	1oj	30	-	11	-	-	-	12	-	21	-	-	19	3	-	5	100
1428	118481	W	1oj	30	-	7	-	-	-										

SRK Serial Number	Sample ID	Preliminary Economic Classification	Lithology ¹	Ferroan Dolomite	Calcite	Chlorite	Chloritoid	Magnesite	Magnetite	Muscovite	Muscovite/Sericite	Paragonite	Plagioclase	Pyrite	Quartz	Rutile	Siderite	Siderite/Magnesite	Sum
				Ca(Fe,Mg)(CO ₃) ₂	CaCO ₃	(Mg,Fe,Al) ₃ (Al,Si) ₂ O ₁₀ (OH) ₂	(Fe,Mg,Mn) ₂ Al ₂ Si ₂ O ₁₀ (OH) ₂	MgCO ₃	Fe ₃ O ₄	KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂		NaAl ₃ Si ₃ O ₁₀ (OH) ₂	(Ca,Na)(Al,Si)AlSi ₂ O ₈	FeS ₂	SiO ₂	TiO ₂	FeCO ₃	(Fe _{0.99} Mg _{0.01})CO ₃	
				%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
1480	08SBD381A-SRK-WR-171	O	10j	13	-	3	-	-	-	-	25	5	-	1	52	1	-	-	100
1481	08SBD381A-SRK-WR-172	O	10j	23	-	11	tr	-	-	-	8	11	-	-	46	1	-	-	100
1482	08SBD381A-SRK-WR-173	O	10j	24	-	15	tr	-	-	-	8	10	-	-	42	1	-	-	100
1483	08SBD381A-SRK-WR-174	O	10j	28	-	21	tr	-	-	-	8	10	-	-	32	1	-	-	100
1484	08SBD381A-SRK-WR-175	O	10j	30	-	20	tr	-	-	-	7	9	-	-	33	1	-	-	100
1485	08SBD381A-SRK-WR-176	O	10j	33	-	16	tr	-	-	-	7	9	-	-	34	1	-	-	100
1486	08SBD381A-SRK-WR-177	O	10j	32	-	15	1	-	-	-	8	9	-	-	34	1	-	-	100
1487	08SBD381A-SRK-WR-178	O	10j	32	-	2	8	-	-	-	4	9	-	-	43	2	-	-	100
1488	08SBD381A-SRK-WR-179	O	10j	23	-	6	11	-	-	-	3	7	-	-	47	2	-	-	100
1489	08SBD381A-SRK-WR-180	O	10j	22	-	3	1	-	-	-	9	10	-	-	54	1	-	-	99
1490	08SBD381A-SRK-WR-181	O	10j	25	-	6	-	-	-	-	18	8	-	tr	41	1	-	-	99
1491	08SBD381A-SRK-WR-182	O	10j	18	-	9	-	-	-	-	15	7	-	tr	49	1	-	-	99
1492	08SBD381A-SRK-WR-183	O	10j	10	-	27	-	-	-	-	21	5	-	1	33	1	-	1	99
1493	08SBD381A-SRK-WR-184	O	10j	10	-	16	-	-	-	-	19	-	20	-	34	1	-	-	100
1494	08SBD381A-SRK-WR-185	O	10j	14	-	9	-	-	-	-	25	-	17	-	31	-	3	-	100
1495	08SBD381A-SRK-WR-186	O	10j	16	-	4	-	-	-	-	15	-	13	-	49	1	1	-	99
1496	08SBD381A-SRK-WR-187	O	10j	12	-	13	-	-	-	-	23	-	15	-	36	1	-	-	100
1497	08SBD381A-SRK-WR-188	O	10j	11	-	18	-	-	-	-	18	-	25	-	28	tr	-	-	100
1498	08SBD381A-SRK-WR-189	O	10j	10	-	19	-	-	-	-	19	-	24	-	27	1	-	-	100
1499	08SBD381A-SRK-WR-190	O	10j	6	1	19	-	-	-	-	17	-	30	-	27	tr	-	-	100
1500	08SBD381A-SRK-WR-191	O	10j	7	1	16	-	-	-	-	20	-	26	-	30	tr	-	-	100
1501	08SBD381A-SRK-WR-192	O	10j	8	-	17	-	-	-	-	19	-	27	-	28	tr	-	-	99
1502	08SBD381A-SRK-WR-193	O	10j	9	-	21	-	-	-	-	23	-	17	-	29	1	-	-	100
1503	08SBD381A-SRK-WR-194	O	10j	11	-	8	-	-	-	-	19	-	27	-	33	1	-	-	99
1504	08SBD381A-SRK-WR-195	O	10j	12	-	15	-	-	-	-	21	-	20	-	30	1	-	-	99
1505	08SBD381A-SRK-WR-196	O	10j	11	-	8	-	-	-	-	20	2	20	1	37	1	-	-	100
1506	08SBD381A-SRK-WR-197	O	10j	10	-	17	-	-	-	-	16	4	22	-	30	tr	-	-	99
1507	08SBD381A-SRK-WR-198	O	10j	3	5	22	-	-	-	-	17	-	25	-	27	tr	-	-	100
1508	08SBD381A-SRK-WR-199	O	10j	-	6	20	-	-	-	-	13	-	34	-	27	tr	-	-	99
1509	08SBD381A-SRK-WR-200	O	10j	6	4	20	-	-	-	-	24	-	14	-	32	tr	-	-	100
1510	08SBD381A-SRK-WR-201	O	10j	2	2	19	-	-	-	-	21	-	23	-	32	1	-	-	100
1511	08SBD381A-SRK-WR-202	O	10j	-	4	15	-	-	-	-	16	-	36	-	29	tr	-	-	100
1512	08SBD381A-SRK-WR-203	O	10j	1	1	25	-	-	-	-	24	-	22	-	27	tr	-	-	100
1513	08SBD381A-SRK-WR-204	mixed	10j	2	3	17	-	-	-	-	17	-	32	-	29	tr	-	-	100
1514	08SBD381A-SRK-WR-205	W	5	9	-	12	-	-	-	-	21	-	27	-	30	1	-	-	100
1515	08SBD381A-SRK-WR-206	W	5	7	-	17	-	-	-	-	24	-	13	-	38	1	-	-	100
1516	08SBD381A-SRK-WR-207	W	5	8	-	22	-	-	-	-	25	-	10	-	34	1	-	-	100
1637	08SBD382-SRK-WR-208	W	5	20	-	1	-	-	-	-	6	4	-	2	34	1	-	-	100
1638	08SBD382-SRK-WR-209	W	5	19	-	-	-	-	-	-	4	5	-	3	56	1	-	-	100
1639	08SBD382-SRK-WR-210	W	5	27	-	2	5	-	-	-	9	6	-	1	33	1	2	-	100
1640	08SBD382-SRK-WR-211	W	5	27	-	2	2	-	-	-	-	-	-	1	20	1	-	-	99
1641	08SBD382-SRK-WR-212	W	5	31	-	2	4	-	-	-	-	-	-	6	28	1	-	-	100
1642	08SBD382-SRK-WR-213	W	5	29	-	2	2	-	-	-	-	-	-	9	20	1	-	-	100
1643	08SBD382-SRK-WR-214	W	5	25	-	2	4	-	-	-	-	-	-	5	37	1	-	-	99
1644	08SBD382-SRK-WR-215	W	5	15	-	13	1	-	-	-	8	7	-	-	55	1	-	-	100
1645	08SBD382-SRK-WR-216	W	5	13	-	10	2	-	-	-	8	7	-	-	59	1	-	-	100
1646	08SBD382-SRK-WR-217	W	5	12	-	12	tr	-	-	-	14	7	-	-	54	1	-	-	100
1647	08SBD382-SRK-WR-218	W	5	12	-	14	-	-	-	-	23	5	-	-	42	1	3	-	100
1648	08SBD382-SRK-WR-219	W	5	13	-	1	-	-	-	-	23	9	-	-	46	2	6	-	100
1649	08SBD382-SRK-WR-220	W	5	14	-	2	-	-	-	-	22	8	-	-	47	2	-	-	100
1650	08SBD382-SRK-WR-221	W	5	13	-	3	-	-	-	-	10	4	-	-	67	1	2	-	100
1651	08SBD382-SRK-WR-222	W	5	15	-	-	-	-	-	-	24	9	-	-	45	1	6	-	100
1652	08SBD382-SRK-WR-223	W	5	13	-	-	-	-	-	-	16	6	-	1	60	2	2	-	100
1653	08SBD382-SRK-WR-224	W	5	12	-	3	-	-	-	-	29	11	-	1	37	2	4	-	99
1654	08SBD382-SRK-WR-225	W	5	12	-	-	-	-	-	-	24	7	-	-	43	1	6	-	100
1655	08SBD382-SRK-WR-226	W	5	13	-	-	-	-	-	-	23	7	-	-	43	1	5	-	100
1656	08SBD382-SRK-WR-227	W	5	11	-	2	-	-	-	-	20	8	-	-	41	1	6	-	100
1657	08SBD382-SRK-WR-228	W	5	14	-	2	-	-	-	-	21	10	-	tr	41	1	4	-	99
1658	08SBD382-SRK-WR-229	W	5	10	-	14	-	-	-	-	28	6	-	1	35	1	5	-	100
1659	08SBD382-SRK-WR-230	W	5	11	-	9	-	-	-	-	17	4	23	-	34	1	1	-	100
1660	08SBD382-SRK-WR-231	W	5	12	-	5	-	-	-	-	18	5	21	-	37	1	1	-	100
1661	08SBD382-SRK-WR-232	W	5	3	-	22	-	-	-	-	33	1	-	3	37	tr	-	-	99
1662	08SBD382-SRK-WR-233	W	5	9	-	7	-	-	-	-	17	2	21	-	43	1	-	-	100
1663	08SBD382-SRK-WR-234	W	5	8	-	10	-	-	-	-	16	3	21	1	40	1	-	-	100
1664	08SBD382-SRK-WR-235	W	5	10	-	7	-	-	-	-	16	2	24	-	40	1	-	-	100
1665	08SBD382-SRK-WR-236	W	5	12	-	6	-	-	-	-	20	3	18	-	39	1	-	-	99
1666	08SBD382-SRK-WR-237	W	5	7	-	18	-	-	-	-	26	2	7	3	36	1	-	-	100
1667	08SBD382-SRK-WR-238	W	5	11	-	8	-	-	-	-	22	3	11	1	44	tr	-	-	100
1668	08SBD382-SRK-WR-239	W	5	9	-	8	-	-	-	-	17	2	25	-	38	1	-	-	100
1669	08SBD382-SRK-WR-240	W	5	11	-	1	-	-	-	-	22	6	14	1	41	1	3	-	100
1670	08SBD382-SRK-WR-241	W	5	10	-	-	-	-	-	-	21	5	26	-	32	1	-	5	100
1671	08SBD382-SRK-WR-242	W	5	13	-	4	-	-	-	-	20	6	10	1	41	1	4	-	100
1672	08SBD382-SRK-WR-243	W	5	11	-	18	-	-	-	-	18	4	13	-	35	1	-	-	100
1673	08SBD382-SRK-WR-244	W	5	8	-	26	-	-	-	-	17	3	15	-	30	1	-	-	100
1674	08SBD382-SRK-WR-245	W	5	9	-	18	-	-	-	-	16	2	23	-	31	1	-	-	100
1675	08SBD382-SRK-WR-246	W	5	8	-	24	-	-	-	-	19	3	14	-	31	1	-	-	100
1676	08SBD382-SRK-WR-247	W	5	9	-	18	-	-	-	-	16	3	21	-	33	tr	-	-	100
1677	08SBD382-SRK-WR-248	W	5	10	-	17	-	-	-	-	16	4	20	-	32	1	-	-	100
1710	07SBD374-SRK-WR-281	W	5	38	-	18	-	-	-	-	-	12	-	-	31	1	-	-	100
1711	07SBD374-SRK-WR-282	W	5	40	-	14	-	-	-	-	2	10	-	-	33	1	-	-	100
1712	07SBD374-SRK-WR-283	W	5	31	-	25	-	-	-	-	9	7	-	-	27	tr	-	-	99
1713	07SBD374-SRK-WR-284	W	5	33	-	23	-	-	-	-	8	8	-	-	27	1	-	-	100
1714	07SBD374-SRK-WR-285	W	5	35	-	9	-	-	-	-	4	14							

SRK Serial Number	Sample ID	Preliminary Economic Classification	Lithology ¹	Ferroan Dolomite	Calcite	Chlorite	Chloritoid	Magnesite	Magnetite	Muscovite	Muscovite/Sericite	Paragonite	Plagioclase	Pyrite	Quartz	Rutile	Siderite	Siderite/Magnesite	Sum
				Ca(Fe,Mg)(CO ₃) ₂	CaCO ₃	(Mg,Fe,Al) ₃ (Al,Si) ₂ O ₁₀ (OH) ₂	(Fe,Mg,Mn) ₂ Al ₂ Si ₂ O ₁₀ (OH) ₂	MgCO ₃	Fe ₃ O ₄	KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂		NaAl ₃ Si ₃ O ₁₀ (OH) ₂	(Ca,Na)(Al,Si)AlSi ₂ O ₈	FeS ₂	SiO ₂	TiO ₂	FeCO ₃	(Fe _{0.30} Mg _{0.70})CO ₃	
				%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
1825	08SBD380-SRK-WR-398	W	5	37	-	15	-	-	-	-	8	7	-	-	29	1	-	3	100
1826	08SBD380-SRK-WR-399	W	5	29	-	21	-	-	-	-	9	3	-	1	26	1	2	8	100
1827	08SBD380-SRK-WR-400	W	5	15	-	19	-	-	32	-	2	4	-	-	28	-	-	-	100
1828	08SBD380-SRK-WR-401	W	5	23	-	18	-	-	22	-	7	-	-	-	29	1	-	-	100
1829	08SBD380-SRK-WR-402	W	5	27	-	4	-	-	26	-	2	4	-	1	31	1	-	-	99
1830	08SBD380-SRK-WR-403	W	5	19	-	14	-	-	-	-	3	4	-	-	22	1	-	36	99
1831	08SBD380-SRK-WR-404	W	5	31	-	10	-	-	-	-	-	10	-	-	32	2	-	14	99
1832	08SBD380-SRK-WR-405	W	5	32	-	16	-	-	-	-	3	11	-	-	33	1	-	4	100
1833	08SBD380-SRK-WR-406	W	5	39	-	2	-	-	-	-	8	10	-	-	33	1	-	7	100
1834	08SBD380-SRK-WR-407	W	5	38	-	-	-	-	-	-	9	10	-	3	36	1	-	3	100
1835	08SBD380-SRK-WR-408	W	5	38	-	-	-	-	-	-	9	9	-	1	36	2	-	3	100
1836	08SBD380-SRK-WR-409	W	5	34	-	16	-	-	-	-	6	10	-	-	32	1	-	1	100
1837	08SBD380-SRK-WR-410	W	5	34	-	11	-	-	-	-	4	10	-	-	30	1	-	-	100
1838	08SBD380-SRK-WR-411	W	5	39	-	22	-	-	-	-	5	11	-	-	33	1	-	-	100
1839	08SBD380-SRK-WR-412	O	5	32	-	19	1	-	-	-	5	10	-	-	32	1	-	-	100
1840	08SBD380-SRK-WR-413	mixed	5	35	-	24	tr	-	-	-	4	8	-	-	29	tr	-	-	100
1841	08SBD380-SRK-WR-414	W	5 mixed	39	7	10	-	-	-	-	4	10	-	-	29	1	-	-	100
1873	08SBD380-SRK-WR-415	O	5 mixed	40	4	11	-	-	-	-	1	11	-	-	32	1	-	-	100
1874	08SBD380-SRK-WR-416	W	9n	43	2	7	-	-	-	-	-	13	-	-	34	1	-	-	100
1875	08SBD380-SRK-WR-417	W	9n	31	7	1	-	-	-	-	-	17	-	3	39	1	-	-	99
1878	07SBD356A-SRK-WR-451	W	9n	37	-	-	-	-	-	-	4	12	-	-	38	2	-	6	99
1879	07SBD356A-SRK-WR-452	W	9n	39	-	5	-	-	-	-	2	12	-	-	33	1	-	8	100
1880	07SBD356A-SRK-WR-453	W	9n	42	-	1	-	-	-	-	4	11	-	1	35	2	-	4	100
1881	07SBD356A-SRK-WR-454	W	10a	39	-	15	-	-	-	-	-	11	-	-	32	1	-	2	100
1882	07SBD356A-SRK-WR-455	W	10a	42	-	8	-	-	-	-	-	12	-	-	32	2	-	4	100
1883	07SBD356A-SRK-WR-456	W	10a	39	-	15	-	-	-	-	-	11	-	-	31	1	-	3	100
1884	07SBD356A-SRK-WR-457	O	10a	38	-	23	-	-	-	-	-	8	-	-	26	1	-	4	100
1885	07SBD356A-SRK-WR-458	O	10a	38	-	18	-	-	-	-	-	11	-	-	31	1	-	1	100
1886	07SBD356A-SRK-WR-459	W	12q	34	-	22	-	-	-	-	-	10	-	-	33	1	-	-	100
2041	08SBD383-SRK-WR-548	W	12q	39	-	5	-	-	-	-	-	12	-	2	34	1	-	7	100
2042	08SBD383-SRK-WR-549	W	12q	43	-	12	-	-	-	-	-	9	-	-	32	1	-	2	99
2043	08SBD383-SRK-WR-550	W	12q	36	-	1	-	-	-	-	-	10	-	-	35	2	-	13	99
2044	08SBD383-SRK-WR-551	O	12q	31	2	22	-	-	-	-	1	8	4	-	31	1	-	-	100
2045	08SBD383-SRK-WR-552	O	12q	12	10	39	-	-	-	-	6	4	7	-	22	-	-	-	100
2046	08SBD383-SRK-WR-553	O	12q	3	17	38	-	-	-	-	5	3	11	-	23	tr	-	-	100
2047	08SBD383-SRK-WR-554	O	12q	7	13	44	-	-	-	-	-	-	11	-	25	tr	-	-	100
2048	08SBD383-SRK-WR-555	O	12q	30	3	27	-	-	-	-	-	9	-	-	30	1	-	-	100
2057	08SBD380-NMS-WR-52	O	12q	35	-	15	-	-	-	-	4	12	-	-	32	1	-	-	99
2058	08SBD380-NMS-WR-53	O	12q	43	1	13	tr	-	-	-	-	10	-	-	31	1	-	-	99
2107	08SBD381A-NMS-WR-44	O	12q	8	1	13	-	-	-	-	19	-	28	-	31	tr	-	-	100
2108	08SBD382-NMS-WR-52	W	12q mixed	29	-	2	3	-	-	-	-	-	-	2	23	1	-	-	100
2109	08SBD382-NMS-WR-53	O	12q mixed	29	-	2	4	-	-	-	-	-	-	8	26	1	-	-	100
2110	08SBD382-NMS-WR-54	O	12q mixed	16	-	6	4	-	-	-	7	6	-	-	59	1	-	-	100
2111	08SBD382-NMS-WR-55	O	12q mixed	10	-	-	-	-	-	-	22	7	15	-	40	1	-	5	100
2112	07SBD374-NMS-WR-50	O	12q mixed	37	-	12	-	-	-	-	8	12	-	-	30	-	-	-	99
2113	07SBD374-NMS-WR-51	O	12q mixed	26	-	4	-	-	-	-	2	13	-	tr	32	1	-	22	100
2114	08SBD381A-NMS-WR-43	O	12q mixed	27	-	11	-	-	-	-	1	12	-	2	41	1	-	4	99

¹Lithology codes as follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **1oj** = mafic metavolcanics with sediments; **5** = sedimentary units; **5 mixed** = mixed sedimentary units; **9n** = late intermediate dyke; **10a** = late gabbro; **12q** = quartz vein; **12q mixed** = mixed quartz vein

"-" indicates that mineral content was below detection

Appendix G – Acid-Base Accounting Database, Boston

Appendix G: Acid-Base Accounting Database, Boston

SRK Serial Number	Sample ID	Lithology ¹	Preliminary Economic Classification	Paste pH	Total S	NP	TIC	TIC _(Ca+Mg)	NP/AP	TIC/AP	TIC _{(Ca+Mg)/AP}
					%S	kgCaCO3/t	kgCaCO3/t	kgCaCO3/t			
730	97 OD 119	1	W	9.2	0.13	417			100		
731	97 OD 121	1	W	8.3	0.09	366					130
732	97 OD 123	1	W	8.4	0.25	404					52
733	97 OD-125	1	W	9	0.09	403					140
734	97 OD-127	1	W	8.7	0.15	379					81
735	97 OD-129	1	W	8.6	0.08	370					150
736	97 OD-131	1	W	8.8	0.2	381					61
737	97 OD-133	1	W	9.4	0.22	421					61
738	97 OD-135	1	W	9.2	0.27	420					50
739	97OD-137	1	W	8.8	0.45	343					24
740	97OD-139	1	W	8.1	0.38	332					28
741	97OD-141	1	W	9.3	0.18	397					71
742	97-OD-143	1	W	8.9	0.23	421					59
743	97-OD-145	1	W	8.9	0.16	398					80
744	97-OD-147	1	W	8.8	0.2	391					63
745	97-OD-149	1	W	8.6	0.41	361					28
746	97-OD-151	1	W	8.2	0.59	318					17
747	9700-153 ABA	1	W	8.1	0.34	302					28
748	9700-155 ABA	1	W	8.3	0.13	373					92
749	9700-157 ABA	1	W	8.2	0.34	387					36
750	97 OD 159	1	W	9.1	0.12	452					120
751	97 OD 161	1	W	8	0.2	339					54
752	97 OD 163	1	W	9.1	0.04	383					310
753	97 OD 165	1	W	8.8	0.18	442					79
754	97OD-167	1	W	8	0.55	399					23
755	97OD-169	1	W	8	0.37	355					31
756	97-OD-171(ABA)	1	W	8.1	1.2	323					9
757	97-OD-173 (ABA)	1	W	8.8	1.3	372					9.2
758	97 OD 175 ABA	1	W	8.5	0.33	361					35
759	97 OD 177 ABA	1	W	7.9	0.16	345					69
760	97 OD 179 ABA	1	W	8.4	0.46	294					20
761	97 OD 181 ABA	1	W	8	0.39	294					24
762	97 OD 183 ABA	1	W	8.4	0.81	267					11
763	97 OD 185 ABA	1	W	7.8	0.39	303					25
764	97 OD 187 ABA	1	W	8	0.25	337					43
765	97 OD 189 ABA	1	W	8.5	0.14	369					84
766	97OD 191 ABA	1	W	8.2	0.54	354					21
767	97OD 193 ABA	1	W	8.1	0.16	336					67
768	97OD 195 ABA	1	W	8.3	0.38	328					28
769	97OD 197 ABA	1	W	8.3	0.23	327					45
770	97OD 199 ABA	1	W	8.2	0.22	325					47
771	97OD-201 ABA	1	W	7.8	0.21	324					49
772	97OD-203 ABA	1	W	8.1	0.23	303					42
773	97OD-205 ABA	1	W	8	0.17	332					62
774	97OD-207 ABA	1	W	7.9	0.33	342					33
775	97OD-209 ABA	1	W	8	0.25	299					38
776	97OD-211 ABA	1	W	8	0.15	352					75
777	97OD-213 ABA	1	W	8.1	0.15	343					73
778	97OD-215 ABA	1	W	8.3	0.13	417					100
779	97OD-217 ABA	1	W	8.7	1.2	308					8.1
780	97OD-219 ABA	1	W	8.6	0.32	422					42
781	97OD-221 ABA	1	W	8.7	0.2	371					59
782	97OD-223 ABA	1	W	8.5	0.24	341					45
783	97OD-225 ABA	1	W	8.7	0.38	340					29
784	97OD-227 ABA	1	W	9.1	0.18	339					60
785	97OD-229 ABA	1	W	8.6	0.15	326					70
786	97OD-231 ABA	1	W	9.4	0.39	224					18
787	97OD-233 ABA	1	W	9.3	0.79	316					13
788	97OD-235 ABA	1	W	8.4	0.24	275					37
789	97-OD-237 ABA	1	W	8.8	0.21	289					44
790	97-OD-239 ABA	1	W	9.3	0.18	302					54
791	97-OD-241 ABA	1	W	9.5	0.22	374					54
792	97-OD-243 ABA	1	W	9.5	0.15	280					60
793	97-OD-245 ABA	1	W	9.1	0.29	268					30
794	97-OD-249 ABA	1	W	8.5	0.17	320					60
795	97-OD-251 ABA	1	W	9.6	0.11	350					100
796	97-OD-254 ABA	1	W	9.3	0.29	293					32
797	97-OD-255 ABA	1	W	9.2	0.09	399					140
798	97OD 257 ABA	1	W	8.4	0.13	358					88
799	97OD 259 ABA	1	W	8.4	0.06	218					120
800	97OD 261 ABA	1	W	8.5	0.05	226					140
801	97OD 263 ABA	1	W	8.5	0.08	215					86
802	97OD 265 ABA	1	W	8.4	0.06	272					150
803	97OD 267 ABA	1	W	8.5	0.22	296					43
804	97OD 269 ABA	1	W	8.7	0.09	257					91
805	97OD 271 ABA	1	W	9.1	0.07	416					190
806	97OD 273 ABA	1	W	8.6	0.05	249					160
807	97OD 275 ABA	1	W	8.7	0.1	309					99
808	97OD 277 ABA	1	W	8.3	0.21	357					54
809	97OD 279 ABA	1	W	8.5	0.42	419					32
810	97OD 281 ABA	1	W	8.3	0.13	384					95
811	9 OD 283 ABA	1	W	9	0.17	378					71
812	97OD 285 ABA	1	W	8.4	0.1	353					110
813	97OD-287 ABA	1	W	8.7	0.08	367					150
814	97OD-289 ABA	1	W	8.4	0.22	278					40
815	97OD-291 ABA	1	W	8.5	0.29	346					38
816	97OD 293	1	W	8.6	0.04	182					150
817	97OD-295-ABA	1	W	8.4	0.01	206					660
818	97OD-297-ABA	1	W	8.6	0.1	331					110
819	97OD-301 ABA	1	W	8.9	0.18	386					69
820	97OD-303 ABA	1	W	8.4	0.25	387					50
821	97OD-305 ABA	1	W	8.9	0.33	324					31
822	97OD-307 ABA	1	W	8.8	0.4	332					27
823	97OD-309 ABA	1	W	9.2	0.21	298					45
824	97OD 311 ABA	1	W	8.4	0.19	279					47
825	97OD 313 ABA	1	W	8.6	0.11	339					99
826	97OD 315 ABA	1	W	8.7	0.18	366					65
827	97OD 317	1	W	9	0.52	312					19
828	97OD319 ABA	1	W	8.1	0.24	360					48
829	97OD 321	1	W	8.6	0.1	323					100
830	97OD-323 ABA	1	W	8.2	0.21	292					44
831	97OD-325 ABA	1	W	8.5	0.62	336					17
832	97OD-327 ABA	1	W	8.9	1.8	391					7.1
833	97OD-329 ABA	1	W	9	0.63	339					17
834	97OD-331 ABA	1	W	9.3	0.4	368					29
835	97OD-333 ABA	1	W	8.6	0.63	337					17
836	97OD-335 ABA	1	W	8.3	0.11	327					95
837	97OD-337 ABA	1	W	8.2	0.04	318					250
838	97-OD-341 ABA	1	W	9	0.25	383					49
839	97-OD-343 ABA	1	W	9	0.07	340					160</

SRK Serial Number	Sample ID	Lithology [†]	Preliminary Economic Classification	Paste pH	Total S	NP	TIC	TIC _(Ca+Mg)	NP/AP	TIC/AP	TIC _{(Ca+Mg)/AP}
					%S	kgCaCO3/t	kgCaCO3/t	kgCaCO3/t			
1046	96OD50	1	W	8.8	0.08	360			140		
1047	96OD52	1	W	8.7	0.17	312			59		
1048	96OD54	1	W	8.6	0.08	317			130		
1049	96OD56	1	W	8.6	0.09	311			110		
1050	96OD58	1	W	8.6	0.06	368			200		
1051	96OD60	1	W	8.9	0.09	335			120		
1052	96OD62	1	W	9.4	0.17	336			63		
1053	96OD64	1	W	9.3	0.8	219			8.8		
1054	96OD66	1	W	8.8	0.27	309			37		
1055	96OD68	1	W	8.6	0.09	422			150		
1056	96OD70	1	W	9	0.22	262			39		
1057	96OD72	1	W	8.9	0.3	347			37		
1058	96OD74	1	W	8.4	0.17	443			83		
1059	96OD76	1	W	9.5	0.53	280			17		
1060	96OD78	1	W	8.7	0.09	333			120		
1061	96OD80	1	W	9.1	0.15	285			61		
1062	96OD82	1	W	9.1	0.05	375			240		
1063	96OD84	1	W	8.9	0.62	219			11		
1064	96OD86	1	W	9.1	0.06	420			220		
1065	96OD88	1	W	9.1	0.12	454			120		
1066	96OD90	1	W	8.9	0.13	362			89		
1067	96OD92	1	W	9.1	0.84	371			14		
1068	96OD94	1	W	8.7	0.14	386			88		
1069	96OD96	1	W	9	2.1	382			5.8		
1070	96OD98	1	W	8.5	0.66	390			19		
1190	Boston #1	1	W	9.3	0.1	420	445	345	130	140	110
1192	Boston #3	1	W	9	0.05	375	386	299	240	250	190
1194	Boston #5	1	W	9.1	0.32	452	512	397	45	51	40
1195	Boston #6	1	W	9.2	0.05	367	375	290	240	240	190
1373	118424	1	W	9	0.3	230	289	224	25	31	24
1374	118425	1	W	9.2	0.47	255	236	17	21	16	
1375	118426	1	W	9.2	0.34	259	362	281	24	34	26
1376	118427	1	W	9.1	0.28	261	377	292	30	43	33
1377	118428	1	W	9.1	0.15	310	451	349	66	96	75
1379	118430	1	W	9.5	0.09	246	330	256	87	120	91
1380	118431	1	W	9.6	0.16	224	297	230	45	59	46
1381	118432	1	W	9.1	0.48	229	443	343	15	30	23
1382	118433	1	W	9.5	0.28	244	28	28	44	34	
1383	118434	1	W	9.5	0.88	232	387	300	8.4	14	11
1384	118435	1	W	9.2	0.31	260	291	225	27	30	23
1385	118436	1	W	9.4	0.39	286	410	318	23	34	26
1386	118437	1	W	9.4	0.43	245	446	345	18	33	26
1388	118439	1	W	9.5	0.19	237	432	335	40	73	56
1389	118440	1	W	9.4	0.25	307	427	331	39	55	42
1390	118441	1	W	9.4	0.43	287	308	21	30	23	
1391	118442	1	W	9.2	0.31	290	383	297	30	40	31
1392	118443	1	W	9.5	0.38	293	402	311	25	34	26
1393	118444	1	W	9.3	0.28	249	347	269	28	40	31
1395	118446	1	W	9.4	0.14	260	343	266	59	78	61
1397	118448	1	W	9.3	0.23	294	383	297	41	53	41
1405	118457	1	W	9.5	0.44	224	307	238	16	22	17
1406	118458	1	W	9.5	0.26	259	354	274	32	44	
1407	118459	1	W	9.5	0.1	267	353	274	85	110	88
1408	118460	1	W	9.2	0.1	307	382	296	98	120	95
1409	118461	1	W	8.9	0.08	315	405	314	130	160	130
1410	118462	1	W	9.3	0.29	307	400	310	34	44	34
1411	118463	1	W	9.3	0.2	290	378	293	46	61	47
1412	118464	1	W	9	0.05	299	325	252	190	210	160
1413	118465	1	W	0.08	8.7	206	205	82	110	82	
1414	118466	1	W	8.9	0.15	317	395	306	68	84	65
1415	118467	1	W	9.2	0.13	320	408	316	79	100	78
1418	118470	1	W	9.3	0.15	319	433	336	68	92	72
1419	118471	1	W	9.3	0.24	291	399	309	39	53	41
1420	118472	1	W	9.3	0.23	282	422	327	39	59	46
1430	118483	1	W	9.3	1.5	248	274	212	5.2	5.8	4.5
1431	118484	1	W	9.5	0.26	327	405	327	40	31	
1432	118485	1	W	9.2	0.49	250	349	270	16	23	18
1434	118487	1	W	9.1	0.27	242	270	209	29	32	25
1435	118488	1	W	9.5	0.09	243	302	234	86	110	83
1436	118489	1	W	9.4	0.1	158	367	285	51	120	91
1437	118490	1	W	9.4	0.15	252	334	259	54	71	55
1438	118491	1	W	9.4	0.1	265	282	219	85	90	70
1439	118492	1	W	9.4	0.13	277	337	261	64	68	64
1440	118493	1	W	9.5	0.46	269	341	264	19	24	18
1441	118494	1	W	9.5	0.1	317	357	277	100	110	89
1442	118495	1	W	9.5	0.89	269	421	327	9.7	15	12
1443	118496	1	W	9.6	0.43	260	407	315	19	30	23
1444	118497	1	W	9.5	0.96	262	388	301	8.7	13	10
1445	118498	1	W	9	0.28	323	530	411	37	61	47
1447	118500	1	W	9.4	0.31	428	304	332	31	44	34
1448	118501	1	W	9.5	0.49	257	427	331	17	28	22
1449	118503	1	W	9.3	1.7	316	348	270	5.9	6.5	5
1451	118505	1	W	9.4	0.4	292	327	254	23	26	20
1452	118506	1	W	8.6	0.26	225	239	185	28	29	23
1453	118507	1	W	8.6	0.17	221	228	176	42	43	33
1454	118508	1	W	8.6	0.06	224	227	176	120	120	94
1459	118513	1	W	9.3	0.17	277	337	261	52	63	49
1461	118515	1	W	8.9	0.16	258	375	291	52	75	58
1462	118516	1	W	9	0.03	213	478	370	230	510	400
1463	118517	1	W	9.4	0.56	260	385	298	15	22	17
1464	118518	1	W	9.5	0.16	300	461	357	60	92	71
1467	118521	1	W	9.4	1.4	304	457	354	6.9	10	8
1468	118522	1	W	9.3	0.33	280	443	343	27	43	33
1639	085BD382-SRK-WR-210	1	W	8.4	0.47	195	217	13	19	15	
1640	085BD382-SRK-WR-211	1	W	8.2	0.69	208	277	214	9.6	13	9.9
1641	085BD382-SRK-WR-212	1	W	8.0	3.9	233	305	236	1.9	2.5	1.9
1642	085BD382-SRK-WR-213	1	W	8.0	5	187	256	198	1.2	1.7	1.3
1643	085BD382-SRK-WR-214	1	W	8.0	3.1	163	216	167	1.7	2.2	1.7
1644	085BD382-SRK-WR-215	1	W	9.3	0.13	101	133	103	25	33	25
1651	085BD382-SRK-WR-222	1	W	9.6	0.23	72	146	10	144	26	20
1653	085BD382-SRK-WR-224	1	W	9.6	0.28	75	144	112	8.6	16	13
1710	075BD374-SRK-WR-281	1	W	9.1	0.07	294	391	303	130	180	140
1711	075BD374-SRK-WR-282	1	W	9.2	0.14	291	421	326	67	96	75
1712	075BD374-SRK-WR-283	1	W	8.9	0.06	270	339	263	140	180	140
1713	075BD374-SRK-WR-284	1	W	9.1	0.04	283	352	273	230	280	220
1714	075BD374-SRK-WR-285	1	W	9.5	0.13	256	385	298	63	95	73
1715	075BD374-SRK-WR-286	1	W	9.5	0.47	296	426	330	29	22	
1716	075BD374-SRK-WR-287	1	W	9.4	0.05	263	405	314	110	160	130
1717	075BD374-SRK-WR-288	1	W	9.5	0.09	264	457	354	94	160	130
1718	075BD374-SRK-WR-289	1	W	9.3	0.16	291	391	303	58	78	61
1719	075BD374-SRK-WR-290	1	W	9.2	0.07	298	403	312	140	180	140
1720	075BD374-SRK-WR-291	1	W	9.1	0.05	158	345	267	100	220	170
1721	075BD374-SRK-WR-292	1	W	9.5	0.08	301	393	305	120	160	120
1821	085BD380-SRK-WR-394	1	W	9.4	0.11	272	373	289	79	110	84
1822	085BD380-SRK-WR-395	1	W	9.5	0.41	287	376	291	22	29	23
1823	085BD380-SRK-WR-396	1	W	9.3	0.21	250	351	272	38	53	41
1825	085BD380-SRK-WR-398	1	W	9.1	0.38	271	402	312	23	34	26
1831	085BD380-SRK-WR-404	1	W	9.5	0.3	272	439	340	29	47	36
1832	085BD380-SRK-WR-405	1	W	9.5	0.09	228	370	287	81	130	100
1833	085BD380-SRK-WR-406	1	W	9.5	0.53	269	432	335	16	26	20
1835	085BD380-SRK-WR-408	1	W	9.5	0.45	216	383	297	15	27	21
1836	085BD380-SRK-WR-409	1	W	9.2	0.09	235	364	274	84	130	97
1837	085BD380-SRK-WR-410	1	W	9.3	0.06	244	341	264	130</		

SRK Serial Number	Sample ID	Lithology ¹	Preliminary Economic Classification	Paste pH	Total S	NP	TIC	TIC _(Ca+Mg)	NP/AP	TIC/AP	TIC _{(Ca+Mg)/AP}
					%S	kgCaCO3/t	kgCaCO3/t	kgCaCO3/t			
919	96B2N12	10j	O	8.6	3.8	236			2.7		
920	96B2N14	10j	O	8.5	2.8	238			2		
921	96B2N16	10j	O	8.4	4.1	281			2.2		
922	96B2N18	10j	O	8.4	2.2	319			4.6		
923	96B2N20	10j	O	8.3	3.3	240			2.3		
924	96B2N22	10j	O	8.3	3.1	234			2.5		
925	96B2N24	10j	O	8	3.4	202			1.9		
926	96B2N26	10j	O	8.3	2.6	194			2.4		
927	96B2N28	10j	O	8.2	1.5	265			5.8		
928	96B2N30	10j	O	8.2	1.9	256			4.6		
929	96B2N32	10j	O	8.2	1.7	323			6.1		
930	96B2N34	10j	O	8.7	0.72	381			17		
931	96B2N36	10j	O	8.6	2.2	312			4.5		
932	96B2N38	10j	O	8.6	0.49	335			22		
933	96B2N40	10j	O	8.6	0.75	410			17		
934	96B2N42	10j	O	8.6	1.6	280			5.6		
935	96B2N44	10j	O	8.6	0.54	214			17		
936	96B2N46	10j	O	8.5	0.53	279			17		
937	96B2N48	10j	O	8.3	1.2	332			8.9		
938	96B2N50	10j	O	8.4	0.68	292			14		
939	96B2N52	10j	O	8.5	1.3	323			7.9		
940	96B2N54	10j	O	8.7	0.77	333			14		
941	96B2N56	10j	O	8.8	0.89	331			12		
942	96B2N58	10j	O	8.9	1	299			9.3		
943	96B2N60	10j	O	8.5	1.6	299			6.2		
944	96B2N62	10j	O	8.6	2.8	337			3.9		
945	96B2N64	10j	O	8.5	5	211			1.3		
946	96B2N66	10j	O	8.4	3.4	211			2		
947	96B2N68	10j	O	8.5	3.2	404			2.8		
948	96B2N70	10j	O	8.8	2.9	250			4.1		
949	96B2N72	10j	O	8.1	0.71	73			3.3		
950	96B2N74	10j	O	8.3	1.9	210			3.6		
951	96B2N76	10j	O	8.2	3.1	297			3		
952	96B2N78	10j	O	8.3	3.1	217			2.2		
953	96B2N84	10j	O	8.8	0.44	73			5.3		
954	96B2N88	10j	O	8.7	1.8	211			3.8		
955	96B2NR1+2	10j	O	8.4	3.6	304			2.7		
956	96B2NR3+4	10j	O	8.3	2.8	337			3.8		
957	96B2NR5+6	10j	O	8.2	2.4	191			2.6		
958	96B2NR7+8	10j	O	8.6	2.6	296			3.6		
959	96B2S02	10j	O	8.4	4.1	181			1.4		
960	96B2S04	10j	O	8.6	2.6	275			3.4		
961	96B2S06	10j	O	8.6	3.1	291			3		
962	96B2S08	10j	O	8.2	2.3	262			3.7		
963	96B2S10	10j	O	8.6	3.6	292			2.6		
964	96B2S12	10j	O	8.7	4.4	232			1.7		
965	96B2S14	10j	O	8.7	3.2	200			2		
966	96B2S16	10j	O	8.6	2.4	159			2.2		
967	96B2S18	10j	O	8.8	1.6	187			3.7		
968	96B2S20	10j	O	8.8	1.4	210			4.2		
969	96B2S22	10j	O	8.9	1.3	287			7.7		
970	96B2S24	10j	O	8.9	2	274			4.4		
971	96B2S26	10j	O	9	2.6	212			2.6		
972	96B2S28	10j	O	8.5	2.8	245			2.8		
973	96B2SR3/4	10j	O	8.7	2.2	172			2.5		
974	96B2SR5/6	10j	O	8.5	3.2	149			1.5		
975	96B2SR7/8	10j	O	8.7	3.7	267			2.3		
976	96B2SR9	10j	O	8.7	5.7	201			1.1		
981	96B3N80	10j	O	9.1	0.6	121			6.5		
982	96B3N82	10j	O	8.7	1.5	195			4.2		
983	96B3N86	10j	O	8.7	0.85	128			4.8		
1819	08SBD380-SRK-WR-392	10j	O	8.9	2.9	355	519	402	3.9	5.7	4.4
1875	08SBD380-SRK-WR-417	10j	mixed	9.1	1.8	253	317	246	4.5	5.6	4.4
894	92NOD20 150	5	W	9.3	0.18	295	377	292	52	67	52
895	92NOD20 185	5	W	8.7	0.7	63	161	125	3.8	7.4	5.7
896	92NOD10 160	5	W	9.5	0.21	255	309	239	39	47	36
897	93NOD28 50	5	W	8.4	0.25	120	127	99	15	16	13
898	93NOD28 80	5	W	9.5	0.34	328	359	278	31	34	26
1427	118480	5	W	9.2	0.49	216	284	220	14	19	14
1428	118481	5	W	8.6	0.82	204	283	219	8	11	8.6
1433	118486	5	W	8	2.9	230	257	199	2.5	2.8	2.2
1460	118514	5	W	9.3	0.18	269	327	253	53	58	45
1470	118524	5	W	9.5	0.39	191	287	223	16	24	18
1471	118525	5	W	9.2	0.19	169	219	170	28	37	29
1472	118526	5	W	9.4	0.23	126	188	146	18	26	20
1479	08SBD381A-SRK-WR-170	5	W	9.0	1	84	114	88	2.6	3.5	2.7
1480	08SBD381A-SRK-WR-171	5	W	9.4	0.41	76	127	98	5.9	9.9	7.7
1481	08SBD381A-SRK-WR-172	5	W	9.5	0.26	171	212	165	21	26	20
1482	08SBD381A-SRK-WR-173	5	W	9.5	0.28	163	225	174	19	26	20
1483	08SBD381A-SRK-WR-174	5	W	9.5	0.14	213	245	218	64	50	50
1484	08SBD381A-SRK-WR-175	5	W	9.6	0.02	188	289	224	300	460	360
1485	08SBD381A-SRK-WR-176	5	W	9.6	0.11	226	302	234	66	88	68
1486	08SBD381A-SRK-WR-177	5	W	9.6	0.06	223	302	234	120	160	120
1487	08SBD381A-SRK-WR-178	5	W	9.6	0.03	218	291	226	230	310	240
1488	08SBD381A-SRK-WR-179	5	W	9.6	0.06	141	209	162	75	110	86
1489	08SBD381A-SRK-WR-180	5	W	9.6	0.15	135	156	29	43	33	33
1490	08SBD381A-SRK-WR-181	5	W	9.5	0.22	193	239	185	28	35	27
1491	08SBD381A-SRK-WR-182	5	W	9.5	0.26	65	177	138	8	22	17
1492	08SBD381A-SRK-WR-183	5	W	9.3	0.18	83	122	95	15	22	17
1493	08SBD381A-SRK-WR-184	5	W	9.3	0.16	73	106	82	15	21	16
1494	08SBD381A-SRK-WR-185	5	W	9.4	0.18	79	162	125	14	29	22
1496	08SBD381A-SRK-WR-187	5	W	9.2	0.34	92	120	93	8.6	11	8.7
1497	08SBD381A-SRK-WR-188	5	W	9.2	0.18	66	79	102	12	18	14
1498	08SBD381A-SRK-WR-189	5	W	9.2	0.17	60	90	70	11	17	13
1499	08SBD381A-SRK-WR-190	5	W	9.4	0.15	48	67	52	10	14	11
1500	08SBD381A-SRK-WR-191	5	W	9.4	0.18	59	72	56	11	13	10
1501	08SBD381A-SRK-WR-192	5	W	9.4	0.19	68	83	65	11	14	11
1502	08SBD381A-SRK-WR-193	5	W	9.3	0.24	76	97	76	10	13	10
1503	08SBD381A-SRK-WR-194	5	W	9.4	0.14	68	110	85	16	25	19
1504	08SBD381A-SRK-WR-195	5	W	9.3	0.23	97	103	103	13	14	14
1505	08SBD381A-SRK-WR-196	5	W	9.1	0.61	76	101	78	4	5.3	4.1
1506	08SBD381A-SRK-WR-197	5	W	9.5	0.1	82	95	74	26	30	24
1507	08SBD381A-SRK-WR-198	5	W	9.5	0.04	79	86	66	63	69	53
1508	08SBD381A-SRK-WR-199	5	W	9.5	0.12	72	62	48	19	16	13
1509	08SBD381A-SRK-WR-200	5	W	9.3	0.14	81	147	114	18	34	26
1510	08SBD381A-SRK-WR-201	5	W	9.3	0.28	38	44	34	4.3	5	3.9
1511	08SBD381A-SRK-WR-202	5	W	9.5	0.13	44	11	41	11	13	10
1512	08SBD381A-SRK-WR-203	5	W	9.2	0.19	21	27	21	3.5	4.5	3.5
1513	08SBD381A-SRK-WR-204	5	W	9.5	0.18	45	52	40	8.1	9.2	7.1
1514	08SBD381A-SRK-WR-205	5	W	9.5	0.15	57	92	72	12	20	15
1515	08SBD381A-SRK-WR-206	5	W	9.1	0.19	48	70	54	8.1	12	9.1
1516	08SBD381A-SRK-WR-207	5	W	8.9	0.23	59	81	63	8.2	11	8.7
1637	08SBD382-SRK-WR-208	5	W	8.5	0.81	115	172	133	4.5	6.8	5.3
1638	08SBD382-SRK-WR-209	5	W	8.8	1.2	116	162	126	3.2	4.4	3.4
1645	08SBD382-SRK-WR-216	5	W	9.3	0.15	85	117	91	18	25	19
1646	08SBD382-SRK-WR-217	5	W	9.3	0.12	86	112	87	23	30	23
1647	08SBD382-SRK-WR-218	5	W	9.4	0.12	88	156	121	24	42	32
1648	08SBD382-SRK-WR-219	5	W	9.6	0.22	95	185	143	14	27	21
1649	08SBD382-SRK-WR-220	5	W	9.5	0.22	99	184	143	14	27	21
1654	08SBD382-SRK-WR-225	5	W	9.5	0.2	85	180	139	14	29	22
1655	08SBD382-SRK-WR-226	5	W	9.5	0.27	88	139	10	139	10	17
1656	08SBD382-SRK-WR-227	5	W	9.6	0.26	79	173	134	9.8	21	17
1657	08SBD382-SRK-WR-228	5	W	9.5	0.26	94	167	130	12	21	16
1658	08SBD382-SRK-WR-229	5	W	9.3	0.51	68	140	108	4.3	8.8	6.8
1659	08SBD382-SRK-WR-230	5	W	9.6	0.14	71	114	88	16	26	20
1660	08SBD3										

Appendix H – Statistical Analysis of Solid-Phase Elemental Data by Lithology, Boston

Lithology ¹	Economic Classification	Statistics	Molybdenum Mo ppm	Copper Cu ppm	Lead Pb ppm	Zinc Zn ppm	Silver Ag ppm	Nickel Ni ppm	Cobalt Co ppm	Manganese Mn ppm	Iron Fe %	Arsenic As ppm	Uranium U ppm	Gold Au ppb	Thorium Th ppm	Strontium Sr ppm	Cadmium Cd ppm	Antimony Sb ppm	Bismuth Bi ppm	Vanadium V ppm	Calcium Ca %	Phosphorus P %	Lanthanum La ppm
1	Waste	Min	0.1	13	0.5	34	0.1	45	18	460	3.3	1.9	0.1	0.5	0.1	21	0.1	0.1	0.1	9	1.9	0.002	1
		P5	0.1	57	0.65	46	0.1	61	35	1000	4.8	6.5	0.1	0.67	0.1	27	0.1	0.1	0.1	20	4.2	0.013	1
		P25	0.2	80	1	54	0.1	97	42	1300	5.9	57	0.1	3.4	0.1	36	0.1	0.2	0.1	45	6.3	0.017	1
		P50	0.7	90	1.4	61	0.1	140	47	1500	6.4	110	0.1	21	0.2	49	0.1	0.3	0.1	64	6.8	0.019	1
		P75	0.9	98	2	70	0.1	210	51	1700	7	230	0.1	84	0.2	65	0.1	0.5	0.1	82	7.4	0.024	1
		P95	1.3	120	9.9	99	0.36	340	63	2000	8	360	0.26	310	0.93	120	0.2	3.7	0.4	150	8.8	0.052	3.6
		Max	3.2	150	46	160	0.7	580	80	2400	9.4	760	1.6	2400	7.9	190	0.5	20	2	190	9.5	0.067	20
		Count	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110
	Ore	Min	0.3	11	0.9	20	0.1	38	17	740	2.9	84	0.1	330	0.1	37	0.1	0.2	0.1	11	5.2	0.008	1
		P5	0.3	36	1.2	26	0.18	47	23	930	4	120	0.1	410	0.1	41	0.1	0.24	0.1	13	5.4	0.01	1
		P25	0.7	76	1.7	36	0.3	77	39	1300	5.9	230	0.1	610	0.1	49	0.1	0.4	0.1	17	5.9	0.014	1
		P50	0.9	85	2	56	0.4	200	45	1400	6.4	320	0.1	1900	0.1	53	0.1	0.5	0.1	25	6.8	0.021	1
		P75	1.1	100	2.1	61	1	220	52	1400	6.9	390	0.1	2700	0.2	56	0.1	1.2	0.1	57	7.4	0.024	1
		P95	2.8	150	3	140	1.6	250	61	1900	8.2	520	0.1	7600	0.72	82	0.38	1.6	2.4	150	8.8	0.026	1
		Max	3.6	180	3.5	160	1.6	260	64	2000	8.6	540	0.1	10000	1	98	0.5	1.8	4	210	9	0.026	1
		Count	9	9	9	9	9	9	9	9	9	9	8	8	8	9	9	9	9	9	9	9	9
	Ore/Waste	Min	0.2	110	0.9	34	0.1	68	35	1000	5.2	75	0.1	290	0.1	34	0.1	0.1	0.1	21	5.7	0.017	1
		P5	0.2	110	0.96	36	0.1	68	35	1100	5.3	87	0.1	290	0.1	35	0.1	0.11	0.1	22	5.8	0.017	1
		P25	0.2	110	1.2	46	0.1	70	36	1100	5.6	130	0.1	310	0.1	41	0.1	0.15	0.1	25	6.2	0.019	1
		P50	0.2	110	1.5	58	0.1	72	37	1200	5.9	190	0.1	330	0.1	48	0.1	0.2	0.1	29	6.6	0.021	1
		P75	0.2	110	6.4	62	0.15	75	38	1300	6.2	290	0.1	520	0.1	51	0.1	0.25	0.1	31	6.7	0.022	1
		P95	0.2	110	10	64	0.19	77	39	1300	6.4	370	0.1	670	0.1	53	0.1	0.29	0.1	33	6.7	0.023	1
		Max	0.2	110	11	65	0.2	77	39	1300	6.4	390	0.1	710	0.1	53	0.1	0.3	0.1	33	6.7	0.023	1
		Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1 mixed	Various ²	Min	0.1	83	0.5	51	0.1	44	40	1100	5.5	41	0.1	2.7	0.1	23	0.1	0.1	0.1	57	5.8	0.016	1
P5		0.13	83	0.53	52	0.1	57	40	1200	5.7	44	0.1	3.2	0.1	25	0.1	0.13	0.1	60	5.9	0.017	1	
P25		0.3	92	0.65	59	0.1	110	46	1400	6.4	53	0.1	5	0.15	34	0.1	0.2	0.1	68	6.3	0.019	1	
P50		0.8	100	0.7	63	0.1	220	51	1500	6.9	120	0.1	7.3	0.2	51	0.1	0.3	0.1	71	6.7	0.02	1	
P75		0.85	110	1.3	74	0.1	290	60	1800	7.5	150	0.1	37	0.25	58	0.1	0.45	0.1	97	7	0.021	1	
P95		1.1	140	1.7	120	0.1	380	70	2200	9.6	310	0.1	230	0.51	64	0.17	0.57	0.1	110	7.1	0.048	2.4	
Max		1.2	160	1.8	140	0.1	410	73	2200	10	370	0.1	300	0.6	64	0.2	0.6	0.1	110	7.1	0.06	3	
Count		7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
1oj	Waste	Min	--	76	0.7	43	0.1	27	40	1400	5	49	0.1	0.6	0.1	25	0.1	0.2	0.1	39	3.9	0.012	1
		P5	0.1	81	0.76	47	0.1	30	42	1400	5.4	60	0.1	0.66	0.1	27	0.1	0.2	0.1	50	5.3	0.013	1
		P25	0.2	89	0.8	59	0.1	37	48	1400	6	76	0.1	1	0.1	34	0.1	0.3	0.1	66	6.9	0.017	1
		P50	0.3	99	1	66	0.1	170	51	1700	7	86	0.1	12	0.1	41	0.1	0.5	0.1	73	7.2	0.021	1
		P75	0.3	120	1.5	74	0.1	220	53	1900	7.6	290	0.1	72	0.2	45	0.1	0.9	0.1	88	7.7	0.05	1
		P95	0.44	130	2.9	92	0.14	290	64	2200	8.4	440	0.1	180	0.34	53	0.14	1.5	0.1	100	9.2	0.057	1.4
		Max	0.5	130	3.3	93	0.2	290	64	2400	9.2	540	0.1	230	0.4	55	0.2	1.9	0.1	110	10	0.06	2
		Count	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
	Ore	Min	0.2	89	2.9	41	0.4	180	50	2500	8.7	970	0.1	1300	0.1	62	0.1	0.8	0.1	37	9.7	0.006	1
		P5	0.2	89	2.9	41	0.4	180	50	2500	8.7	970	0.1	1300	0.1	62	0.1	0.8	0.1	37	9.7	0.006	1
		P25	0.2	89	2.9	41	0.4	180	50	2500	8.7	970	0.1	1300	0.1	62	0.1	0.8	0.1	37	9.7	0.006	1
		P50	0.2	89	2.9	41	0.4	180	50	2500	8.7	970	0.1	1300	0.1	62	0.1	0.8	0.1	37	9.7	0.006	1
		P75	0.2	89	2.9	41	0.4	180	50	2500	8.7	970	0.1	1300	0.1	62	0.1	0.8	0.1	37	9.7	0.006	1
		P95	0.2	89	2.9	41	0.4	180	50	2500	8.7	970	0.1	1300	0.1	62	0.1	0.8	0.1	37	9.7	0.006	1
		Max	0.2	89	2.9	41	0.4	180	50	2500	8.7	970	0.1	1300	0.1	62	0.1	0.8	0.1	37	9.7	0.006	1
		Count	1	1	1	1																	

Lithology ¹	Economic Classification	Statistics	Chromium Cr ppm	Magnesium Mg %	Barium Ba ppm	Titanium Ti %	Boron B ppm	Aluminum Al %	Sodium Na %	Potassium K %	Tungsten W ppm	Mercury Hg ppb	Scandium Sc ppm	Thallium Tl ppm	Sulphur S %	Gallium Ga ppm	Selenium Se ppm	Beryllium Be ppm
1	Waste	Min	10	1	2	0.001	20	0.23	0.006	--	0.1	10	2.8	0.1	0.05	1	0.5	--
		P5	17	1.7	6	0.001	20	0.4	0.015	0.01	0.1	10	6.4	0.1	0.052	1	0.5	0.05
		P25	120	2.8	9	0.001	20	1	0.047	0.023	0.1	10	13	0.1	0.09	3	0.5	0.25
		P50	190	3.1	11	0.001	20	1.4	0.063	0.03	0.1	10	14	0.1	0.12	4	0.5	0.5
		P75	320	3.6	15	0.001	20	1.9	0.076	0.04	0.1	10	16	0.1	0.34	5	0.5	0.5
		P95	620	4.7	27	0.0046	20	3.8	0.1	0.06	11	10	19	0.1	2.7	8	0.76	0.5
		Max	1200	9.6	80	0.1	20	4.9	0.86	0.37	100	70	22	0.3	4.7	10	1.6	0.5
		Count	110	110	110	110	110	110	110	110	110	110	110	110	44	110	110	2
	Ore	Min	71	2	5	0.001	20	0.09	0.02	0.02	0.1	10	7	0.1	0.8	1	0.5	0.5
		P5	81	2	7	0.001	20	0.12	0.03	0.024	0.1	10	7.6	0.1	0.87	1	0.5	0.5
		P25	110	2.2	11	0.001	20	0.3	0.051	0.03	0.1	10	10	0.1	1.1	1	0.5	0.5
		P50	120	2.7	14	0.001	20	0.4	0.066	0.03	0.4	10	12	0.1	1.5	1	0.55	0.5
		P75	170	3.2	15	0.001	20	1.3	0.076	0.04	1.5	10	13	0.1	1.8	2.3	1	0.5
		P95	260	3.7	60	0.09	20	3.4	0.56	0.37	15	10	14	0.1	2.1	3.7	1	0.5
		Max	290	3.9	90	0.15	20	4.8	0.89	0.59	19	10	14	0.1	2.1	4	1	0.5
		Count	9	9	9	9	8	9	9	9	9	9	8	8	2	8	8	1
	Ore/Waste	Min	75	2.2	8	0.001	20	0.3	0.067	0.03	0.2	10	11	0.1	0.27	1	0.5	--
		P5	77	2.2	8.3	0.001	20	0.33	0.069	0.031	0.2	10	11	0.1	0.27	1.1	0.5	--
		P25	87	2.3	9.5	0.001	20	0.44	0.076	0.035	0.2	10	11	0.1	0.29	1.5	0.5	--
		P50	98	2.5	11	0.001	20	0.57	0.085	0.04	0.2	10	12	0.1	0.31	2	0.5	--
		P75	99	2.9	12	0.001	20	0.58	0.086	0.04	0.25	10	12	0.1	0.42	2	0.5	--
		P95	99	3.2	12	0.001	20	0.58	0.087	0.04	0.29	10	12	0.1	0.5	2	0.5	--
		Max	99	3.3	12	0.001	20	0.58	0.087	0.04	0.3	10	12	0.1	0.52	2	0.5	--
		Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	--
1 mixed	Various ²	Min	31	2.1	7	0.001	20	0.92	0.021	0.02	0.1	10	13	0.1	0.13	3	0.5	--
		P5	63	2.2	7.3	0.001	20	1	0.025	0.023	0.1	10	13	0.1	0.15	3	0.5	--
		P25	220	2.6	9.5	0.001	20	1.4	0.037	0.03	0.1	10	14	0.1	0.21	3.5	0.5	--
		P50	350	3.7	11	0.001	20	2	0.046	0.03	0.1	10	14	0.1	0.3	4	0.5	--
		P75	430	4	14	0.0015	20	2.5	0.06	0.04	0.1	10	15	0.1	0.38	6	0.55	--
		P95	750	4.7	34	0.002	20	3.1	0.098	0.054	1.6	10	16	0.1	0.44	6.7	0.67	--
		Max	890	5	43	0.002	20	3.2	0.11	0.06	2.2	10	16	0.1	0.46	7	0.7	--
		Count	7	7	7	7	7	7	7	7	7	7	7	7	2	7	7	--
1oj	Waste	Min	8	2.4	7	0.001	20	0.83	0.037	0.02	0.1	10	13	0.1	0.07	3	0.5	--
		P5	9.2	2.6	7	0.001	20	1	0.04	0.02	0.1	10	13	0.1	0.076	3	0.5	--
		P25	11	2.7	10	0.001	20	1.1	0.051	0.03	0.1	10	13	0.1	0.12	4	0.5	--
		P50	220	3	10	0.001	20	1.6	0.074	0.03	0.1	10	14	0.1	0.31	4	0.5	--
		P75	320	3.2	12	0.001	20	1.8	0.084	0.04	0.2	10	17	0.1	0.46	5	0.6	--
		P95	370	3.5	14	0.001	20	2	0.091	0.044	11	10	19	0.1	0.76	7	0.9	--
		Max	430	3.6	15	0.001	20	2.2	0.097	0.05	28	10	20	0.1	0.82	7	0.9	--
		Count	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	--
	Ore	Min	130	3.3	8	0.001	20	0.38	0.04	0.03	50	10	11	0.1	3	1	0.6	--
		P5	130	3.3	8	0.001	20	0.38	0.04	0.03	50	10	11	0.1	3	1	0.6	--
		P25	130	3.3	8	0.001	20	0.38	0.04	0.03	50	10	11	0.1	3	1	0.6	--
		P50	130	3.3	8	0.001	20	0.38	0.04	0.03	50	10	11	0.1	3	1	0.6	--
		P75	130	3.3	8	0.001	20	0.38	0.04	0.03	50	10	11	0.1	3	1	0.6	--
		P95	130	3.3	8	0.001	20	0.38	0.04	0.03	50	10	11	0.1	3	1	0.6	--
		Max	130	3.3	8	0.001	20	0.38	0.04	0.03	50	10	11	0.1	3	1	0.6	--
		Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	--
	Ore/Waste	Min	77	1.5	8	0.001	20	0.27	0.06	0.03	0.6	10	9.2	0.1	1.8	1	1.1	--
		P5	77	1.5	8	0.001	20	0.27	0.06	0.03	0.6	10	9.2	0.1	1.8	1	1.1	--
		P25	77	1.5	8	0.001	20	0.27	0.06	0.03	0.6	10	9.2	0.1	1.8	1	1.1	--
		P50	77	1.5	8	0.001	20	0.27	0.06	0.03	0.6	10	9.2	0.1	1.8	1	1.1	--
		P75	77	1.5	8	0.001	20	0.27	0.06	0.03	0.6	10	9.2	0.1	1.8	1	1.1	--
		P95	77	1.5	8	0.001	20	0.27	0.06	0.03	0.6	10	9.2	0.1	1.8	1	1.1	--
		Max	77	1.5	8	0.001	20	0.27	0.06	0.03	0.6	10	9.2	0.1	1.8	1	1.1	--
		Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	--
5	Various ³	Min	1	0.79	2	0.001	20	0.12	0.01	0.01	0.1	10	1.1	0.1	0.05	1	0.5	--
		P5	1	0.92	7	0.001	20	0.31	0.028	0.03	0.1	10	1.9	0.1	0.05	1	0.5	--
		P25	12	1.1	16	0.001	20	0.79	0.06	0.06	0.1	10	2.6	0.1	0.14	2	0.5	--
		P50	29	1.3	44	0.001	20	1.5	0.073	0.16	0.1	10	3.2	0.1	0.19	4	0.5	--
		P75	43	1.4	59	0.002	20	1.9	0.093	0.2	0.1	10	4.9	0.1	0.25	6	0.5	--
		P95	67	2.1	81	0.003	20	2.4	0.11	0.25	0.26	10	9.7	0.1	1	8	0.8	--
		Max	280	4.3	100	0.01	20	2.9	0.12	0.33	13	60	16	0.3	1.3	10	2.9	--
		Count	85	85	85	85	85	85	85	85	85	85	85	85	77	85	85	--
5 mixed	Various ⁴	Min	15	1.5	9	0.001	20	0.3	0.063	0.06	0.1	10	4.9	0.1	1	1	0.5	--
		P5	17	1.5	12	0.001	20	0.35	0.066	0.061	0.14	11	5.2	0.11	1.1	1.1	0.6	--
		P25	27	1.7	24	0.001	20	0.54	0.076	0.063	0.3	15	6.6	0.13	1.4	1.5	0.98	--
		P50	40	1.9	39	0.001	20	0.77	0.089	0.065	0.5	20	8.4	0.15	1.8	2	1.5	--
		P75	52	2.1	53	0.001	20	1	0.1	0.068	0.7	25	10	0.18	2.2	2.5	1.9	--
		P95	62	2.3	65	0.001	20	1.2	0.11	0.07	0.86	29	11	0.2	2.5	2.9	2.3	--
		Max	64	2.3	68	0.001	20	1.2	0.11	0.07	0.9	30	12	0.2	2.6	3	2.4	--
		Count	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	--

Lithology ¹	Economic Classification	Statistics	Molybdenum Mo ppm	Copper Cu ppm	Lead Pb ppm	Zinc Zn ppm	Silver Ag ppm	Nickel Ni ppm	Cobalt Co ppm	Manganese Mn ppm	Iron Fe %	Arsenic As ppm	Uranium U ppm	Gold Au ppb	Thorium Th ppm	Strontium Sr ppm	Cadmium Cd ppm	Antimony Sb ppm	Bismuth Bi ppm	Vanadium V ppm	Calcium Ca %	Phosphorus P %	Lanthanum La ppm
9n	Waste	Min	0.1	14	0.7	27	0.1	81	18	470	2.6	1.9	0.1	0.7	0.2	30	0.1	0.1	0.1	5	5.5	0.028	1
		P5	0.2	14	0.7	29	0.1	86	18	470	2.7	2.1	0.16	1.1	0.42	43	0.1	0.1	0.1	5.6	5.5	0.044	1.8
		P25	0.6	15	0.7	38	0.1	110	19	480	2.7	2.9	0.4	2.7	1.3	96	0.1	0.1	0.1	8	5.6	0.11	5
		P50	0.6	17	1.1	43	0.1	110	21	530	2.9	4.8	0.4	3.1	1.8	110	0.1	0.1	0.1	9	5.7	0.11	7
		P75	0.9	71	1.4	54	0.1	110	24	540	3	52	0.5	5.6	2.2	150	0.1	0.3	0.1	18	6	0.11	9
		P95	0.9	110	1.4	95	0.18	120	36	1700	9	93	0.5	28	2.4	290	0.1	0.3	0.1	98	6.2	0.12	16
		Max	0.9	120	1.4	110	0.2	120	39	1900	11	100	0.5	34	2.4	330	0.1	0.3	0.1	120	6.3	0.12	18
		Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
10a	Various ⁵	Min	0.1	15	0.7	32	0.1	200	52	1100	5.9	260	0.1	4.9	0.1	50	0.1	1	0.1	23	3.2	0.006	1
		P5	0.12	19	0.8	34	0.1	250	54	1200	5.9	300	0.1	16	0.1	59	0.1	1.1	0.1	25	3.4	0.0064	1
		P25	0.2	33	1.2	41	0.1	470	61	1300	6	440	0.1	61	0.1	97	0.1	1.7	0.1	33	4.1	0.008	1
		P50	0.2	35	2.8	45	0.3	500	64	1600	6	700	0.1	140	0.1	110	0.1	3.8	0.1	60	5.4	0.011	1
		P75	0.2	45	3.1	64	0.5	510	65	1600	6.9	880	0.1	260	0.1	130	0.1	5.4	0.1	64	5.9	0.012	1
		P95	0.28	81	3.3	69	0.58	640	80	1600	7.7	1100	0.1	1100	0.1	180	0.1	7.3	0.1	66	6.3	0.017	1
		Max	0.3	89	3.4	70	0.6	670	84	1600	7.9	1100	0.1	1300	0.1	190	0.1	7.8	0.1	67	6.4	0.018	1
		Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
12q	Waste	Min	0.8	35	2.3	38	0.2	24	9.7	410	2.8	39	0.1	4	0.2	38	0.1	0.2	0.1	5	2.1	0.013	1
		P5	0.82	39	2.7	40	0.22	24	10	420	2.8	43	0.16	4.8	0.54	48	0.11	0.2	0.1	5.3	2.1	0.015	1.8
		P25	0.9	56	4.3	46	0.3	28	12	440	2.8	58	0.4	8.2	1.9	90	0.15	0.2	0.1	6.5	2.2	0.021	5
		P50	1	77	6.3	54	0.4	32	14	460	2.9	78	0.7	12	3.6	140	0.2	0.2	0.1	8	2.2	0.029	9
		P75	1.2	98	7.8	180	0.4	120	32	1000	4.5	310	0.9	75	4.4	150	1	0.3	0.2	16	4.8	0.033	12
		P95	1.4	110	9	270	0.4	190	46	1500	5.9	500	1.1	130	5	150	1.6	0.38	0.28	22	6.9	0.035	14
		Max	1.4	120	9.3	300	0.4	210	49	1600	6.2	550	1.1	140	5.1	160	1.8	0.4	0.3	24	7.4	0.036	15
		Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Ore	Min	1.2	87	2.1	40	0.1	37	24	1200	4.2	230	0.1	18	0.2	21	0.1	0.2	0.1	9	4.3	0.008	1
		P5	1.2	91	2.1	44	0.23	40	27	1200	4.4	230	0.1	160	0.2	24	0.1	0.25	0.1	10	4.8	0.0085	1
		P25	1.5	100	2.1	59	0.6	68	35	1400	5.4	260	0.1	690	0.2	33	0.1	0.4	0.1	17	6.3	0.011	1
		P50	2.3	110	2.3	72	0.9	180	41	1500	6.7	370	0.1	2700	0.2	44	0.15	0.45	0.1	26	6.7	0.012	1
		P75	2.6	120	3.6	77	1.3	270	53	1700	8.4	530	0.1	4900	0.2	72	0.28	0.73	0.1	36	8.1	0.012	1
		P95	3.2	130	5	280	1.5	290	61	1800	9.6	620	0.1	5400	0.35	100	1.2	0.95	0.1	88	9.5	0.036	1.8
		Max	3.4	140	5.3	350	1.5	300	63	1800	9.8	630	0.1	5500	0.4	110	1.5	1	0.1	100	9.8	0.044	2
		Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
12q mixed	Various ⁵	Min	0.9	36	1.8	41	0.2	36	14	660	3.1	97	0.1	4.9	0.1	56	0.1	0.3	0.1	9	2.8	0.007	1
		P5	1.1	48	1.8	43	0.2	68	20	730	3.6	180	0.1	56	0.1	57	0.1	0.3	0.1	11	3.7	0.0079	1
		P25	1.6	77	2.1	50	0.3	150	35	1100	5.3	410	0.1	480	0.1	61	0.1	0.5	0.1	19	6.2	0.011	1
		P50	1.7	79	3.1	55	0.8	170	39	1300	6.7	480	0.1	1900	0.2	72	0.1	0.7	0.1	27	7.7	0.012	1
		P75	2.3	79	12	68	1.5	250	46	1500	7	560	0.1	2700	0.2	80	0.3	0.85	0.15	36	9.1	0.018	1
		P95	2.6	82	130	120	1.6	260	50	2100	9	660	1.2	4400	4.1	170	0.51	1.4	0.2	51	10	0.038	11
		Max	2.7	83	190	150	1.6	260	51	2300	9.9	690	1.6	5000	5.7	210	0.6	1.6	0.2	57	11	0.047	15
		Count	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7

¹Lithology codes as follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **1oj** = mafic metavolcanics with sediments; **5** = sedimentary units; **5 mixed** = mixed sedimentary units; **9n** = late intermediate dyke; **10a** = late gabbro; **12q** = quartz vein; **12q mixed** = mixed quartz vein

¹Lithology codes

Lithology ¹	Economic Classification	Statistics	Chromium Cr ppm	Magnesium Mg %	Barium Ba ppm	Titanium Ti %	Boron B ppm	Aluminum Al %	Sodium Na %	Potassium K %	Tungsten W ppm	Mercury Hg ppb	Scandium Sc ppm	Thallium Tl ppm	Sulphur S %	Gallium Ga ppm	Selenium Se ppm	Beryllium Be ppm
9n	Waste	Min	20	2.4	10	0.001	20	0.32	0.046	0.05	0.1	10	2.5	0.1	0.99	1	0.5	--
		P5	23	2.4	14	0.001	20	0.41	0.05	0.054	0.1	10	2.5	0.1	0.99	1.2	0.5	--
		P25	34	2.4	30	0.001	20	0.78	0.065	0.07	0.1	10	2.6	0.1	0.99	2	0.5	--
		P50	40	2.4	31	0.001	20	0.92	0.076	0.08	0.1	10	2.9	0.1	0.99	2	0.5	--
		P75	110	2.4	36	0.001	20	0.95	0.081	0.09	0.1	10	4	0.1	0.99	3	0.5	--
		P95	110	2.6	100	0.001	20	2.4	0.09	0.098	0.1	10	13	0.1	0.99	7	0.5	--
		Max	120	2.6	120	0.001	20	2.8	0.092	0.1	0.1	10	16	0.1	0.99	8	0.5	--
		Count	5	5	5	5	5	5	5	5	5	5	5	5	1	5	5	--
10a	Various ⁵	Min	110	3.2	4	0.001	20	0.35	0.015	0.01	0.1	10	11	0.1	0.05	1	0.5	--
		P5	160	4	4	0.001	20	0.42	0.016	0.012	0.12	10	12	0.1	0.08	1.2	0.5	--
		P25	340	6.8	4	0.001	20	0.72	0.021	0.02	0.2	10	14	0.1	0.2	2	0.5	--
		P50	760	7.9	9	0.001	20	1.3	0.035	0.04	0.2	10	14	0.1	0.39	3	0.6	--
		P75	770	8.7	9	0.001	20	1.5	0.036	0.05	0.3	10	14	0.1	0.43	4	0.6	--
		P95	810	9.4	19	0.001	20	1.6	0.12	0.058	0.46	10	16	0.1	1.1	4	0.76	--
		Max	820	9.6	22	0.001	20	1.6	0.14	0.06	0.5	10	16	0.1	1.3	4	0.8	--
		Count	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	--
12q	Waste	Min	18	0.98	12	0.001	20	0.37	0.047	0.06	0.1	10	2	0.1	0.12	1	0.5	--
		P5	19	0.98	13	0.001	20	0.38	0.048	0.063	0.1	10	2	0.1	0.13	1	0.5	--
		P25	21	1	18	0.001	20	0.4	0.052	0.075	0.1	10	2	0.1	0.17	1	0.5	--
		P50	23	1	24	0.001	20	0.43	0.056	0.09	0.1	10	2	0.1	0.23	1	0.5	--
		P75	49	1.7	29	0.001	20	0.48	0.067	0.11	0.15	10	4.9	0.15	0.28	1	0.7	--
		P95	69	2.2	33	0.001	20	0.52	0.076	0.12	0.19	10	7.1	0.19	0.32	1	0.86	--
		Max	74	2.3	34	0.001	20	0.53	0.078	0.12	0.2	10	7.7	0.2	0.33	1	0.9	--
		Count	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	--
	Ore	Min	63	1.3	10	0.001	20	0.13	0.032	0.03	0.1	10	4.2	0.1	--	1	0.7	--
		P5	66	1.4	10	0.001	20	0.15	0.033	0.033	0.1	10	4.6	0.1	--	1	0.8	--
		P25	81	1.8	11	0.001	20	0.24	0.035	0.043	0.13	10	6.5	0.1	--	1	1.1	--
		P50	120	2.6	12	0.001	20	0.4	0.039	0.055	0.2	10	9.1	0.1	--	1	1.3	--
		P75	180	3.8	12	0.001	20	0.84	0.046	0.06	0.28	10	10	0.1	--	1.8	1.7	--
		P95	430	4.1	14	0.001	20	1.9	0.052	0.068	0.38	10	13	0.18	--	5	2	--
		Max	510	4.2	15	0.001	20	2.2	0.054	0.07	0.4	10	14	0.2	--	6	2.1	--
		Count	6	6	6	6	6	6	6	6	6	6	6	6	--	6	6	--
12q mixed	Various ⁵	Min	22	1.2	10	0.001	20	0.21	0.03	0.02	0.1	10	2.4	0.1	0.22	1	0.5	--
		P5	38	1.6	10	0.001	20	0.22	0.031	0.023	0.1	10	4	0.1	0.22	1	0.53	--
		P25	98	2.8	11	0.001	20	0.45	0.032	0.04	0.15	10	8.2	0.1	0.22	1	0.7	--
		P50	140	3.4	14	0.001	20	0.71	0.036	0.06	0.2	10	9	0.1	0.22	2	0.8	--
		P75	180	3.8	15	0.001	20	0.85	0.04	0.07	0.2	10	10	0.1	0.22	2	0.95	--
		P95	240	4.1	34	0.001	20	1	0.059	0.13	0.27	24	11	0.1	0.22	2.7	1.8	--
		Max	250	4.2	42	0.001	20	1	0.067	0.15	0.3	30	12	0.1	0.22	3	2.1	--
		Count	7	7	7	7	7	7	7	7	7	7	7	7	1	7	7	--

¹Lithology codes as follows: **1** = mafic metavolcanics; **1** as follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **1oj** = mafic metavolcanics with sediments; **5** = sedimentary units; **5 mixed** = mixed sedimentary units; **9n** = late intermediate dyke; **10a** = late

Appendix I – Humidity Cell Test Sample Mineralogy and Static Data, Boston

Appendix I1 – XRD Mineralogy

Appendix I-1: XRD Mineralogy for Humidity Cell Samples

Humidity Cell ID	Lithology ¹	Preliminary Economic Classification	Sample Type	Sample ID	Ferroan Dolomite Ca(Fe,Mg)(CO ₃) ₂	Calcite CaCO ₃	Chlorite (Mg,Fe,Al) ₆ (Al,Si) ₄ O ₁₀ (OH) ₈	Chloritoid (Fe,Mg,Mn) ₂ Al ₄ Si ₂ O ₁₀ (OH) ₄	Muscovite KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂	Muscovite/Sericite	Paragonite NaAl ₃ Si ₃ O ₁₀ (OH) ₂	Plagioclase (Ca,Na)(Al,Si)AlSi ₂ O ₈	Pyrite FeS ₂	Pyrophyllite AlSi ₂ O ₅ (OH)	Pyroxene Ca,Na)(Mg,Fe,Al,Ti)(Si,Al) ₂ C	Quartz SiO ₂	Rutile TiO ₂	Siderite FeCO ₃	Siderite/Magnesite	Tourmaline Na(Fe,Mg) ₃ Al ₆ Si ₆ O ₁₈ (BO ₃) ₃ (OH) ₄	Sum
HC-31	1	W	Pulp	07SBD374-SRK-WR-285	22	8	33	bd	bd	bd	9	bd	bd	bd	bd	26	tr	2	bd	bd	100
HC-12	1	mixed	Chip sample	08-BOS-BAR-03	23	6.4	26	bd	bd	1.7	6.3	4.8	1	bd	bd	28	0.58	bd	1.7	bd	100
HC-12a	1	mixed	Pulp	Wt. Av. Composite	21	bd	14	7	bd	15	6	bd	bd	bd	bd	36	1	bd	bd	bd	100
HC-10	1 mixed	W	Chip sample	08-BOS-BAR-01	23	bd	15	0.16	bd	12	8.5	bd	1	bd	bd	40	1	bd	bd	bd	100
HC-10a	1 mixed	W	Pulp	Wt. Av. Composite	38	bd	14	bd	bd	3	10	bd	bd	bd	bd	30	1	4	bd	bd	100
HC-32	1oj	W	Pulp	08SBD380-SRK-WR-389	36	1	7	bd	8	bd	5	6	2	bd	bd	32	3	bd	bd	bd	100
HC-33	1oj	W	Pulp	08SBD380-SRK-WR-391	32	bd	2	bd	11	bd	7	3	3	bd	bd	35	3	bd	3	bd	99
HC-11	5	W	Chip sample	08-BOS-BAR-02	39	bd	10	bd	bd	1.2	11	bd	1	bd	bd	32	1.4	bd	4.4	bd	100
HC-11a	5	W	Pulp	Wt. Av. Composite	35	bd	9	bd	bd	4	14	bd	bd	bd	bd	32	2	bd	3	bd	99
HC-34	5	W	Pulp	08SBD382-SRK-WR-208	33	bd	21	bd	bd	2	9	bd	1	bd	bd	30	1	bd	bd	3	100
HC-35	5	W	Pulp	08SBD382-SRK-WR-236	43	tr	18	bd	bd	3	9	bd	1	bd	bd	25	1	bd	bd	bd	100
HC-37	12q	W	ABA	118453	20	bd	1	bd	bd	6	4	bd	2	13	bd	53	1	bd	bd	bd	100
HC-36	12q	O	Pulp	08TDD631-SRK-WR-435	12	bd	6	bd	bd	20	3	18	bd	bd	bd	39	1	bd	bd	bd	99
HC-38	12q	O	ABA	118455	27	1	bd	bd	bd	12	3	bd	2	bd	bd	52	2	bd	bd	bd	99

¹Lithology codes as follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **1oj** = mafic metavolcanics with sediments; **5** = sedimentary units; **5 mixed** = mixed sedimentary units; **9n** = late intermediate dyke; **10a** = late gabbro; **12q** = quartz vein; **12q mixed** = mixed quartz vein

Appendix I2 – Acid-Base Accounting Data for Pre- and Post-Humidity Cell
Test Samples

Appendix I-2 – Acid-Base Accounting Data for Pre- and Post-Humidity Cell Test Samples

Humidity Cell #	Lithology	Description	Preliminary Economic Classification	Sample Type	Paste pH	Total Sulphur	NP ²	TIC	TIC _(Ca+Mg)	NP/AP	TIC/AP	TIC _{(Ca+Mg)/AP}	NP/AP	TIC/AP	TIC _{(Ca+Mg)/AP}
						%S									
HC-31	1	Ultramafic to Mafic Metavolcanic Rocks	Waste	Pre-HCT	9.5	0.13	256	385	298	63	95	73	non-PAG	non-PAG	non-PAG
	Post-HCT			9.3	0.11	269	388	301	78	113	88				
HC-55	1		Waste	Pre-HCT	9.3	0.29	307	400	310	34	44	34	non-PAG	non-PAG	non-PAG
	Post-HCT			9.1	0.4	340	386	299	30	34	26				
HC-12	1		Ore/Waste	Pre-HCT	9.4	0.14	281	438	339	64	100	78	non-PAG	non-PAG	non-PAG
					9.5	0.22	271	397	308	39	57	44			
			Post-HCT	9.2	0.1	295	474	367	94	152	118				
HC-10	1 mixed	Mixed Mafic Metavolcanics	Waste	Pre-HCT	9.0	0.16	240	302	234	48	60	47	non-PAG	non-PAG	non-PAG
					9.3	0.18	240	283	219	43	51	39			
				Post-HCT	9.1	0.1	205	328	255	60	96	74			
HC-32	1oj	Mafic Metavolcanics with Sediments	Waste	Pre-HCT	9.1	0.86	270	369	286	10	14	11	non-PAG	non-PAG	non-PAG
	Post-HCT			9.0	0.5	304	389	302	21	27	21				
HC-33	1oj		Waste	Pre-HCT	9.0	0.33	351	449	348	34	44	34	non-PAG	non-PAG	non-PAG
				Post-HCT	9.1	0.3	348	489	379	33	46	36			
HC-11	5	Early Sedimentary Units (Argillite-Wacke) ¹	Waste	Pre-HCT	9.3	0.32	146	216	167	15	22	17	non-PAG	non-PAG	non-PAG
					9.4	0.27	157	222	172	19	26	20			
				Post-HCT	9.4	0.3	125	198	153	15	24	19			
HC-35	5		Waste	Pre-HCT	9.4	0.20	89	123	96	14	20	15	non-PAG	non-PAG	non-PAG
				Post-HCT	9.5	0.3	91	107	83	11	13	10			
HC-34	5		Waste	Pre-HCT	8.5	0.81	115	172	133	4.5	6.8	5.3	non-PAG	non-PAG	non-PAG
				Post-HCT	8.4	1.0	133	187	145	4.5	6.3	4.9			
HC-37	12q	Quartz vein	Waste	Pre-HCT	9.3	1.5	272	300	232	5.9	6.5	5.0	non-PAG	non-PAG	non-PAG
				Post-HCT	9.0	1.2	288	417	323	7.5	11	8.4			
HC-38	12q		Ore	Pre-HCT	8.9	3.0	194	270	209	2.1	2.9	2.3	Uncertain non-PAG	Uncertain non-PAG	Uncertain non-PAG
				Post-HCT	8.9	2.4	246	327	254	3.4	4.5	3.5			

Notes:¹Early used in a relative sense only.²NP determined using the modified (MEND 1991) method.

*See discussion in Table 3.8 and Section 3.2.1. On this basis, pre-test values of NP and TIC are also likely low.

Appendix I3 – Solid-Phase Trace Metal Data for Pre- and Post-Humidity
Cell Samples – ICP Metals by Aqua Regia Digestion

Appendix I-3: Solid-Phase Trace Metal Data for Pre- and Post-Humidity Cell Samples - ICP Metals by Aqua Regia Digestion

Humidity Cell #	Lithology	Description	Preliminary Economic Classification	Sample Type	Al ppm	As ppm	B ppm	Ba ppm	Bi ppm	Ca ppm	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe ppm	Ga ppm	Hg ppm	K ppm	La ppm	Mg ppm	Mn ppm	Mo ppm	Na ppm	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Se ppm	Sr ppm	Th ppm	Ti ppm	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
HC-31	1	Ultramafic to Mafic Metavolcanic Rocks	Waste	Pre-HCT	11000	84	20	14	0.1	65000	0.1	37	97	140	57000	2	0.01	500	1	27000	1200	0.2	930	65	210	1.8	0.2	14	0.5	37	0.1	10	0.1	0.1	46	11	56
				Post-HCT	8100	71	<20	9	<0.1	58000	<0.1	36	53	190	61000	2	<0.01	400	<1	31000	1200	0.4	640	74	210	1.2	<0.1	14	0.5	39	<0.1	<0.001	<0.1	<0.1	48	42	56
HC-55	1		Waste	Pre-HCT	17000	140	<20	8	<0.1	83000	0.1	49	390	73	61000	4	<0.01	200	<1	42000	1400	0.1	460	240	170	1	0.4	18	<0.5	76	<0.1	10	<0.1	<0.1	78	6.6	49
				Post-HCT	20000	140	20	10	0.1	68000	0.1	47	470	67	58000	4	0.01	300	1	41000	1400	0.8	430	230	160	1.1	0.3	14	0.5	59	0.3	10	0.1	0.1	75	>100.0	47
HC-12	1		Ore/Waste	Pre-HCT	9800	110	<20	8	<0.1	62000	<0.1	32	96	78	69000	3	<0.01	300	<1	31000	1800	0.8	660	75	190	1	<0.1	12	0.7	42	<0.1	<10	<0.1	<0.1	50	<0.1	67
				Post-HCT	11000	160	20	11	0.1	69000	0.1	45	120	98	75000	3	0.00001	400	1	31000	1800	0.8	810	93	210	2.2	0.5	14	0.5	47	0.1	10	0.1	0.1	57	0.1	77
HC-10	1 mixed	Mixed Mafic Metavolcanics	Waste	Pre-HCT	24000	91	<20	7	<0.1	56000	<0.1	44	230	99	60000	6	<0.01	<100	<1	30000	1500	0.3	210	140	190	0.6	0.1	15	0.8	43	<0.1	50	<0.1	<0.1	100	<0.1	59
				Post-HCT	29000	110	20	12	0.1	67000	0.1	56	270	110	72000	7	0.00001	200	1	35000	1600	0.5	480	160	220	1.3	0.4	18	0.5	47	0.1	20	0.1	0.1	130	0.1	71
HC-32	1oj	Mafic Metavolcanics with Sediments	Waste	Pre-HCT	15000	230	<20	7	<0.1	71000	<0.1	48	250	100	62000	4	0.01	200	<1	32000	1400	1.2	330	200	120	1.7	0.2	12	<0.5	47	0.1	<0.001	<0.1	<0.1	69	0.4	71
				Post-HCT	18000	290	20	7	0.1	70000	0.1	53	260	85	63000	4	0.01	300	1	32000	1400	0.4	370	220	140	1	0.2	13	0.5	49	0.1	10	0.1	0.1	70	0.2	69
HC-33	1oj		Waste	Pre-HCT	15000	330	<20	8	<0.1	89000	<0.1	57	330	90	79000	4	0.01	200	<1	34000	2300	0.5	310	230	130	1	0.3	13	<0.5	48	<0.1	<0.001	<0.1	<0.1	71	0.3	64
				Post-HCT	16000	370	20	7	0.1	85000	0.1	51	320	76	79000	4	0.01	200	1	33000	2400	0.1	420	220	120	0.8	0.3	14	0.5	52	0.1	10	0.1	0.1	73	0.5	59
HC-11	5	Early Sedimentary Units (Argillite-Wacke) ¹	Waste	Pre-HCT	11000	20	<20	12	<0.1	42000	0.1	21	22	45	45000	3	<0.01	500	11	14000	1200	0.7	350	17	750	2.5	0.6	5.1	<0.5	60	2.1	20	<0.1	0.3	33	<0.1	83
				Post-HCT	13000	28	20	28	0.2	40000	0.2	25	23	60	47000	4	0.00001	900	14	14000	1200	2.4	650	19	910	3.7	0.8	5	0.5	77	2.8	10	0.1	0.5	35	0.1	86
HC-35	5		Waste	Pre-HCT	7500	53	<20	29	0.2	23000	0.1	16	59	49	29000	2	<0.01	1300	14	9700	500	1	520	42	440	12	0.2	2.5	0.7	79	5.4	<10	<0.1	0.9	9	0.1	63
				Post-HCT	9800	56	20	57	0.2	22000	0.4	17	20	47	29000	3	0.01	1900	19	9600	470	0.9	790	38	440	17	0.2	2.6	0.5	100	6.6	10	0.1	1.3	10	0.1	110
HC-34	5		Waste	Pre-HCT	2600	88	<20	6	0.3	35000	<0.1	15	16	93	27000	<1	0.03	600	10	13000	480	2	180	32	550	6.8	1.6	2.3	0.7	35	2.5	20	0.2	0.4	10	0.1	36
				Post-HCT	4500	74	20	12	0.3	32000	0.1	15	9	110	28000	1	0.02	1000	10	13000	470	1.4	720	29	570	7.3	1.6	2.7	1.1	44	2.4	40	0.1	0.5	12	0.1	34
HC-37	12q	Quartz vein	Waste	Pre-HCT	2600	480	<20	6	<0.1	72000	0.1	48	41	110	54000	<1	<0.01	300	<1	23000	1500	0.8	230	190	130	2.3	0.8	7	0.7	33	<0.1	<10	<0.1	<0.1	21	0.2	51
				Post-HCT	3700	550	20	12	0.1	74000	0.2	49	74	120	62000	1	0.01	600	1	23000	1600	1.4	470	210	130	2.3	0.4	7.7	0.9	38	0.2	10	0.2	0.1	24	0.2	54
HC-38	12q		Ore	Pre-HCT	2500	180	<20	7	<0.1	65000	<0.1	33	52	110	79000	<1	<0.01	300	2	17000	1800	0.5	450	32	450	1.8	0.3	9.6	1.3	29	0.3	10	<0.1	<0.1	25	0.1	72
				Post-HCT	3100	230	20	12	0.1	62000	0.2	35	63	130	98000	1	0.01	400	2	17000	1800	2.6	540	37	440	2.1	0.2	8.8	2.1	36	0.4	10	0.1	0.1	26	0.1	78

Notes:

¹Early used in a relative sense only.
*See discussion in Table 3.8 and Section 3.2.1. On this basis, pre-test values of NP and TIC are also likely low.

Appendix I4 – Optical Mineralogy for Selected Humidity Cell Samples

Petrography Report

CHARACTERIZATION OF CRUSHED ROCK HOPE BAY PROJECT, NUNAVUT CANADA

Feb 7, 2011

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Background

Ten crushed rock samples from the Hope Bay Project are characterized in this report. Optical reporting was requested by Lisa Barazzuol of SRK Consulting (Canada) Inc. A geological writeup on the Hope Bay project and QXRD data for the samples was provided by Lisa Barazzuol. The samples were received by Kathryn Dunne from Maxxam laboratory at the end of November and submitted for polished thin section production at Vancouver Petrographics Ltd. on Dec. 3, 2010 by Kathryn Dunne. The prepared polished thin sections were received in January and then examined optically by Kathryn Dunne. The purpose of the optical study was to characterize the mineralogy with particular emphasis on sulphide minerals and any carbonate minerals present.

The optical observations are summarized below and petrographic descriptions of polished thin sections with representative photomicrographs follow the summary. All percentages in the descriptions are approximate based on visual estimation.

Definition of terms

Please note that the term “Fe-ox” is used in this report for unknown iron-oxides, -hydroxides, -oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals. The term “rutile” is used in this report for very fine-grained Ti-oxides which may also include leucosene and anatase. The term “sericite” is used in this report as a fine to very fine-grained colourless mica, either muscovite, illite, or paragonite.

Summary

<u>Sample #</u>	<u>Description Page #</u>	<u>Sample #</u>	<u>Description Page #</u>
HC-17	5	HC-50	33
HC-20	9	HC-51	38
HC-24	16	HC-52	43
HC-32	22	HC-53	48
HC-35	28	HC-55	53

The samples comprise fine to coarse rock chips (< 24 mm) and liberated mineral grains. Rock chips represent altered and variably deformed mafic volcanic/intrusive rock, sedimentary rock and quartz veins (based on Rock Type code provided). The alteration and deformation have resulted in strongly foliated and banded rock fragments with virtually no features of the protoliths remaining. Deformation in altered igneous rocks is represented by sericite, chlorite and/or rutile aggregates defining a strong foliation fabric. In some samples, bands of sericite-rutile or chlorite-rutile alternate with massive bands of carbonate-quartz aggregate. Rock chips generally comprises some of the following mineral assemblages: 1) rutile-chlorite-quartz-carbonate, 2) quartz-carbonate, 3) sericite-chlorite-carbonate, 4) albite-quartz-carbonate (Madrid deposit), 5) sericite-rutile±tourmaline ±pyrite and 6) quartz-sericite-carbonate-rutile. Vein fragments comprise quartz±carbonate and carbonate aggregate.

Carbonate occurs in major amounts in the sections (10-50%) with the exception of one quartz vein sample (HC-53) which has trace amounts of carbonate (see tabular summary, over). Carbonate occurs as colourless to locally cloudy brownish, fine to very fine-grained and locally medium-grained aggregates. Carbonate occurs as: 1) anhedral to less commonly rhombic, patchy aggregates within foliated fragments, 2) anhedral aggregates within massive quartz-carbonate and carbonate aggregate, 3) anhedral aggregates within quartz±carbonate vein fragments and carbonate stringers and 4) anhedral liberated grains. Some of the carbonate in sample HC-17 is calcite based on reaction to HCl. In sample HC-24, some of the carbonate is partly replaced by minor (~1%) amounts of Fe-ox which occurs as very fine-grained, red-brown aggregates of unknown composition. In samples HC-50 and HC-52, very fine-grained Fe-ox aggregate occurs rarely partly replacing carbonate. In sample HC-51, very fine-grained Fe-ox aggregate occurs in late fractures.

Summary cont.

Sulphide occurs in trace to major amounts (up to 5%) as pyrite and in trace amounts or rarely as chalcopyrite in most sections (see tabular summary, below). Rare sphalerite is observed as inclusions in pyrite in sample HC-20. Rare amounts of unknown phases are observed in samples HC-20 and HC-55. Pyrite grains are fine to very fine-grained, rarely medium-grained (HC-32), and occur disseminated, as clusters and as patchy sub-anhedral or eu-anhedral grains and aggregate in altered rock fragments and as liberated anhedral grains and aggregate. In sample HC-53, pyrite occurs disseminated in trace amounts in quartz vein fragments. Pyrite grains have irregular to straight grain boundaries which are unaltered. Chalcopyrite grains are fine to very fine-grained and can occur disseminated in rock fragments, as anhedral aggregates associated with pyrite, as inclusions in pyrite or as liberated grains. Chalcopyrite grains are unaltered. Rare, unknown, high reflectance very fine grains occur as aggregates associated with pyrite and as inclusions in pyrite in sample HC-20. Another unknown, highly reflective phase occurs as rare, patchy fine to very fine-grains in sample HC-55.

Tabular summary:

Sample #	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-17	pyrite chalcopyrite	2 tr	colourless, fine to very fine-grained	40		x	chlorite quartz rutile sericite feldspar	40 8 8 1 tr
HC-20	pyrite chalcopyrite unknown sphalerite	5 r r r	colourless to cloudy brownish, fine to very fine-grained	50		x	quartz plagioclase chlorite rutile sericite K-feldspar gold	30 ? 1 1 tr tr r
HC-24	pyrite chalcopyrite	5 tr	colourless, fine to very fine-grained	60	very fine-grained, red-brown	1	plagioclase chlorite quartz rutile sericite	15 10 7 1 tr
HC-32	pyrite chalcopyrite	3 tr	colourless and cloudy brownish, fine to very fine-grained	50		x	quartz chlorite sericite tourmaline rutile	20 15 7 3 1
HC-35	pyrite chalcopyrite	1 r.	cloudy and colourless brownish, very fine to medium-grained	25		x	sericite quartz plagioclase chlorite rutile zircon	25 20 20 7 2 r.
HC-50	pyrite chalcopyrite	5 r.	colourless to cloudy brownish, very fine to medium-grained	30	red-brown unknown	r.	quartz sericite rutile chlorite	40 20 4 r.

Table continued over

Tabular summary (cont.):

Sample #	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-51	pyrite chalcopyrite	tr r.	colourless to cloudy brownish, very fine to medium-grained	50	red-brown unknown	r.	sericite quartz chlorite rutile	20 13 10 6
HC-52	pyrite	2	colourless to cloudy very fine to fine- grained	10	red-brown unknown	r.	quartz sericite rutile ?clay/chlorite	80 6 1 tr
HC-53	pyrite	tr	colourless to cloudy brownish, very fine to fine-grained	tr		x	quartz sericite rutile ?clay/chlorite tourmaline	99 tr tr tr r.
HC-55	pyrite chalcopyrite unknown	1 tr r.	colourless to cloudy brownish, fine to very fine-grained	50		x	quartz chlorite sericite plagioclase rutile tourmaline	25 10 10 2 1 r.

tr = trace (< 1%); r. = rare; x = none observed; fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm;
 Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric
 hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals

Project: Hope Bay**Deposit:** Madrid**Zone:** Suluk**Rock Type:** Mafic volcanic with sediments: Flow basalt with interflow chert/argillite/sandstone**Sample ID:** HC-17**Offcut #:** AP-1**Crushed Rock and Offcut Mount Description:**

Fine to coarse angular chips (less than 9 mm size). Chips comprise mostly dark grey, lesser greenish-grey and pale grey very fine-grained rock with texture varying from massive to foliated. Traces of fine-grained pyrite occurs disseminated. Reaction of chips to cold dilute HCl. No reaction of chips to magnet. No reaction of rock chips to etching with HF and staining with sodium cobaltinitrite (no yellow stain).

Polished Thin Section Description:

Fine to coarse chips representing altered and variably deformed rock: 1) fine to very fine-grained, intensely foliated rutile-chlorite± carbonate aggregate locally with bands of fine to very fine-grained quartz-carbonate ±chlorite aggregate, 2) fine to very fine-grained massive quartz-carbonate aggregate and 3) minor patchy very fine-grained sericite±chlorite-carbonate aggregate. A number of irregular stringers of fine to medium-grained carbonate and less commonly fine-grained quartz-carbonate occur in many of the chips. Chlorite comprises approximately 40% of the section as very fine-grained aggregates. Major rutile, approximately 8%, occurs as very fine-grained aggregates within the foliation and replacing fine-grained disseminated tabular forms. Quartz, approximately 8%, occurs as fine to very fine-grained (< 0.2 mm) patchy, anhedral aggregates commonly with undulose extinction. Locally quartz occurs as very fine-grained pressure fringes to pyrite grains in foliated rock fragments. Sericite occurs in minor amounts, ~ 1%, as very fine-grained flaky aggregates. Traces of feldspar occur within rock fragments with quartz-carbonate aggregate and sericite±chlorite-carbonate aggregate.

Carbonate occurs in major amounts (~40%) as colourless carbonate in the following forms: 1) fine to very fine-grained (< 0.1 mm), anhedral aggregates within foliated rutile-chlorite-carbonate fragments, 2) fine to very fine-grained (< 0.6 mm), anhedral aggregates within quartz-carbonate aggregate, 3) very fine-grained aggregate associated with sericite-bearing fragments, 4) fine-grained (< 0.8 mm) anhedral aggregates within carbonate stringers and 5) as fine-grained liberated grains (< 0.7 mm). Note some of the carbonate within quartz-carbonate aggregate and rutile-chlorite-carbonate fragments is strained with local development of undulatory extinction and subgrains. Some of the carbonate is calcite based on reaction of crushed rock to cold, dilute HCl.

Sulphide occurs in minor amounts (~2%) as pyrite and in trace amounts as chalcopyrite. Pyrite grains are fine to very fine grained (< 0.3 mm) and occur as disseminated to patchy sub-anhedral grains and aggregate in altered rock fragments and as liberated anhedral grains and aggregate. Some pyrite grains are highly fractured. Pyrite grains have irregular to straight grain boundaries which are unaltered. Traces of fine to very fine-grained (< 0.2 mm) chalcopyrite occur disseminated in rock fragments, as anhedral aggregates associated with pyrite and as inclusions in pyrite.

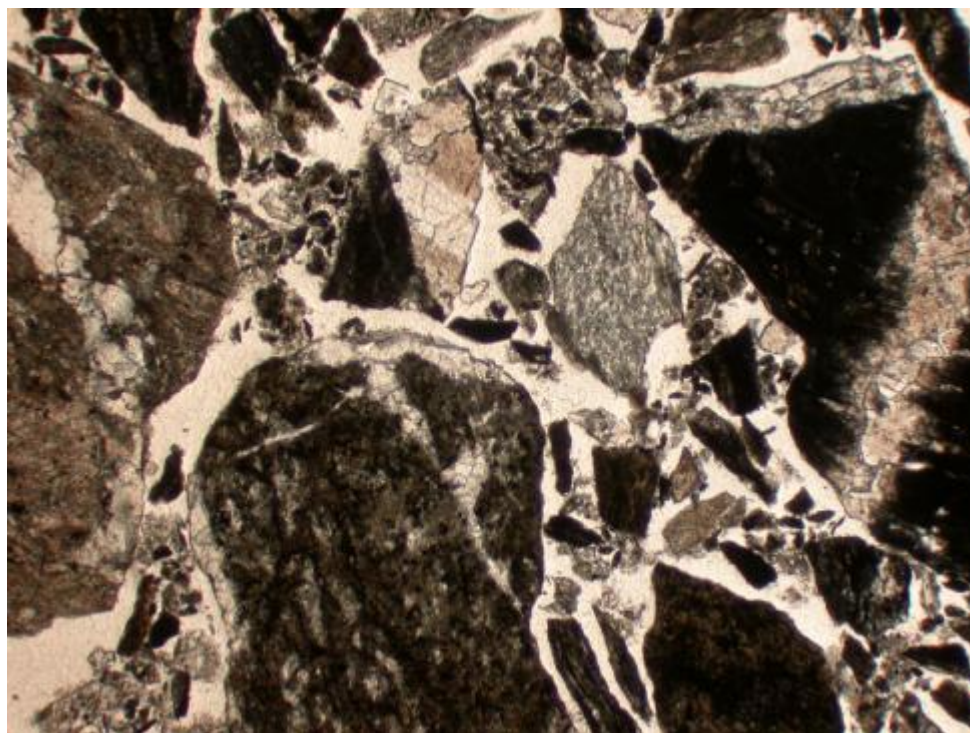
Tabular summary (visual estimate):

Sample # -	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-17	pyrite	2	colourless, fine to very fine-grained	40		x	chlorite	40
	chalcopyrite	tr					quartz	8
							rutile	8
							sericite	1
							feldspar	tr

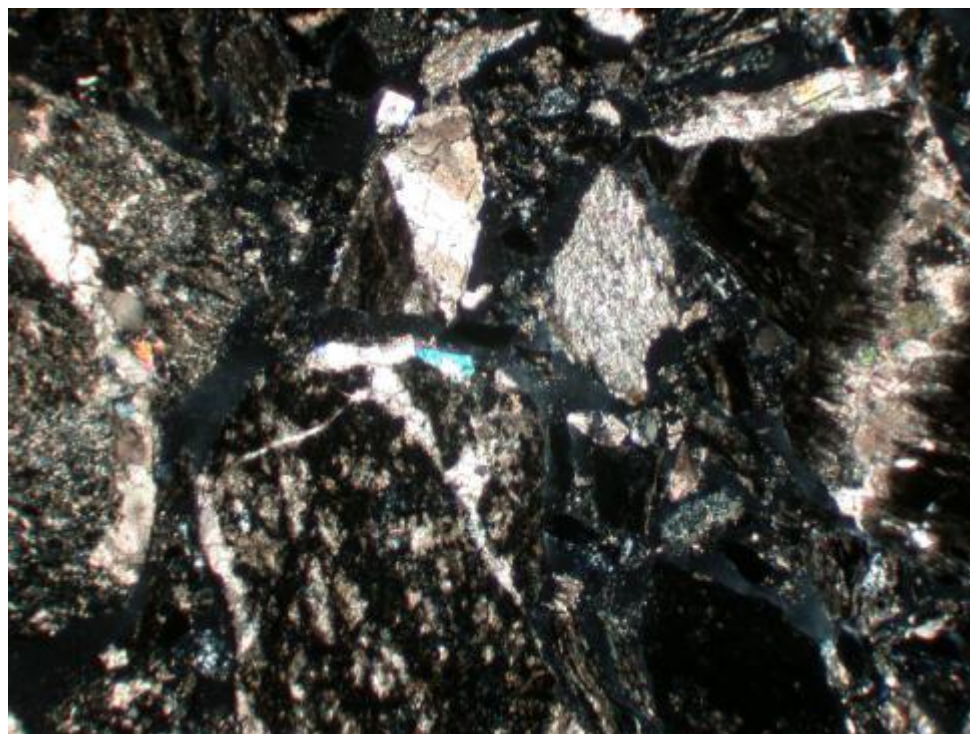
Abbreviations: tr = trace (< 1%); r. = rare; x = none observed

-fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm; medium-grained = 1-5 mm

-Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals

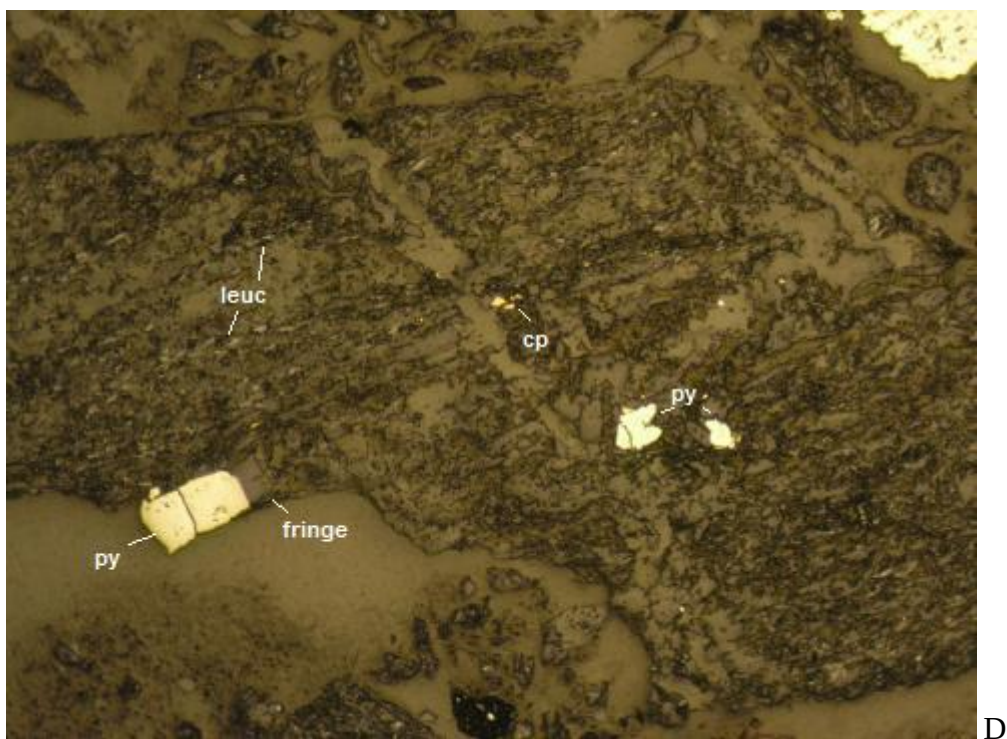
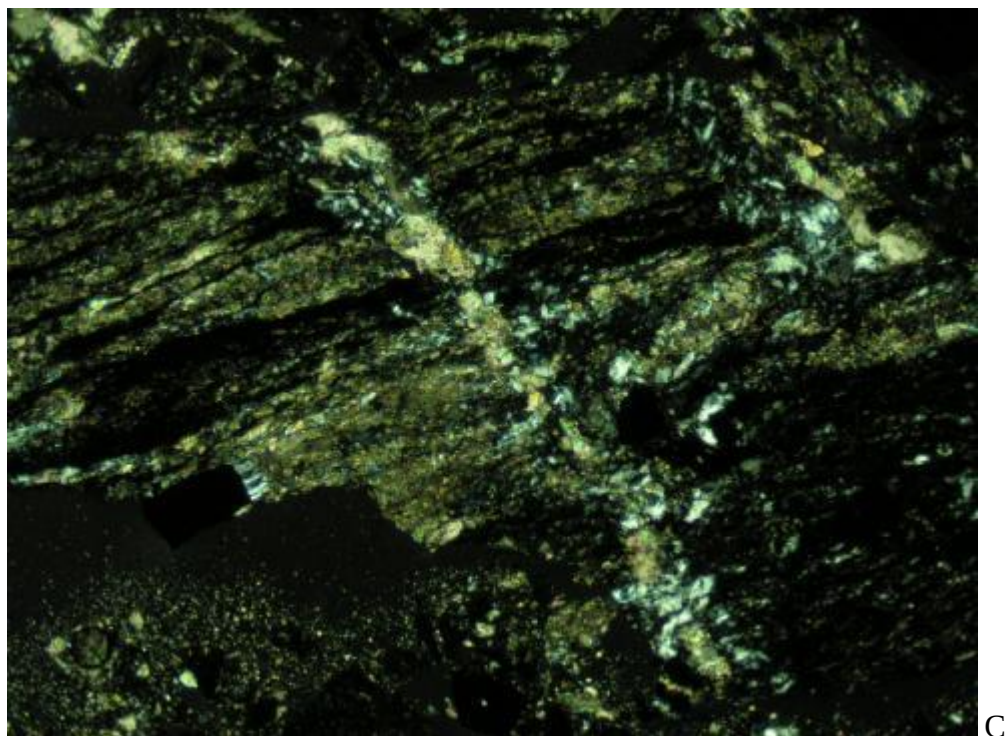


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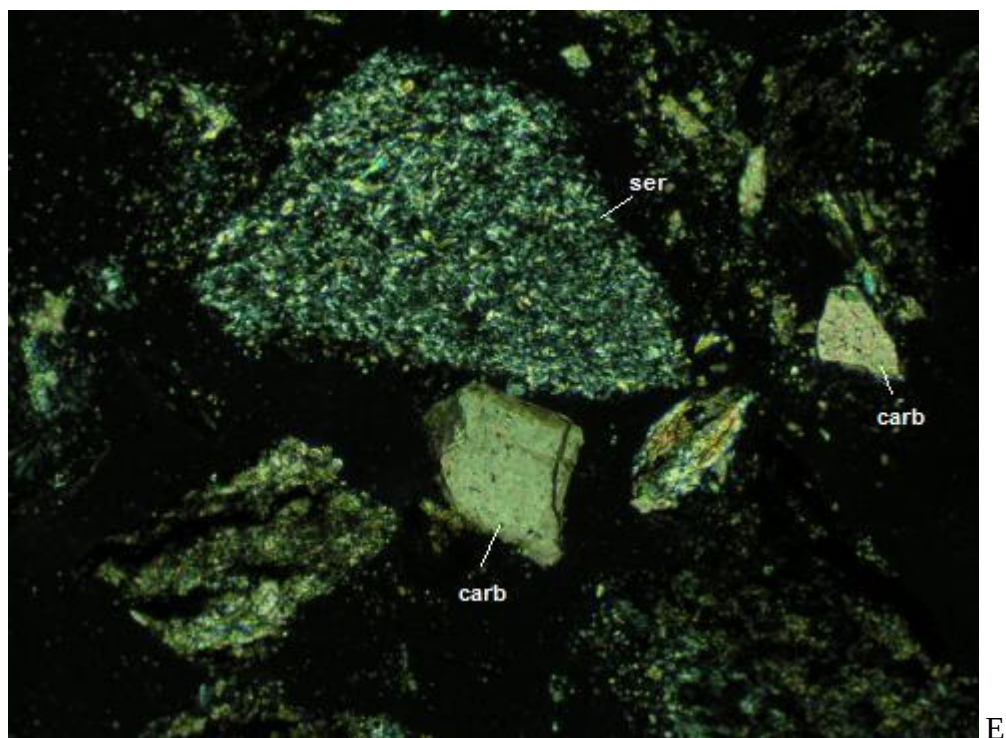


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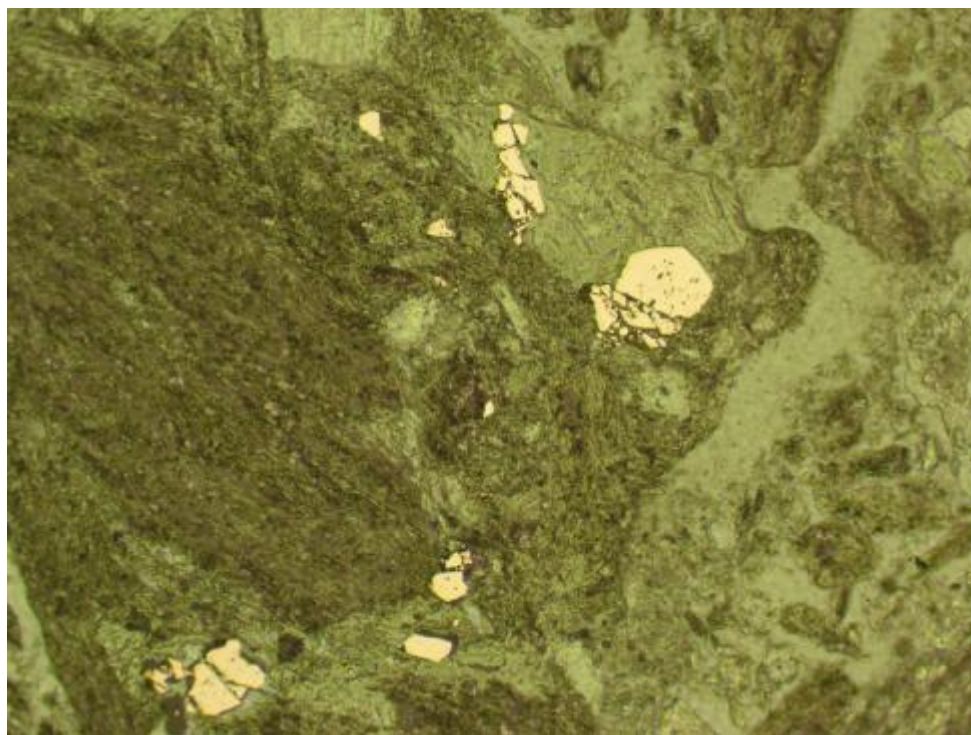
HC-17: A&B) View of altered and deformed rock rock chips represented by intensely foliated rutile-chlorite± carbonate aggregate locally with bands of fine to very fine-grained quartz-carbonate ±chlorite aggregate and minor sericite±chlorite-carbonate aggregate cut by irregular stringers of fine carbonate. A) PPL, B) XPL, FOV ≈ 4.5 mm.



HC-17: C&D) Detailed view of foliated rutile-chlorite-carbonate rock fragment cut by carbonate-quartz stringers. Note disseminated pyrite and chalcopyrite. Note pyrite with pressure fringe (left). C) XPL, D) RL, FOV = ~ 2.6 mm



E



F

HC-17: E) Overview of sericite-altered rock fragment (ser), rutile-chlorite-carbonate rock fragments and liberated carbonate grains (carb). XPL, FOV $\approx$ 1.3 mm. F) Fractured anhedral pyrite grains within rutile-chlorite-carbonate rock fragment. PPL+RL, FOV $\approx$ 1.3 mm.

Project: Hope Bay**Deposit:** Madrid**Zone:** Naartok E**Rock Type:** Sedimentary units: Argillite**Sample ID:** HC-20**Offcut #:** AP-2**Crushed Rock and Offcut Mount Description:**

Fine to coarse angular chips (less than 9 mm size). Chips comprise dark grey fine-grained rock locally with white siliceous patches. Major disseminated fine-grained pyrite. No reaction of chips to cold dilute HCl. No reaction of chips to magnet. Reaction of rock chips to etching with HF and staining with sodium cobaltinitrite (traces of yellow stain).

Polished Thin Section Description:

Fine to coarse chips representing massive, pyritic rock comprising plagioclase-quartz-carbonate($\pm$ chlorite $\pm$ rutile) aggregate. Quartz occurs as fine-grained, irregular anhedral grains and patchy aggregates (up to 1 mm size) and as very fine-grained aggregates. Fine quartz grains display undulatory extinction and development of subgrains. Locally quartz occurs as very fine-grained pressure fringes to pyrite grains. The amount of quartz in the section is estimated at 30%. Plagioclase, likely mostly albite, occurs as fine-grained (< 0.3 mm) scattered tabular grains and as patchy very fine-grained aggregates with quartz. The amount of plagioclase in the section cannot be estimated accurately optically. Carbonate occurs as fine to very fine-grained anhedral aggregates within rock fragments (as described below) and rarely in veinlets with quartz. In a few fragments, minor chlorite, $\sim 1\%$, occurs as very fine-grained aggregates associated with rutile aggregate. Rutile occurs in minor amounts, $\sim 1\%$, in the section, disseminated as very fine-grained anhedral aggregates and in acicular form. Sericite occurs in trace amounts as very fine-grained flaky aggregates in pyrite pressure fringes and locally as fine ribbons with chlorite. K-feldspar occurs in trace amounts with patchy distribution in some fragments (based on stained offcut).

Carbonate occurs in major amounts ($\sim 50\%$) as colourless to cloudy brownish carbonate in the following forms: 1) fine to very fine-grained (< 0.5 mm), anhedral aggregates within quartz-carbonate aggregate, 2) fine-grained (< 0.4 mm) anhedral aggregates within carbonate $\pm$ quartz veinlets and 3) as fine-grained liberated grains (< 0.25 mm). Note some of the carbonate within quartz-carbonate aggregate is strained with local development of undulatory extinction and subgrains.

Sulphide occurs in major amounts ($\sim 5\%$) as pyrite and rarely as chalcopyrite, an unknown phase and sphalerite. Pyrite grains are fine to very fine grained (< 0.4 mm) and occur as disseminated to patchy eu-anhedral grains and aggregate in altered rock fragments and as liberated grains and aggregate. Pyrite grains have irregular to straight grain boundaries which are unaltered. Rare very fine-grained chalcopyrite occurs disseminated in rock fragments as inclusions in pyrite and as liberated grains. Rare very fine-grained sphalerite occurs as inclusions in pyrite. Rare traces of a very fine-grained, unknown, highly reflective phase (light grey in reflected light, isotropic) occur as aggregates associated with pyrite and as inclusions in pyrite. Rare traces of very fine-grained (~ 5 μ m) gold grains are observed as inclusions in pyrite.

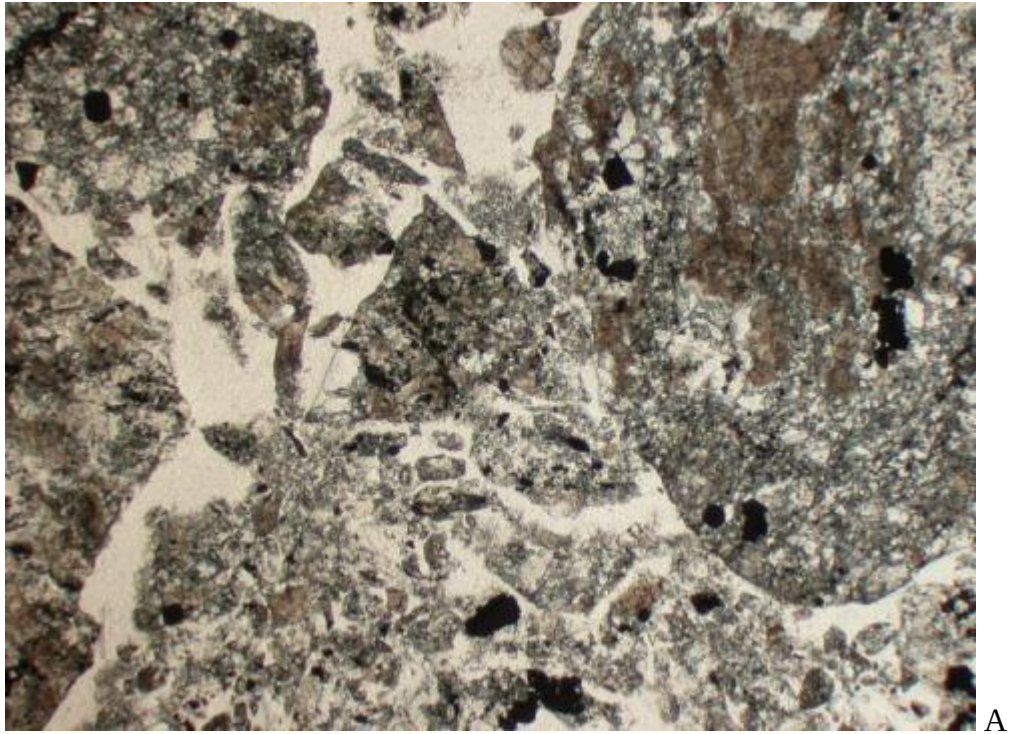
Project: Hope Bay**Deposit:** Madrid**Zone:** Naartok E**Rock Type:** Sedimentary units: Argillite**Sample ID:** HC-20**Offcut #:** AP-2Tabular summary (visual estimate):

Sample # -	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-20	pyrite	5	colourless to cloudy brownish, fine to very fine-grained	50		x	quartz	30
	chalcopyrite	r					plagioclase	?
	unknown	r					chlorite	1
	sphalerite	r					rutile	1
							sericite	tr
							K-feldspar	tr
							gold	r

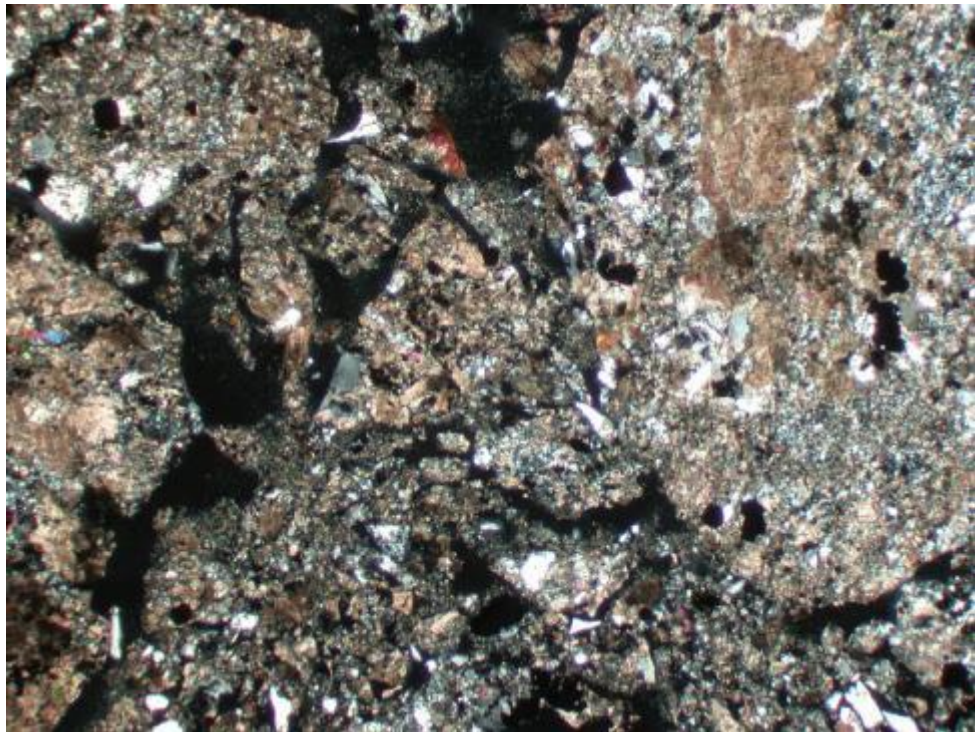
Abbreviations: tr = trace (< 1%); r. = rare; x = none observed

-fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm; medium-grained = 1-5 mm

-Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals

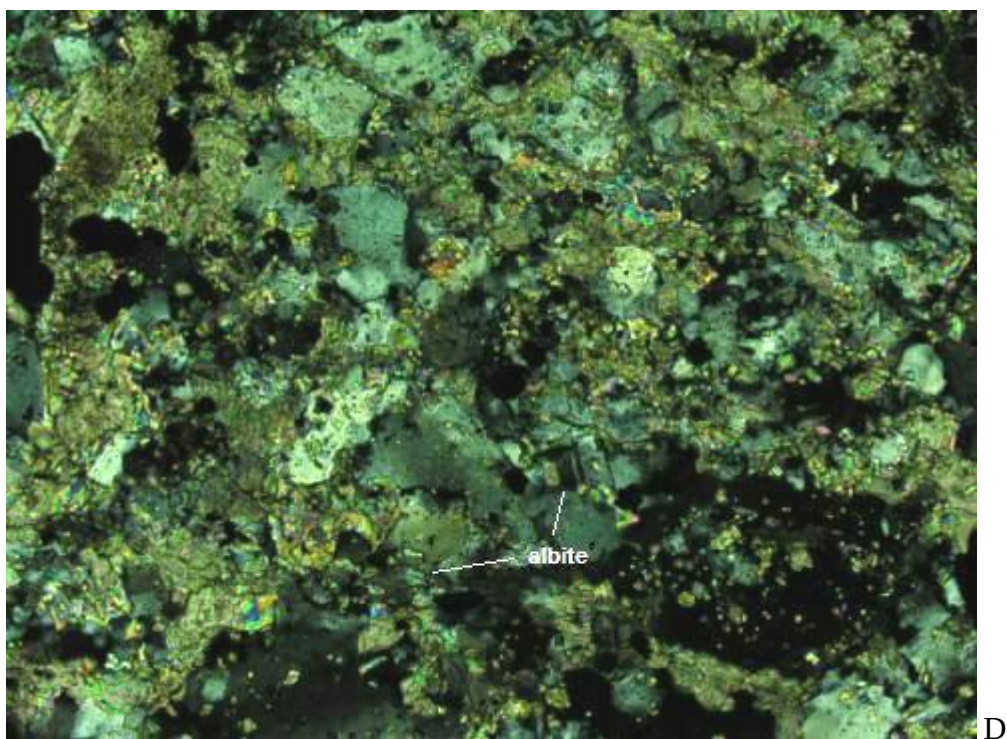
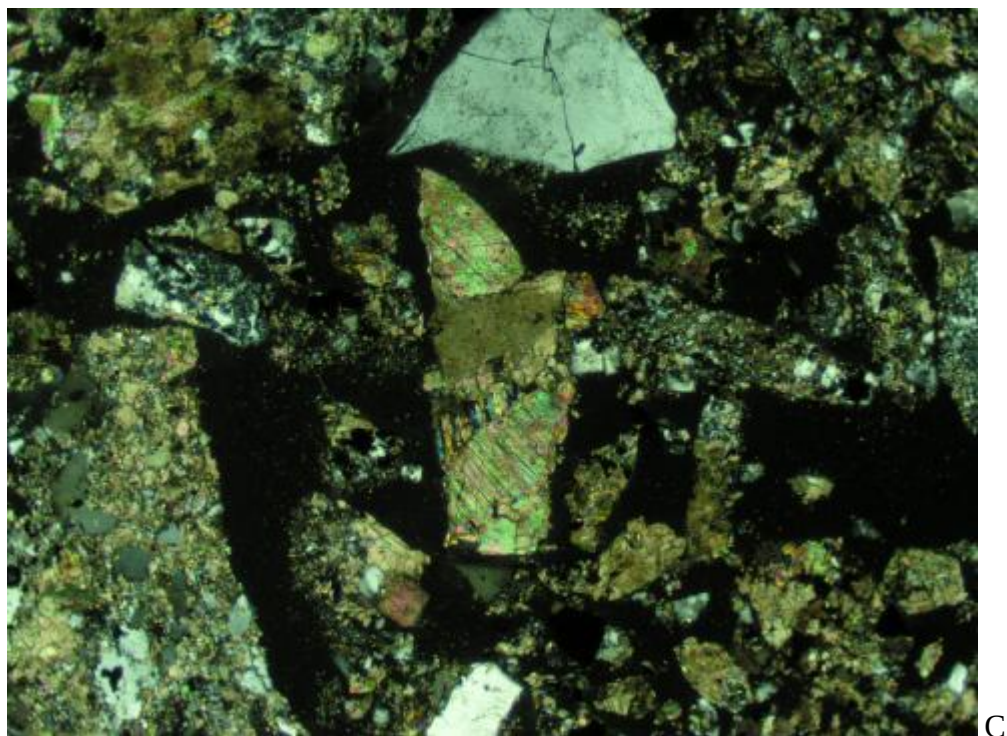


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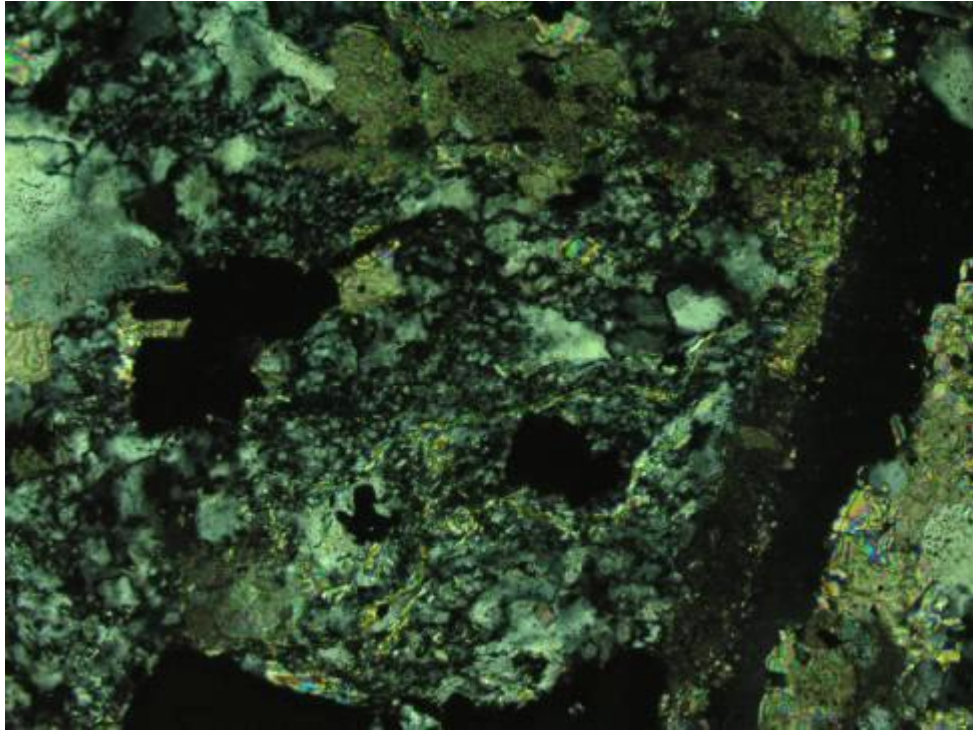


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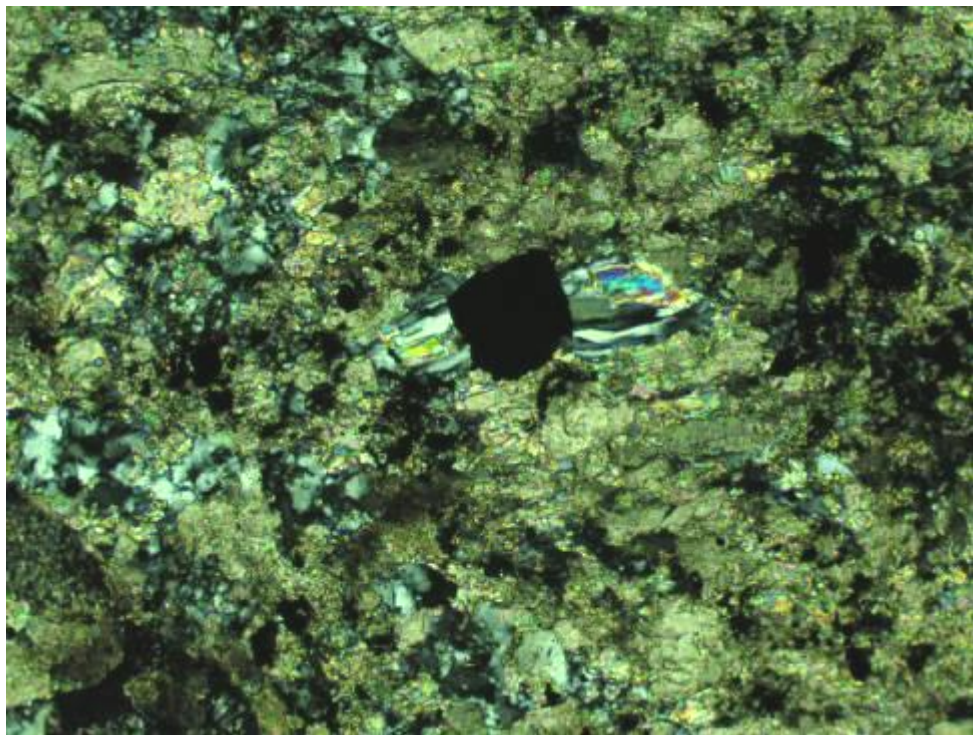
HC-20: A&B) View of pyritic rock comprising plagioclase-quartz-carbonate($\pm$ chlorite $\pm$ rutile) aggregate. A) PPL, B) XPL, FOV $\approx$ 4.5 mm.



HC-20: C) Liberated fine carbonate aggregate (centre). XPL, FOV $\approx$ 2.6 mm. D) Detailed view of plagioclase (albite)-quartz-carbonate aggregate. XPL, FOV $\approx$ 1.3 mm

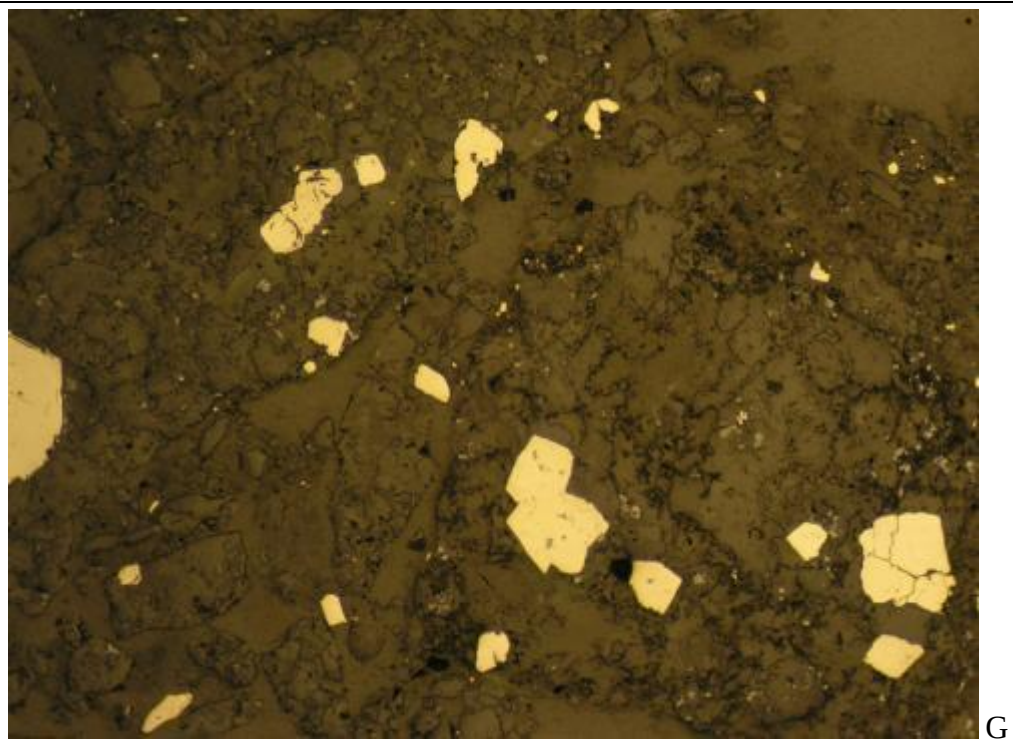


E

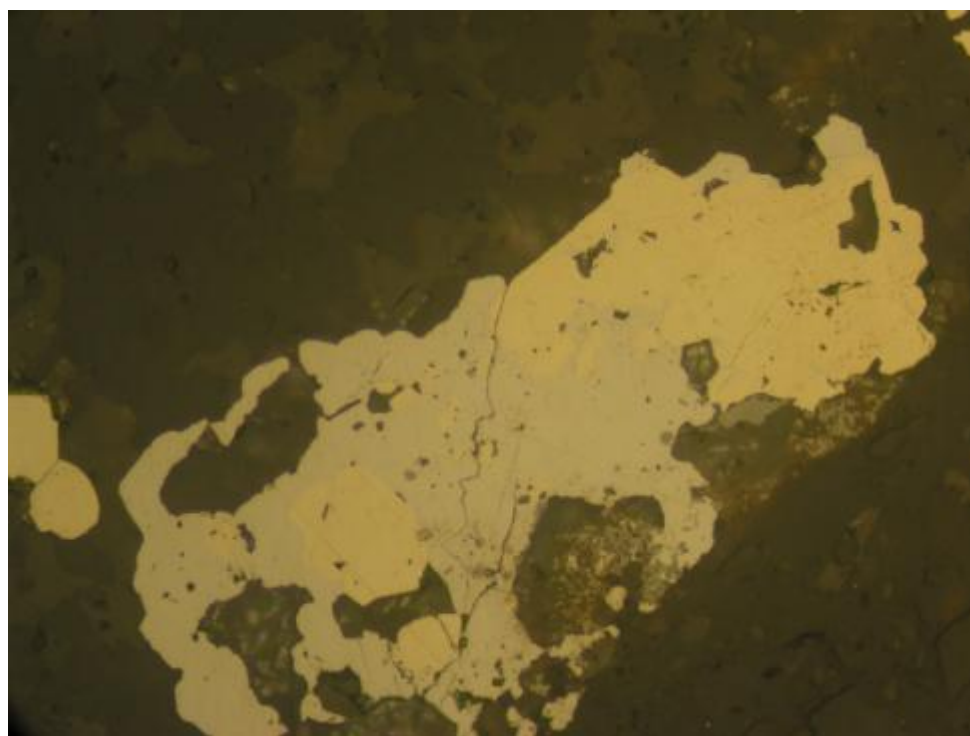


F

HC-20: E) Ribbons of sericite-chlorite within albite-quartz-carbonate aggregate. XPL, FOV $\approx$ 0.7 mm. F) Pyrite grain (opaque, centre) with quartz-sericite pressure fringe. XPL, FOV $\approx$ 1.3 mm.

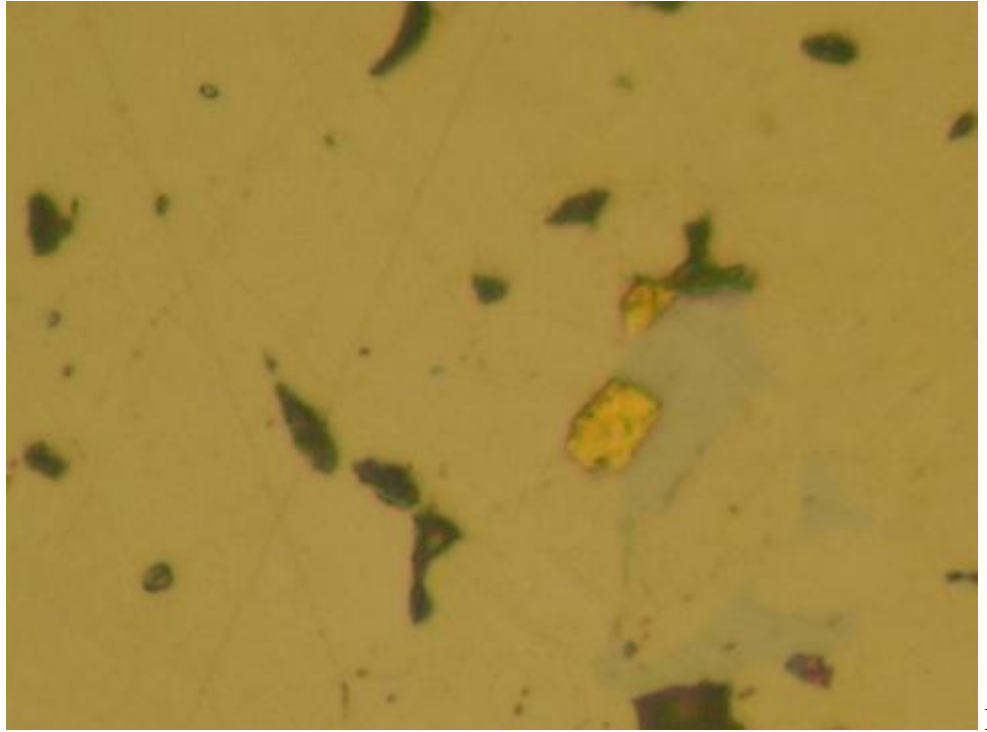


G



H

HC-20: G) Overview of disseminated pyrite within section. RL, FOV $\approx$ 2.6 mm. H) Pyrite and unknown aggregate (light grey). RL, FOV $\approx$ 1.3 mm.



HC-20: I) Inclusions of gold (bright yellow) associated with unknown phase (light grey) within pyrite (yellowish-white). RL, FOV $\approx$ 0.08 mm.

Project: Hope Bay**Deposit:** Madrid**Zone:** Naartok E**Rock Type:** Mafic volcanic: C-type**Sample ID:** HC-24**Offcut #:** AP-3**Crushed Rock and Offcut Mount Description:**

Fine to coarse angular chips (less than 8 mm size). Chips comprise dark grey, olive-brown and lesser brown very fine-grained rock and white granular carbonate aggregate. Minor fine-grained pyrite occurs locally disseminated. No reaction of chips to cold dilute HCl. No reaction of chips to magnet. Minor, ~1%, red-brown stain of some rock chips. Reaction of brown-stained rock chips to etching with HF and staining with sodium cobaltinitrite (minor yellow and strong orange stain).

Polished Thin Section Description:

Fine to coarse chips representing variably altered rock: 1) fine-grained plagioclase laths forming massive aggregate with patchy carbonate alteration, bands of and disseminated very fine-grained rutile and disseminated pyrite grains (note very fine-grained sericite can occur as ribbons in some chips and carbonate can occur in excess of plagioclase in some chips), 2) fine to very fine-grained albite-quartz-carbonate aggregate, 3) fine-grained massive quartz-carbonate aggregate, 4) fine-grained carbonate aggregate with very fine-grained sericite occurs as patchy aggregates in some chips, 5) very fine-grained carbonate with bands of graphite±rutile and chlorite, 6) fine to very fine-grained pyrite aggregate. Chlorite comprises ~ 10% of the section as very fine-grained aggregates. Rutile occurs in minor amounts, ~1%, disseminated as very fine-grained anhedral aggregates, in acicular form and replacing tabular forms. Quartz, ~ 7%, occurs as fine to very fine-grained (< 0.4 mm) patchy, anhedral aggregates commonly with undulose extinction. Sericite occurs in trace amounts as flaky aggregates forming patches and ribbons. Plagioclase, ~15%, occurs as fine-grained laths (< 0.3 mm) and as fine to very fine albite (< 0.3 mm) within altered rock aggregates.

Carbonate occurs in major amounts (~60%) as colourless carbonate in the following forms: 1) fine to very fine-grained (< 0.3 mm), anhedral aggregates as replacement of rock fragments, 2) fine to very fine-grained (< 0.6 mm) anhedral aggregates within quartz-carbonate and carbonate aggregate, and 3) as fine-grained liberated grains (< 0.6 mm). Note some of the carbonate within quartz-carbonate aggregate is strained with local development of undulatory extinction and subgrains. Note that Fe-ox, occurs as very fine-grained, red-brown unknown aggregates replacing carbonate in minor amounts, ~1%, resulting in a red-brown colouration of some chips.

Sulphide occurs in major amounts (~5%) as pyrite and in trace amounts as chalcopyrite. Pyrite grains are fine to very fine grained (< 0.25 mm) and occur disseminated, as clusters and in patchy sub-anhedral grains and aggregate in altered rock fragments and as liberated anhedral grains and aggregate. Some pyrite grains are strongly pitted. Pyrite grains have irregular to straight grain boundaries which are unaltered. Traces of fine to very fine-grained (< 0.2 mm) chalcopyrite occur disseminated in rock fragments, as anhedral grains associated with pyrite, as infill to pyrite and as inclusions in pyrite.

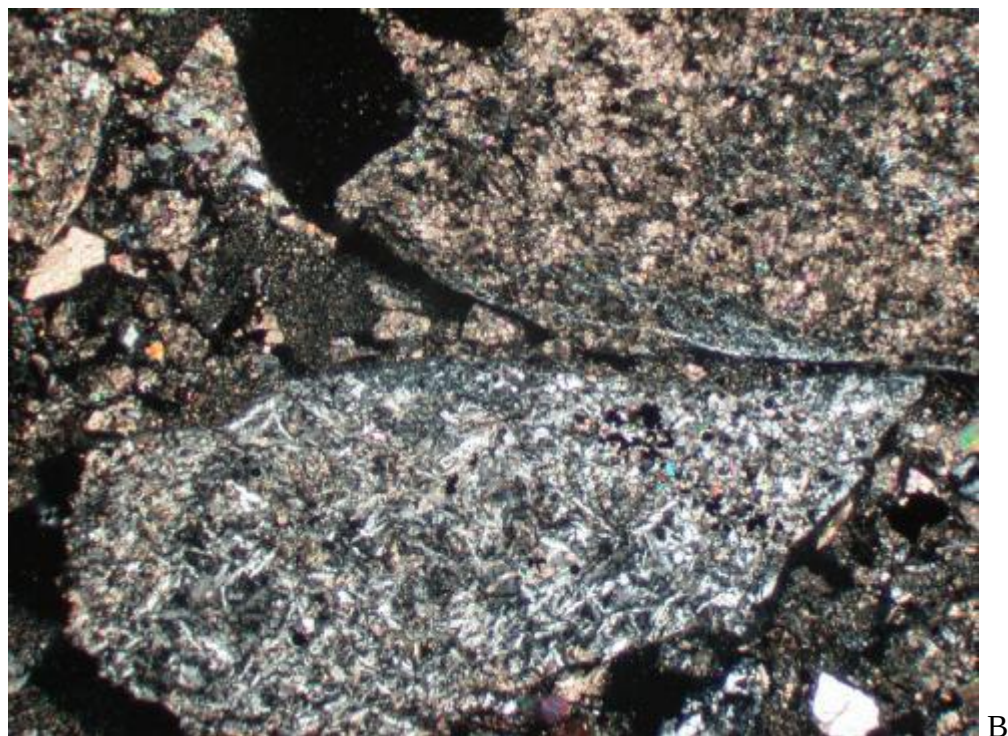
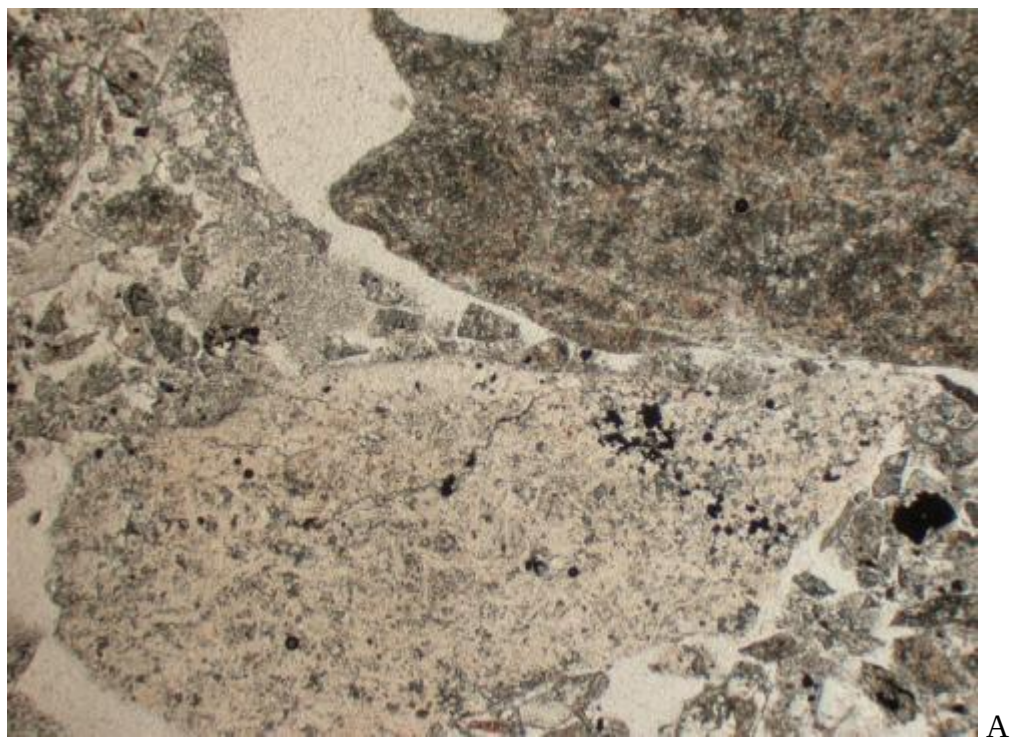
Tabular summary (visual estimate):

Sample # -	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-24	pyrite	5	colourless, fine to very fine-grained	60	very fine-grained, red-brown	1	plagioclase	15
	chalcopyrite	tr					chlorite	10
							quartz	7
							rutile	1
							sericite	tr

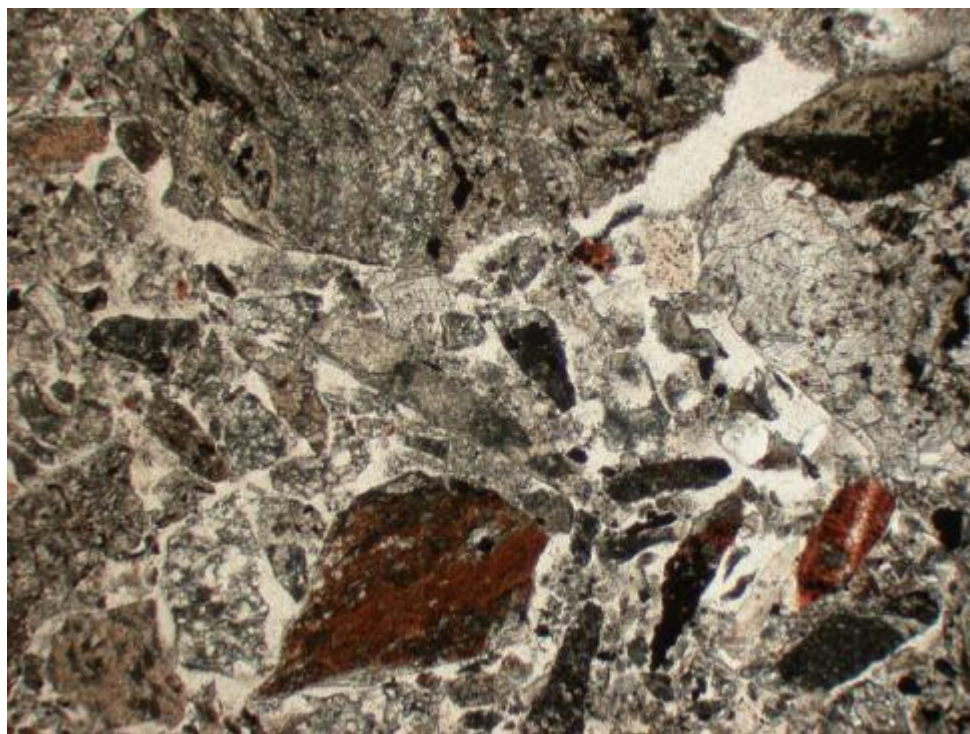
Abbreviations: tr = trace (< 1%); r. = rare; x = none observed

-fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm; medium-grained = 1-5 mm

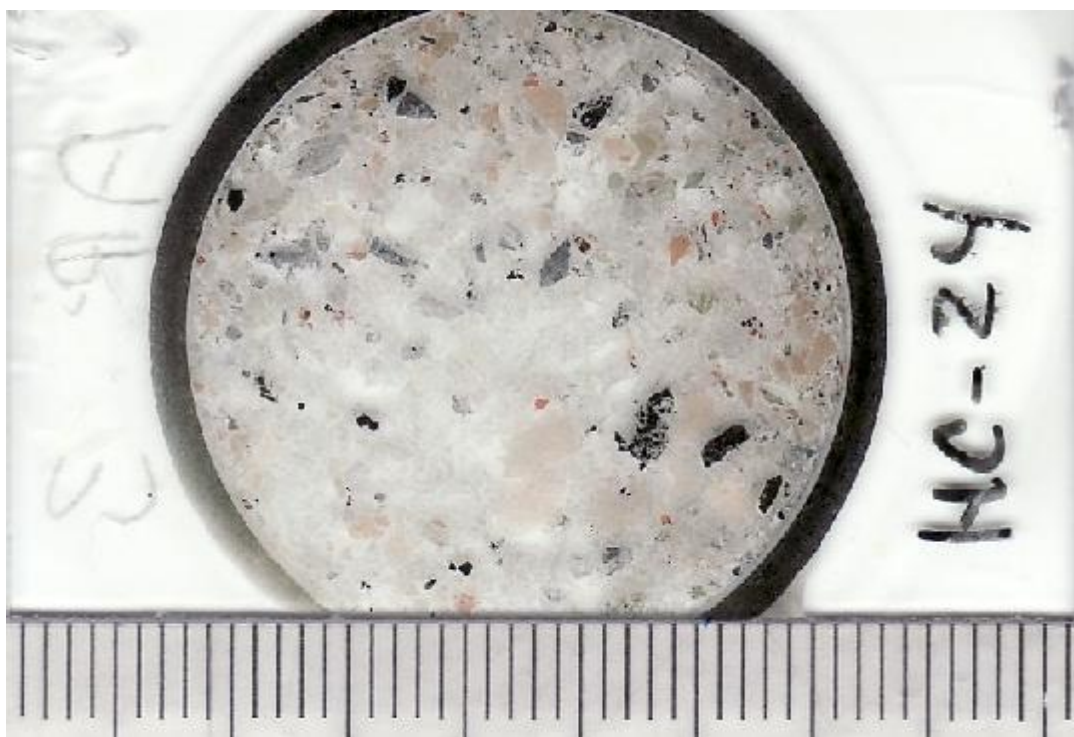
-Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals



HC-24: A&B) View of altered rock rock chips represented by fine-grained plagioclase laths forming aggregate partly replaced by carbonate (bottom of photo) and chlorite-carbonate aggregate with sericite ribbons (top). A) PPL, B) XPL, FOV $\approx$ 4.5 mm.

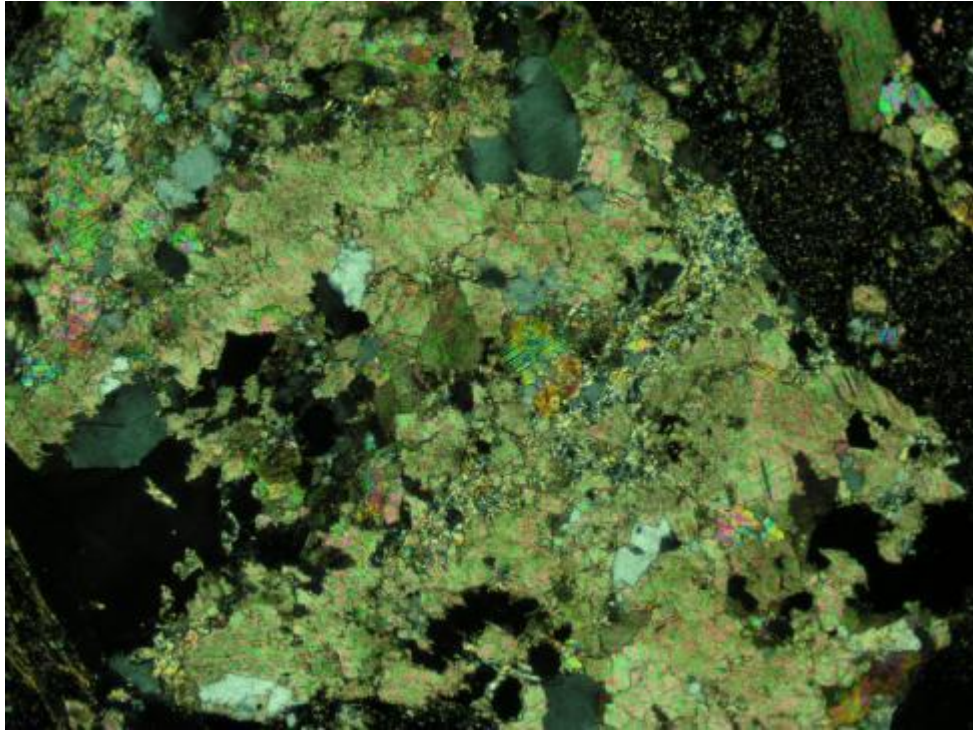


C

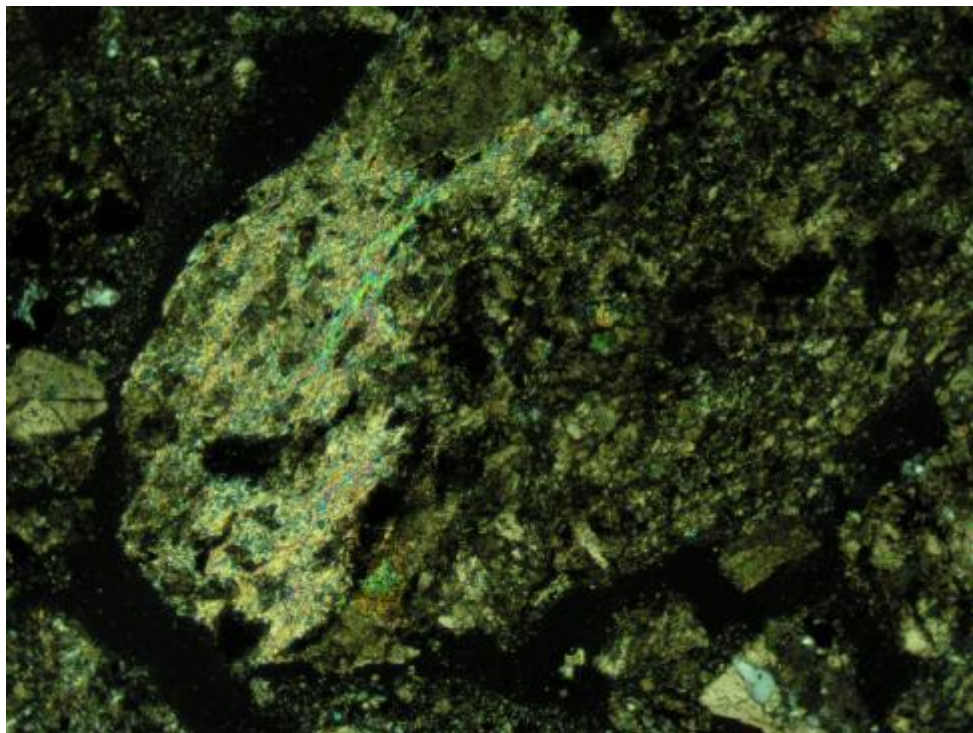


D

HC-24: C&D) Fe-ox as very fine-grained red-brown aggregates replacing carbonate in minor amounts, ~1%, resulting in a red-brown colouration of some chips. C) PPL, FOV = ~ 4.5 mm, D) scan of section, FOV = 4.7 cm.

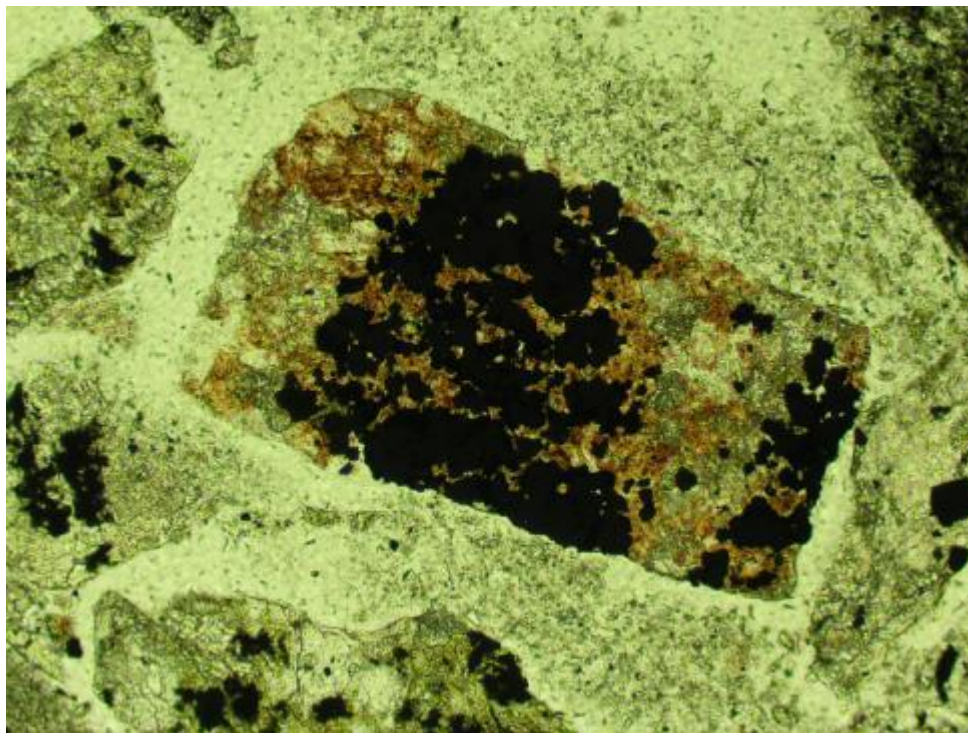


E

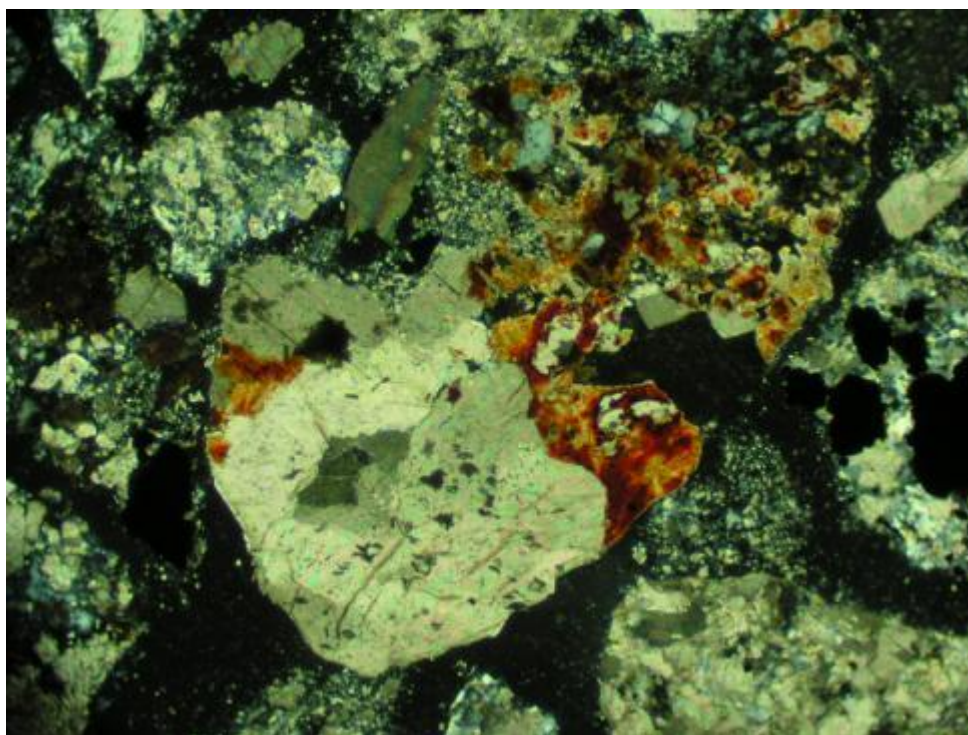


F

HC-24: E) Quartz-carbonate aggregate with patchy sericite. XPL, FOV $\approx$ 2.6 mm. F) Fine-grained carbonate with patchy sericite aggregate. XPL, FOV $\approx$ 2.6 mm.

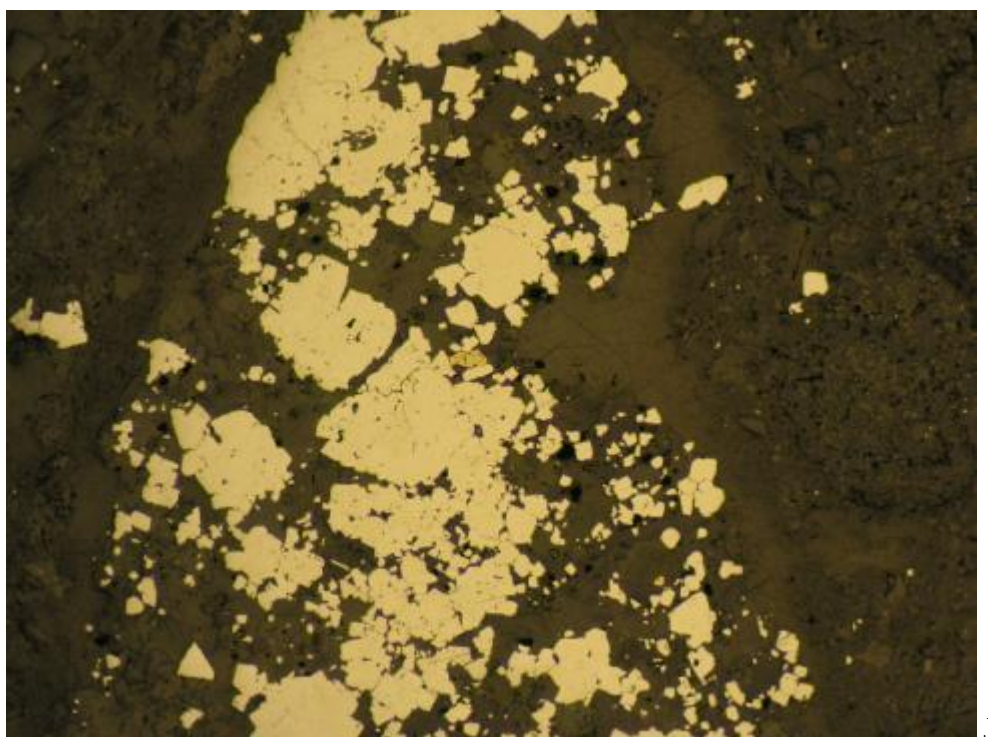
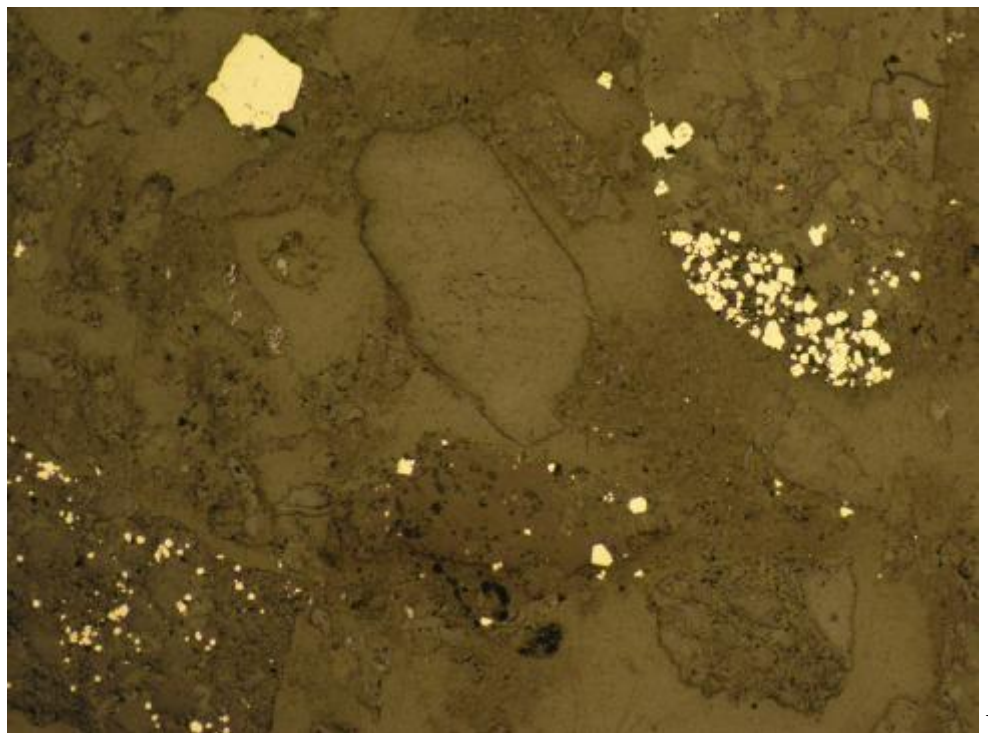


G



H

HC-24: G) Fragment of chlorite-opaques (pyrite)-carbonate with carbonate partly replaced by red-brown Fe-ox aggregate. PPL, FOV ≈ 1.3 mm. H) Patchy carbonate aggregate partly replaced by red-brown Fe-ox. XPL, FOV ≈ 1.3 mm.



HC-24: I) Representative view of pyrite distribution disseminated, in clusters and as liberated grains. RL, FOV $\approx$ 2.6 mm. J) Cluster of pyrite aggregate with trace chalcopyrite (yellow, centre). RL, FOV $\approx$ 1.6 mm.

Project: Hope Bay**Deposit:** Boston**Zone:** Boston**Rock Type:** Mafic volcanic with sediments: Heterolithic fragmental basalt with interflow chert/argillite/sandstone**Sample ID:** HC-32**Offcut #:** AP-4**Crushed Rock and Offcut Mount Description:**

Fine to coarse angular chips (less than 8 mm size). Chips comprise fine-grained greenish-grey banded rock, translucent material and white quartz vein fragments. Traces of fine-grained pyrite occurs locally disseminated. No reaction of chips to cold dilute HCl. No reaction of chips to magnet. No reaction of chips to etching with HF and staining with sodium cobaltinitrite (no yellow stain).

Polished Thin Section Description:

Fine to coarse chips representing variably altered and variably deformed rock: 1) strongly foliated, very fine-grained sericite aggregate with radiating fine tourmaline, very fine bands of rutile and disseminated pyrite, 2) fine to very fine-grained, strongly foliated and banded quartz-chlorite-rutile-sericite±carbonate and quartz-chlorite-rutile-carbonate aggregate, 3) fine to very fine-grained massive quartz-carbonate aggregate, 4) fine-grained quartz±carbonate±rarely tourmaline aggregate as vein fragments and 5) fine to medium-grained carbonate aggregate. Quartz, carbonate, tourmaline and pyrite occur as liberated grains. Chlorite comprises ~ 15% of the section as very fine-grained aggregates. Tourmaline, ~3%, occurs as fine to very fine-grained (< 0.35 mm), colourless to pale green, acicular and radiating aggregates. Rutile occurs in minor amounts, ~1%, as very fine-grained aggregates in bands, as fine disseminated grains and as patchy aggregates. Quartz, ~ 20%, occurs as very fine-grained patchy, anhedral aggregates in rock fragments and as fine to very fine anhedral aggregates (< 1 mm), commonly with undulose extinction and development of subgrains, in vein fragments. Sericite, ~7%, occurs as very fine-grained anhedral aggregates developed along foliation planes forming a banded texture.

Carbonate occurs in major amounts (~50%) as colourless to cloudy brownish carbonate in the following forms: 1) fine to very fine-grained (< 0.6 mm), anhedral aggregates as replacement of rock fragments, 2) fine to very fine-grained (< 1 mm) anhedral aggregates within quartz±carbonate vein fragments, and 3) as fine-grained liberated grains (< 0.7 mm). Note some of the carbonate is strained with local development of undulatory extinction and subgrains.

Sulphide occurs in minor amounts (~3%) as pyrite and rarely as chalcopyrite. Pyrite grains are fine to medium-grained (< 0.4 mm), subhedral and occur disseminated and as clusters and in altered rock fragments and as fine to medium-grained (< 3 mm) liberated anhedral grains and aggregate. Pyrite grains have irregular to straight grain boundaries which are unaltered. Rare fine to very fine-grained (< 0.1 mm) chalcopyrite occur disseminated in rock fragments and as inclusions in pyrite.

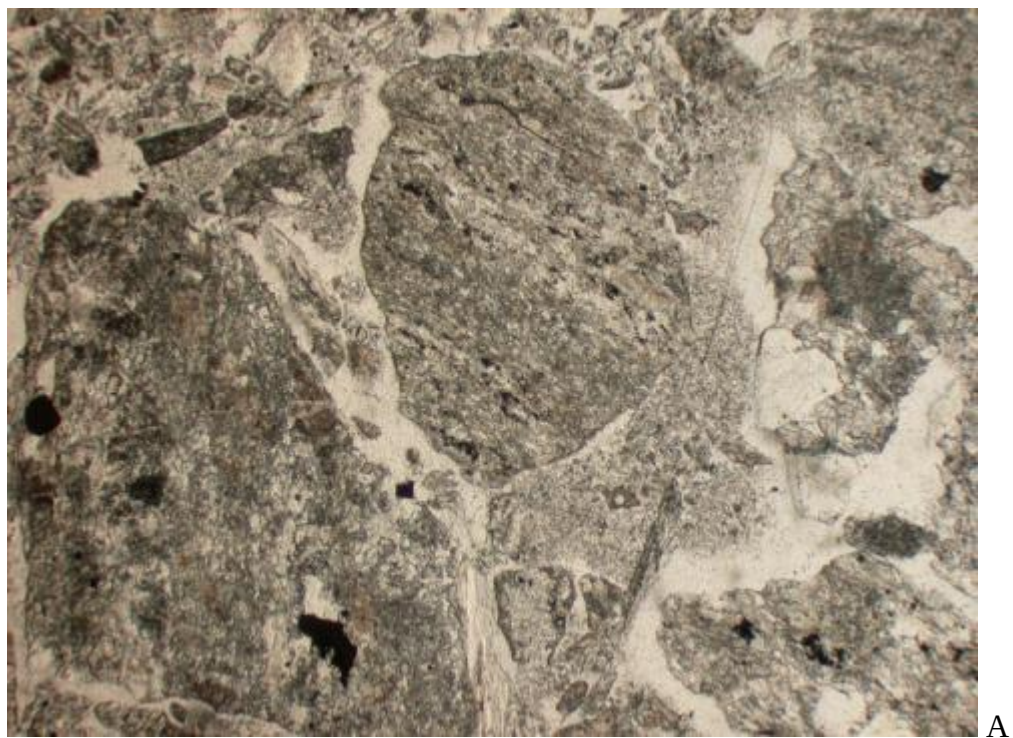
Tabular summary (visual estimate):

Sample # -	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-32	pyrite	3	colourless and cloudy brownish, fine to very fine-grained	50		x	quartz	20
	chalcopyrite	tr					chlorite	15
							sericite	7
							tourmaline	3
							rutile	1

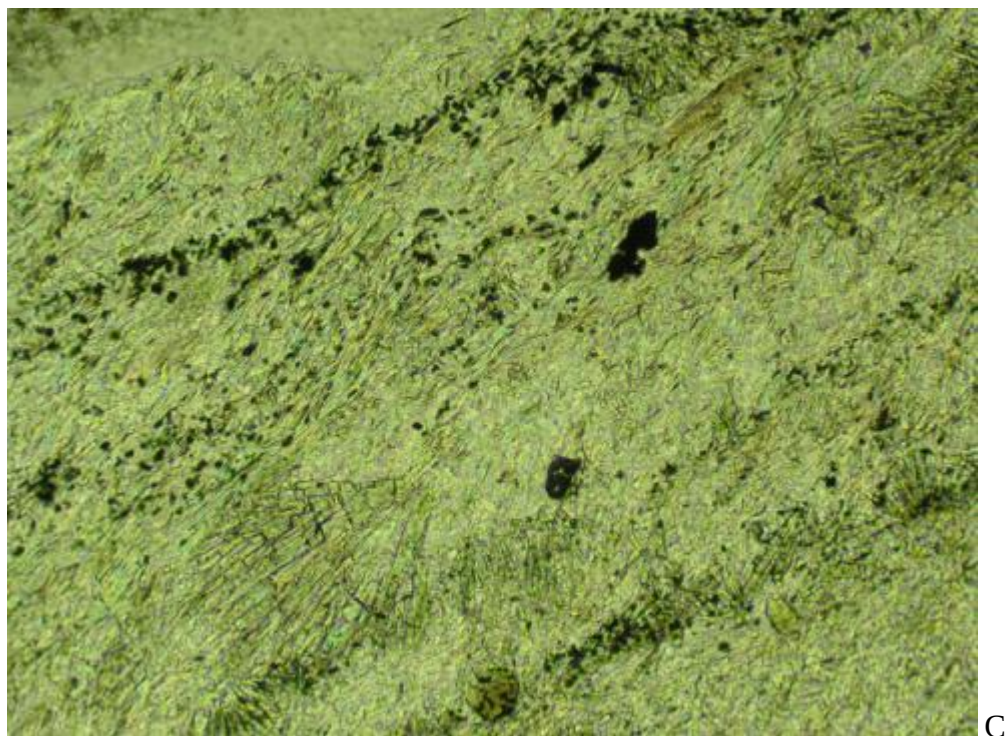
Abbreviations: tr = trace (< 1%); r. = rare; x = none observed

-fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm; medium-grained = 1-5 mm

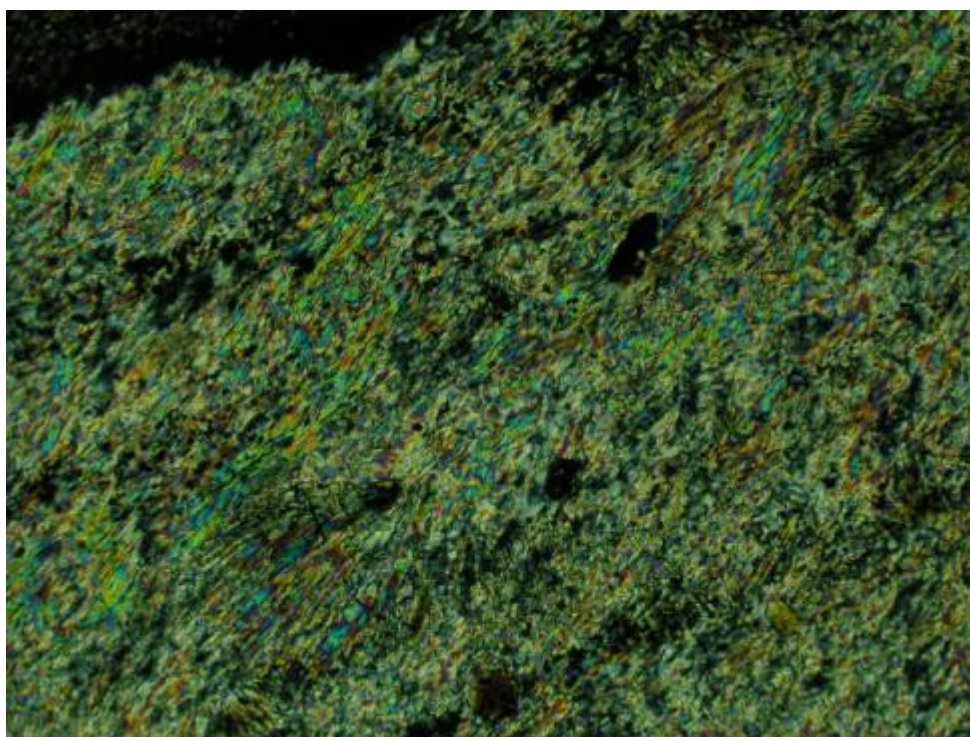
-Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals



HC-32: A&B) View of banded quartz-chlorite-rutile-sericite-carbonate aggregate with disseminated opaques (pyrite) and quartz-carbonate vein fragment (right). A) PPL, B) XPL, FOV $\approx$ 4.5 mm.

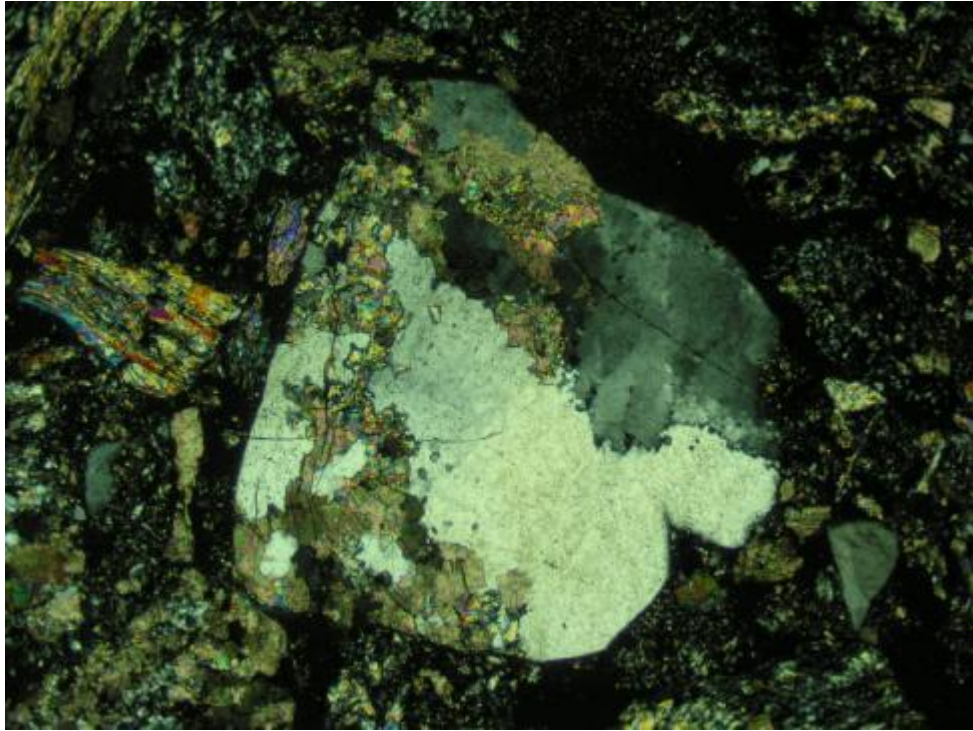


C

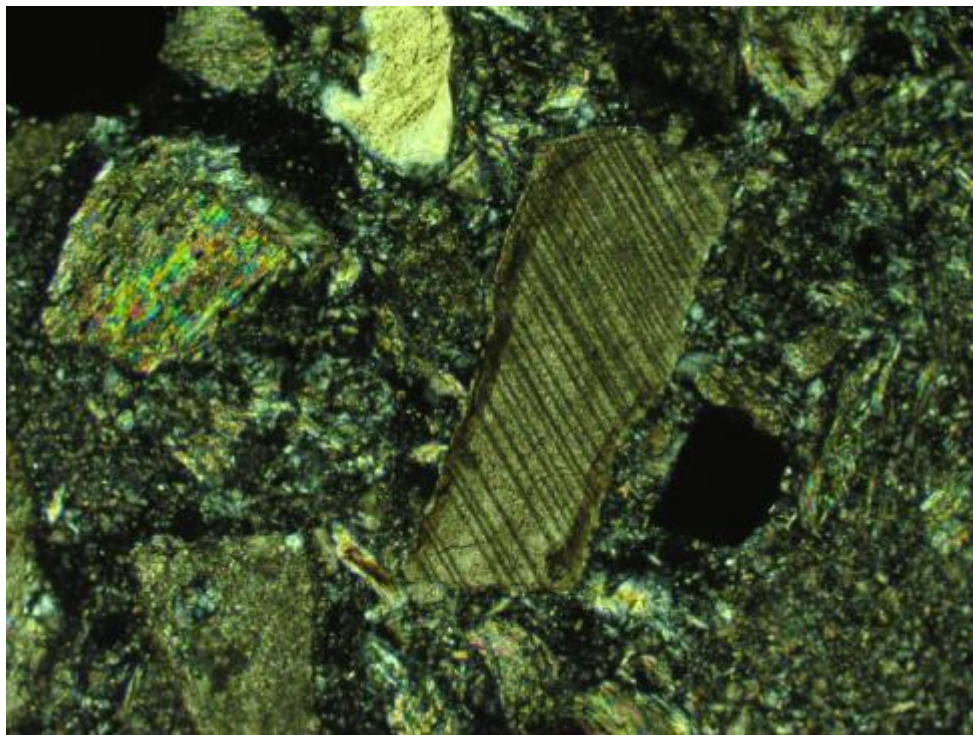


D

HC-32: C&D) Detailed view of sericite aggregate with radiating fine tourmaline, very fine bands of rutile and disseminated pyrite. FOV $\approx$ 4.5 mm, C) PPL, D) XPL.

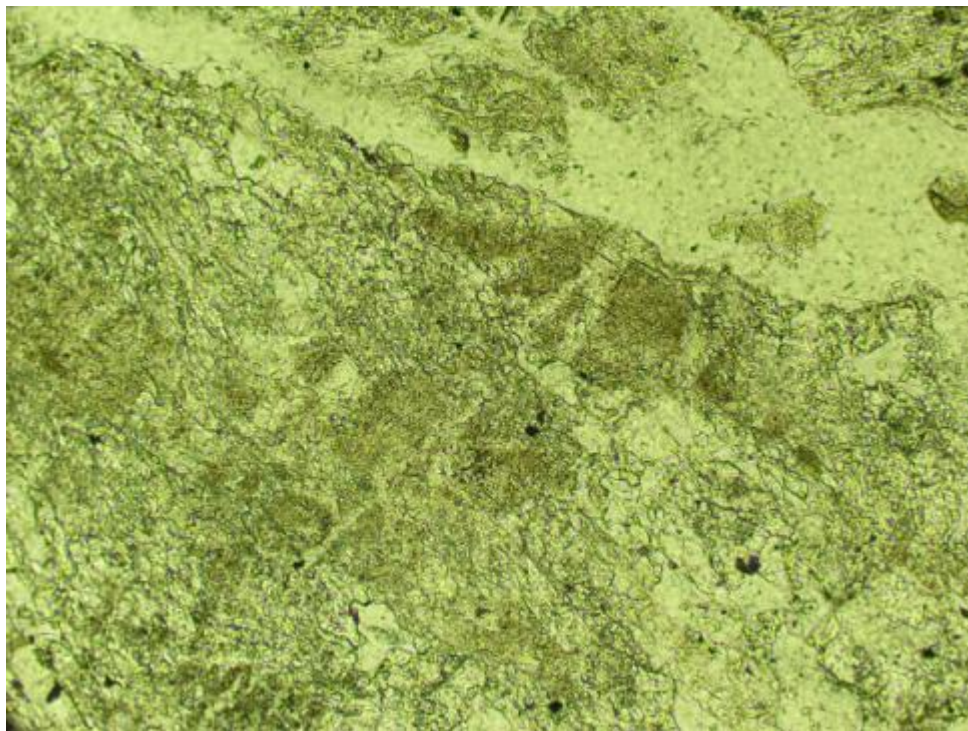


E

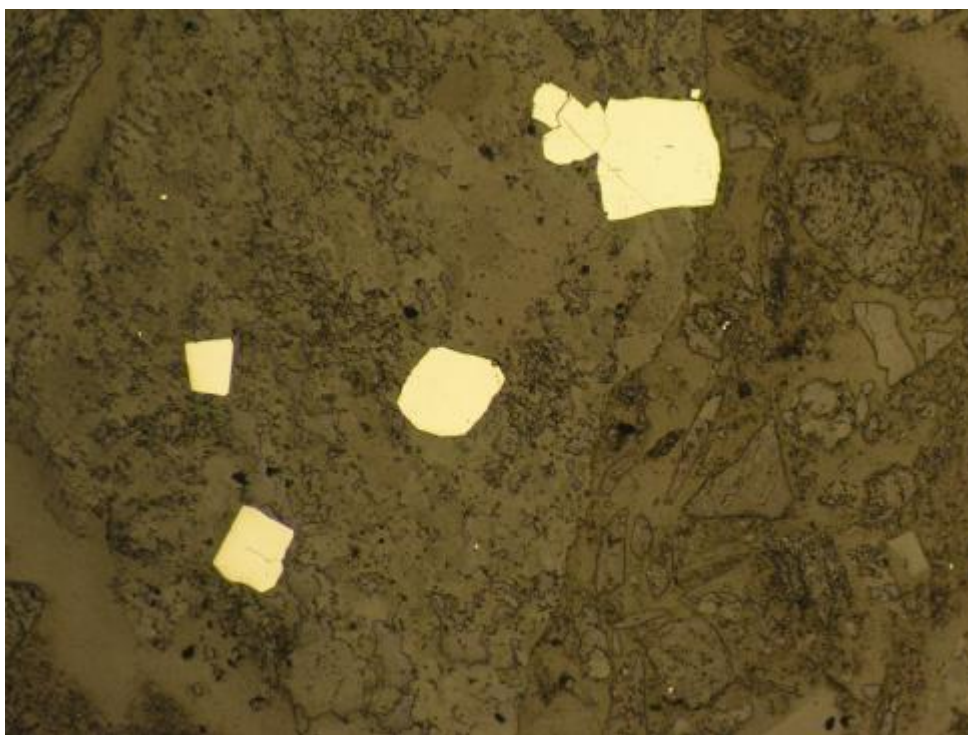


F

HC-32: E) Quartz-carbonate vein fragment (centre) and liberated tourmaline aggregate (left). XPL, FOV $\approx$ 2.6 mm.
F) Liberated cloudy carbonate grain (centre). XPL, FOV $\approx$ 1.3 mm.

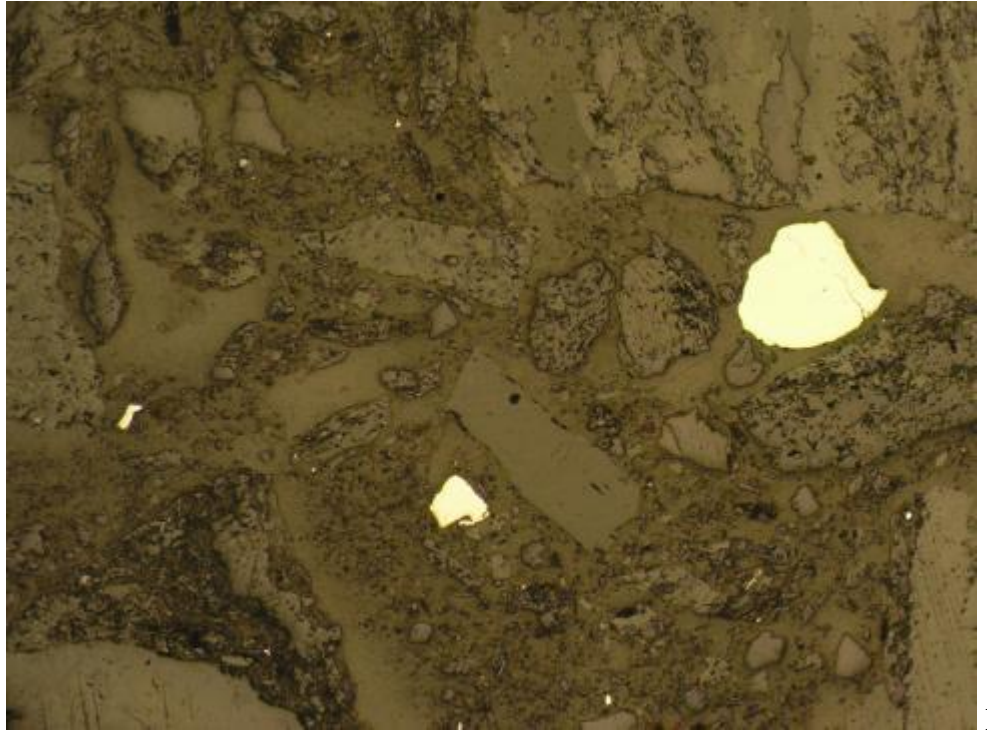


G



H

HC-32: G) Very fine-grained colourless to cloudy brownish carbonate aggregate. PPL, FOV $\approx$ 1.3 mm. H) Disseminated pyrite in quartz-carbonate aggregate. RL, FOV $\approx$ 2.6 mm.



HC-32: I) Liberated pyrite grains. RL, FOV $\approx$ 2.6 mm.

Project: Hope Bay**Deposit:** Boston**Zone:** Boston**Rock Type:** Sedimentary units: Wacke**Sample ID:** HC-35**Offcut #:** AP-5**Crushed Rock and Offcut Mount Description:**

Fine to coarse angular chips (less than 8 mm size). Chips comprise fine-grained greenish-grey and medium to dark grey foliated rock and white vein fragments. No reaction of chips to cold dilute HCl. No reaction of chips to magnet. No reaction of chips to etching with HF and staining with sodium cobaltinitrite (no yellow stain).

Polished Thin Section Description:

Fine to coarse chips representing variably altered and variably deformed rock: 1) foliated rock comprising very fine-grained plagioclase-quartz-chlorite-rutile±sericite aggregate with patchy fine to very fine carbonate aggregate and scattered porphyroclasts of fine-grained anhedral quartz and less commonly plagioclase, 2) fine to very fine-grained quartz aggregate as vein fragments, 3) fine to medium-grained carbonate±quartz aggregate as vein fragments and 4) fine-grained carbonate aggregate as vein fragments. Quartz, carbonate, plagioclase and trace pyrite occur as liberated grains. Chlorite comprises ~ 7% of the section as very fine-grained patchy aggregates within foliated rock fragments. Rutile occurs in minor amounts, ~2%, as very fine-grained aggregates in bands, as fine disseminated grains and as patchy aggregates. Quartz, ~ 20%, occurs as very fine-grained anhedral aggregates with plagioclase in foliated rock fragments, as fine-grained porphyroclasts and as fine to very fine anhedral aggregates (< 0.5 mm), commonly with undulose extinction and development of subgrains, in vein fragments. Plagioclase, ~ 20%, occurs as very fine-grained anhedral aggregates with quartz in foliated rock fragments and as fine-grained porphyroclasts. Sericite, ~25%, occurs as very fine-grained anhedral aggregates developed along foliation planes forming a banded texture. Traces of very fine-grained zircon occur rarely disseminated in the foliated rock fragments.

Carbonate occurs in major amounts (~25%) as colourless to cloudy brownish carbonate in the following forms: 1) fine to very fine-grained (< 0.15 mm), anhedral patchy aggregates as replacement of foliated rock fragments, 2) fine to medium-grained (< 1.5 mm) anhedral aggregates within carbonate±quartz vein fragments, and 3) as fine to medium-grained liberated grains (< 2 mm).

Sulphide occurs in minor amounts (~1%) as pyrite and rarely as chalcopyrite. Pyrite grains are fine to very fine-grained (< 0.1 mm), sub-anhedral and occur disseminated and as clusters and in altered rock fragments and as fine-grained (< 0.6 mm) liberated anhedral grains. Pyrite grains have irregular to straight grain boundaries which are unaltered. Rare fine to very fine-grained (< 0.1 mm) chalcopyrite occur disseminated and clusters in rock fragments.

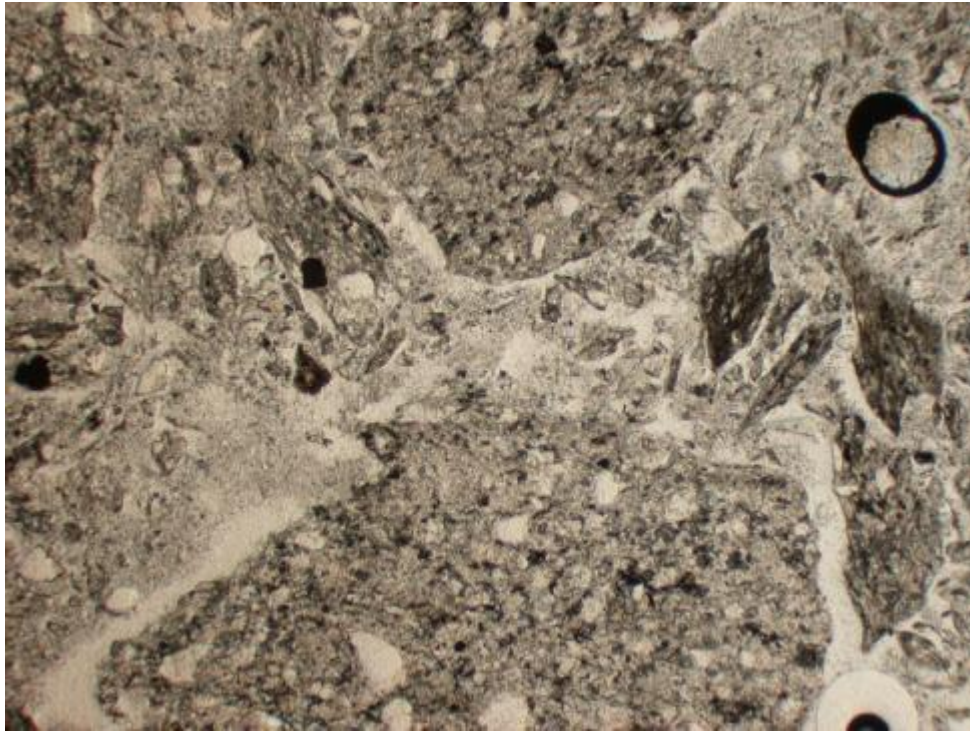
Tabular summary (visual estimate):

Sample # -	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-35	pyrite	1	cloudy and colourless brownish, very fine to medium-grained	25		x	sericite	25
	chalcopyrite	r.					quartz	20
							plagioclase	20
							chlorite	7
							rutile	2
							zircon	r.

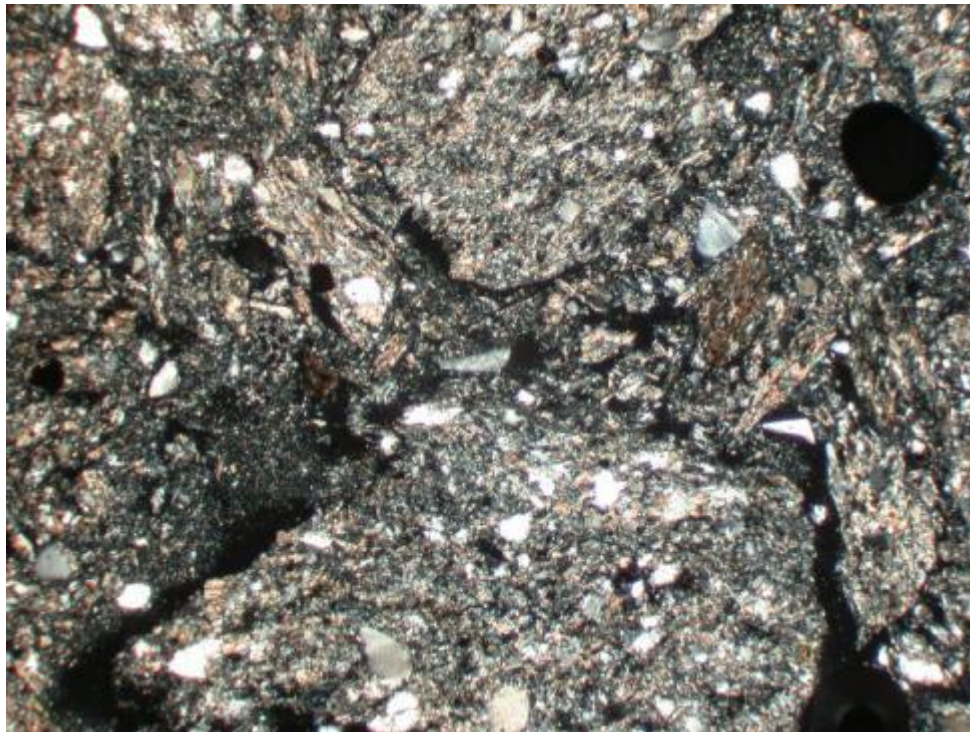
Abbreviations: tr = trace (< 1%); r. = rare; x = none observed

-fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm; medium-grained = 1-5 mm

-Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals

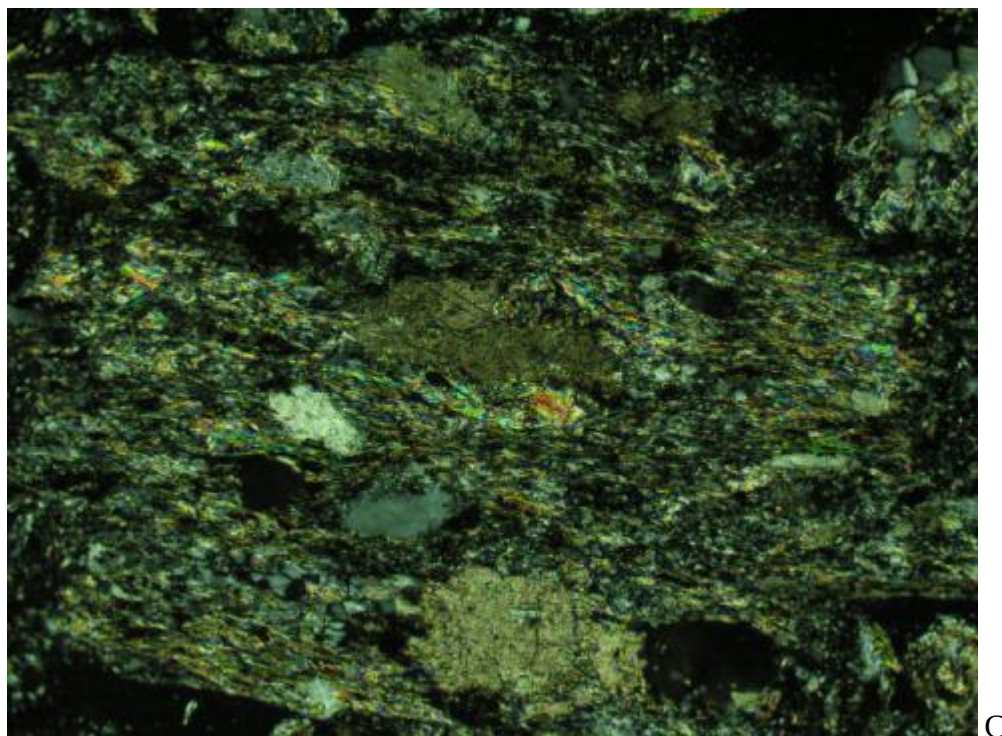


A

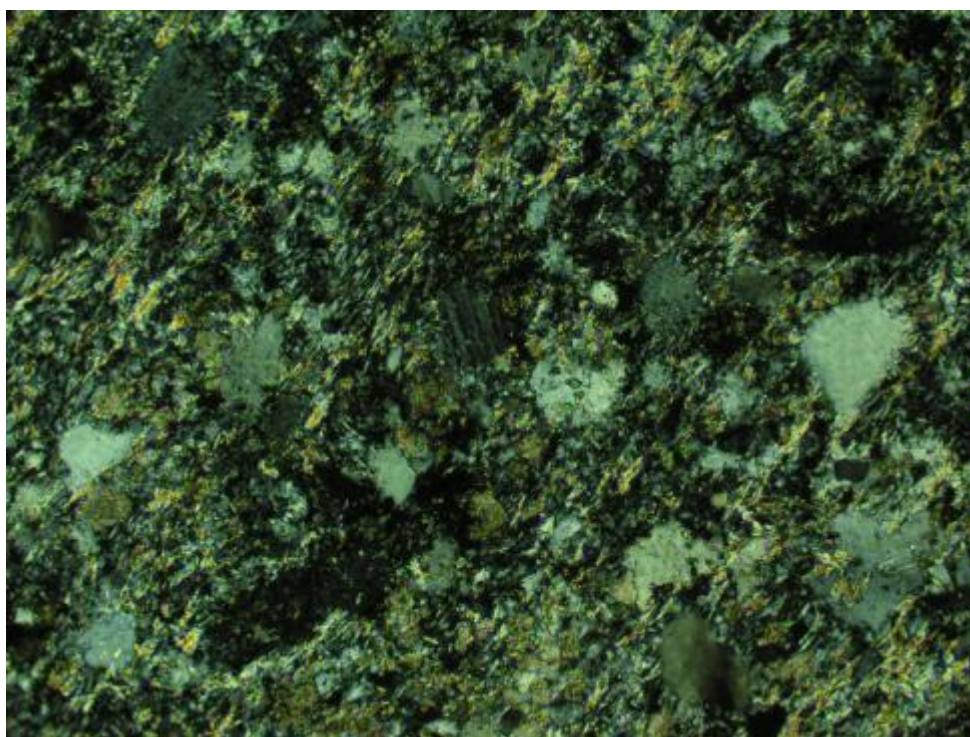


B

HC-35: A&B) View of foliated rock with scattered porphyroclasts of fine-grained anhedral quartz and plagioclase. A) PPL, B) XPL, FOV $\approx$ 4.5 mm.

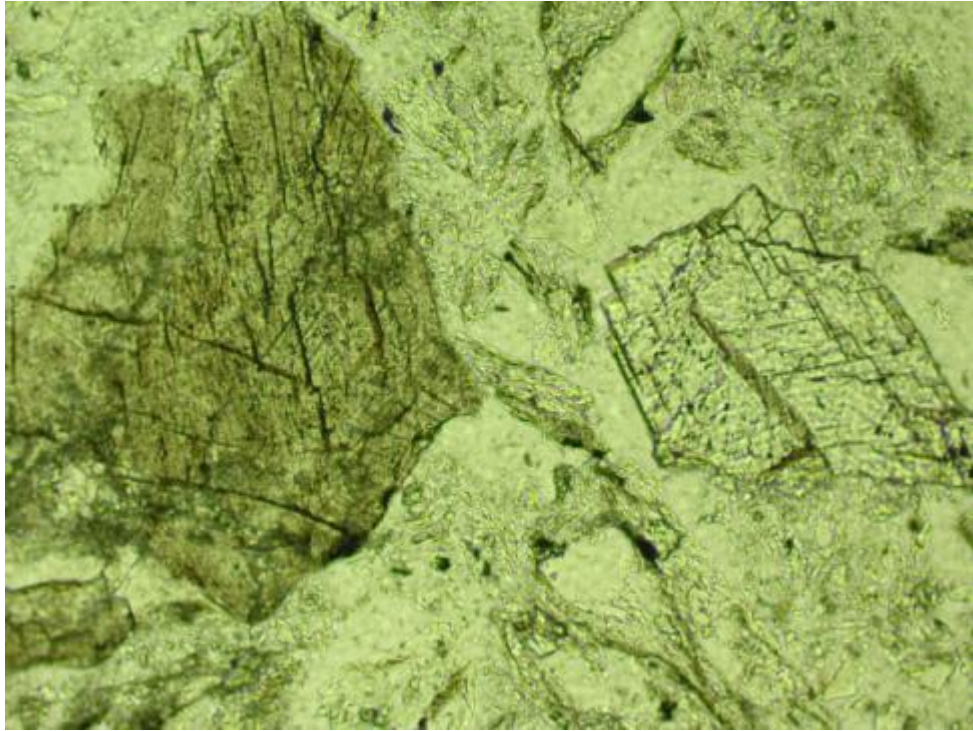


C

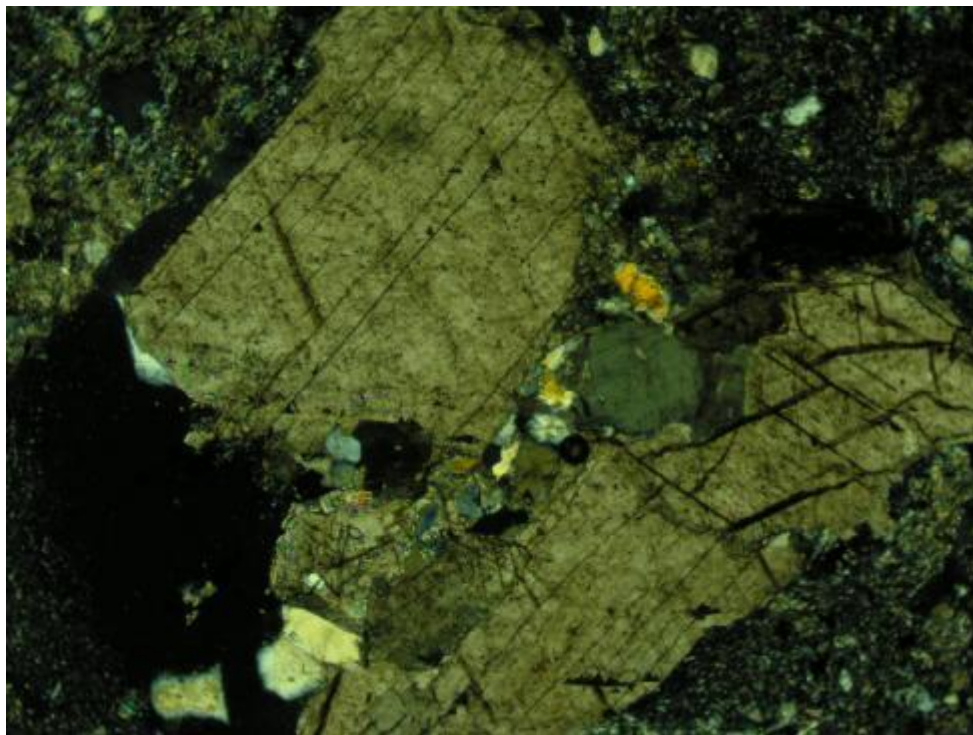


D

HC-35: C&D) Detailed separate views of foliated rock comprising very fine-grained plagioclase-quartz-chlorite-rutile±sericite aggregate with patchy fine to very fine carbonate aggregate and scattered porphyroclasts of fine-grained anhedral quartz and less commonly plagioclase. FOV ≈ 1.3 mm, XPL.

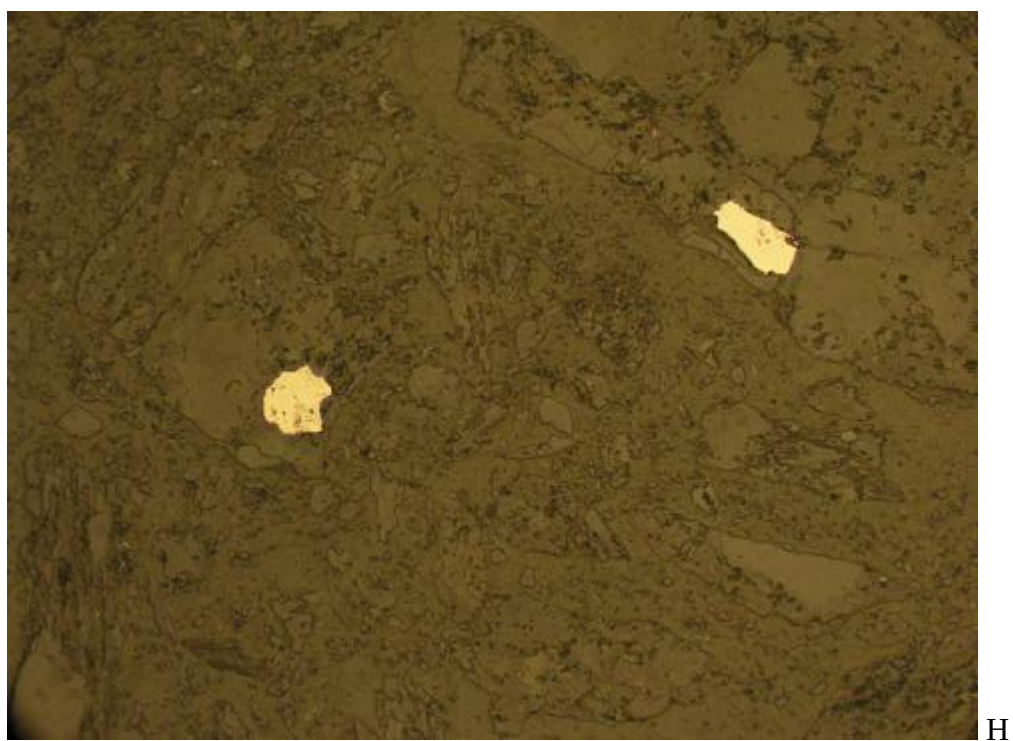
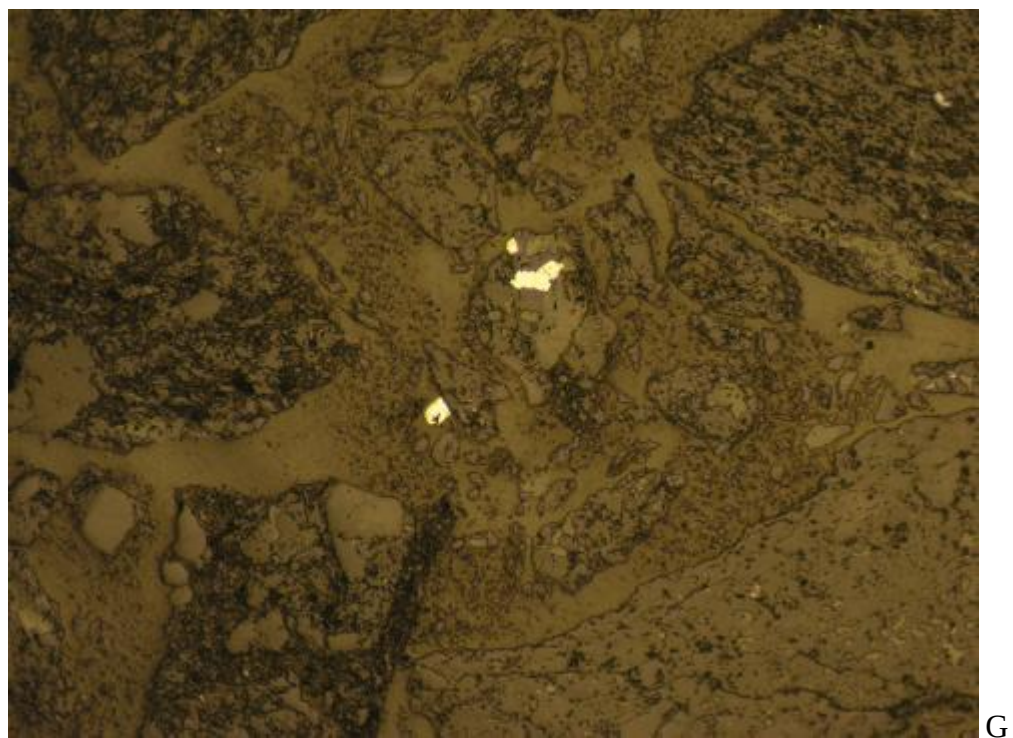


E



F

HC-35: E) Cloudy brownish carbonate aggregate (left) and colourless liberated carbonate grain (right). PPL, FOV ≈ 1.3 mm. F) Carbonate-quartz vein fragment. XPL, FOV ≈ 2.6 mm.



HC-35: G) Distribution of pyrite in section. RL, FOV ≈ 2.6 mm. H) Detailed view of anhedral disseminated pyrite. RL, FOV ≈ 1.3 mm.

Project: Hope Bay**Deposit:** Doris**Zone:****Rock Type:** Mafic volcanic: Flow basalt**Sample ID:** HC-50**Offcut #:** AP-6**Crushed Rock and Offcut Mount Description:**

Fine to coarse angular chips (less than 20 mm size). Chips comprise mostly light olive-grey strongly foliated rock and white quartz vein fragments. Trace to major amounts of fine-grained pyrite occur disseminated, in bands or in fractures. No reaction of chips to cold dilute HCl. No reaction of chips to magnet. No reaction of rock chips to etching with HF and staining with sodium cobaltinitrite (no yellow stain).

Polished Thin Section Description:

Fine to coarse chips representing altered and variably deformed rock: 1) fine to very fine-grained, strongly foliated quartz-sericite-carbonate-rutile aggregate with sericite and rutile defining the orientation of the foliation, 2) fine to very fine-grained massive quartz-carbonate aggregate locally with minor sericite and 3) very fine to medium-grained quartz, carbonate and carbonate-quartz vein fragments (approx. 25% of section). Carbonate, quartz and pyrite occur commonly as liberated grains. Sericite, ~ 20%, occurs as fine to very fine-grained (< 0.35 mm) flaky aggregates. Quartz, approximately 40%, occurs as fine to very fine-grained (< 0.1 mm) anhedral aggregates within massive quartz-carbonate aggregate and as fine to medium-grained aggregates (< 2 mm) in vein fragments. Vein quartz commonly has undulose extinction and development of subgrains. Traces of quartz and sericite occur as fine to very fine-grained pressure fringes to pyrite porphyroblasts. Minor rutile, ~ 4%, occurs as very fine-grained aggregates within the foliation of rock fragments, as clusters and disseminated. Rarely, chlorite occurs with quartz and carbonate as very fine aggregates in veinlets cutting foliated rock fragments.

Carbonate occurs in major amounts (~30%) as colourless to cloudy brownish carbonate in the following forms: 1) fine to very fine-grained (< 0.2 mm), anhedral to rhombic colourless to cloudy aggregates within foliated quartz-sericite-carbonate-rutile fragments, 2) fine to very fine-grained (< 0.2 mm), anhedral aggregates within massive quartz-carbonate±sericite fragments, 3) fine to medium-grained cloudy brownish aggregate (< 2 mm) in vein fragments and 4) as fine to medium-grained cloudy brownish liberated grains (< 2 mm). Approximately half the carbonate, particularly the vein carbonate is cloudy and brownish. Note some of the vein carbonate is strained with local development of undulatory extinction and subgrains. Rarely, very fine-grained red-brown Fe-ox occur partly replacing cloudy carbonate.

Sulphide occurs in major amounts (overall ~5%) as pyrite with rare chalcopyrite. Pyrite grains are fine to very fine grained (< 1 mm) and occur as disseminated to patchy sub-anhedral grains and aggregate in altered rock fragments and as liberated anhedral grains. The amount of pyrite in rock chips varies from absent to abundant. Pyrite grains have irregular to straight grain boundaries which are unaltered. Chalcopyrite occurs rarely as very fine inclusions in pyrite.

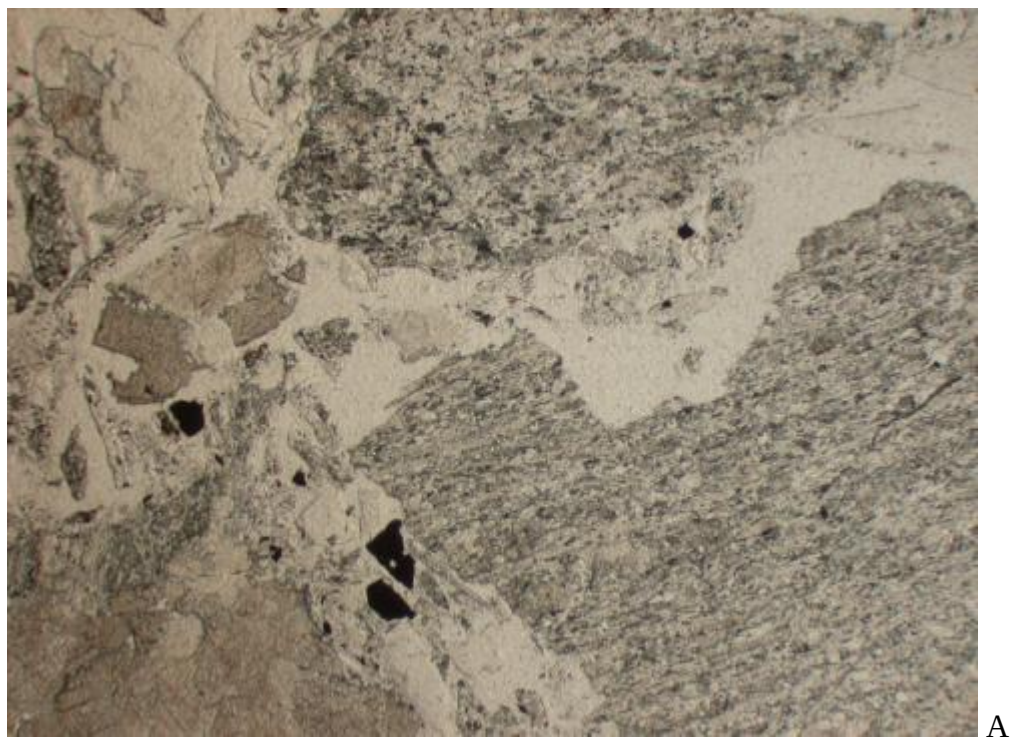
Tabular summary (visual estimate):

Sample # -	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-50	pyrite	5	colourless to cloudy	30	red-brown	r.	quartz	40
	chalcopyrite	r.	brownish, very fine to medium-grained		unknown		sericite	20
							rutile	4
							chlorite	r.

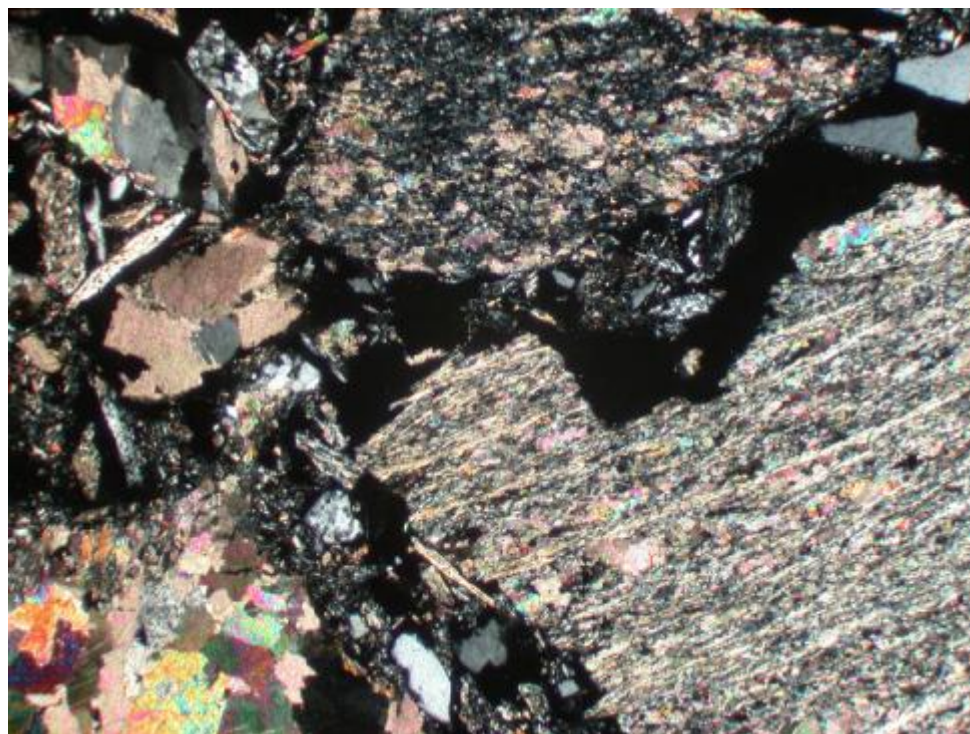
Abbreviations: tr = trace (< 1%); r. = rare; x = none observed

-fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm; medium-grained = 1-5 mm

-Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals

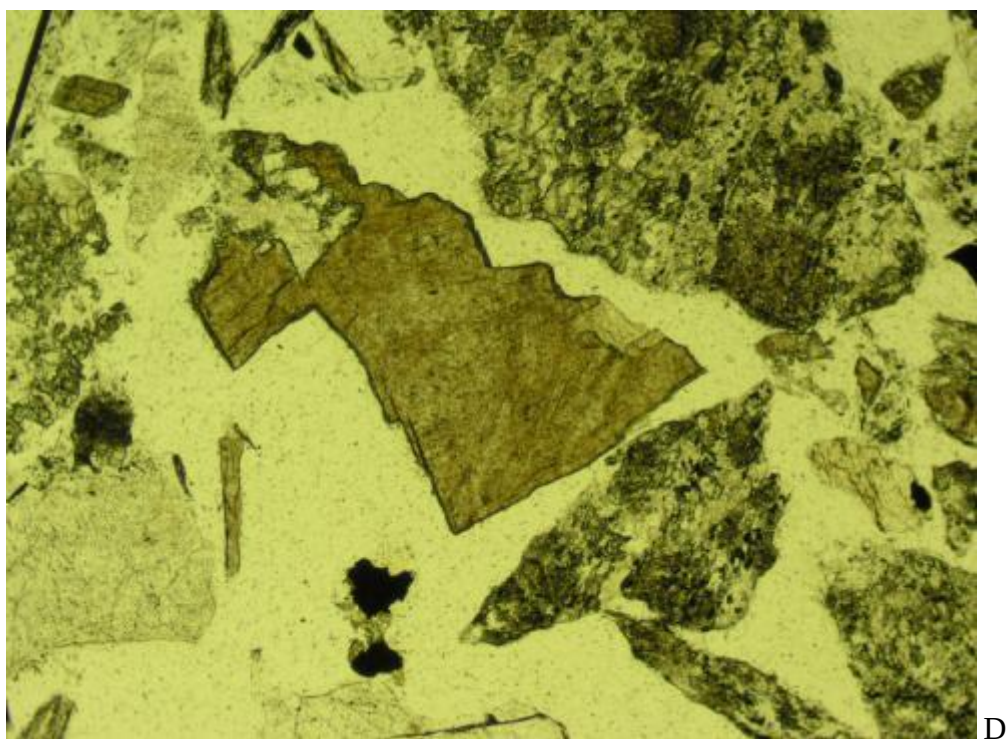


A

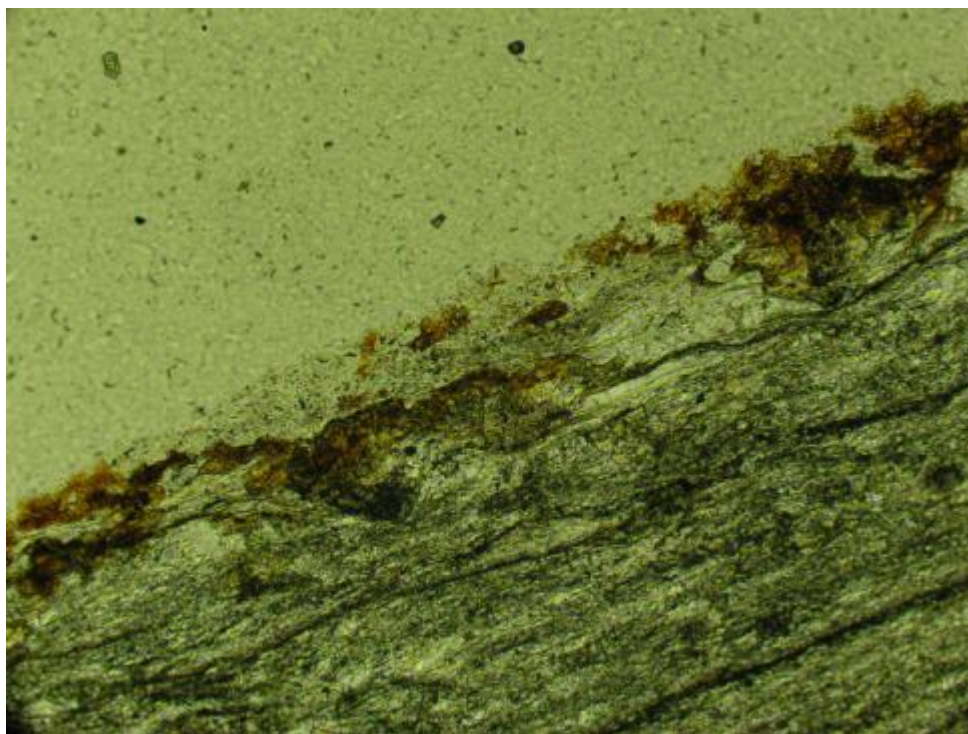


B

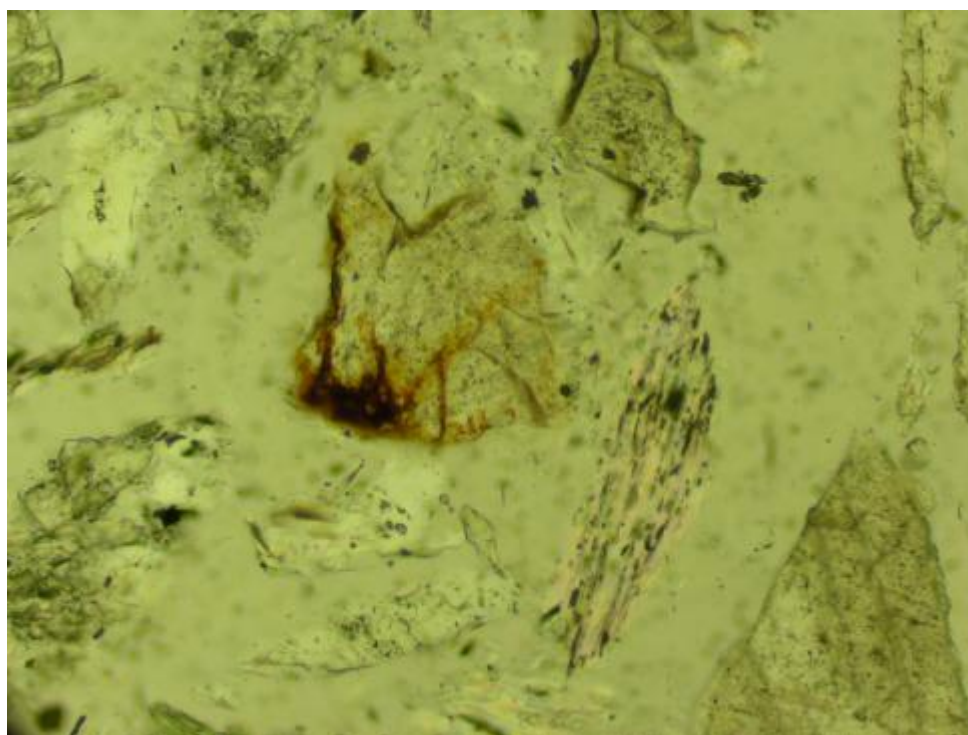
HC-50: A&B) View of altered and deformed rock rock chips including strongly foliated quartz-sericite-carbonate-rutile aggregate (right), massive quartz-carbonate±sericite aggregate (top) and carbonate and quartz-carbonate vein fragments (left). A) PPL, B) XPL, FOV ≈ 4.5 mm.



HC-50: C) Detailed view strongly foliated quartz-sericite-carbonate-rutile aggregate. Note patchy colourless to cloudy carbonate. FOV $\approx$ 1.3 mm, PPL, D) View of cloudy brownish carbonate vein fragment (centre). FOV $\approx$ 2.6 mm, PPL.

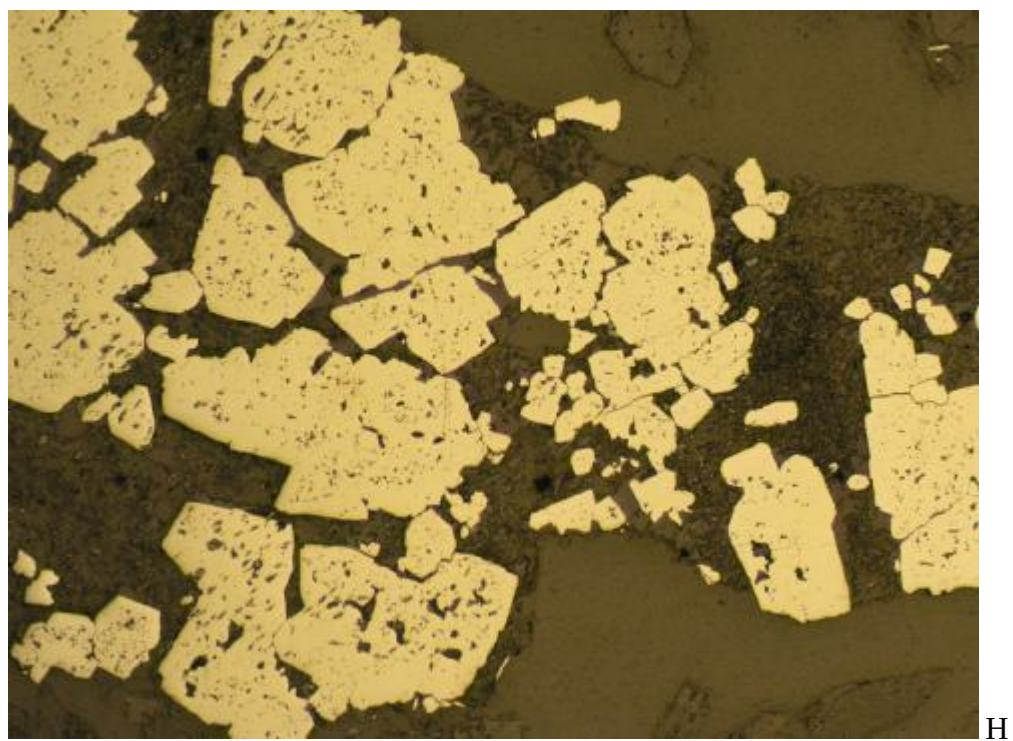
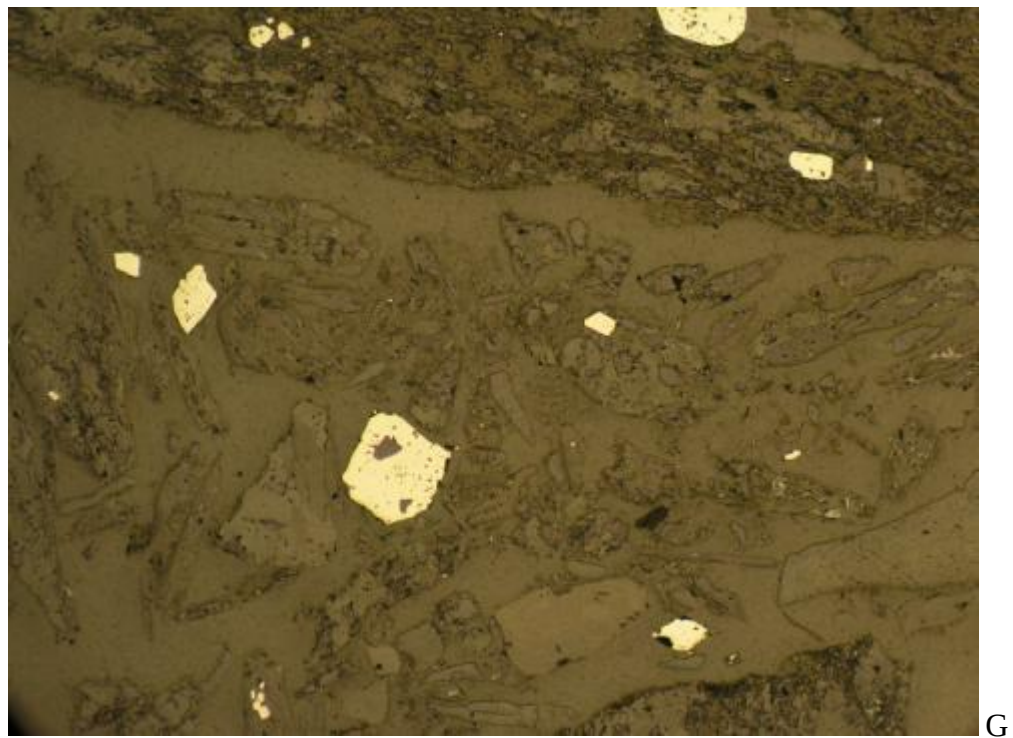


E



F

HC-50: E) Fine-grained anhedral carbonate aggregate partly replaced by red-brown Fe-ox at edge of foliated quartz-sericite-carbonate-rutile aggregate. PPL, FOV $\approx$ 1.3 mm. F) Liberated cloudy carbonate partly replaced by red-brown Fe-ox aggregate. PPL, FOV $\approx$ 0.7 mm.



HC-50: G) Liberated pyrite grains and disseminated pyrite within foliated rock fragment. RL, FOV $\approx$ 2.6 mm. H) Abundant fine-grained sub-anhedral pyrite aggregate within rock fragment. RL, FOV $\approx$ 2.6 mm.

Project: Hope Bay
Rock Type: Late gabbro
Sample ID: HC-51

Deposit: Doris

Zone:

Offcut #: AP-7

Crushed Rock and Offcut Mount Description:

Fine to coarse angular chips (less than 20 mm size). Chips comprise mostly dark greenish-grey granular rock and foliated greenish-brown fragments. Minor fine-grained pyrite occur disseminated. No reaction of chips to cold dilute HCl. No reaction of chips to magnet. No reaction of rock chips to etching with HF and staining with sodium cobaltinitrite (no yellow stain).

Polished Thin Section Description:

Fine to coarse chips representing altered and variably deformed rock: 1) fine to very fine-grained, weakly foliated carbonate-chlorite-rutile±quartz±sericite aggregate with chlorite and rutile defining the orientation of the foliation, 2) fine to very fine-grained massive to weakly foliated quartz-sericite-carbonate-rutile aggregate, 3) fine to medium-grained quartz-carbonate vein fragments and 4) very fine to fine-grained carbonate and carbonate±chlorite veinlets (0.2 mm to > 2 mm). Sericite, ~ 20%, occurs as fine to very fine-grained (< 0.1 mm) flaky aggregates. Quartz, approximately 13%, occurs as fine to very fine-grained (< 0.1 mm) anhedral aggregates within foliated and massive rock fragments and as fine to medium-grained aggregates (< 3 mm) in vein fragments. Vein quartz commonly has undulose extinction. Minor rutile, ~ 6%, occurs as very fine-grained aggregates forming discontinuous bands in rock fragments, as clusters and disseminated. Chlorite, ~10%, occurs as very fine-grained aggregates in weakly foliated carbonate-chlorite-rutile±quartz±sericite aggregate. Rarely, chlorite occurs with carbonate as very fine aggregates in veinlets cutting foliated rock fragments. Rare traces of very fine-grained red-brown Fe-ox occur in late fractures.

Carbonate occurs in major amounts (~50%) as colourless to cloudy brownish carbonate in the following forms: 1) fine to very fine-grained (typically < 0.15 mm, up to 0.35 mm), anhedral to rhombic colourless to cloudy aggregates within massive to foliated rock fragments and 2) fine to medium-grained cloudy brownish aggregate (< 2 mm) in vein fragments. Much of the carbonate, particularly the vein carbonate is cloudy and brownish. Note some of the vein carbonate is strained with local development of undulatory extinction and subgrains.

Sulphide occurs in trace amounts as pyrite with rare chalcopyrite. Pyrite grains are fine to very fine grained (< 0.5 mm) and occur disseminated in some altered rock fragments. Pyrite grains have irregular to straight grain boundaries which are unaltered. Chalcopyrite occurs rarely disseminated as very fine anhedral grains.

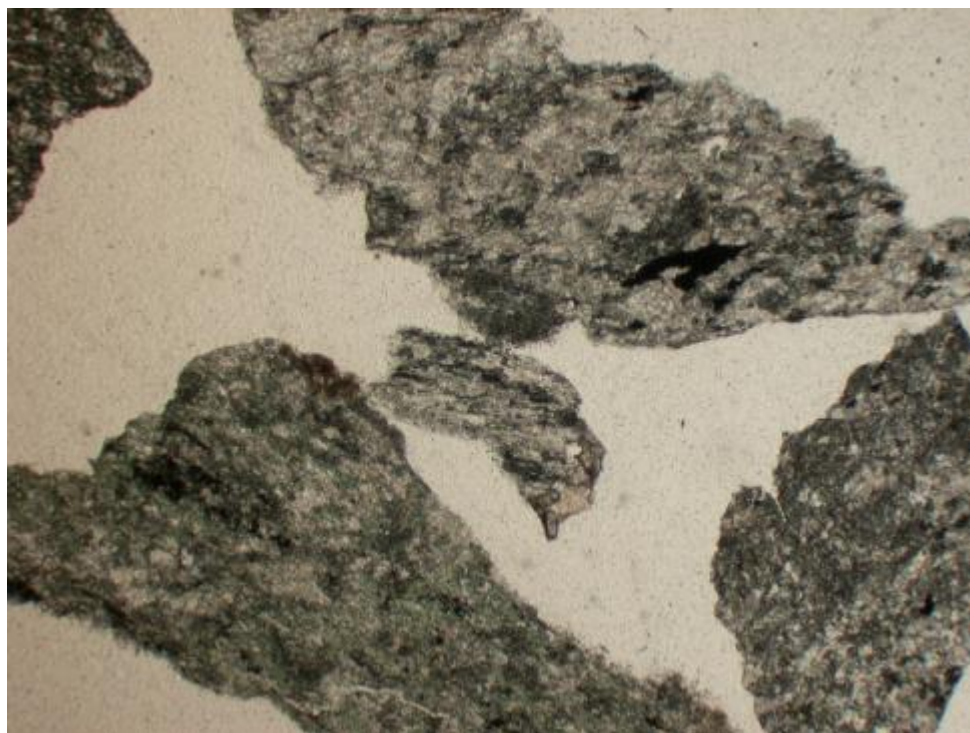
Tabular summary (visual estimate):

Sample # -	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-51	pyrite	tr	colourless to cloudy	50	red-brown	r.	sericite	20
	chalcopyrite	r.	brownish, very fine to medium-grained		unknown		quartz	13
							chlorite	10
							rutile	6

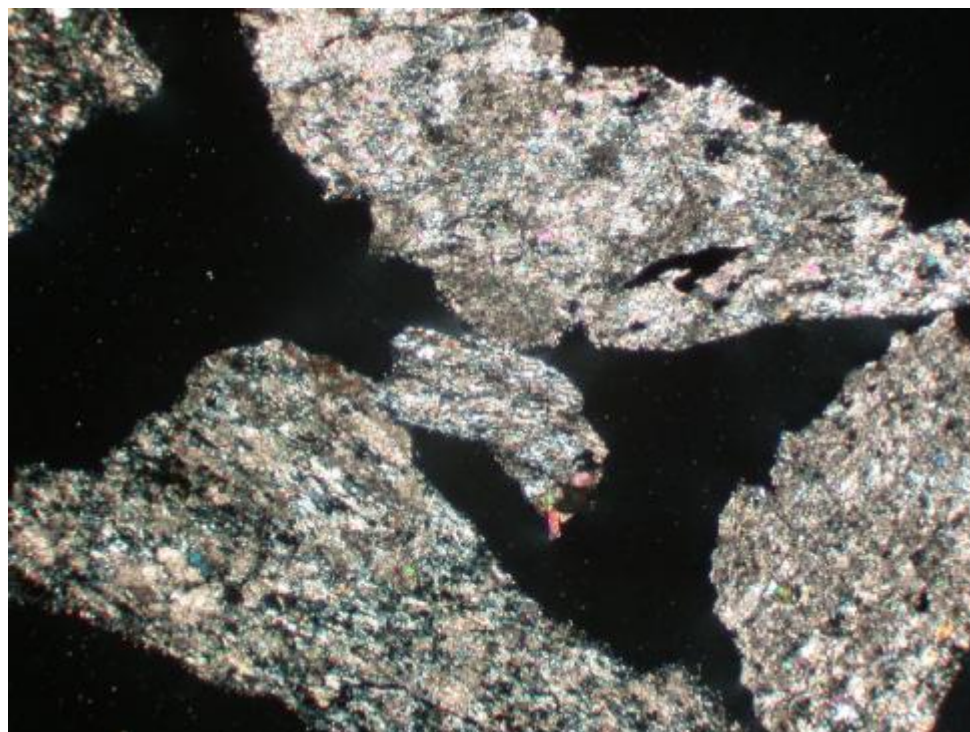
Abbreviations: tr = trace (< 1%); r. = rare; x = none observed

-fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm; medium-grained = 1-5 mm

-Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals

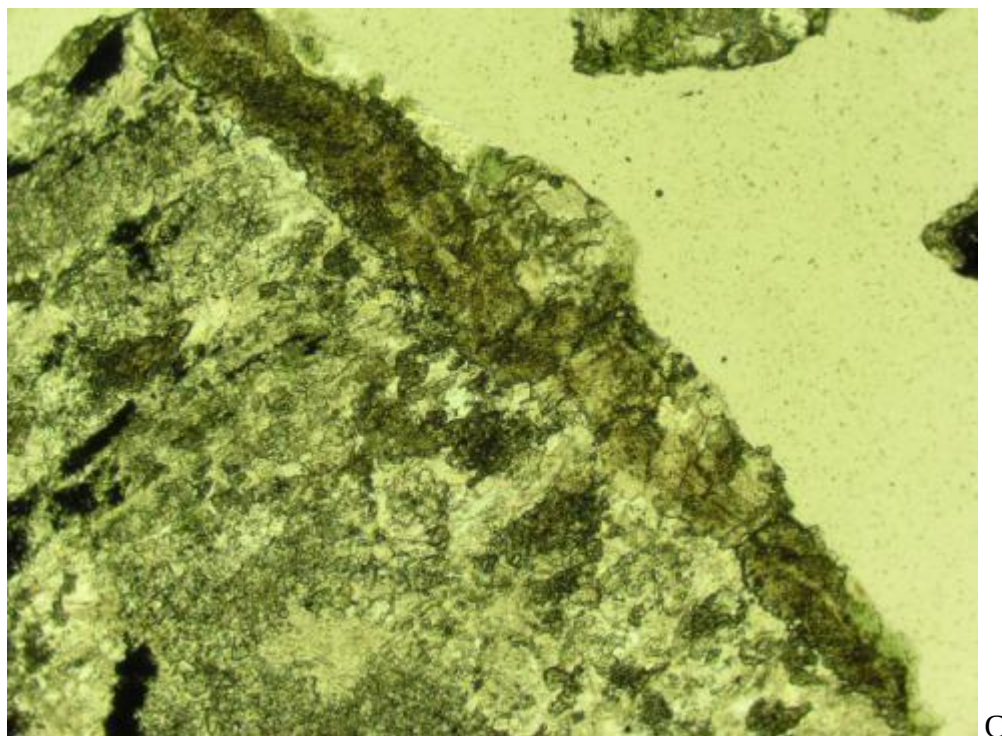


A

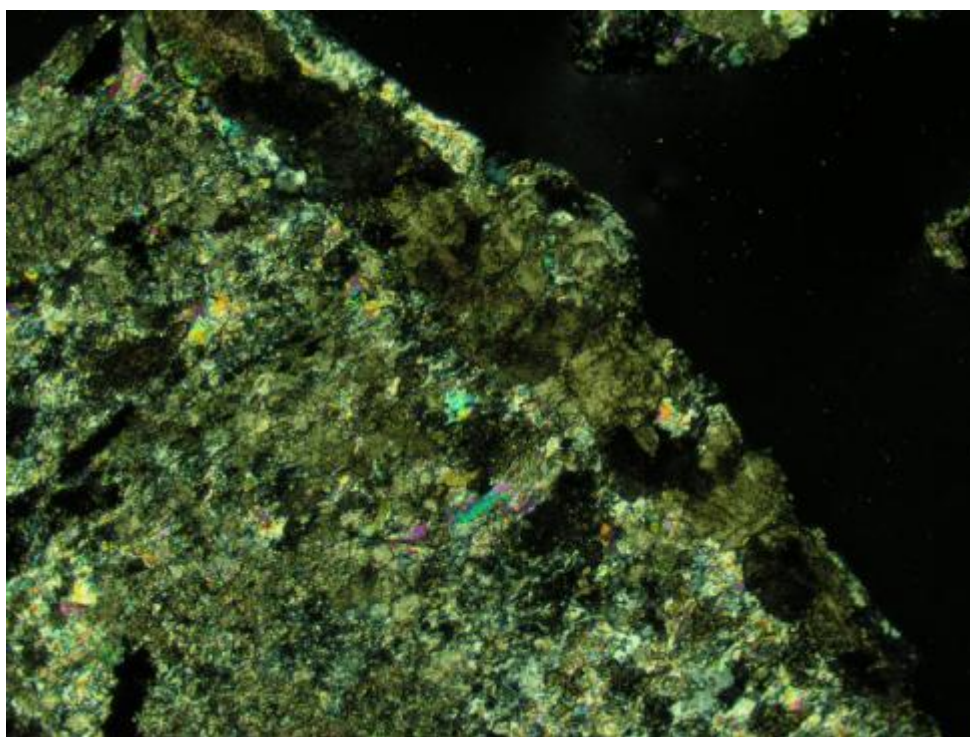


B

HC-51: A&B) View of altered and deformed rock rock chips including weakly foliated carbonate-chlorite-rutile±quartz±sericite aggregate (lower left) and massive to weakly foliated quartz-sericite-carbonate-rutile aggregate (top and right). A) PPL, B) XPL, FOV ≈ 4.5 mm.

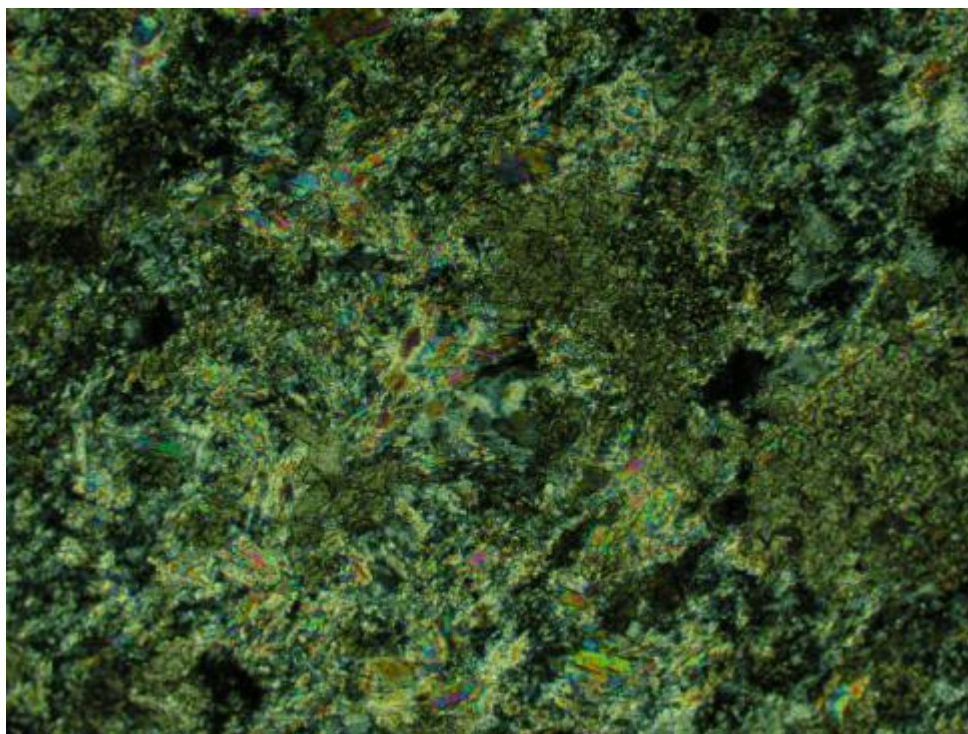


C

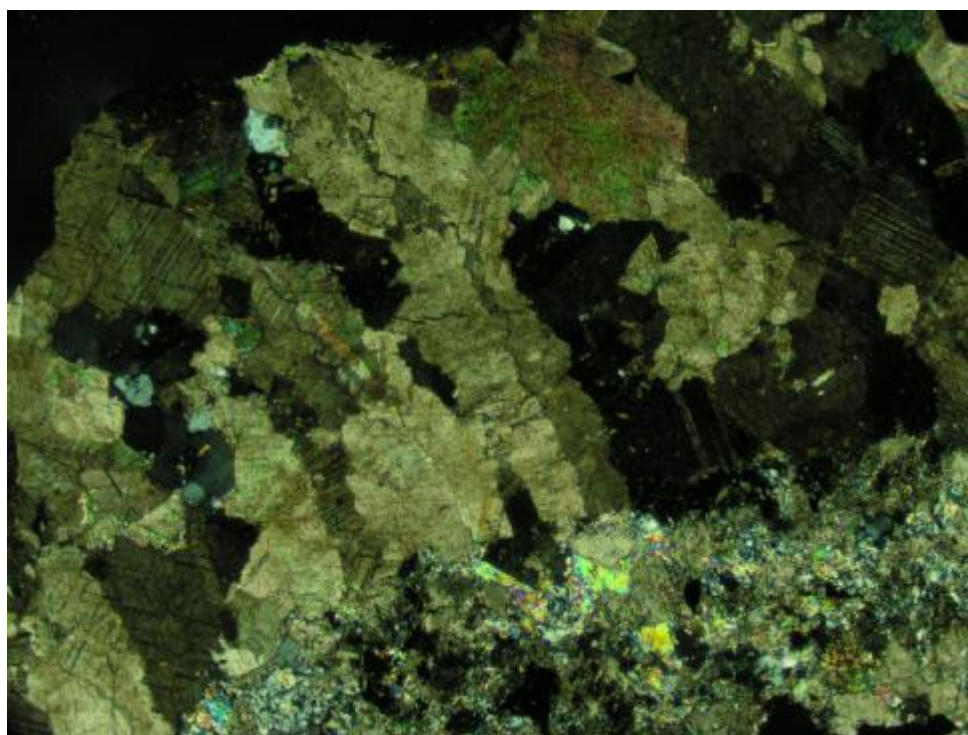


D

HC-51: C&D) Detailed view of massive carbonate-sericite-quartz-rutile aggregate cut by cloudy brownish carbonate-chlorite veinlet. Note carbonate in rock fragment varies from colourless to cloudy brownish. FOV $\approx$ 2.6 mm, C) PPL, E) XPL.

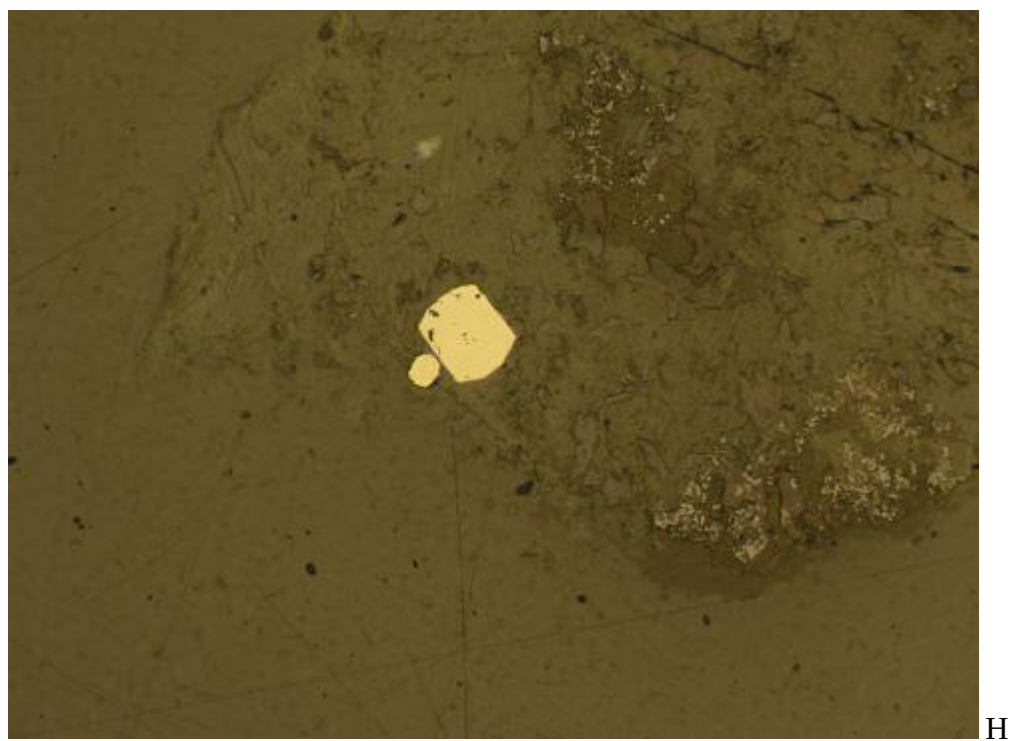
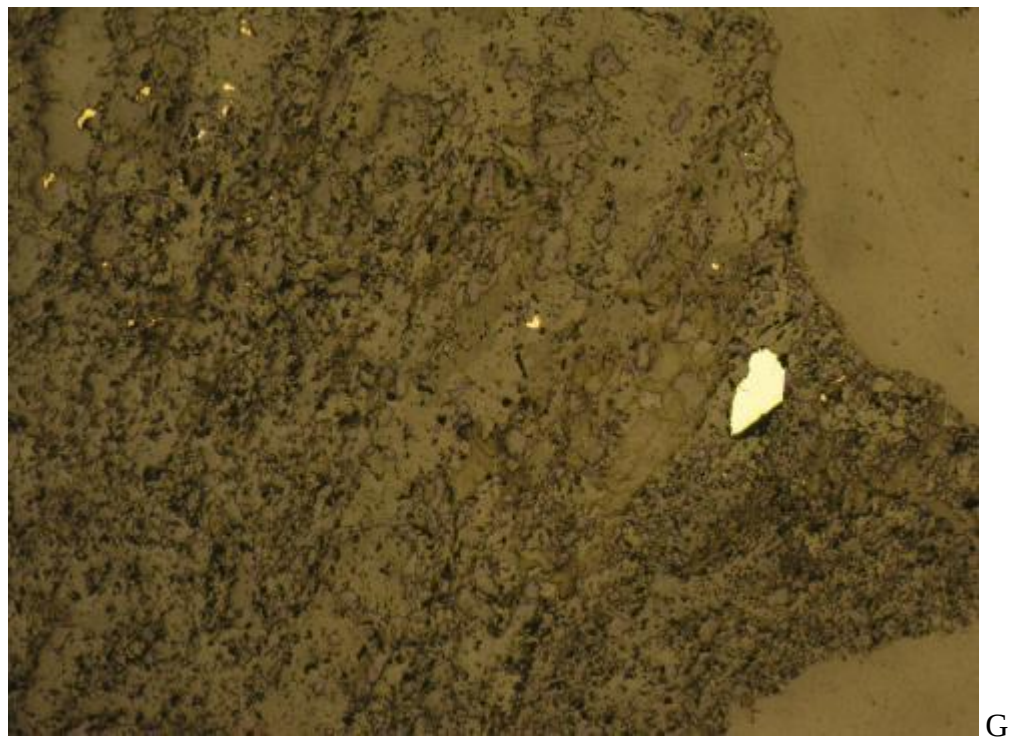


E



F

HC-51: E) Detailed view of massive carbonate-sericite-quartz-rutile aggregate. XPL, FOV $\approx$ 1.3 mm. F) Cloudy brown carbonate-quartz veinlet. XPL, FOV $\approx$ 2.6 mm.



HC-51: G) Disseminated unaltered pyrite (right) and traces of chalcopyrite (top left). RL, FOV $\approx$ 2.6 mm. H) Subhedral disseminated pyrite with straight unaltered boundaries. RL, FOV $\approx$ 1.3 mm.

Project: Hope Bay
Rock Type: Quartz vein
Sample ID: HC-52

Deposit: Doris

Zone:

Offcut #: AP-8

Crushed Rock and Offcut Mount Description:

Fine to coarse angular chips (less than 15 mm size). Chips comprise mostly white quartz vein (~80%) and foliated greyish-brown rock fragments with minor fine-grained pyrite disseminated and in bands parallel to the foliation. No reaction of chips to cold dilute HCl. No reaction of chips to magnet. No reaction of rock chips to etching with HF and staining with sodium cobaltinitrite (no yellow stain).

Polished Thin Section Description:

Fine to coarse chips representing altered rock and vein fragments: 1) fine to very fine-grained, strongly foliated sericite-rutile±carbonate±quartz ±pyrite aggregate with sericite and rutile defining the orientation of the foliation, 2) fine to very fine-grained, massive carbonate-quartz-sericite-rutile±?clay/chlorite ±pyrite aggregate and 3) fine to coarse-grained quartz vein fragments, locally with traces of patchy fine-grained carbonate and rarely with very fine chlorite as fracture infill. Quartz, approximately 80%, occurs as very fine to coarse-grained (< 8 mm) anhedral aggregates in vein fragments. Vein quartz commonly has undulose extinction and locally development of subgrains. Sericite, ~6%, occurs as very fine-grained flaky aggregates within rock fragments. Minor rutile, ~1%, occurs as very fine-grained aggregates forming discontinuous bands in rock fragments, as clusters and disseminated. Brownish-green ?clay/chlorite occurs in trace amounts as very fine-grained aggregates in some rock fragments and as rarely as fracture infill within quartz veinlets.

Carbonate occurs in major amounts (~10%) as colourless to cloudy carbonate in the following forms: 1) fine to very fine-grained (< 0.8 mm), anhedral colourless to cloudy aggregates within massive to foliated rock fragments and 2) very fine to fine-grained cloudy aggregate (< 0.2 mm) in vein fragments and rarely 3) as fine cloudy liberated grains. Note some of the carbonate is strained with local development of undulatory extinction. Rarely, very fine-grained red-brown Fe-ox occur partly replacing carbonate at edges of vein fragments.

Sulphide occurs in minor amounts (2%) as pyrite. Pyrite grains are fine to very fine grained (< 1 mm) and occur disseminated in some altered rock fragments and as liberated grains. Pyrite grains have irregular to straight grain boundaries which are unaltered.

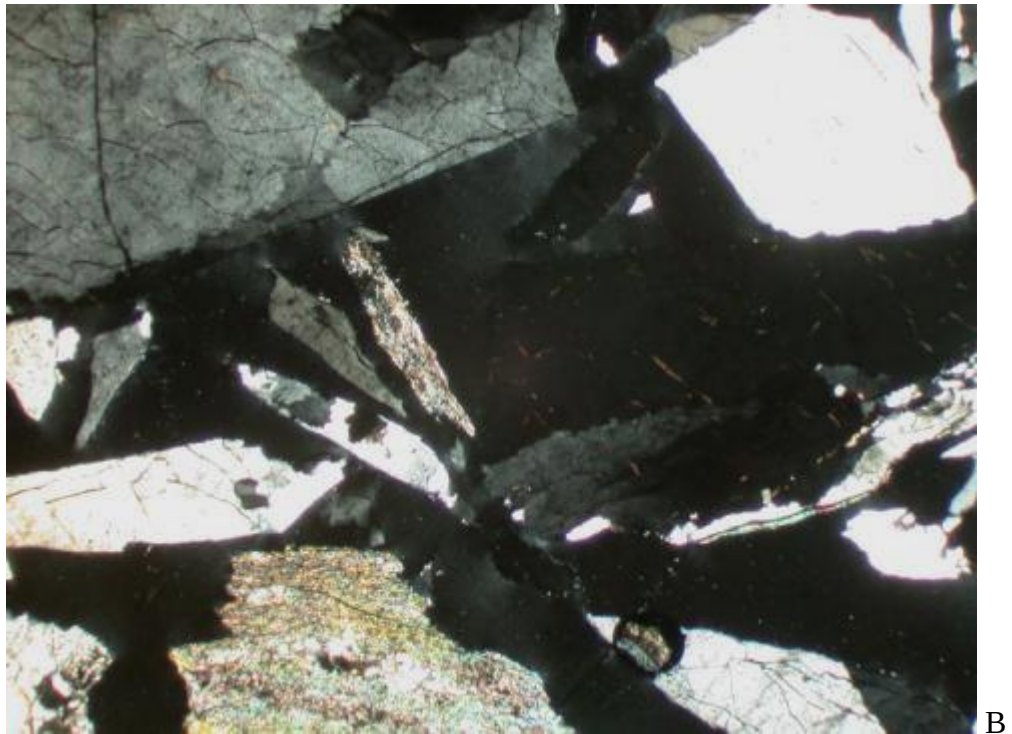
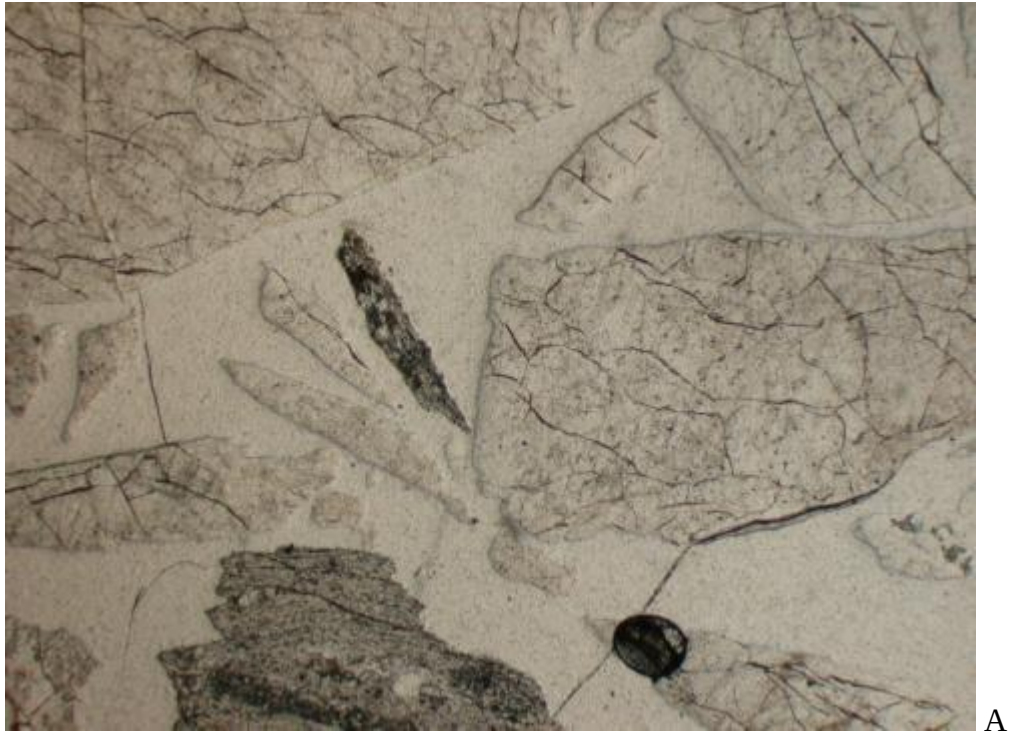
Tabular summary (visual estimate):

Sample # -	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-52	pyrite	2	colourless to cloudy	10	red-brown	r.	quartz	80
			very fine to fine-grained		unknown		sericite	6
							rutile	1
							?clay/chlorite	tr

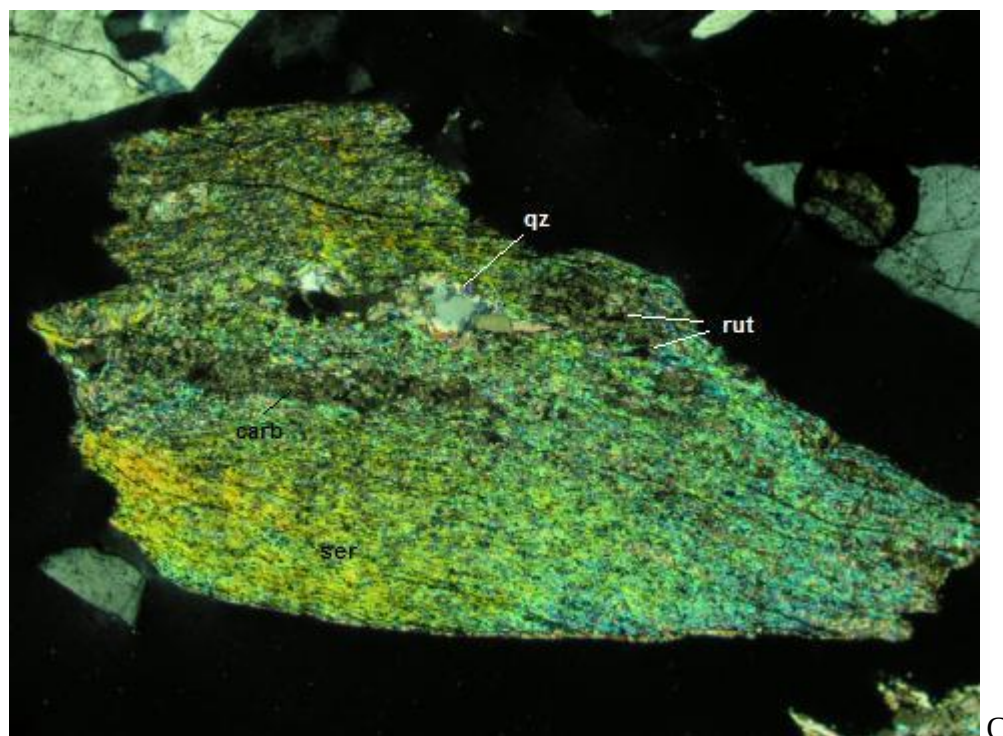
Abbreviations: tr = trace (< 1%); r. = rare; x = none observed

-fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm; medium-grained = 1-5 mm

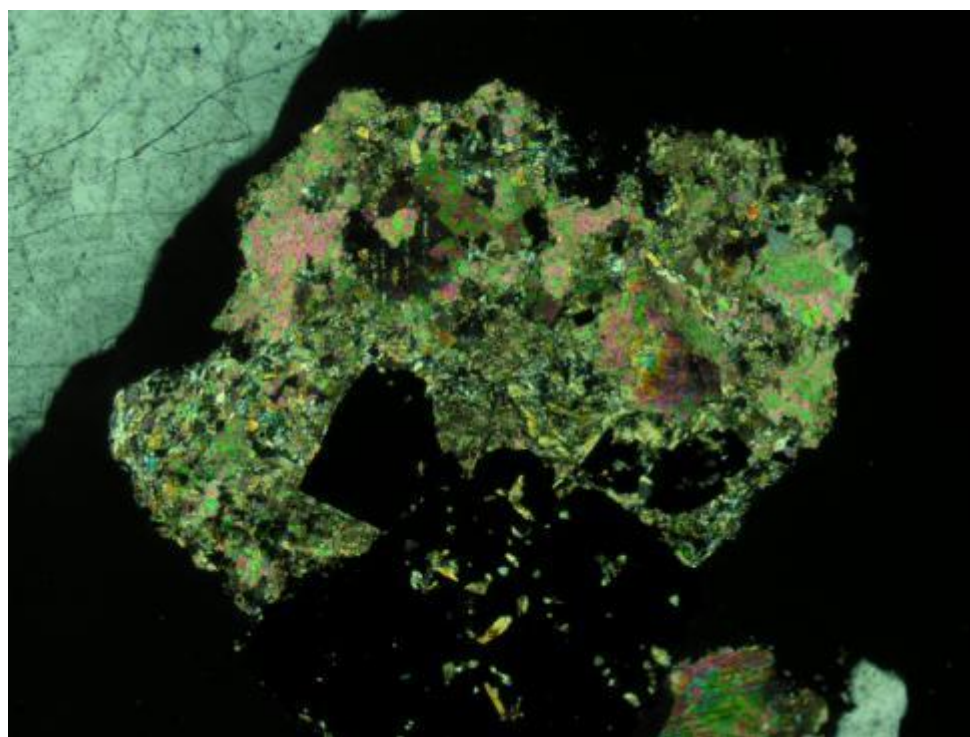
-Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals



HC-52: A&B) View of foliated sericite-rutile±carbonate±quartz aggregate (centre and lower left) and quartz vein fragments. A) PPL, B) XPL, FOV ≈ 4.5 mm.

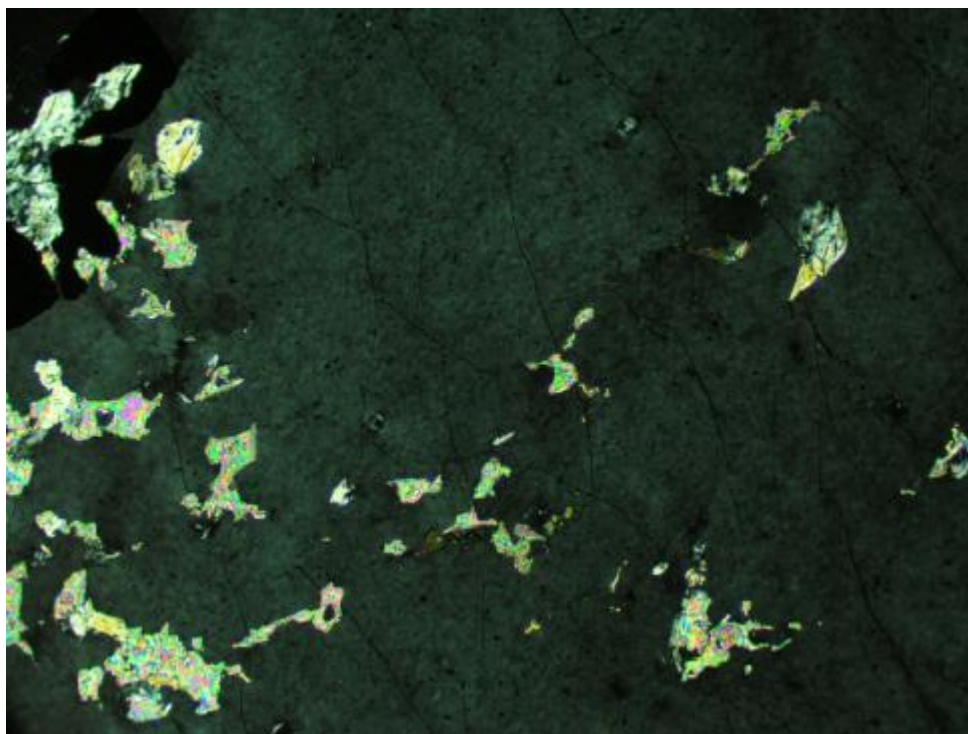


C

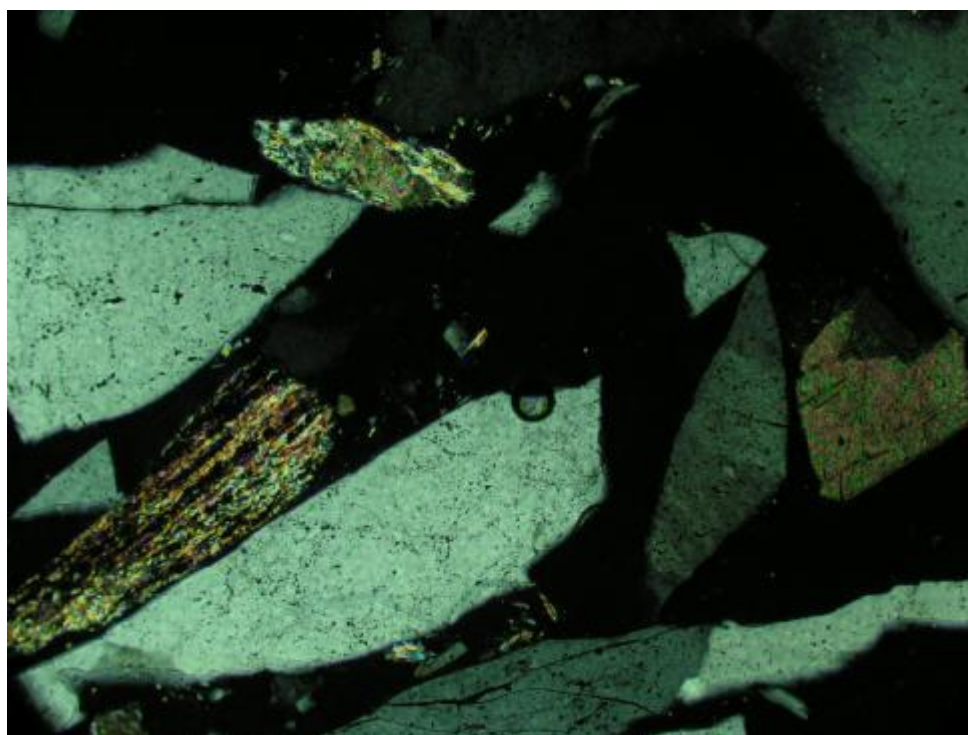


D

HC-52: C) Detailed view of fragment of foliated sericite-rutile±carbonate±quartz aggregate. FOV ≈ 2.6 mm, XPL. D) Detailed view of fragment of massive carbonate-sericite-quartz-rutile-pyrite aggregate. FOV ≈ 2.6 mm, XPL.

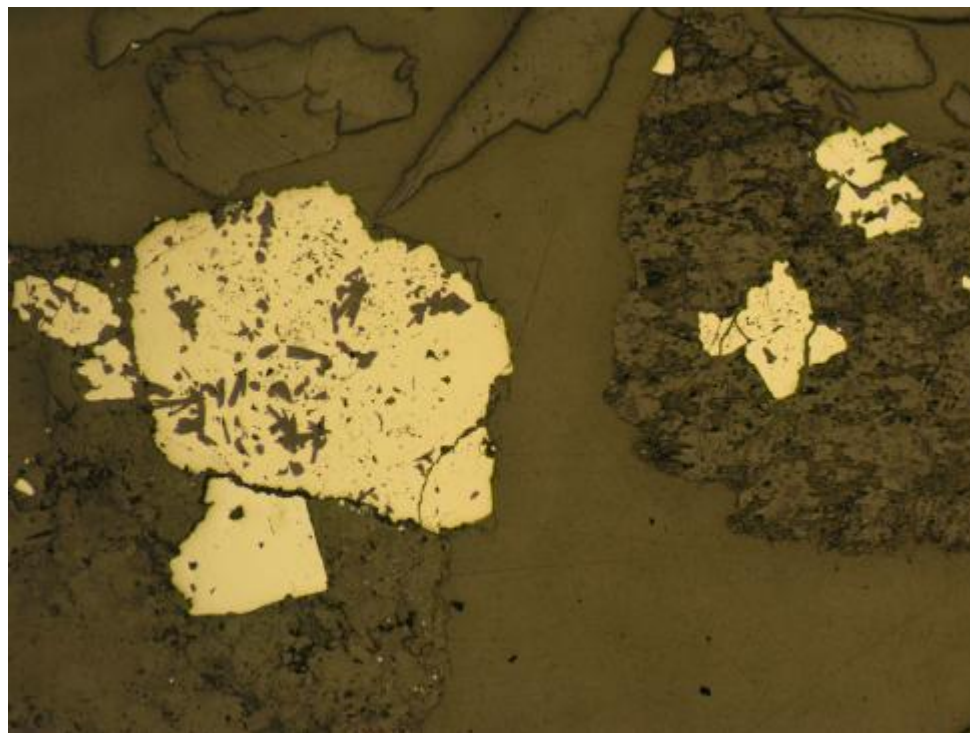


E

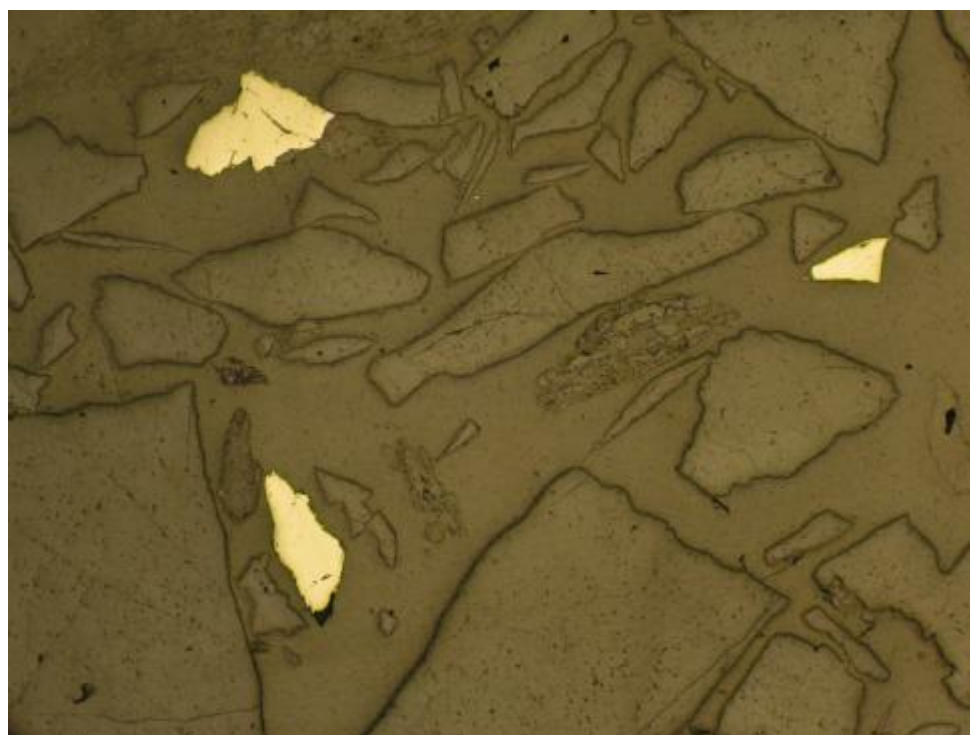


F

HC-52: E) Detailed view of patchy carbonate within quartz vein fragment. XPL, FOV $\approx$ 1.3 mm. F) Detailed view of quartz vein fragments, liberated carbonate grain (right) and sericite-rutile aggregate (left top and bottom). XPL, FOV $\approx$ 2.6 mm.



G



H

HC-52: G) Disseminated unaltered pyrite grains and aggregate within rock fragments. RL, FOV $\approx$ 2.6 mm. H) Liberated pyrite grains (unaltered). RL, FOV $\approx$ 2.6 mm.

Project: Hope Bay
Rock Type: Quartz vein
Sample ID: HC-53

Deposit: Doris

Zone:

Offcut #: AP-9

Crushed Rock and Offcut Mount Description:

Fine to coarse angular chips (less than 24 mm size). Chips comprise mostly white quartz vein (~99%) and minor foliated greyish-brown rock fragments. No reaction of chips to cold dilute HCl. No reaction of chips to magnet. No reaction of rock chips to etching with HF and staining with sodium cobaltinitrite (no yellow stain).

Polished Thin Section Description:

Fine to coarse chips representing quartz vein fragments. Traces of patchy fine to very fine-grained carbonate associated with sericite aggregate occur within some of the vein fragments. Traces of sericite±rutile, locally tourmaline and brownish-green ?clay/chlorite aggregate are developed at quartz grain boundaries in some fragments. Quartz, approximately 99%, occurs as very fine to coarse-grained (< 7 mm) anhedral aggregates in vein fragments. Vein quartz commonly has undulose extinction and locally development of subgrains. Trace sericite occurs as very fine-grained anhedral to flaky aggregates as patches in the vein fragments. Traces of rutile occurs as very fine-grained aggregates associated with sericite aggregate. Rare traces of tourmaline occur as very fine needles associated with patchy very fine brownish-green ?clay/chlorite aggregate and locally associated with sericite and carbonate aggregate.

Carbonate occurs in trace amounts as colourless to cloudy brownish carbonate. The carbonate is fine to very fine-grained (< 0.2 mm), anhedral and occurs as patchy aggregates commonly associated with sericite in the quartz vein fragments. Note some of the carbonate is strained with local development of undulatory extinction.

Sulphide occurs in trace amounts as pyrite. Pyrite grains are fine to very fine-grained (< 0.15 mm) and occur disseminated in quartz vein fragments and associated with patchy sericite±clay aggregate. Pyrite grains have irregular to straight grain boundaries which are unaltered.

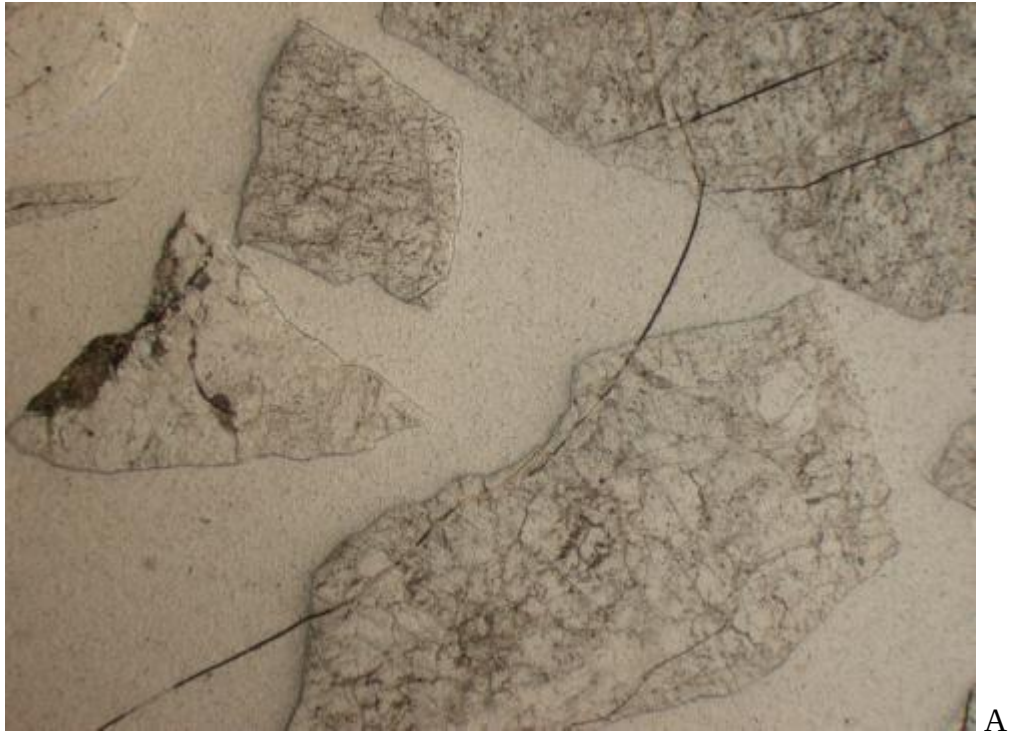
Tabular summary (visual estimate):

Sample # -	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-53	pyrite	tr	colourless to cloudy brownish, very fine to fine-grained	tr		x	quartz	99
							sericite	tr
							rutile	tr
							?clay/chlorite	tr
							tourmaline	r.

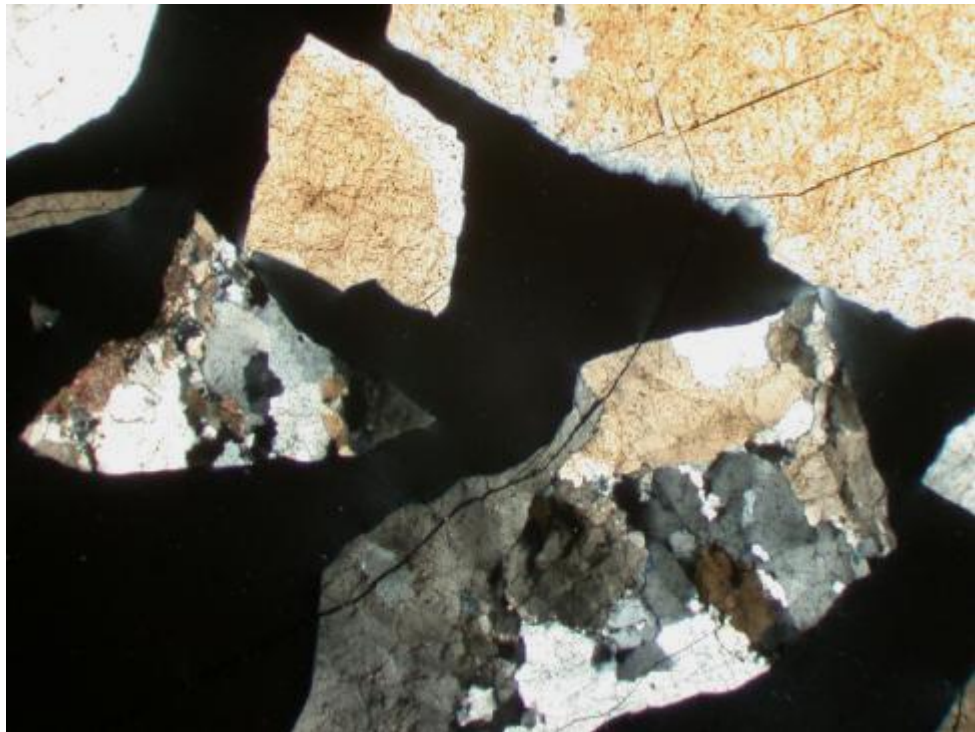
Abbreviations: tr = trace (< 1%); r. = rare; x = none observed

-fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm; medium-grained = 1-5 mm

-Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals

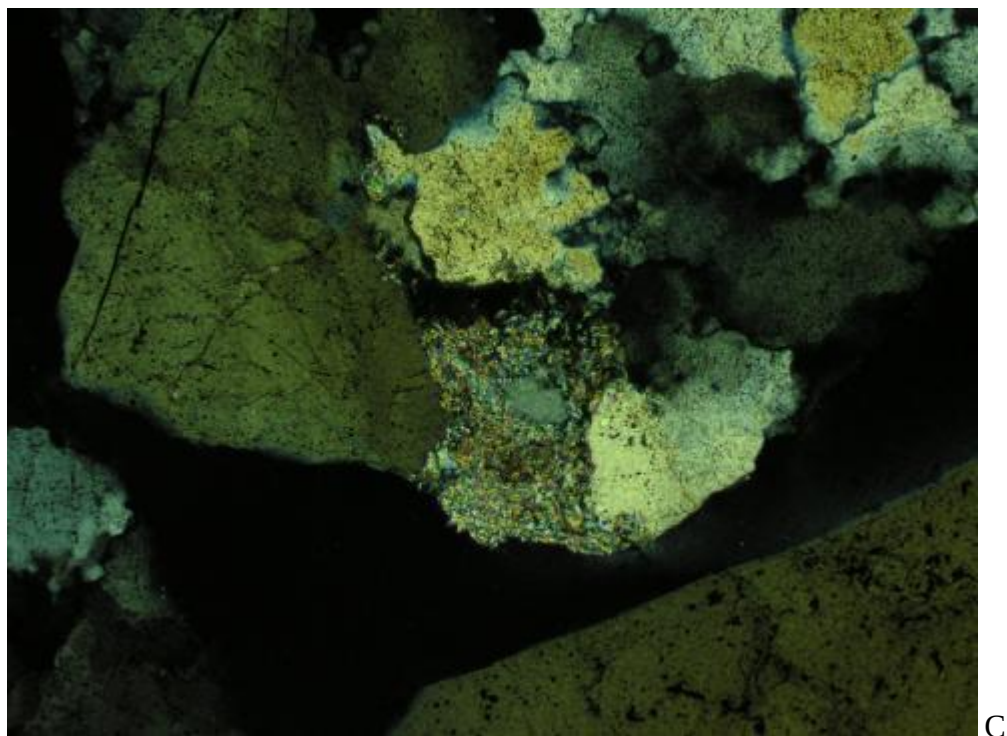


A

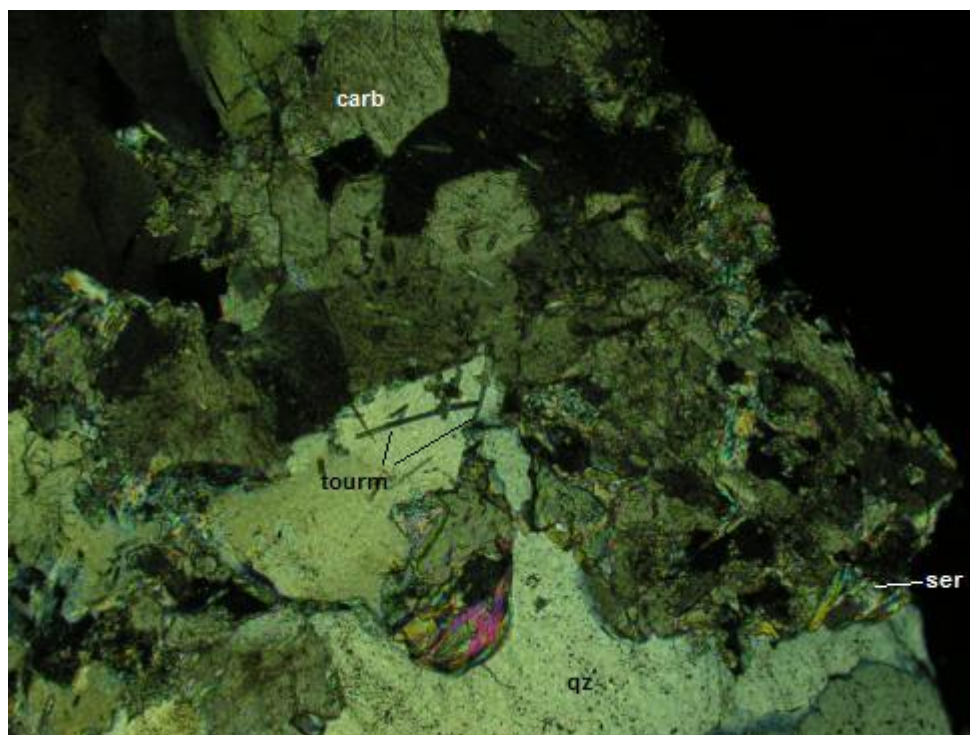


B

HC-53: A&B) View of quartz vein fragments. Note patchy carbonate aggregate within vein fragment (left). A) PPL, B) XPL, FOV $\approx$ 4.5 mm.

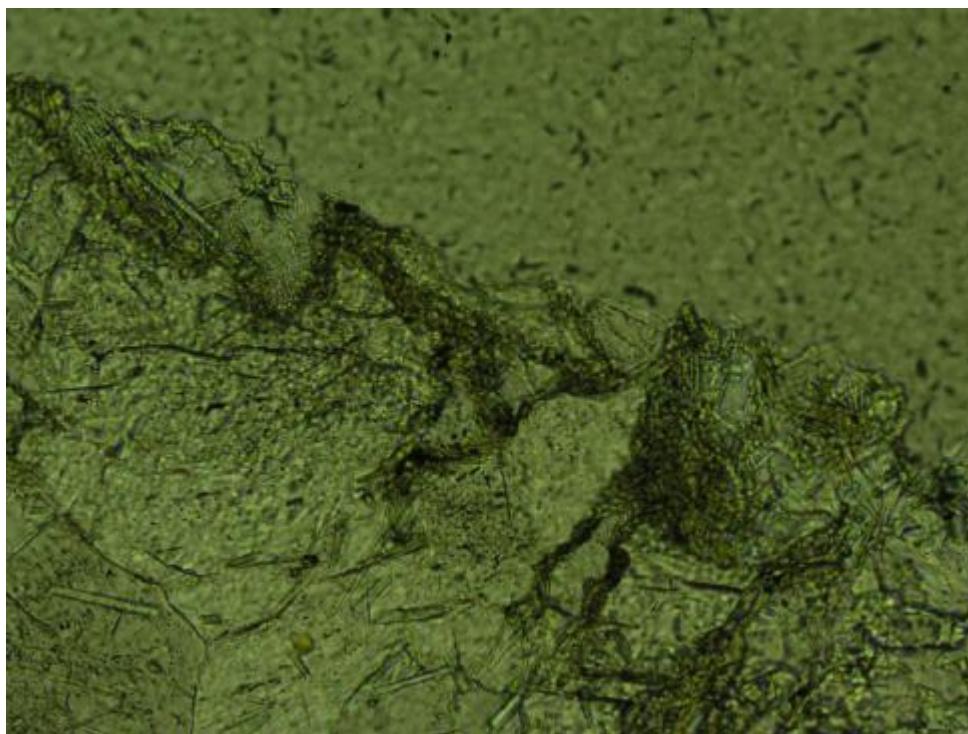


C

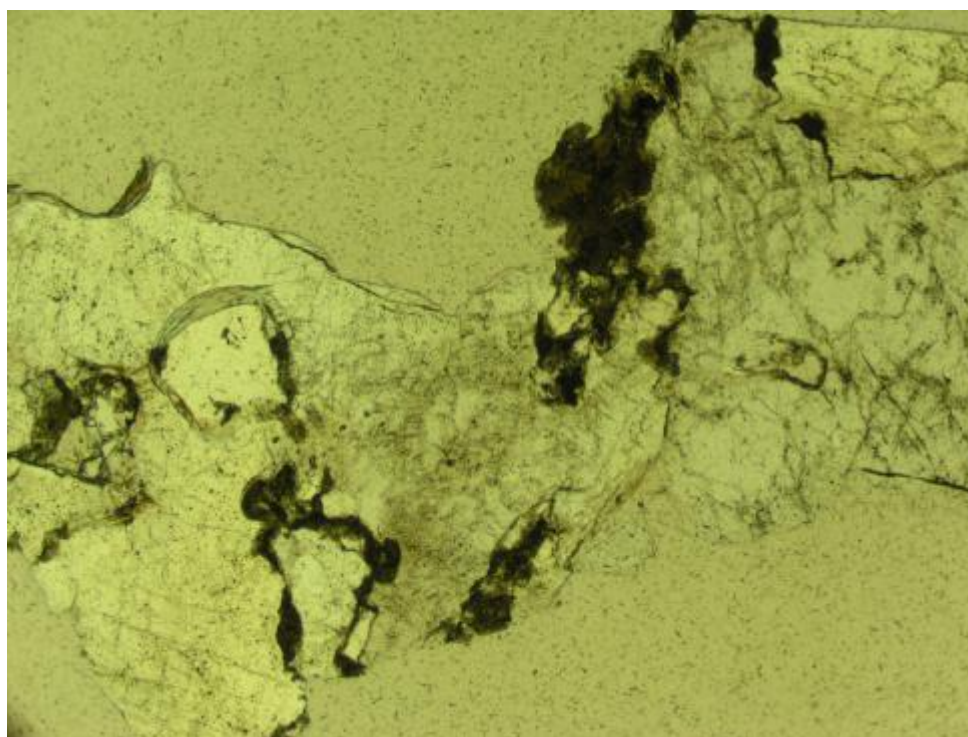


D

HC-53: C) Detailed view of very fine-grained sericite aggregate within quartz vein fragment. FOV $\approx$ 1.3 mm, XPL. D) Detailed view of patchy carbonate-sericite-(tourmaline) aggregate within quartz vein fragment. FOV $\approx$ 1.3 mm, XPL.

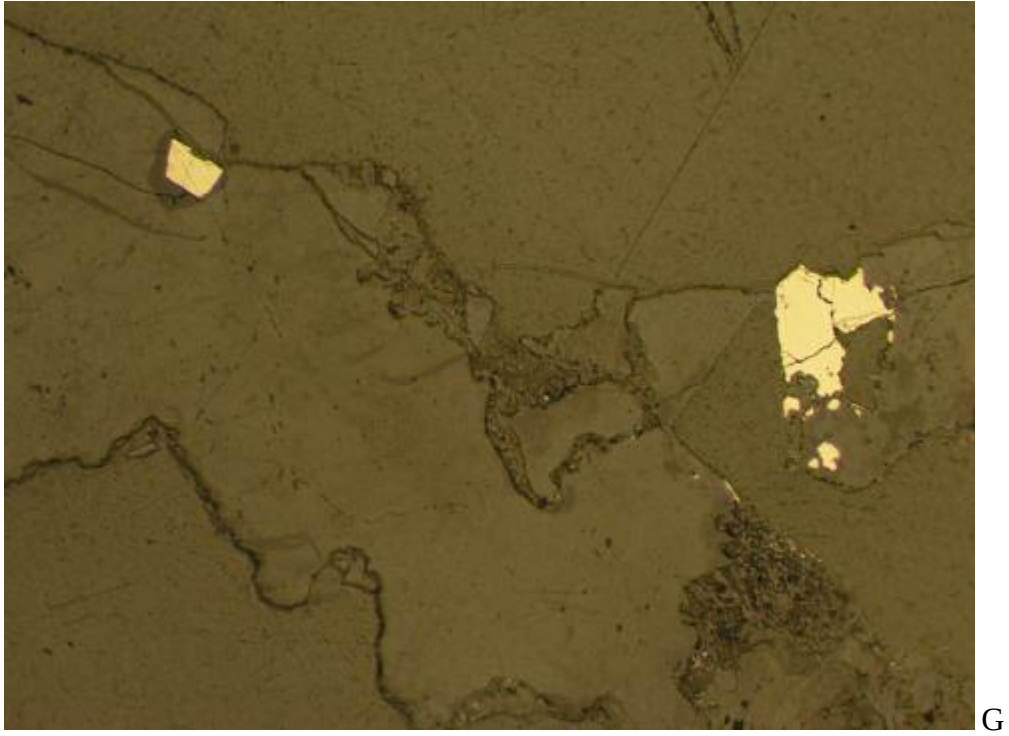


E



F

HC-53: E) Detailed view of acicular tourmaline and aphanitic brownish-green aggregate within quartz vein fragment. PPL, FOV $\approx$ 0.7 mm. F) Detailed view of quartz vein fragments with aphanitic brownish-green ?clay/chlorite aggregate developed at grain boundaries. PPL, FOV $\approx$ 2.6 mm.



HC-53: G) Detailed view of anhedronal pyrite grains within quartz vein fragment. RL, FOV $\approx$ 0.7 mm.

Project: Hope Bay**Deposit:** Boston**Zone:****Rock Type:** Mafic volcanic: Basalt**Sample ID:** HC-55**Offcut #:** AP-10**Crushed Rock and Offcut Mount Description:**

Fine to coarse angular chips (less than 13 mm size). Chips comprise mostly light olive-grey strongly foliated rock, banded green-brown rock and white quartz vein fragments. Traces of fine-grained pyrite occurs disseminated. No reaction of chips to cold dilute HCl. No reaction of chips to magnet. Rare traces of reaction of rock chips to etching with HF and staining with sodium cobaltinitrite (trace yellow stain).

Polished Thin Section Description:

Fine to coarse chips representing altered and variably deformed rock: 1) fine to very fine-grained, strongly foliated chlorite-quartz-plagioclase-rutile-carbonate±sericite aggregate with chlorite and locally rutile and sericite defining the orientation of the foliation, 2) fine to very fine-grained massive quartz-carbonate aggregate locally with minor sericite, 3) fine-grained, anhedral carbonate aggregate, 4) very fine to medium-grained quartz and carbonate-quartz vein fragments and 5) rarely strongly foliated, very fine-grained sericite aggregate with radiating fine tourmaline, very fine bands of rutile and disseminated pyrite. Carbonate, quartz and pyrite occur commonly as liberated grains. Chlorite comprises approximately 10% of the section as very fine-grained aggregates within strongly foliated rock fragments. Minor rutile, approximately 1%, occurs as very fine-grained aggregates within the foliation, as clusters and disseminated. Quartz, approximately 25%, occurs as fine to very fine-grained (< 1 mm) patchy, anhedral aggregates commonly with undulose extinction and development of subgrains. Traces of quartz occur as fine to very fine-grained pressure fringes to pyrite and carbonate porphyroblasts. Sericite, ~ 10%, occurs as fine to very fine-grained (< 0.15 mm) flaky aggregates. Minor plagioclase, ~2% occurs as very fine aggregate within strongly foliated fragments.

Carbonate occurs in major amounts (~50%) as colourless and cloudy brownish carbonate in the following forms: 1) fine to very fine-grained (< 0.15 mm), anhedral to rhombic colourless aggregates within foliated chlorite-quartz-plagioclase-rutile-carbonate±sericite fragments, 2) fine to very fine-grained (< 0.1 mm), anhedral aggregates within carbonate and quartz-carbonate aggregate, 3) fine to medium-grained aggregate (< 2 mm) in vein fragments and 4) as fine-grained liberated grains (< 0.2 mm). Approximately half the carbonate, particularly the vein carbonate is cloudy and brownish. Note some of the carbonate is strained with local development of undulatory extinction and subgrains.

Sulphide occurs in minor amounts (~1%) as pyrite, in trace amounts as chalcopyrite and rarely as an unknown phase. Pyrite grains are fine to very fine grained (< 0.45 mm) and occur as disseminated to patchy sub-anhedral grains and aggregate in altered rock fragments and as liberated anhedral grains. Pyrite grains have irregular to straight grain boundaries which are unaltered. Traces of fine to very fine-grained (< 0.1 mm) chalcopyrite occur disseminated in rock fragments, as infill to pyrite and as inclusions in pyrite. Rarely grains of an unknown highly reflective, weakly anisotropic phase occur as patchy fine to very fine-grains (< 0.2 mm) in quartz-carbonate aggregate. The unknown grains resemble pyrite but are white rather than yellowish white in reflected light.

Project: Hope Bay
Rock Type: Mafic volcanic: Basalt
Sample ID: HC-55

Deposit: Boston

Zone:

Offcut #: AP-10

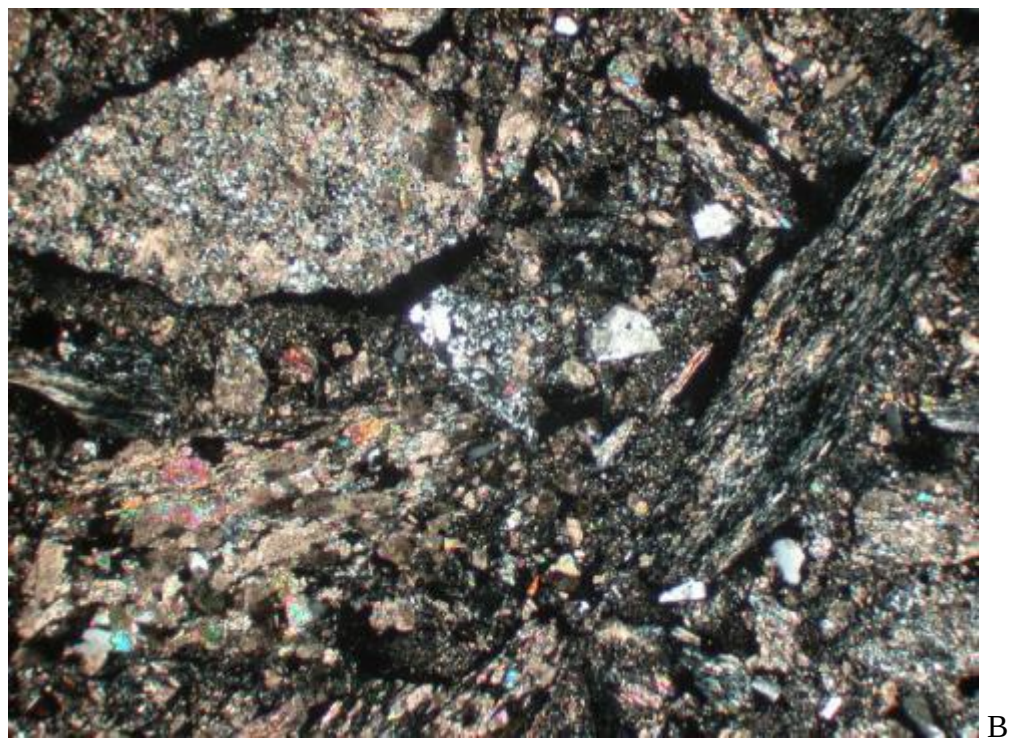
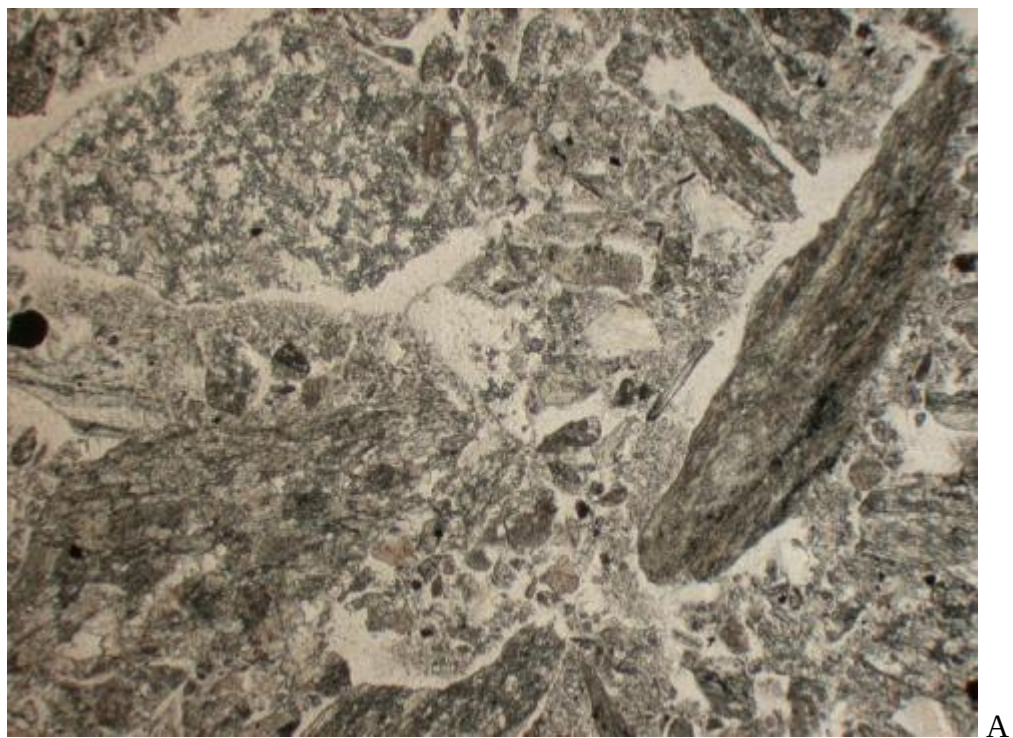
Tabular summary (visual estimate):

Sample # -	Sulphide	% ~	Carbonate occurrence	% ~	Fe-Ox	% ~	Other	% ~
HC-55	pyrite	1	colourless to cloudy	50		x	quartz	25
	chalcopryrite	tr	brownish, fine to very				chlorite	10
	unknown	r.	fine-grained				sericite	10
							plagioclase	2
							rutile	1
							tourmaline	r.

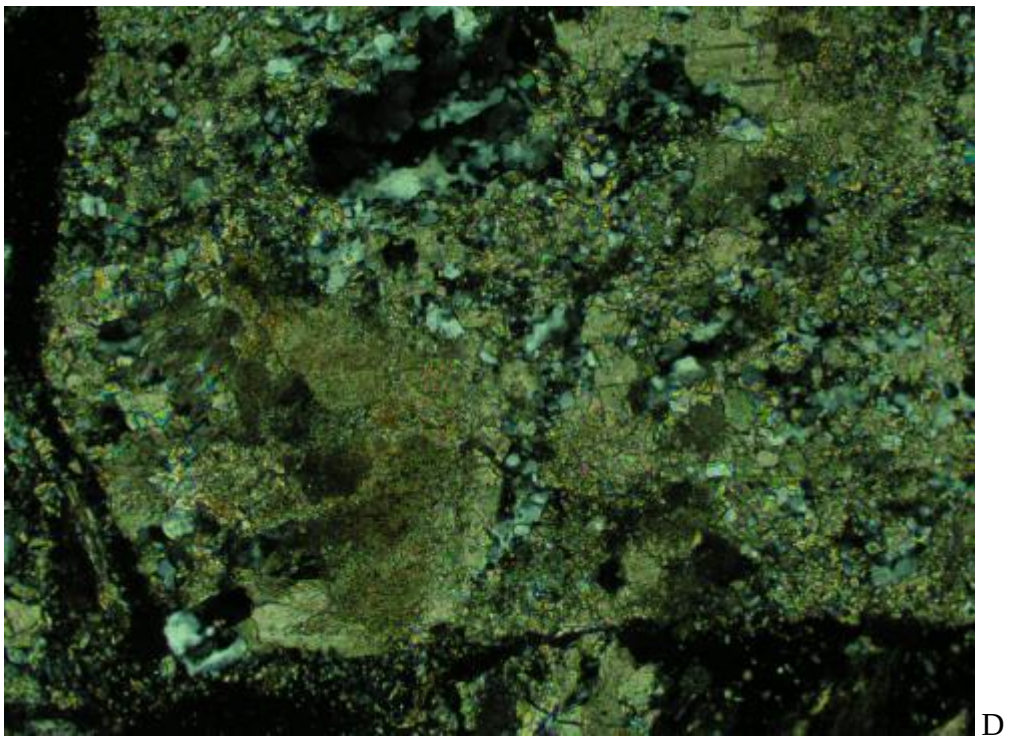
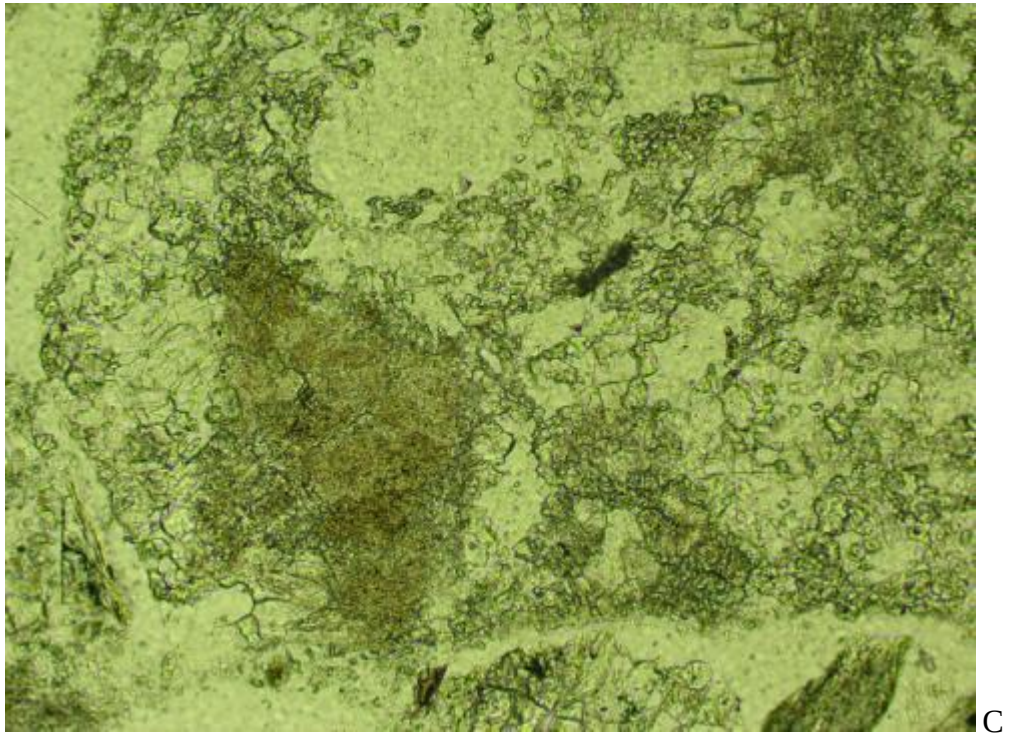
Abbreviations: tr = trace (< 1%); r. = rare; x = none observed

-fine-grained = > 0.05 mm and < 1 mm; very fine-grained = < 0.05 mm; medium-grained = 1-5 mm

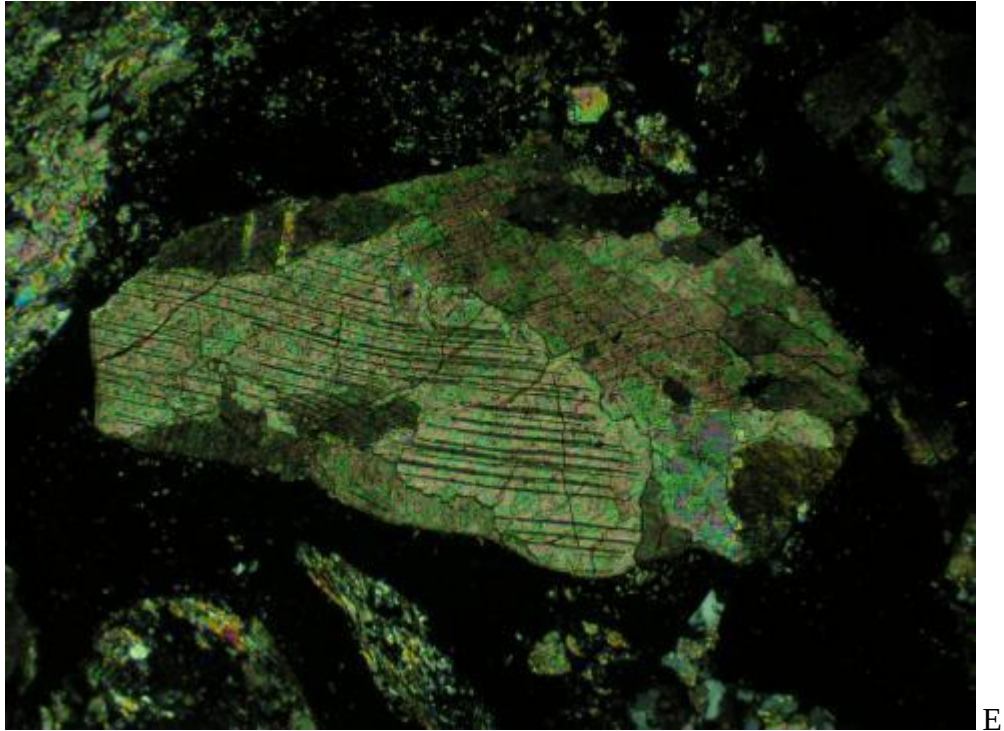
-Fe-ox = iron and/or Fe-Ti-oxides, includes amorphous, very fine-grained poorly crystalline and/or crystalline ferric hydroxides, oxides, oxyhydroxides, hydroxy-sulphate and/or oxyhydroxy-sulphate minerals



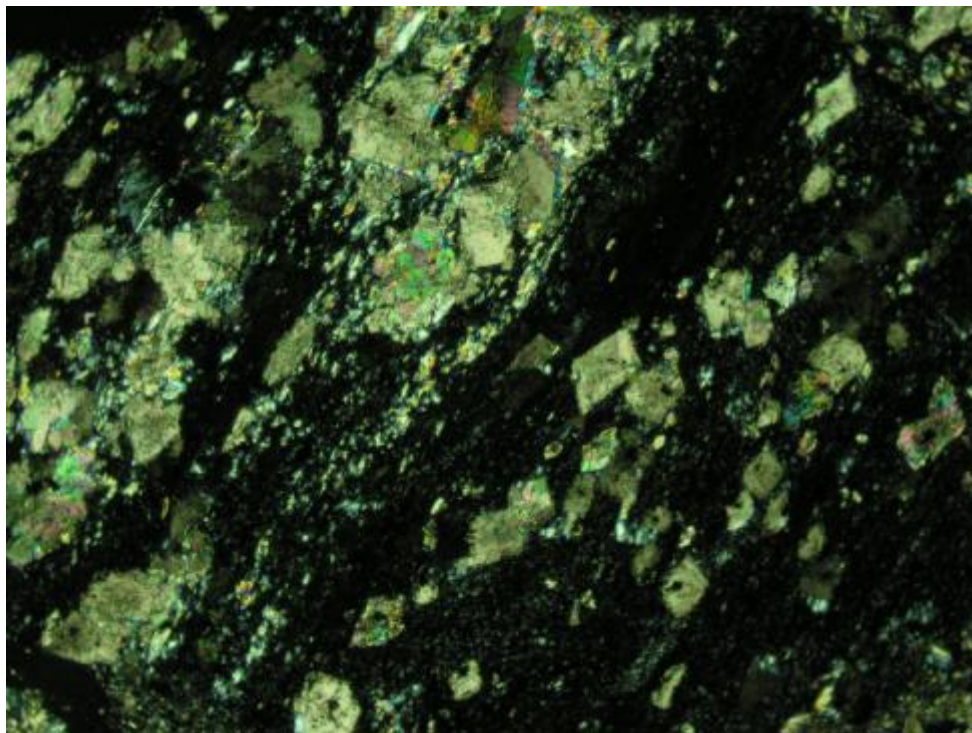
HC-55: A&B) View of altered and deformed rock rock chips including strongly foliated chlorite-quartz-plagioclase-rutile-carbonate-sericite aggregate (right), massive quartz-carbonate aggregate (top left) and carbonate aggregate (lower left). A) PPL, B) XPL, FOV $\approx$ 4.5 mm.



HC-55: C&D) Detailed view of massive quartz-carbonate rock fragment. Note patches of cloudy brownish carbonate. FOV $\approx$ 2.6 mm, C) PPL, D) XPL.

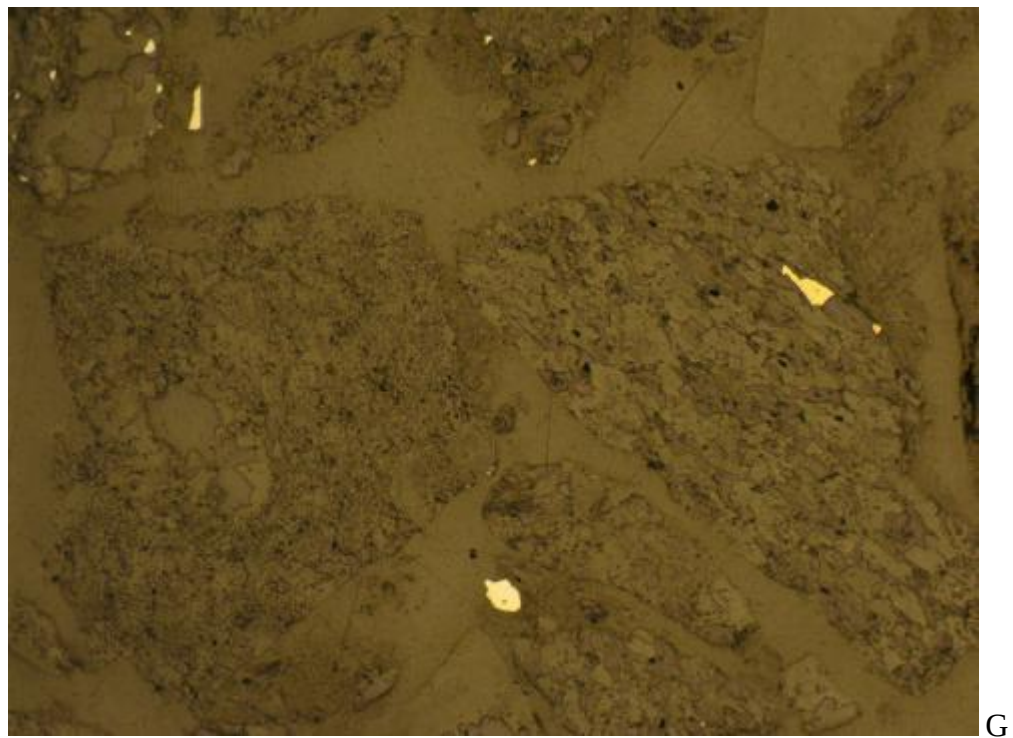


E

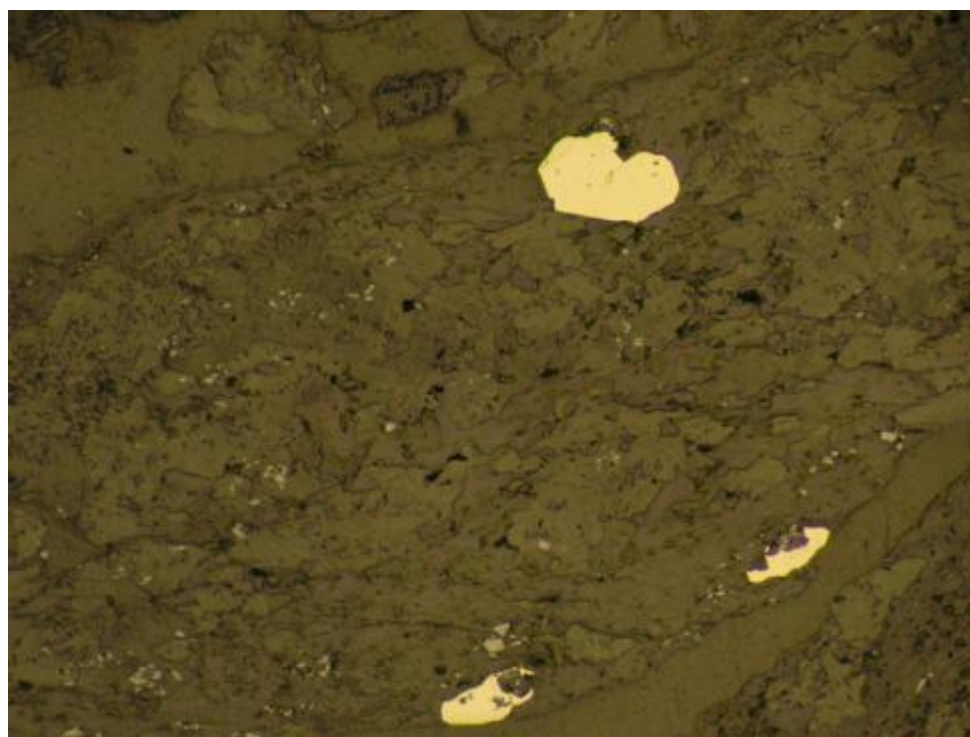


F

HC-55: E) Fragment of fine-grained anhedral carbonate aggregate. XPL, FOV $\approx$ 1.0 mm. F) Anhedral to rhombic colourless carbonate within foliated chloritic rock fragment. XPL, FOV $\approx$ 2.6 mm.

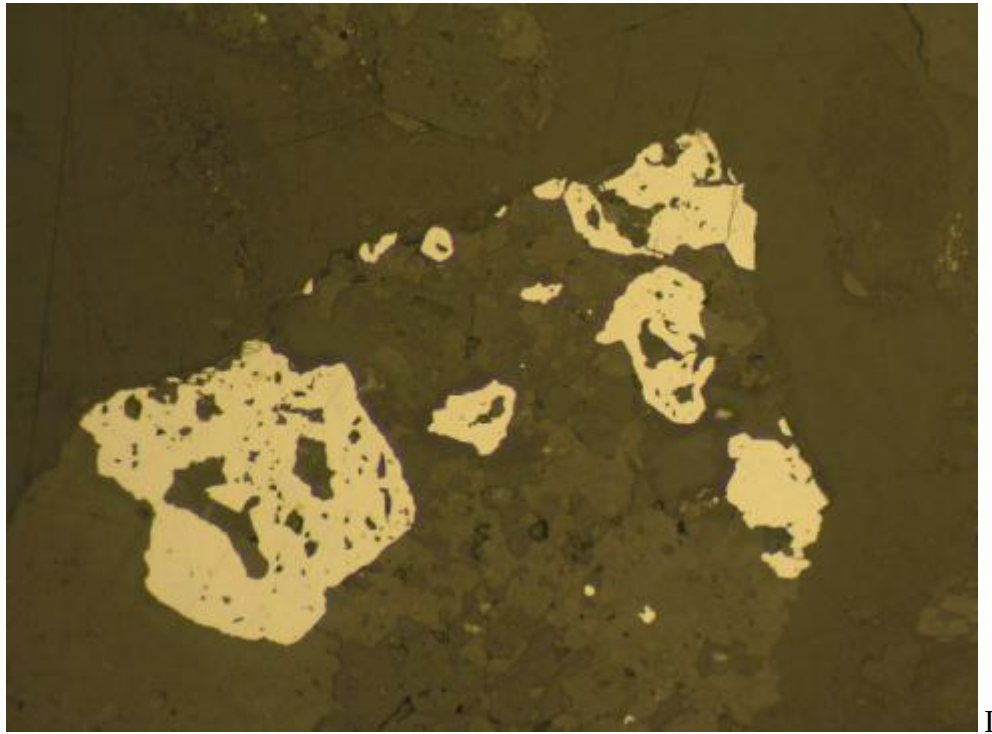


G



H

HC-55: G) Pyrite as disseminated and liberated grains. Traces of disseminated chalcopyrite. RL, FOV $\approx$ 2.6 mm.
H) Anhedral pyrite grains and traces of rutile within massive quartz-carbonate aggregate. RL, FOV $\approx$ 1.3 mm.



HC-55: I) White unknown grains within quartz-carbonate aggregate. RL, FOV $\approx$ 0.3 mm.

Statement of qualifications: Kathryn P.E. Dunne

I, Kathryn P.E. Dunne, of the City of Salmon Arm, province of British Columbia, do hereby certify that:

1. I am an independent consulting geologist, with a business office at 4610 Lakeshore Road NE, Salmon Arm, B.C., Canada. My business mailing address is: Bag 9000, # 207, 190B Trans Can Hwy NE, Salmon Arm, BC, V1E 1S3.
2. I am a graduate in geology, with a BSc in geology from The University of British Columbia (1985).
3. I received my Masters degree in geology from The University of British Columbia, Vancouver, B.C. in 1988.
4. I am a registered member of the Association of Professional Engineers and Geoscientists of the Province of British Columbia (No. 18674).
5. I am a fellow of the Geological Association of Canada and a member of the Society of Economic Geologists and Mineralogical Association of Canada.
6. I have practiced my profession as a geologist for approximately 21 years: 4 years as geologist with the British Columbia Geological Survey Branch, 3 years as research coordinator at the Mineral Deposit Research Unit housed within the Department of Earth and Ocean Sciences at the University of British Columbia, and 14 years as an independent consultant.
7. The petrographic data of this report was collected by me in January and February 2011.

.....
Kathryn P.E. Dunne, M.Sc., P.Geo.
Consulting Geologist
February 7, 2011

Appendix I5 – MLA Mineralogy for Humidity Cell Samples

NEWMONT MINING CORPORATION

**Semiquantitative Mineralogy by XRD and Sulfide
Characterization by MLA for Forty-three Ore and
Waste Composites from Various Sites in Hope Bay
undergoing Humidity Cell Testing**



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Memorandum

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210117, 210172, 210173

DATE: February 10, 2011

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SUBJECT: Semiquantitative Mineralogy by XRD and Sulfide Characterization by MLA for Forty-three Ore and Waste Composites from Various Sites in Hope Bay undergoing Humidity Cell Testing

SUMMARY

XRD (X-ray diffraction) and MLA (Mineral Liberation Analyzer) were used to characterize forty-four environmental composites from various sites in Hope Bay undergoing humidity cell testing. Samples were analyzed by XRD for bulk semiquantitative mineralogy and analyzed by MLA for characterization of any sulfides detected. MLA was able to detect trace amounts of sulfide, commonly unaccounted for by XRD due to detection limits, and supply mineral associations and free surface amounts from detected sulfides. MLA used the Extended Back-Scattered Electron (XBSE) method; an extended liberation analysis where back-scattered electron (BSE) images are collected and segmented based on a range of gray levels. A copper standard was used in establishing a gray scale due to the similar gray levels of the complex mixed gangue found in the samples. This elevated the contrast between gray levels optimizing the segmentation of gangue, which is necessary for a more accurate account of mineral association. Pyrite's (the predominate sulfide detected in most samples) particle size was given by percent passing values P_{50} (50% passing) and P_{80} (80% passing) in microns, ranging from 25-905 μ m; <1%-40% is the range of encapsulated pyrite. Pyrite's crystal morphology was classed as anhedral, subhedral, and euhedral; in addition pyrite particles were described as either coarse and/or fine-grained, whether there was dissemination in gangue, and whether particles had sieve texture.

INTRODUCTION

Forty-three ore and waste composites from different sites in Hope Bay undergoing humidity cell testing were submitted by C. Bucknam for identification of mineral content by XRD and sulfide characterization by MLA. Mineral weight percents, sulfide mineral associations, sulfide encapsulation, size and morphology of pyrite (the predominate sulfide detected in most of the

samples), calculated and measured assays, and back scattered electron images from MLA, are given for each composite.

DISCUSSION

Experimental

Analytic pulps of the samples were initially analyzed by XRD for semiquantitative mineralogy. Table I shows major and minor phases identified by XRD, with quantities determined by Rietveld refinement, whole pattern fitting, and based on chemical analyses. Table III shows measured chemical analyses used to aid XRD identifications, and to check XRD quantity estimates.

The samples were then analyzed by MLA (Mineral Liberation Analyzer), which uses a SEM (scanning electron microscope) with EDS (energy dispersive X-ray spectrometers) and automated quantitative mineralogy software, to detect trace minerals with a focus in characterizing sulfides. Five grams from each sample were mounted and slurried in epoxy, polished, and carbon-coated for MLA analysis. Most samples were analyzed at a ¼" mesh size (four samples were analytic pulps, -500 mesh) using the Extended Back-Scattered Electron (XBSE) measurement. MLA/XBSE is an extended liberation analysis where back-scattered electron (BSE) images are collected and segmented based on gray levels. An EDS spectrum is then collected for each segmented gray level image or "phase" and matched to a standards (mineral) list by pattern fitting.

Gold is commonly used as a standard to establish a gray level scale because of its brightness. Due to the similar gray levels of the complex mixed gangue found in the samples, copper was used to establish the gray scale. This elevated the contrast between gray levels which optimized the segmentation of gangue.

Data Analysis

Each sample is detailed with a brief description which includes the following:

- Major and minor minerals detected by XRD and MLA.
- Mineral weight percentages for any sulfide detected by MLA.
- Mineral associations of sulfides (≥ 0.01 wt%) detected by MLA.
- Encapsulation of sulfide quantities (≥ 0.01 wt%) determined by MLA.
- Particle size of pyrite, given by percent passing values P_{50} (50% passing) and P_{80} (80% passing), in microns.
- Pyrite's crystal morphology.

Mineral Content

XRD and MLA mineral weight percentages are given in a table for each sample (Table II contains MLA mineral weight % for all samples, Table V contains mineral key). The minerals are listed based on highest to lowest weight % by MLA, which were in accordance with XRD quantities for most samples. Sulfides detected by MLA are in bold. Calculated assays from MLA weight % for each sample are included in Table IV.

XRD and MLA shows the predominate gangue in these samples are silicates (quartz, albite, chlorite, muscovite/sericite, K-feldspar, and paragonite) and carbonates (ankerite, siderite, and calcite). XRD quantities of major and minor phases should be regarded when comparing with MLA's quantities for gangue; similar gray levels were still not fully segmented by MLA even though a Cu standard was used to optimize segmentation. XRD only detected pyrite when it was ~1% or higher, whereas trace amounts were detected by MLA.

There were eleven sulfide phases detected in this suite of samples: pyrite (FeS_2), chalcopyrite (CuFeS_2), gersdorffite ($(\text{Fe}, \text{Co}, \text{Ni})\text{AsS}$), pyrrhotite ($\text{Fe}_{(1-x)}\text{S}$), arsenopyrite (FeAsS), galena (PbS), cobaltite (CoAsS), millerite (NiS), sphalerite (ZnS), tetradymite ($\text{Bi}_2\text{Te}_2\text{S}$), and tetrahedrite (Cu_3SbS_3). Pyrite was the predominate sulfide followed by chalcopyrite.

Sulfide Mineral Associations

A table showing mineral associations was created for each sample, for any sulfides detected by MLA. The values represent the percentage of the periphery length in which a sulfide is associated (touching) with another phase. There is a "free surface" column which represents the percent of the sulfide that is exposed (touching epoxy). The last column in the table is "OTHER", this percentage represents the sum of phases which had <1% association with each sulfide detected in the sample.

Sulfide Encapsulation

A table showing sulfide encapsulation was created for each sample, for any sulfides detected by MLA. The values represent the percentage of sulfide that occurred in grains that were present in the following three categories:

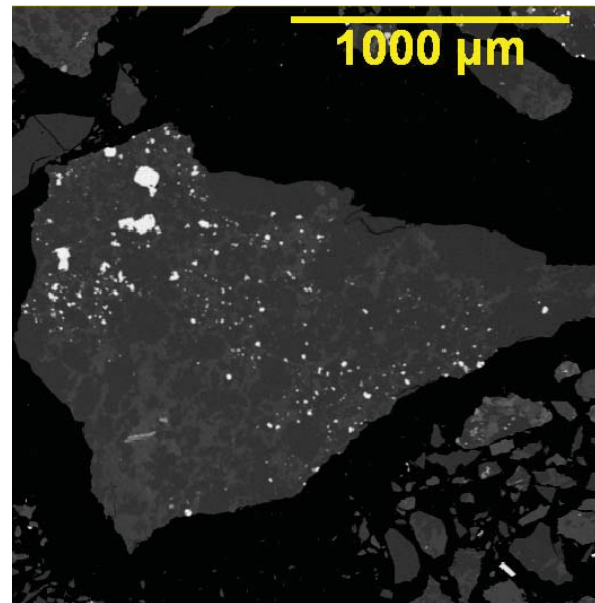
- 1) encapsulated (0% exposed)
- 2) liberated (100% exposed)
- 3) intermediate exposure ($0\% < x < 100\%$)

This can be useful for determining potential oxidation of sulfides. For example, it may be assumed that sulfide that was completely encapsulated will not oxidize, which could help explain disagreements between humidity cell test results and anticipated results based on sulfur chemical analyses. Encapsulation was based on two-dimensional images, which could be exaggerated due to possible exposure in the third dimension.

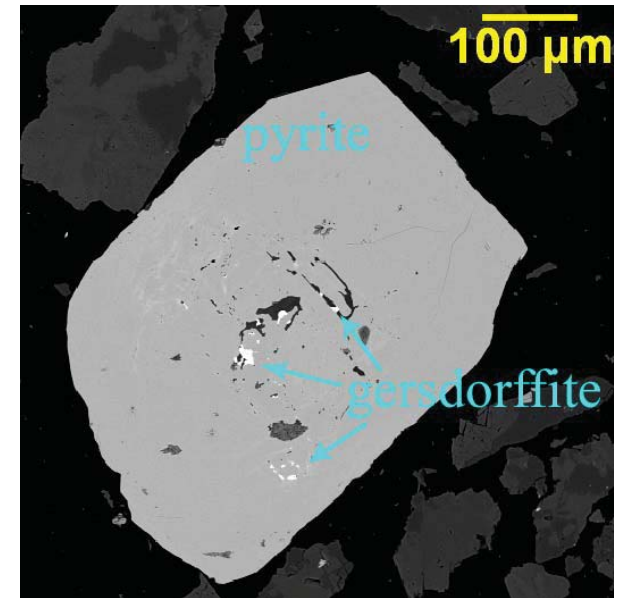
06PMD470, 217.03-218.7m (HC-20) - Predominately composed of ankerite, quartz, and albite. Lesser amounts of pyrite, muscovite/sericite, chlorite, and rutile were also detected. MLA measured a relatively high amount of pyrite (6.05%) along with trace amounts of gersdorffite (0.09%), chalcopyrite (<0.01%), and <0.001% cobaltite and pyrrhotite. Pyrite was mainly associated with ankerite (23%) and quartz (17%); 48% of pyrite had a free surface. Three percent of pyrite was encapsulated, 25% was liberated, and 72% had intermediate exposure. Pyrite had a P₅₀ and P₈₀ of 132µm and 247µm respectively. Pyrite's crystal morphology, displayed in images below, is mostly subhedral to euhedral, coarse to fine-grained with slight sieve texture. Gersdorffite was mainly associated with ankerite (37%), quartz (20%), and pyrite (16%); 12% of gersdorffite had a free surface. Forty-seven percent of gersdorffite was encapsulated, 6% was liberated, and 47% had intermediate exposure. An image of subhedral pyrite with gersdorffite inclusions is displayed in right image below.

Mineral Weight %

Mineral	MLA	XRD
	Wt%	Wt%
Ankerite	43.57	45
Quartz	38.49	38
Albite	8.26	11
Pyrite	6.05	4
Chlorite	1.97	<1
Muscovite	0.40	2
Rutile	0.36	<1
Amphibole	0.23	
Ilmenite	0.19	
Gersdorffite	0.09	
Kspar	0.09	
Chromite	0.08	
Apatite	0.06	
Biotite	0.04	
Siderite	0.04	
Paragonite	0.03	
Epidote	0.01	
Calcite	<0.01	
Chalcopyrite	<0.01	
Monazite	<0.01	
Sphene	<0.01	
Tourmaline	<0.01	
Anhydrite	<0.001	
Cobaltite	<0.001	
Gold	<0.001	
Iron	<0.001	
Pyrophyllite	<0.001	
Pyrrhotite	<0.001	



BSE image of bright coarse and fine-grained pyrite in an ankerite (light gray) and quartz (dark gray) particle.



BSE image of very bright gersdorffite inclusions in light gray subhedral pyrite with sieve texture.

Sulfide Mineral Associations

MINERAL	Albite	Amphibole	Ankerite	Chlorite	Gersdorffite	Muscovite	Pyrite	Quartz	Free Surface	OTHER
Chalcopyrite	4.04	2.97	24.41	9.31	1.18	3.60	32.31	8.99	12.44	0.76
Cobaltite	0.00	0.00	27.91	0.00	0.00	0.00	0.00	20.65	51.44	0.00
Gersdorffite	6.76	0.31	37.05	3.26	0.00	2.53	16.29	19.87	11.79	2.16
Pyrite	7.63	0.03	22.60	1.08	1.12	0.98	0.00	17.10	48.12	1.35
Pyrrhotite	1.09	0.00	3.75	0.00	0.00	0.00	16.57	18.80	59.79	0.00

Sulfide Exposure

Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	32.37	65.67	1.96
Cobaltite	25.93	0.00	74.07
Gersdorffite	46.91	46.83	6.26
Pyrite	3.18	71.93	24.90
Pyrrhotite	3.09	62.65	34.26

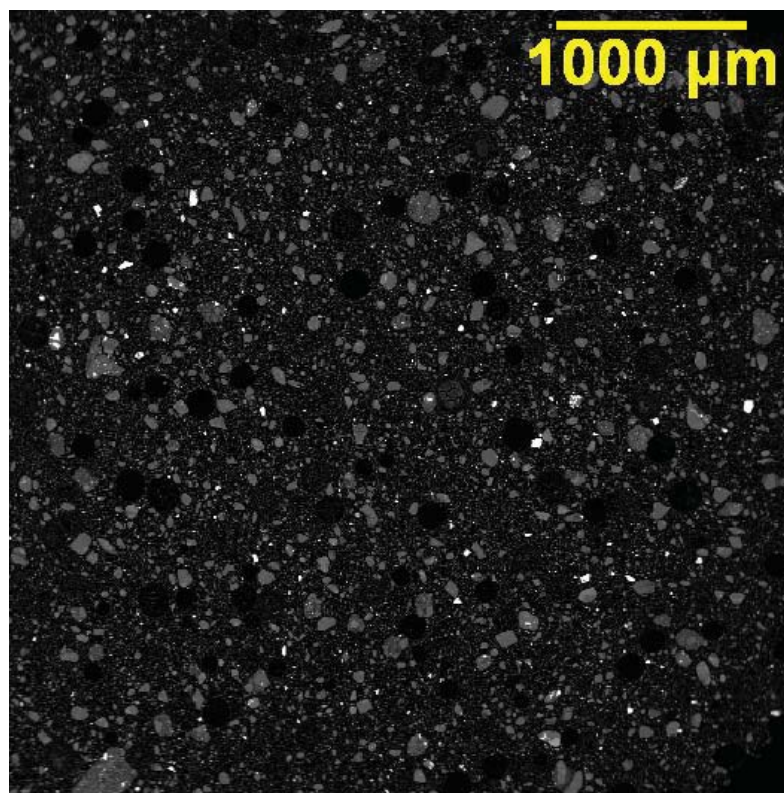
Pyrite Particle Size by Percent Passing

P-value	µm
P50	132.34
P80	247.34

07PMD542, 104.15-105.29m (HC-21) - Predominately composed of albite, muscovite/sericite, quartz, and ankerite. Lesser amounts of pyrite, chlorite, and rutile were also detected. MLA measured a relatively high amount of pyrite (9.35%), almost double of what XRD detected; based on total sulfur amount (3.54%) from chemical analyses pyrite weight percent should be ~7%. Sulfide mineral associations and sulfide exposure parameters were not included for this sample because most particles have been liberated due to pulverization. The image below shows pulverized sample with liberated grains of gangue and sulfides.

Mineral Weight %

Mineral	MLA	XRD
	Wt%	Wt%
Muscovite	26.35	24
Quartz	22.93	20
Albite	22.26	27
Ankerite	14.20	20
Pyrite	9.35	5
Chlorite	1.89	3
Kspar	0.75	
Paragonite	0.65	
Apatite	0.52	
Ilmenite	0.34	
Rutile	0.23	1
Epidote	0.16	
Tourmaline	0.08	
Amphibole	0.07	
Calcite	0.05	
Pyrrhotite	0.04	
Pyrophyllite	0.03	
Biotite	0.02	
Chalcopyrite	0.02	
Iron	0.02	
Monazite	0.02	
Barite	<0.01	
Chromite	<0.01	
FeClay	<0.01	
Siderite	<0.01	
Sphalerite	<0.01	
Sphene	<0.01	
Cobaltite	<0.001	
Xenotime	<0.001	



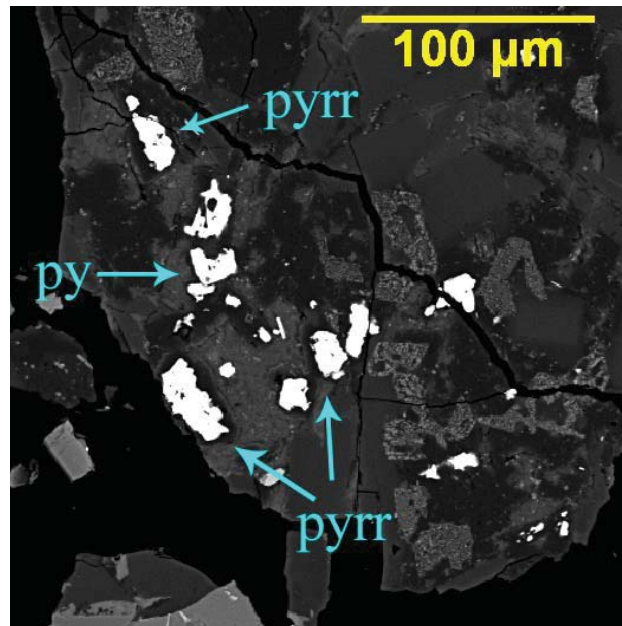
Low magnification BSE image of pulverized sample. Bright gray particles are sulfides and darker gray particles are gangue. Black spheres are holes in the epoxy formed by air bubbles during sample mounting.

06PMD470, 371.05-376.28m (HC-22) - Predominately composed of diopside and plagioclase (albite, andesine). Lesser amounts of chlorite, quartz, titanomagnetite, and ankerite were also detected. MLA measured trace amounts of chalcopyrite (0.06%), pyrrhotite (0.03%), pyrite (0.02%), and <0.001% tetrahedrite. Pyrite was mainly associated with albite (22%) and chlorite (18%); 17% of pyrite had a free surface. Thirty-four percent of pyrite was encapsulated, 21% was liberated, and 45% had intermediate exposure. Pyrite had a P₅₀ and P₈₀ of 10µm and 16µm respectively. Pyrite's crystal morphology, displayed in left image below, is mostly anhedral and fine-grained. Chalcopyrite was mainly associated with diopside (30%) and albite (20%); 11% of chalcopyrite had a free surface. Sixty-seven percent of chalcopyrite was encapsulated, 5% was liberated, and 28% had intermediate exposure. Pyrrhotite (also displayed in left image below) was mainly associated with chlorite (30%) and albite (14%); 23% of pyrrhotite had a free surface. Three of pyrrhotite was encapsulated, 6% was liberated, and 91% had intermediate exposure. MLA detected titanium-rich magnetite (titanomagnetite), shown in the right image below.

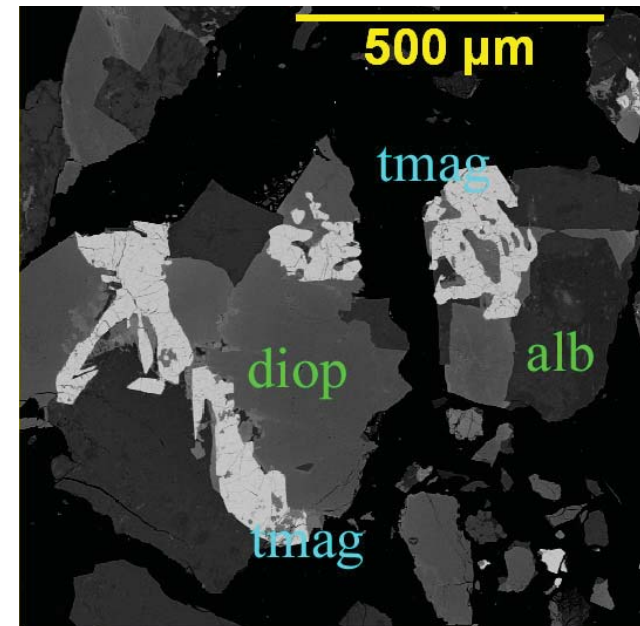
Mineral Weight %

Mineral	MLA	XRD
	Wt%	Wt%
Diopside	40.18	40
Albite	25.92	45
Andesine	12.64	
Titanomagnetite	5.34	2*
Chlorite	4.69	8
Epidote	3.51	
Quartz	3.03	3
Calcite	0.89	
Ankerite	0.86	1
Kspar	0.86	
Amphibole	0.64	
Biotite	0.55	
Sphene	0.32	
Ilmenite	0.29	
Apatite	0.08	
Chalcopyrite	0.06	
Paragonite	0.04	
Pyrrhotite	0.03	
Tourmaline	0.03	
Pyrite	0.02	
Hematite	<0.01	
Iron	<0.01	
Olivine	<0.01	
Rutile	<0.01	
Siderite	<0.01	
Gold	<0.001	
Monazite	<0.001	
Tetrahedrite	<0.001	
Zircon	<0.001	

*Titanomagnetite was quantified as magnetite by XRD



BSE image of bright anhedral pyrite (py) and pyrrhotite (pyrr) in mixed gangue of epidote, quartz, chlorite, and albite.



BSE image of bright titanomagnetite (tmag) in light gray diopside (diop) and dark gray albite (alb) mixed particles.

Sulfide Mineral Associations

MINERAL	Albite	Andesine	Ankerite	Biotite	Calcite	Chalcopyrite	Chlorite	Diopside	Epidote	Kspar	Pyrite	Pyrrhotite	Quartz	Titanomagnetite	Free Surface	OTHER
Chalcopyrite	19.89	11.78	1.24	2.24	1.14	0.00	8.15	30.09	1.33	1.19	0.51	0.10	5.99	3.57	10.97	1.81
Pyrite	21.72	5.77	1.27	0.43	0.87	1.05	17.63	19.42	2.47	0.26	0.00	2.85	6.38	1.68	17.06	1.14
Pyrrhotite	14.25	5.49	0.11	0.42	1.64	0.28	29.64	4.88	1.03	0.24	3.78	0.00	14.18	1.25	22.75	0.04
Tetrahedrite	22.80	0.00	0.00	0.00	0.00	32.16	0.00	37.21	0.00	0.00	0.00	0.00	0.00	0.00	7.83	0.00

Sulfide Exposure

Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	67.28	28.17	4.55
Pyrite	33.99	45.21	20.80
Pyrrhotite	3.33	90.60	6.07
Tetrahedrite	94.12	2.75	3.14

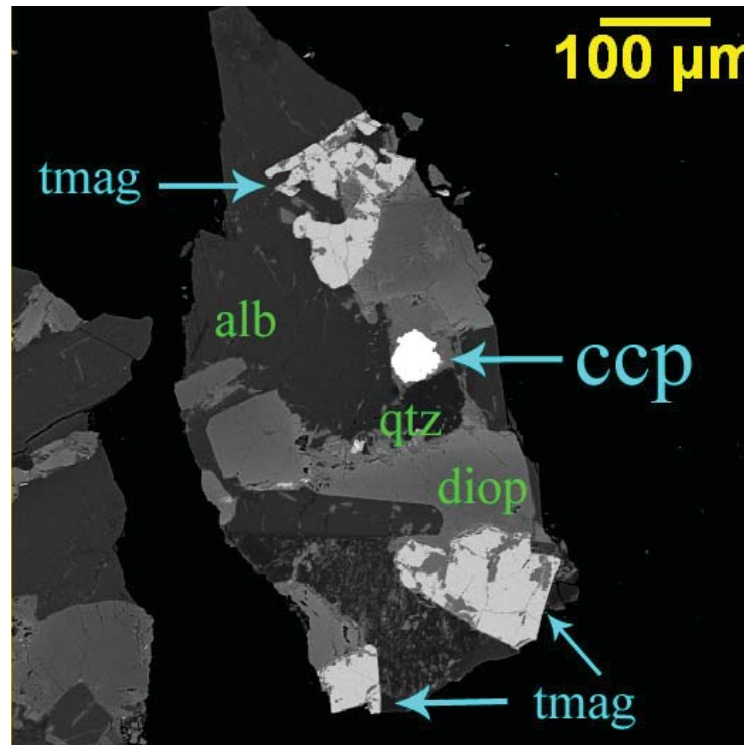
Pyrite Particle Size by Percent Passing

P-value	µm
P50	9.88
P80	16.03

07PMD542, 73.28-77m (HC-23) - Predominately composed of plagioclase (albite, andesine) and diopside. Lesser amounts of chlorite, quartz, titanomagnetite, and ankerite were also detected. MLA detected major amounts of diopside (38.08%) compared to XRD (18%) due to difficulties segmenting similar gray level phases, which is most likely the reason for lower MLA quantities of plagioclase compared to XRD. MLA measured trace amounts of chalcopyrite (0.06%), <0.01% pyrite and pyrrhotite, and <0.001% tetrahedrite. Chalcopyrite was mainly associated with diopside (30%) and albite (19%); 9% of chalcopyrite had a free surface. Sixty-seven percent of chalcopyrite was encapsulated, 3% was liberated, and 30% had intermediate exposure. Pyrite was mainly associated with diopside (18%) and chlorite (15%); 31% of pyrite had a free surface. Forty percent of pyrite was encapsulated, 37% was liberated, and 22% had intermediate exposure. Pyrite had a P₅₀ and P₈₀ of 9µm and 16µm respectively. MLA detected titanium-rich magnetite (titanomagnetite), shown in the image below.

Mineral Weight %		
Mineral	MLA Wt%	XRD Wt%
Diopside	38.08	18
Albite	24.30	63
Andesine	13.11	
Chlorite	9.78	8
Titanomagnetite	5.73	5*
Quartz	3.29	2
Epidote	3.14	
Ankerite	0.64	4
Biotite	0.62	
Calcite	0.47	
Ilmenite	0.28	
Sphene	0.22	
Apatite	0.09	
Chalcopyrite	0.06	
Hematite	0.06	
Siderite	0.05	
Tourmaline	0.03	
Chromite	0.02	
Kspar	0.02	
Olivine	<0.01	
Pyrite	<0.01	
Pyrrhotite	<0.01	
Enstatite	<0.001	
FeClay	<0.001	
Monazite	<0.001	
Paragonite	<0.001	
Rutile	<0.001	
Tetrahedrite	<0.001	
Zircon	<0.001	

*Titanomagnetite was quantified as magnetite by XRD



BSE image of bright chalcopyrite grain (ccp) and light grey titanomagnetite (tmg) in a diopside (diop) and albite (alb) mixed particle.

Sulfide Mineral Associations

MINERAL	Albite	Andesine	Ankerite	Biotite	Calcite	Chalcopyrite	Chlorite	Diopside	Pyrite	Pyrrhotite	Quartz	Titanomagnetite	Free Surface	OTHER
Chalcopyrite	18.92	9.45	0.96	2.31	0.39	0.00	11.26	29.76	0.15	0.24	11.49	5.00	8.84	1.23
Pyrite	9.28	5.97	1.23	3.38	2.23	1.14	15.12	17.92	0.00	4.00	5.30	1.29	31.19	1.96
Pyrrhotite	11.65	1.10	24.38	0.00	18.73	2.31	14.07	7.62	5.17	0.00	4.87	0.00	10.10	0.00
Tetrahedrite	14.54	31.29	0.00	6.92	0.00	7.13	0.00	23.61	0.00	0.00	16.52	0.00	0.00	0.00

Sulfide Exposure

Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	66.68	30.25	3.07
Pyrite	40.40	22.22	37.39
Pyrrhotite	73.60	22.13	4.27
Tetrahedrite	100.00	0.00	0.00

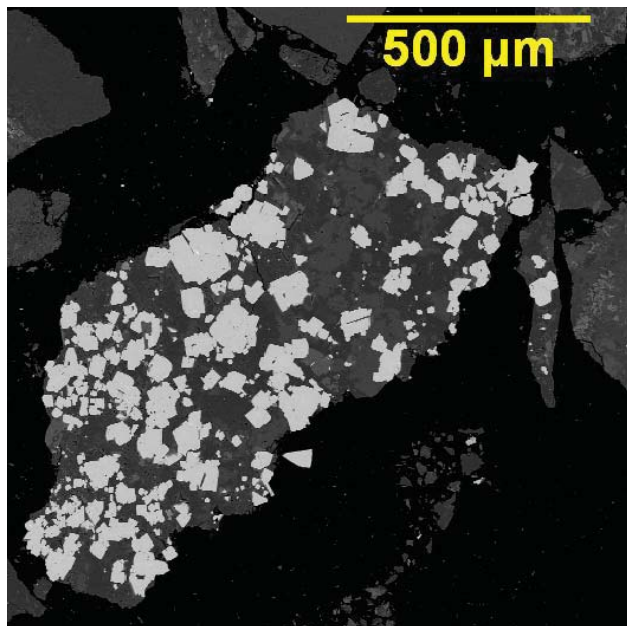
Pyrite Particle Size by Percent Passing

P-value	µm
P50	8.67
P80	16.21

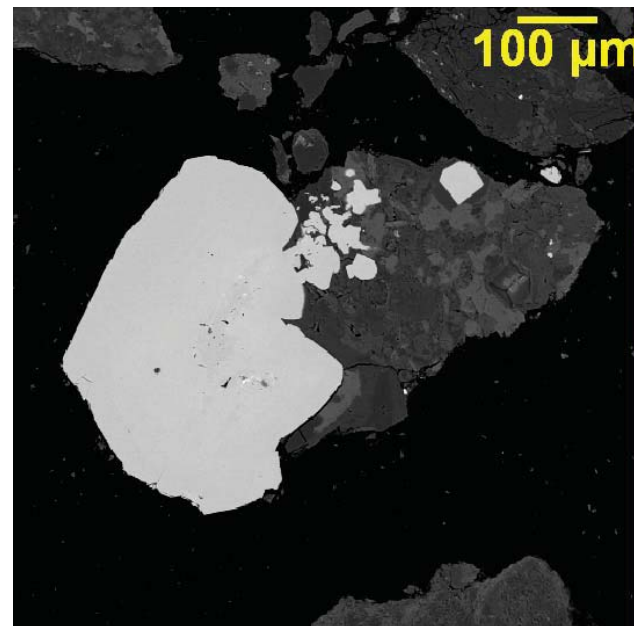
06PMD484, 224.5-226.5m (HC-24) - Predominately composed of ankerite, albite, quartz, and chlorite. MLA detected 17% muscovite/sericite which is in close agreement with the K values (1.4-2.0%) from chemical analyses. Lesser amounts of pyrite, and rutile were also detected. MLA measured minor amounts of pyrite (3.69%) along with trace amounts of chalcopyrite (0.03%), gersdorffite (0.03%), and <0.001% cobaltite, pyrrhotite and sphalerite. Pyrite was mainly associated with ankerite (18%), muscovite/sericite (17%), chlorite (11%), and quartz (10%); 28% of pyrite had a free surface. Three percent of pyrite was encapsulated, 14% was liberated, and 83% had intermediate exposure. Pyrite had a P₅₀ and P₈₀ of 125µm and 301µm respectively. Pyrite's crystal morphology, displayed in images below, is mostly subhedral to euhedral, coarse to fine-grained with sieve texture. Chalcopyrite was mainly associated with ankerite (26%) and chlorite (17%); 18% of chalcopyrite had a free surface. Forty-five percent of chalcopyrite was encapsulated, 6% was liberated, and 49% had intermediate exposure. Gersdorffite was mainly associated with muscovite/sericite (23%), chlorite (22%) and ankerite (17%); 10% of gersdorffite had a free surface. Seventy percent of gersdorffite was encapsulated, 3% was liberated, and 28% had intermediate exposure.

Mineral Weight %

Mineral	MLA Wt%	XRD Wt%
Ankerite	41.14	45
Muscovite	16.68	9
Quartz	12.06	15
Albite	11.52	15
Chlorite	10.62	12
Pyrite	3.69	3
Kspar	2.53	
Amphibole	0.39	
Rutile	0.38	1
Ilmenite	0.26	
Epidote	0.22	
Biotite	0.16	
Paragonite	0.10	
Calcite	0.08	
Apatite	0.05	
Chalcopyrite	0.03	
Chromite	0.03	
Gersdorffite	0.03	
Tourmaline	0.02	
Monazite	<0.01	
Siderite	<0.01	
Sphene	<0.01	
Xenotime	<0.01	
Cobaltite	<0.001	
FeClay	<0.001	
Gold	<0.001	
Pyrophyllite	<0.001	
Pyrrhotite	<0.001	
Sphalerite	<0.001	



BSE image of bright coarse and fine-grained euhedral pyrite in an ankerite (light gray) and muscovite/sericite (dark gray) particle.



BSE image of bright subhedral/euhedral pyrite in a chlorite (light gray) and muscovite/sericite (dark gray) particle.

Sulfide Mineral Associations

MINERAL	Albite	Ankerite	Chalcopyrite	Chlorite	Gersdorffite	Kspar	Muscovite	Pyrite	Quartz	Free Surface	OTHER
Chalcopyrite	2.60	26.46	0.00	16.64	5.65	0.42	7.31	10.36	10.64	18.08	1.83
Cobaltite	0.00	20.29	2.10	35.78	0.00	0.00	0.00	0.00	41.82	0.00	0.00
Gersdorffite	5.72	16.75	5.98	22.17	0.00	1.63	23.48	5.97	7.03	10.19	1.08
Pyrite	10.73	18.01	0.21	10.99	0.12	3.26	16.91	0.00	9.94	28.20	1.63
Pyrrhotite	9.06	0.00	0.00	7.58	0.00	0.00	4.88	35.04	2.29	41.15	0.00
Sphalerite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00

Sulfide Exposure

Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	45.42	48.69	5.89
Cobaltite	100.00	0.00	0.00
Gersdorffite	69.38	27.70	2.92
Pyrite	2.98	83.13	13.89
Pyrrhotite	23.99	70.95	5.07
Sphalerite	100.00	0.00	0.00

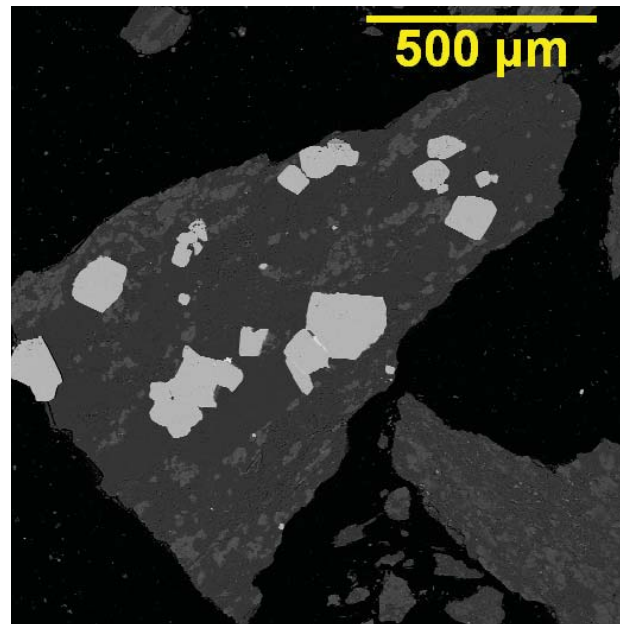
Pyrite Particle Size by Percent Passing

P-value	µm
P50	125.15
P80	300.75

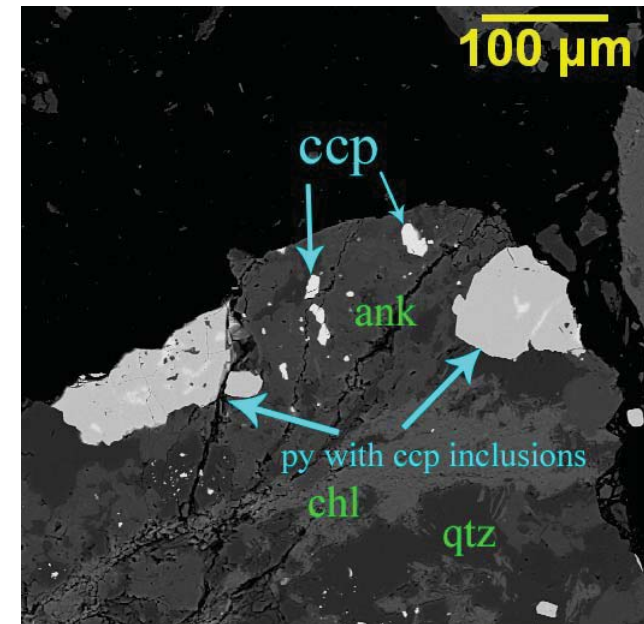
07PMD552, 58.5-72m (HC-25) - Predominately composed of ankerite, quartz, and muscovite/sericite. Lesser amounts of paragonite, chlorite, albite, and rutile were also detected. MLA measured trace amounts of pyrite (0.97%), chalcopyrite (0.03%), 0.01% cobaltite and gersdorffite, <0.01% millerite, and <0.001% pyrrhotite and sphalerite. Pyrite was mainly associated with muscovite/sericite (25%) and quartz (16%); 19% of pyrite had a free surface. Seven percent of pyrite was encapsulated, 9% was liberated, and 84% had intermediate exposure. Pyrite had a P_{50} and P_{80} of 91 μ m and 169 μ m respectively. Pyrite's crystal morphology, displayed in images below, is mostly anhedral to subhedral, coarse grained with sieve texture. Chalcopyrite was mainly associated with pyrite (24%) and quartz (21%); 12% of chalcopyrite had a free surface. Fifty-two percent of chalcopyrite was encapsulated, 4% was liberated, and 44% had intermediate exposure. Gersdorffite and cobaltite were mainly associated with muscovite/sericite (21-27%); 12% of gersdorffite and 5% of cobaltite had a free surface. Thirty-seven percent of gersdorffite was encapsulated, 3% was liberated, and 60% had intermediate exposure. Eighty-three percent of cobaltite was encapsulated, 1% was liberated, and 15% had intermediate exposure.

Mineral Weight %

Mineral	MLA	XRD
	Wt%	Wt%
Ankerite	24.18	31
Muscovite	21.26	16
Albite	19.31	10
Quartz	13.72	19
Paragonite	11.52	11
Chlorite	6.31	11
Kspar	1.47	
Pyrite	0.97	
Epidote	0.53	
Tourmaline	0.28	
Amphibole	0.13	
Calcite	0.08	
Rutile	0.07	1
Ilmenite	0.05	
Apatite	0.04	
Chalcopyrite	0.03	
Biotite	0.02	
Cobaltite	0.01	
Gersdorffite	0.01	
Millerite	<0.01	
Monazite	<0.01	
Pyrophyllite	<0.01	
Siderite	<0.01	
Chromite	<0.001	
Enstatite	<0.001	
FeClay	<0.001	
Iron	<0.001	
Magnetite	<0.001	
Pyrrhotite	<0.001	
Sphalerite	<0.001	
Sphene	<0.001	
Xenotime	<0.001	



BSE image of bright subhedral/euhedral pyrite grains in an ankerite (light gray) and albite (dark gray) particle.



BSE image of very bright chalcopyrite grains encapsulated in bright gray pyrite found in mixed gangue (ankerite-ank, chlorite-chl, and quartz-qtz).

Sulfide Mineral Associations

MINERAL	Albite	Ankerite	Chalcopyrite	Chlorite	Cobaltite	Gersdorffite	Kspar	Millerite	Muscovite	Paragonite	Pyrite	Quartz	Siderite	Free Surface	OTHER
Chalcopyrite	6.13	15.33	0.00	6.48	0.26	0.15	0.66	0.85	8.34	3.58	24.25	20.81	0.49	12.10	0.57
Cobaltite	10.44	16.67	0.98	4.45	0.00	7.29	1.19	1.12	20.70	12.43	12.16	7.20	0.00	4.77	0.60
Gersdorffite	11.35	7.87	0.36	5.31	4.80	0.00	5.04	1.96	26.77	9.56	8.58	5.67	0.00	12.32	0.41
Millerite	10.12	17.35	6.11	1.80	2.15	5.73	0.00	0.00	19.75	0.84	18.79	14.73	0.00	2.62	0.00
Pyrite	11.33	11.00	1.94	1.84	0.26	0.28	1.29	0.21	24.90	10.92	0.00	15.87	0.02	19.26	0.88
Pyrrhotite	0.00	13.97	0.00	3.09	0.00	0.00	0.00	0.00	0.00	3.33	54.15	9.96	1.55	13.94	0.00
Sphalerite	24.62	43.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.44	0.00	0.00	0.00

Sulfide Exposure

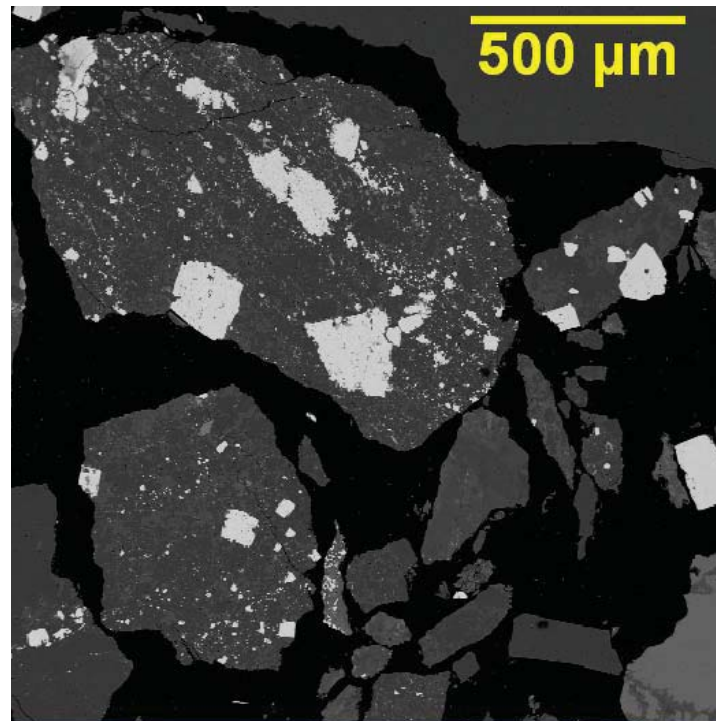
Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	52.36	43.89	3.75
Cobaltite	83.32	15.40	1.28
Gersdorffite	36.64	60.03	3.33
Millerite	84.67	14.83	0.50
Pyrite	7.32	83.77	8.90
Pyrrhotite	6.59	73.08	20.33
Sphalerite	100.00	0.00	0.00

Pyrite Particle Size by Percent Passing

P-value	µm
P50	90.70
P80	169.39

07PMD522, 27-38m (HC-26) - Predominately composed of ankerite, quartz, and albite. Lesser amounts of chlorite, pyrite, and rutile were also detected. MLA measured relatively high amounts of pyrite (6.61%), which is in agreement with XRD and chemical analyses. Also detected were trace amounts of gersdorffite (0.02%), chalcopyrite (0.01%), and <0.001% galena and pyrrhotite. Pyrite was mainly associated with albite (30%) and ankerite (28%); 20% of pyrite had a free surface. One percent of pyrite was encapsulated, 8% was liberated, and 91% had intermediate exposure. Pyrite had a P₅₀ and P₈₀ of 102µm and 192µm respectively. Pyrite's crystal morphology, displayed in image below, is anhedral to euhedral, coarse to fine-grained with sieve texture. Disseminated pyrite is common in gangue. Gersdorffite was mainly associated with ankerite (39%) and chlorite (31%); 9% of gersdorffite had a free surface. Thirty-four percent of gersdorffite was encapsulated, 3% was liberated, and 63% had intermediate exposure. Chalcopyrite was mainly associated with albite (34%) and ankerite (21%); 15% of chalcopyrite had a free surface. Twenty-four percent of chalcopyrite was encapsulated, 7% was liberated, and 68% had intermediate exposure.

Mineral Weight %		
	MLA	XRD
Mineral	Wt%	Wt%
Ankerite	35.86	35
Quartz	25.91	24
Albite	22.19	23
Chlorite	7.79	9
Pyrite	6.61	7
Muscovite	0.56	
Ilmenite	0.33	
Rutile	0.28	2
Apatite	0.20	
Kspar	0.11	
Chromite	0.05	
Amphibole	0.02	
Gersdorffite	0.02	
Siderite	0.02	
Chalcopyrite	0.01	
Tourmaline	0.01	
Biotite	<0.01	
Calcite	<0.01	
Epidote	<0.01	
Monazite	<0.01	
Paragonite	<0.01	
Sphene	<0.01	
FeClay	<0.001	
Galena	<0.001	
Gold	<0.001	
Magnetite	<0.001	
Pyrophyllite	<0.001	
Pyrrhotite	<0.001	
Xenotime	<0.001	



BSE image of bright coarse-grained euhedral pyrite and fine-grained anhedral pyrite disseminated in mixed gangue (albite and ankerite).

Sulfide Mineral Associations

MINERAL	Albite	Ankerite	Chlorite	Gersdorffite	Muscovite	Pyrite	Quartz	Rutile	Free Surface	OTHER
Chalcopyrite	34.31	21.55	5.26	1.25	1.66	15.35	4.65	0.36	14.78	0.85
Galena	0.00	0.00	0.00	0.00	0.00	77.92	15.99	0.00	6.09	0.00
Gersdorffite	1.83	38.85	31.35	0.00	0.00	7.59	7.81	1.49	8.97	2.11
Pyrite	30.01	27.56	8.91	0.06	1.83	0.00	9.48	0.53	19.85	1.77
Pyrrhotite	29.72	11.20	0.00	0.00	0.00	35.18	1.64	0.00	22.26	0.00

Sulfide Exposure

Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	23.93	68.43	7.64
Galena	89.19	10.81	0.00
Gersdorffite	33.71	63.00	3.29
Pyrite	1.00	91.08	7.92
Pyrrhotite	81.13	11.32	7.55

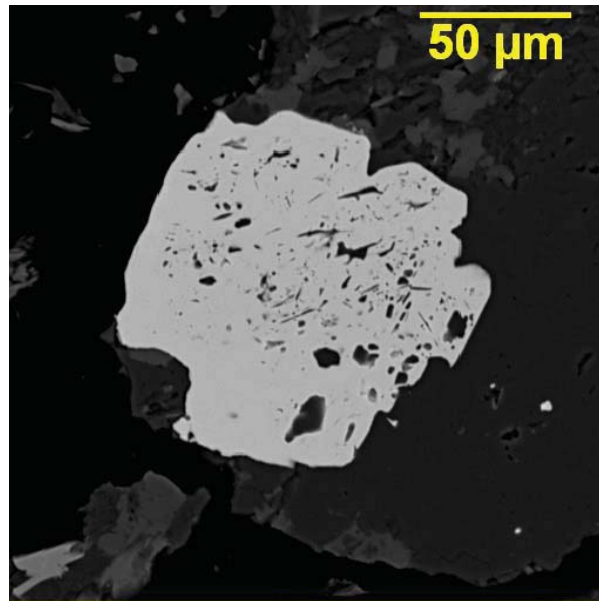
Pyrite Particle Size by Percent Passing

P-value	µm
P50	102.30
P80	192.10

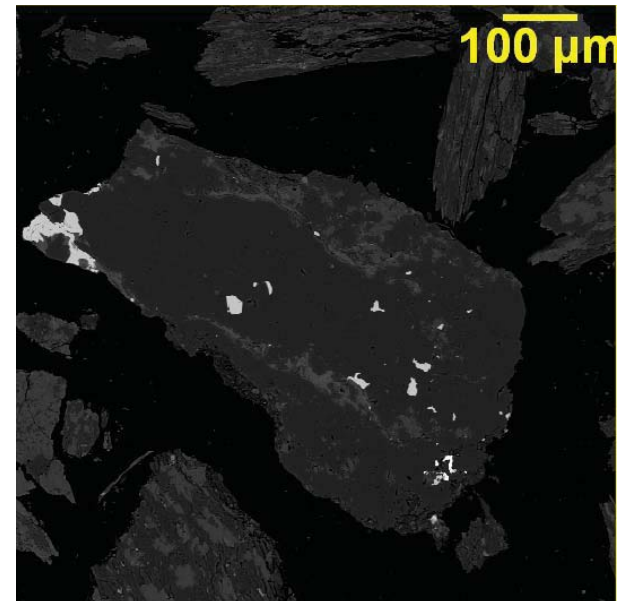
07PMD522, 126-136.5m (HC-27) - Predominately composed of ankerite, paragonite, quartz, and chlorite. Albite detected by MLA was most likely exaggerated in the expense of other gangue minerals due to difficulty in segmenting phases with similar gray levels. Lesser amounts of calcite were also detected. MLA measured trace amounts of pyrite (0.14%), chalcopyrite (0.03%), gersdorffite (0.01%), and <0.01% cobaltite and sphalerite. Pyrite was mainly associated with quartz (17%), ankerite (14%), and paragonite (13%); 37% of pyrite had a free surface. Ten percent of pyrite was encapsulated, 36% was liberated, and 54% had intermediate exposure. Pyrite had a P_{50} and P_{80} of 82 μ m and 147 μ m respectively. Pyrite's crystal morphology, displayed in left image below, is mostly subhedral, coarse grained with sieve texture. Chalcopyrite (displayed in right image below) was mainly associated with quartz (28%) and ankerite (11%); 35% of chalcopyrite had a free surface. Twenty-eight percent of chalcopyrite was encapsulated, 15% was liberated, and 56% had intermediate exposure. Gersdorffite was mainly associated with paragonite (28%) and quartz (21%); 14% of gersdorffite had a free surface. Thirty-one percent of gersdorffite was encapsulated, <1% was liberated, and 68% had intermediate exposure.

Mineral Weight %

Mineral	MLA	XRD
	Wt%	Wt%
Ankerite	24.25	30
Paragonite	23.27	24
Quartz	20.93	26
Albite	13.48	
Chlorite	7.17	17
Muscovite	4.27	
Tourmaline	2.83	
Calcite	2.42	2
Epidote	0.57	
Amphibole	0.44	
Pyrite	0.14	<1
Apatite	0.06	
Rutile	0.06	
Chalcopyrite	0.03	
Ilmenite	0.03	
Gersdorffite	0.01	
Pyrophyllite	0.01	
Chromite	<0.01	
Cobaltite	<0.01	
FeClay	<0.01	
Iron	<0.01	
Monazite	<0.01	
Siderite	<0.01	
Sphalerite	<0.01	
Biotite	<0.001	
Enstatite	<0.001	
Kspar	<0.001	
Sphene	<0.001	
Xenotime	<0.001	



BSE image of bright subhedral pyrite with sieve texture in dark gray quartz.



BSE image of bright chalcopyrite grains in a chlorite (light gray) and quartz (dark gray) particle.

Sulfide Mineral Associations

MINERAL	Albite	Ankerite	Calcite	Chlorite	Muscovite	Paragonite	Pyrite	Quartz	Tourmaline	Free Surface	OTHER
Chalcopyrite	4.82	10.92	2.23	6.23	2.22	8.02	0.94	27.74	1.40	34.86	0.62
Cobaltite	15.84	4.53	0.00	4.53	6.31	17.33	0.00	27.46	0.40	23.59	0.00
Gersdorffite	7.31	13.83	0.00	8.65	2.85	27.79	0.00	21.37	4.53	13.58	0.09
Pyrite	5.95	13.69	1.23	6.40	2.44	12.95	0.00	16.84	2.32	37.13	1.05
Sphalerite	0.00	3.65	7.01	11.59	0.82	0.00	1.56	25.35	0.00	50.02	0.00

Sulfide Exposure

Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	28.33	56.22	15.45
Cobaltite	62.02	5.85	32.13
Gersdorffite	31.40	68.14	0.47
Pyrite	10.23	53.52	36.24
Sphalerite	38.35	37.27	24.38

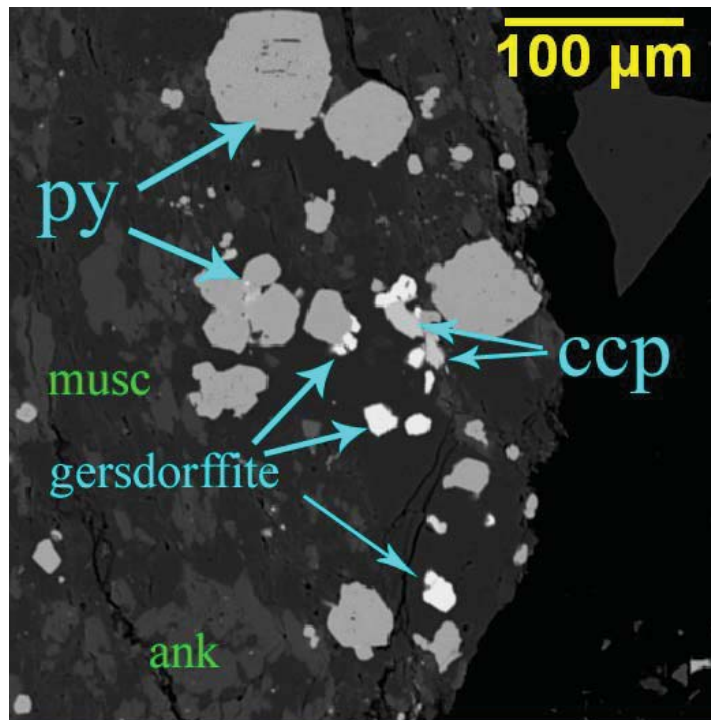
Pyrite Particle Size by Percent Passing

P-value	µm
P50	82.19
P80	147.08

06PMD470, 85-88m (HC-28) - Predominately composed of ankerite, albite, quartz, chlorite, and muscovite/sericite. Lesser amounts pyrite and rutile were also detected. MLA measured minor amounts of pyrite (3.63%) along with trace amounts of gersdorffite (0.02%), chalcopyrite (0.01%), and <0.001% cobaltite, pyrrhotite and sphalerite. Pyrite was mainly associated with albite (21%), muscovite/sericite (18%), and ankerite (15%); 26% of pyrite had a free surface. Three percent of pyrite was encapsulated, 12% was liberated, and 84% had intermediate exposure. Pyrite had a P_{50} and P_{80} of 98 μ m and 257 μ m respectively. Pyrite's crystal morphology, displayed in image below, is subhedral to euhedral, coarse to fine-grained with some sieve texture. Gersdorffite was mainly associated with muscovite/sericite (41%); 9% of gersdorffite had a free surface. Seventy-nine percent of gersdorffite was encapsulated, 6% was liberated, and 15% had intermediate exposure. Chalcopyrite was mainly associated with albite (23%) and pyrite (20%); 14% of chalcopyrite had a free surface. Seventy percent of chalcopyrite was encapsulated, 8% was liberated, and 22% had intermediate exposure.

Mineral Weight %

Mineral	MLA Wt%	XRD Wt%
Ankerite	31.45	35
Albite	22.61	25
Muscovite	17.79	11
Quartz	10.56	13
Chlorite	10.52	13
Pyrite	3.63	3
Paragonite	2.27	
Tourmaline	0.44	
Epidote	0.15	
Ilmenite	0.12	
Amphibole	0.10	
Rutile	0.10	<1
Apatite	0.08	
Kspar	0.07	
Calcite	0.04	
Gersdorffite	0.02	
Chalcopyrite	0.01	
Biotite	<0.01	
Monazite	<0.01	
Siderite	<0.01	
Xenotime	<0.01	
Chromite	<0.001	
Cobaltite	<0.001	
Electrum	<0.001	
FeClay	<0.001	
Gold	<0.001	
Iron	<0.001	
Pyrophyllite	<0.001	
Pyrrhotite	<0.001	
Sphalerite	<0.001	
Sphene	<0.001	



BSE image of white gersdorffite, bright gray chalcopyrite (ccp), and light gray subhedral/euhedral pyrite grains encapsulated in muscovite/sericite (musc, dark gray) and ankerite (ank, medium gray).

Sulfide Mineral Associations

MINERAL	Albite	Ankerite	Chalcopyrite	Chlorite	Gersdorffite	Muscovite	Paragonite	Pyrite	Quartz	Free Surface	OTHER
Chalcopyrite	23.39	12.85	0.00	7.56	4.22	12.64	0.00	19.86	3.90	14.45	1.14
Cobaltite	12.94	0.00	0.00	48.91	0.00	5.27	0.00	0.00	19.53	13.35	0.00
Gersdorffite	13.76	11.36	3.16	5.87	0.00	40.50	0.88	7.59	5.94	9.33	1.60
Pyrite	21.44	14.77	0.30	8.56	0.15	18.03	1.67	0.00	7.08	26.37	1.64
Pyrrhotite	0.00	16.92	0.00	3.61	0.00	6.80	3.61	44.80	10.44	13.82	0.00
Sphalerite	0.00	73.85	0.00	0.00	0.00	0.00	0.00	10.30	12.37	3.48	0.00

Sulfide Exposure

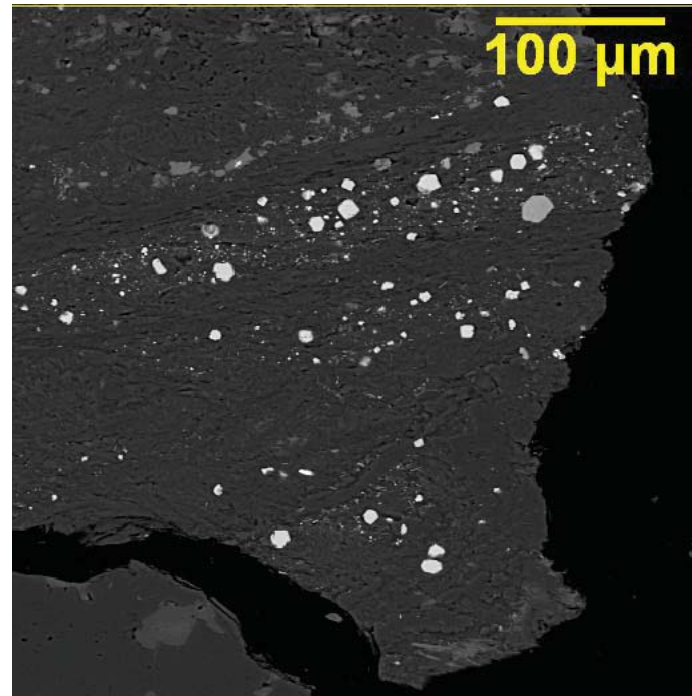
Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	70.28	21.72	8.00
Cobaltite	19.51	80.49	0.00
Gersdorffite	78.96	14.67	6.36
Pyrite	3.41	84.15	12.44
Pyrrhotite	24.56	75.44	0.00
Sphalerite	98.15	0.00	1.85

Pyrite Particle Size by Percent Passing

P-value	µm
P50	98.20
P80	257.35

08PMD657A, 101.5-111.5m (HC-29) - Predominately composed of ankerite, quartz, albite, and muscovite/sericite. Lesser amounts of chlorite, siderite, and rutile were also detected. Paragonite detected by MLA was most likely exaggerated in the expense of albite due to difficulty in segmenting both phases with such similar gray levels. MLA measured trace amounts of pyrite (0.13%), 0.01% chalcopyrite and gersdorffite, and <0.001% cobaltite. Pyrite was mainly associated with muscovite/sericite (34%), and paragonite (28%); 12% of pyrite had a free surface. Twenty-nine percent of pyrite was encapsulated, 15% was liberated, and 56% had intermediate exposure. Pyrite had a P₅₀ and P₈₀ of 19µm and 39µm respectively. Pyrite's crystal morphology, displayed in image below, is anhedral to euhedral, some coarse, but was mostly finely-grained disseminated pyrite. Chalcopyrite was mainly associated with ankerite (35%); 24% of chalcopyrite had a free surface. Forty-four percent of chalcopyrite was encapsulated, 15% was liberated, and 41% had intermediate exposure. Gersdorffite was mainly associated with paragonite (41%) and muscovite/sericite (32%); 10% of gersdorffite had a free surface. 62% of gersdorffite was encapsulated, 5% was liberated, and 33% had intermediate exposure.

Mineral Weight %		
Mineral	MLA	XRD
	Wt%	Wt%
Ankerite	32.62	39
Quartz	27.57	27
Muscovite	16.56	9
Paragonite	15.22	
Chlorite	4.76	5
Albite	1.19	15
Siderite	1.06	2
Tourmaline	0.33	
Apatite	0.22	
Pyrite	0.13	
Rutile	0.12	2
Ilmenite	0.10	
Amphibole	0.06	
Monazite	0.03	
Chalcopyrite	0.01	
Epidote	0.01	
Gersdorffite	0.01	
Calcite	<0.01	
FeClay	<0.01	
Kspar	<0.01	
Magnetite	<0.01	
Biotite	<0.001	
Chromite	<0.001	
Cobaltite	<0.001	
Enstatite	<0.001	
Iron	<0.001	
Pyrophyllite	<0.001	
Sphene	<0.001	
Xenotime	<0.001	
Zircon	<0.001	



BSE image of bright subhedral/euhedral coarse and fine-grained disseminated pyrite in dark gray muscovite/sericite.

Sulfide Mineral Associations

MINERAL	Ankerite	Chlorite	Gersdorffite	Ilmenite	Muscovite	Paragonite	Pyrite	Quartz	Siderite	Free Surface	OTHER
Chalcopyrite	34.60	6.94	0.00	0.00	8.86	5.14	0.81	10.67	7.98	23.72	1.29
Cobaltite	0.00	3.21	4.46	0.00	20.05	28.84	10.55	19.31	0.00	13.58	0.00
Gersdorffite	6.20	3.71	0.00	0.26	31.58	41.40	2.35	2.77	0.81	10.25	0.67
Pyrite	5.67	3.94	0.13	1.15	33.87	27.83	0.00	11.98	0.71	12.41	2.31

Sulfide Exposure

Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	44.30	40.75	14.95
Cobaltite	30.77	69.23	0.00
Gersdorffite	61.88	32.91	5.21
Pyrite	28.87	55.82	15.32

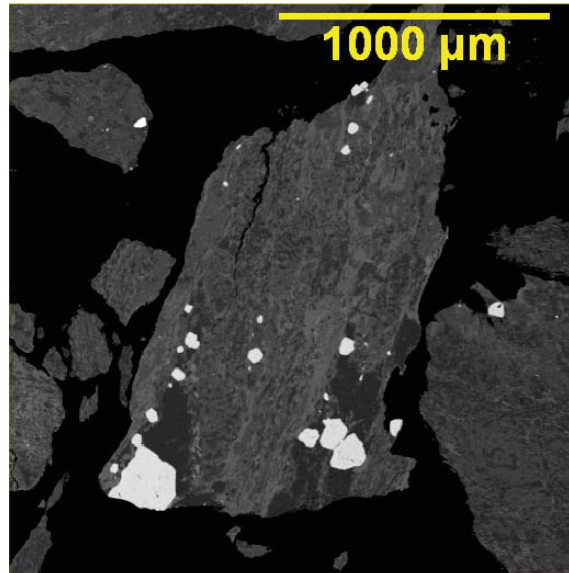
Pyrite Particle Size by Percent Passing

P-value	µm
P50	18.96
P80	39.10

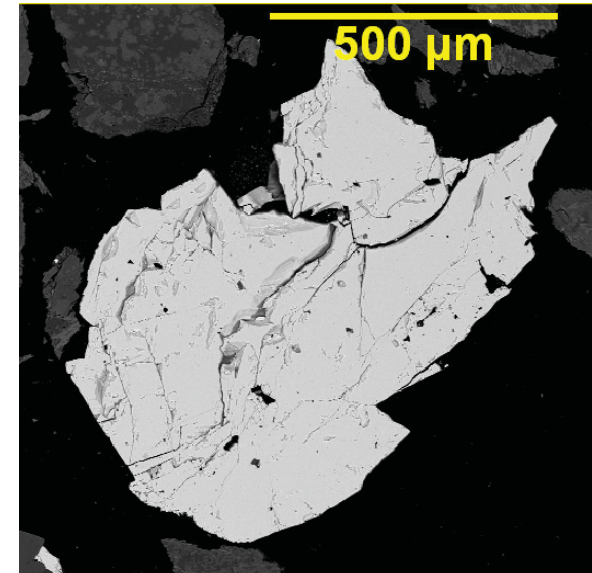
08PMD657A, 90.5-91m (HC-30) - Predominately composed of ankerite, quartz, and chlorite. Lesser amounts of muscovite/sericite, albite, calcite, and rutile were also detected. MLA measured trace amounts of chalcopryite (0.79%), pyrite (0.72%), and <0.001% pyrrhotite. Calculated Cu (2.88%) is slightly higher than measured Cu (~2%), but is still in agreement with relatively elevated amount of chalcopryite detected in the sample. Pyrite was mainly associated with ankerite (32%) and quartz (20%); 20% of pyrite had a free surface. 4% of pyrite was encapsulated, 3% was liberated, and 92% had intermediate exposure. Pyrite had a P₅₀ and P₈₀ of 182µm and 238µm respectively. Pyrite's crystal morphology, displayed in left image below, is subhedral to euhedral, coarse grained with sieve texture. Chalcopryite (large liberated particle displayed in right image below) was mainly associated with ankerite (32%); 47% of chalcopryite had a free surface. Two percent of chalcopryite was encapsulated, 73% was liberated, and 25% had intermediate exposure.

Mineral Weight %

Mineral	MLA	XRD
	Wt%	Wt%
Ankerite	52.45	37
Quartz	19.02	23
Chlorite	14.72	29
Albite	7.63	2
Muscovite	1.44	6
Rutile	1.01	1
Amphibole	0.97	
Chalcopryite	0.79	
Pyrite	0.72	
Paragonite	0.50	
Calcite	0.32	1
Apatite	0.13	
Kspar	0.10	
Biotite	0.08	
Ilmenite	0.06	
Tourmaline	0.05	
Epidote	<0.01	
Iron	<0.01	
Monazite	<0.01	
Siderite	<0.01	
Sphene	<0.01	
FeClay	<0.001	
Pyrrhotite	<0.001	
Xenotime	<0.001	



BSE image of bright subhedral/euhedral pyrite in mixed gangue (ankerite, chlorite, and quartz).



BSE image of a large liberated chalcopryite grain measuring 1000 x 600 microns in size

Sulfide Mineral Associations

MINERAL	Albite	Ankerite	Chlorite	Muscovite	Paragonite	Pyrite	Quartz	Free Surface	OTHER
Chalcopyrite	0.39	31.94	9.41	0.89	0.03	0.76	9.34	46.89	0.35
Pyrite	4.67	31.58	17.70	2.66	1.33	0.00	19.98	19.74	2.34
Pyrrhotite	0.00	20.31	0.00	0.00	0.00	52.89	24.65	2.15	0.00

Sulfide Exposure

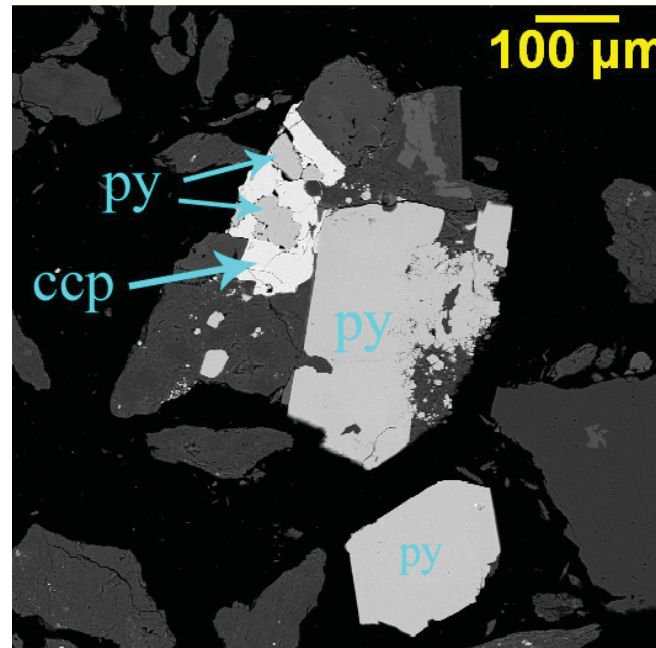
Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	1.62	25.31	73.07
Pyrite	4.23	92.44	3.33
Pyrrhotite	0.00	100.00	0.00

Pyrite Particle Size by Percent Passing

P-value	μm
P50	181.56
P80	238.44

04PMD272, 105-110m (HC-39) - Predominately composed of quartz, muscovite/sericite, ankerite, and paragonite. Lesser amounts of chlorite and rutile were also detected. MLA detected exaggerated amounts of muscovite/sericite (40.81%) compared to XRD (20%) due to difficulties segmenting similar gray level phases, which is most likely the reason for lower MLA quantities of quartz, ankerite, and paragonite compared to XRD values; K values (~1.8%) from chemical analyses suggests XRD quantities for muscovite/sericite are more accurate. MLA measured minor amounts of pyrite (1.09%) and trace amounts of chalcopyrite (0.02%), <0.01% gersdorffite, and <0.001% pyrrhotite and sphalerite. Pyrite was mainly associated with muscovite (59%), but this value is most likely skewed due to exaggerated muscovite/sericite quantities detected by MLA; 17% of pyrite had a free surface. Seven percent of pyrite was encapsulated, 15% was liberated, and 77% had intermediate exposure. Pyrite had a P₅₀ and P₈₀ of 72µm and 202µm respectively. Pyrite's crystal morphology, displayed in image below, is subhedral to euhedral, with mostly coarse grained particles with slight sieve texture. Chalcopyrite (also displayed in image below) was mainly associated with pyrite (33%) and ankerite (19%); 17% of chalcopyrite had a free surface. Thirteen percent of chalcopyrite was encapsulated, <1% was liberated, and 87% had intermediate exposure.

Mineral Weight %		
	MLA	XRD
Mineral	Wt%	Wt%
Muscovite	40.81	20
Quartz	30.45	41
Ankerite	13.18	19
Paragonite	11.85	16
Chlorite	1.27	2
Pyrite	1.09	1
Apatite	0.56	
Albite	0.27	
Tourmaline	0.22	
Monazite	0.07	
Rutile	0.06	1
Amphibole	0.05	
Ilmenite	0.04	
Kspar	0.03	
Calcite	0.02	
Chalcopyrite	0.02	
Epidote	<0.01	
FeClay	<0.01	
Gersdorffite	<0.01	
Siderite	<0.01	
Zircon	<0.01	
Anhydrite	<0.001	
Biotite	<0.001	
Chromite	<0.001	
Gold	<0.001	
Iron	<0.001	
Magnetite	<0.001	
Pyrophyllite	<0.001	
Pyrrhotite	<0.001	
Sphalerite	<0.001	
Sphene	<0.001	
Xenotime	<0.001	



BSE image of bright chalcopyrite (ccp) and light gray subhedral/euhedral pyrite (py).

Sulfide Mineral Associations

MINERAL	Ankerite	Chlorite	Muscovite	Paragonite	Pyrite	Quartz	Tourmaline	Free Surface	OTHER
Chalcopyrite	18.85	5.43	12.38	9.66	33.05	3.22	0.00	17.16	0.27
Gersdorffite	6.12	3.01	61.39	2.74	8.83	16.13	0.00	0.96	0.82
Pyrite	2.75	3.18	58.73	7.67	0.00	8.43	0.38	17.42	1.45
Pyrrhotite	0.00	0.61	56.43	0.00	37.31	0.00	3.97	1.67	0.00
Sphalerite	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Sulfide Exposure

Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	12.79	86.75	0.46
Gersdorffite	95.25	4.75	0.00
Pyrite	7.06	77.48	15.45
Pyrrhotite	93.04	6.96	0.00
Sphalerite	100.00	0.00	0.00

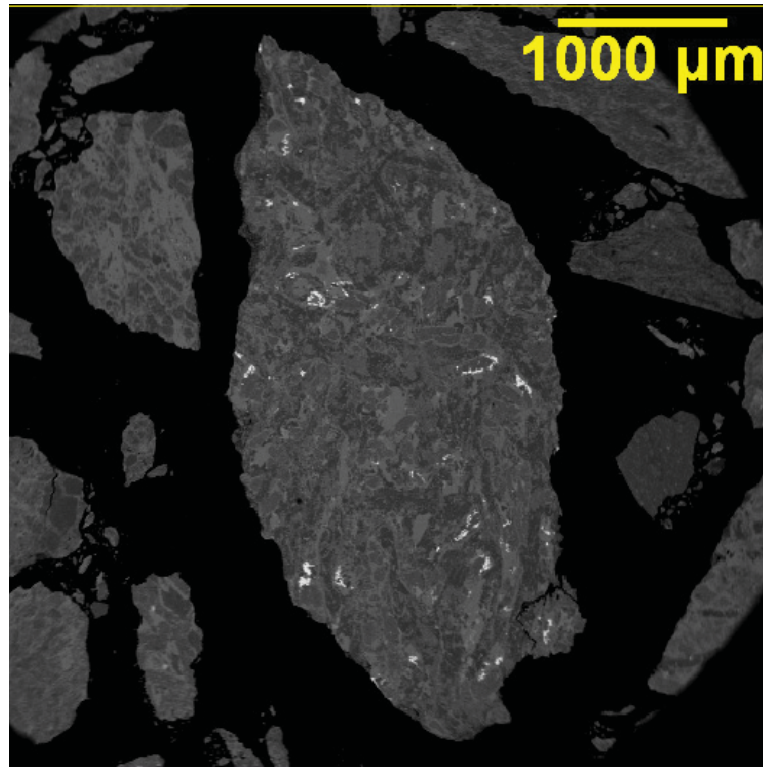
Pyrite Particle Size by Percent Passing

P-value	µm
P50	72.21
P80	202.24

05PMD310, 6-31m (HC-40) - Predominately composed of chlorite (~50%). Lesser amounts albite, muscovite/sericite, quartz, amphibole, and ankerite were also detected. MLA measured trace amounts of pyrite (0.26%), chalcopyrite (0.02%), and <0.001% cobaltite and pyrrhotite. Pyrite was mainly associated with amphibole (40%) and chlorite (29%); 9% of pyrite had a free surface. Fourteen percent of pyrite was encapsulated, 3% was liberated, and 83% had intermediate exposure. Pyrite had a P₅₀ and P₈₀ of 40µm and 77µm respectively. Pyrite's crystal morphology, displayed in image below, is anhedral and mostly found in one particle composed of amphibole, albite, and chlorite. Chalcopyrite was mainly associated with chlorite (34%) and quartz (16%); 7% of chalcopyrite had a free surface. Forty-four percent of chalcopyrite was encapsulated, <1% was liberated, and 56% had intermediate exposure.

Mineral Weight %

Mineral	MLA	XRD
	Wt%	Wt%
Chlorite	50.56	51
Albite	10.69	10
Muscovite	10.14	11
Quartz	7.79	10
Amphibole	6.04	9
Ankerite	5.80	8
Kspar	4.16	
Biotite	2.57	
Epidote	0.47	
Rutile	0.38	
Sphene	0.31	
Tourmaline	0.31	
Pyrite	0.26	
Ilmenite	0.17	
Paragonite	0.16	
Calcite	0.06	
Siderite	0.06	
Apatite	0.03	
Chalcopyrite	0.02	
Chromite	<0.01	
Iron	<0.01	
Magnetite	<0.01	
Monazite	<0.01	
Cobaltite	<0.001	
FeClay	<0.001	
Pyrrhotite	<0.001	
Xenotime	<0.001	



BSE image of bright anhedral pyrite in mixed gangue composed of chlorite, amphibole, and albite.

Sulfide Mineral Associations

MINERAL	Albite	Amphibole	Ankerite	Chlorite	Epidote	Kspar	Muscovite	Pyrite	Quartz	Sphene	Free Surface	OTHER
Chalcopyrite	11.14	15.97	0.00	34.14	0.00	2.20	4.90	3.28	16.46	3.31	7.05	1.55
Cobaltite	0.00	0.00	0.00	68.43	0.00	0.00	31.57	0.00	0.00	0.00	0.00	0.00
Pyrite	6.19	39.45	1.44	29.07	1.31	1.27	5.27	0.00	4.87	0.09	9.43	1.60
Pyrrhotite	32.01	0.00	0.00	67.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sulfide Exposure

Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	43.69	56.01	0.30
Cobaltite	100.00	0.00	0.00
Pyrite	14.07	83.27	2.67
Pyrrhotite	100.00	0.00	0.00

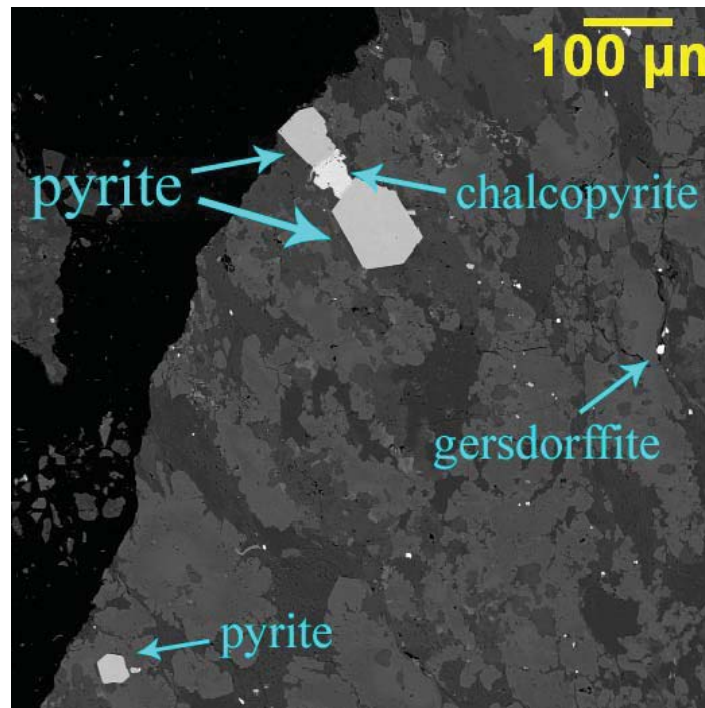
Pyrite Particle Size by Percent Passing

P-value	µm
P50	39.65
P80	76.54

05PMD293, 8.89-34m (HC-41) - Predominately composed of ankerite, quartz, and muscovite/sericite. Lesser amounts chlorite, albite, siderite, and rutile were also detected. MLA measured trace amounts of pyrite (0.40%), gersdorffite (0.03%), chalcopyrite (0.02%), <0.01% tetrahedrite, and <0.001% cobaltite. Pyrite was mainly associated with quartz (18%), ankerite (17%), and muscovite/sericite (16%); 33% of pyrite had a free surface. Twenty-two percent of pyrite was encapsulated, 18% was liberated, and 60% had intermediate exposure. Pyrite had a P₅₀ and P₈₀ of 56µm and 97µm respectively. Pyrite's crystal morphology, displayed in image below, is subhedral to euhedral, with coarse to fine-grained particles. Gersdorffite was mainly associated with muscovite/sericite (30%) and had 15% free surface. Sixty-five percent of gersdorffite was encapsulated, 8% was liberated, and 27% had intermediate exposure. Chalcopyrite was mainly associated with quartz (24%) and ankerite (21%); 17% of chalcopyrite had a free surface. Seventy percent of chalcopyrite was encapsulated, 10% was liberated, and 20% had intermediate exposure.

Mineral Weight %

Mineral	MLA	XRD
	Wt%	Wt%
Ankerite	33.49	35
Quartz	24.18	25
Muscovite	21.20	21
Chlorite	7.81	8
Albite	7.63	7
Siderite	2.97	3
Kspar	1.20	
Pyrite	0.40	
Biotite	0.31	
Ilmenite	0.21	
Amphibole	0.15	
Tourmaline	0.15	
Rutile	0.10	<1
Apatite	0.06	
Paragonite	0.05	
Gersdorffite	0.03	
Chalcopyrite	0.02	
Chromite	0.01	
Calcite	<0.01	
Epidote	<0.01	
FeClay	<0.01	
Iron	<0.01	
Magnetite	<0.01	
Monazite	<0.01	
Sphene	<0.01	
Tetrahedrite	<0.01	
Anhydrite	<0.001	
Barite	<0.001	
Cobaltite	<0.001	
Gold	<0.001	
Pyrophyllite	<0.001	
Scheelite	<0.001	
Xenotime	<0.001	



BSE image of white gersdorffite inclusions along with bright chalcopyrite associated with light gray euhedral pyrite. Mixed gangue is composed of chlorite (medium gray), ankerite (med-dark gray), and albite (dark gray).

Sulfide Mineral Associations

MINERAL	Albite	Ankerite	Chalcopyrite	Chlorite	Kspar	Muscovite	Pyrite	Quartz	Siderite	Free Surface	OTHER
Chalcopyrite	5.39	20.88	0.00	7.55	0.40	12.84	6.79	24.12	2.63	17.40	1.99
Cobaltite	19.79	31.28	7.63	1.23	0.00	9.47	0.00	13.60	0.00	17.01	0.00
Gersdorffite	4.20	12.45	0.00	12.80	1.17	29.60	1.26	16.10	6.05	15.07	1.30
Pyrite	5.45	17.25	0.51	6.88	1.00	15.54	0.00	17.61	1.05	33.23	1.49
Tetrahedrite	0.00	23.39	0.00	0.00	0.00	2.13	0.00	7.45	0.00	67.04	0.00

Sulfide Exposure

Free Surface of Particle (%)	0% (not exposed)	0% < x < 100%	100% (liberated)
Chalcopyrite	70.25	19.81	9.94
Cobaltite	68.97	25.12	5.91
Gersdorffite	64.71	26.67	8.63
Pyrite	22.33	60.01	17.67
Tetrahedrite	0.00	28.88	71.12

Pyrite Particle Size by Percent Passing

P-value	µm
P50	56.46
P80	97.04

TABLE V
Mineral Key

MINERAL	FORMULA
Albite, Andesine (PLAG)	$\text{NaAlSi}_3\text{O}_8(\text{Ca,Na})(\text{Al,Si})_4\text{O}_8$
Alstonite	$\text{BaCa}(\text{CO}_3)_2$
Amphibole (AMP)	$\text{Ca}_2(\text{Mg,Fe,Al})_5(\text{Al,Si})_8\text{O}_{22}(\text{OH})_2$
Anhydrite	CaSO_4
Ankerite (ANK)	$\text{Ca}(\text{Fe,Mg})(\text{CO}_3)_2$
Apatite	$\text{Ca}_5(\text{PO}_4)_3(\text{OH})$
Arsenopyrite	FeAsS
Barite	BaSO_4
Biotite	$\text{K}(\text{Mg,Fe})_3(\text{Si}_3\text{Al})\text{O}_{10}(\text{OH})_2$
Calcite (CAL)	CaCO_3
Chalcopyrite (CCP)	CuFeS_2
Chlorite (CHL)	$(\text{Mg,Fe,Al})_6(\text{Al,Si})_4\text{O}_{10}(\text{OH})_8$
Chromite	$(\text{FeZn})\text{Cr}_2\text{O}_4$
Cobaltite	CoAsS
Diopside (PYROX)	$(\text{Ca,Na})(\text{Mg,Fe,Al,Ti})(\text{Si,Al})_2\text{O}_6$
Electrum	Au_2Ag
Enstatite	MgSiO_3
Epidote (EPI)	$\text{Ca}_2(\text{Fe}^{3+},\text{Al})\text{Al}_2(\text{Si}_2\text{O}_7)(\text{SiO}_4)(\text{O,OH})_2$
FeClay	$\text{Na}_{0.3}\text{Fe}_2(\text{Si,Al})_4\text{O}_{10}(\text{OH})_2 \cdot \text{N}(\text{H}_2\text{O})$
Galena	PbS
Gersdorffite	$(\text{Fe,Co,Ni})\text{AsS}$
Gold	Au
Hematite	$\text{Fe}^{3+}_2\text{O}_3$
Hessite	Ag_2Te
Ilmenite	FeTiO_3
Iron	Fe
K-feldspar (KSPAR)	KAlSi_3O_8
Magnetite (MAG)	Fe_3O_4
Millerite	NiS
Monazite	$(\text{La,Ce})\text{PO}_4$
Muscovite/Sericite (MUSC/SER)	$\text{KAl}_2(\text{AlSi}_3\text{O}_{10})(\text{OH})_2$
Olivine	$(\text{Mg,Fe})_2\text{SiO}_4$
Paragonite (PG)	$\text{NaAl}_2(\text{Si}_3\text{Al})\text{O}_{10}(\text{OH})_2$
Petzite	Ag_3AuTe_2
Platinum	Pt
Pyrite (PY)	FeS_2
Pyrophyllite (PYRO)	$\text{AlSi}_2\text{O}_5(\text{OH})$
Pyrrhotite	$\text{Fe}_{(1-x)}\text{S}$
Quartz (QTZ)	SiO_2
Rutile (RUT)	TiO_2
Scheelite	CaWO_4
Sepiolite (SEP)	$\text{Mg}_4\text{Si}_6\text{O}_{15}(\text{OH})_2 \cdot 6(\text{H}_2\text{O})$
Siderite (SID)	FeCO_3
Sphalerite	ZnS
Sphene (TIT)	CaTiSiO_5
Stibnite	Sb_2S_3
Tetradymite	$\text{Bi}_2\text{Te}_2\text{S}$
Tetrahedrite	Cu_3SbS_3
Titanomagnetite	$\text{Fe}_{3-x}\text{Ti}_x\text{O}_4$
Tourmaline (TL)	$(\text{Ca,Na})(\text{Mg,Fe}^{2+})_3\text{Al}_5\text{Mg}(\text{BO}_3)_3\text{Si}_6\text{O}_{18}(\text{OH,F})_4$
Xenotime	YPO_4
Zircon	ZrSiO_4

Mineral abbreviations are from XRD Table I.

Appendix J – Humidity Cell Test Results, Boston

Appendix J1 – Summary of ABA and Kinetic Test Results

Appendix J-1: Summary of ABA and Kinetic Test Results

Humidity Cell ID	Lithology ¹	Total Sulphur % Rank ²	Preliminary Economic Classification	Static Test Results					Kinetic Test Results					
				Total Sulphur	NP	TIC	NP/AP	TIC/AP	pH		SO ⁴ Release Rates		As Release Rates	
				%	kg CaCO ₃ /t				min	max	Initial	Stable	Initial	Stable
HC-31	1	32%	W	0.13	256	385	63	95	8.3	9.7	0.6	1.1	0.017	0.032
HC-55	1	67%	W	0.29	307	400	34	44	7.3	9.4	6.7	1.0	0.013	0.023
HC-12	1	33%	mixed	0.14	281	438	64	100	7.6	8.9	1.9	0.9	0.014	0.080
	1	52%		0.22	271	397	39	57						
HC-10	1 mixed	41%	W	0.16	240	302	48	60	7.6	9.2	1.8	0.8	0.0085	0.023
	1 mixed	47%	W	0.18	240	283	43	51						
HC-32	1oj	89%	W	0.86	270	369	10	14	7.7	9.4	3.6	2.2	0.11	0.13
HC-33	1oj	47%	W	0.33	351	449	34	44	8.2	9.3	3.0	2	0.085	0.18
HC-11	5	77%	W	0.32	146	216	15	22	7.3	8.4	4.1	12	0.0015	0.00020
	5	74%		0.27	157	222	19	26						
HC-35	5	55%	W	0.20	89	123	14	20	7.4	9.3	0.6	1.1	0.019	0.0063
HC-34	5	92%	W	0.81	115	172	4.5	6.8	7.3	8.3	130	6	0.0024	0.00081
HC-37	12q	67%	W	1.5	272	300	5.9	6.5	7.5	8.8	5.8	4.8	0.14	0.14
HC-38	12q	86%	O	3.0	194	270	2.1	2.9	7.4	8.6	11	14	0.0076	0.0012

¹Lithology codes as follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **1oj** = mafic metavolcanics with sediments; **5** = sedimentary units; **5 mixed** = mixed sedimentary units; **9n** = late intermediate dyke; **10a** = late gabbro; **12q** = quartz vein; **12q mixed** = mixed quartz vein

²HCT and pulp samples of lithologies 1 (waste), 1 w. sediments and 12q were compared to samples of their respective lithologies and economic classification from the overall Boston sample set (Section 3.1.3). Due to limited sample set ore/waste samples of lithology 1 (HC-12) were compared to entire sample set of lithology 1 (irrespective of economic classification), while samples of lithology 1 mixed (HC-10) were compared to 1 (waste) samples. HCT and pulp samples of lithology 5 were compared to samples of the same lithology irrespective of economic classification.

Appendix J2 – Summary of Trace Element Stable Release Rates for Humidity Cell Tests

Appendix J-2: Summary of Trace Element (ICP) Stable Release Rates for Humidity Cell Tests (mg/kg/week)

Humidity Cell ID	Rock Type ¹	Total Sulphur % Rank ²	Preliminary Economic Classification	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg	Mo
				mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week
HC-31	1	32%	W	0.00016	0.00033	0.032	0.00013	0.0000044	0.0000022	0.022	0.0000022	1.5	0.000065	0.00031	0.00016	0.004	0.000022	0.00022	1	0.0022	2.3E-06	0.000046
HC-55	1	67%	W	0.0085	0.0006	0.023	0.00028	0.0000048	0.0000025	0.024	0.0000025	2.9	0.000058	0.00027	0.00026	0.0038	0.000021	0.00024	1.7	0.0041	1E-06	0.000087
HC-12	1	33%	mixed	0.0072	0.00062	0.08	0.00048	0.000034	0.000033	0.017	0.0000062	2.1	0.000078	0.00065	0.00035	0.0049	0.000034	0.00038	1.3	0.003	8E-06	0.000041
HC-10	1 mixed	41%	W	0.013	0.00087	0.023	0.00077	0.000036	0.000035	0.016	0.0000066	1.8	0.0001	0.000078	0.00033	0.033	0.000033	0.00024	1.1	0.0039	8E-06	0.000039
HC-32	1oj	89%	W	0.0074	0.00083	0.13	0.00015	0.0000044	0.0000022	0.022	0.0000023	1.5	0.000063	0.00055	0.00018	0.0042	0.000013	0.00022	1	0.0036	3.3E-06	0.000076
HC-33	1oj	47%	W	0.0067	0.0011	0.18	0.00016	0.0000045	0.0000023	0.023	0.0000023	1.8	0.000059	0.0006	0.00018	0.0045	0.000023	0.00023	1.1	0.0035	2.6E-06	0.000058
HC-11	5	77%	W	0.0019	0.00012	0.0002	0.00015	0.0000045	0.0000023	0.023	0.000003	5.6	0.000045	0.000027	0.00009	0.0039	0.0000066	0.00023	2.9	0.00051	1E-06	0.00027
HC-35	5	55%	W	0.018	0.00034	0.0063	0.00051	0.0000045	0.0000022	0.022	0.0000027	3.5	0.000062	0.00017	0.00026	0.0041	0.000071	0.00023	1.6	0.0017	1.5E-06	0.0017
HC-34	5	92%	W	0.0092	0.00071	0.00081	0.0003	0.0000045	0.0000022	0.027	0.0000027	2.2	0.000064	0.00012	0.00024	0.004	0.00002	0.0003	1.6	0.0016	3.5E-06	0.0019
HC-37	12q	67%	W	0.0037	0.0026	0.14	0.00044	0.0000044	0.0000022	0.022	0.0000022	2.4	0.000051	0.00083	0.00019	0.004	0.000016	0.00022	1.2	0.0041	2.7E-06	0.00019
HC-38	12q	86%	O	0.0022	0.00014	0.0012	0.00035	0.0000046	0.0000023	0.023	0.0000023	9.2	0.000054	0.00017	0.00023	0.001	0.00002	0.00023	3.5	0.0007	2E-06	0.00018

¹Lithology codes as follows: 1 = mafic metavolcanics; 1 mixed = mixed mafic metavolcanics; 1oj = mafic metavolcanics with sediments; 5 = sedimentary units; 5 mixed = mixed sedimentary units; 9n = late intermediate dyke; 10a = late gabbro; 12q = quartz vein; 12q mixed = mixed quartz vein

²HCT and pulp samples of lithologies 1 (waste), 1 w. sediments and 12q were compared to samples of their respective lithologies and economic classification from the overall Boston sample set (Section 3.1.3). Due to limited sample set ore/waste samples of lithology 1 (HC-12) were compared to entire sample set of lithology 1 (irrespective of economic classification), while samples of lithology 1 mixed (HC-10) were compared to 1 (waste) samples. HCT and pulp samples of lithology 5 were compared to samples of the same lithology irrespective of economic classification.

Humidity Cell ID	Rock Type ¹	Total Sulphur % Rank ²	Preliminary Economic Classification	Ni	P	K	Se	Si	Ag	Na	Sr	Ti	Sn	Ti	U	V	Zn	Zr
				mg/kg/week	g/kg/week	g/kg/week	mg/kg/week	g/kg/week	mg/kg/week	g/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week	mg/kg/week
HC-31	100%	32%	W	0.00018	0.0024	0.26	0.000099	0.087	0.0000022	0.062	0.0056	0.00000087	0.00001	0.00022	0.00000087	0.00017	0.00027	0.000044
HC-55	100%	67%	W	0.00042	0.0027	0.095	0.000071	0.11	0.0000024	0.05	0.003	0.00000097	0.000086	0.00024	0.0000014	0.00012	0.00042	0.000048
HC-12	100%	33%	mixed	0.00059	0.0053	0.15	0.00013	0.1	0.000011	0.067	0.007	0.00000049	0.000036	0.00021	0.000016	0.00019	0.00025	0.00023
HC-10	1 mixed	41%	W	0.0003	0.0056	0.13	0.000065	0.094	0.000011	0.093	0.0032	0.000005	0.000038	0.00019	0.000017	0.00014	0.00028	0.00025
HC-32	1oj	89%	W	0.00085	0.0022	0.14	0.000048	0.094	0.0000022	0.061	0.0019	0.00000088	0.000062	0.00022	0.0000065	0.00028	0.00024	0.000044
HC-33	1oj	47%	W	0.00089	0.003	0.15	0.0001	0.12	0.0000023	0.051	0.003	0.0000018	0.000067	0.00023	0.0000029	0.00023	0.00013	0.000045
HC-11	500%	77%	W	0.000062	0.0044	0.13	0.000075	0.058	0.0000023	0.055	0.011	0.0000024	0.000044	0.00023	0.000013	0.000091	0.00033	0.000045
HC-35	500%	55%	W	0.00026	0.0032	0.16	0.000023	0.17	0.0000024	0.074	0.012	0.000001	0.00001	0.00023	0.000082	0.000095	0.00038	0.000045
HC-34	500%	92%	W	0.00029	0.0027	0.78	0.00018	0.09	0.0000022	0.1	0.0061	0.0000043	0.0000076	0.00024	0.00003	0.00009	0.0002	0.000045
HC-37	12q	67%	W	0.0023	0.0038	0.15	0.00004	0.11	0.0000022	0.047	0.0039	0.0000029	0.00001	0.00022	0.0000068	0.00015	0.00015	0.000044
HC-38	12q	86%	O	0.00029	0.004	0.14	0.000075	0.064	0.0000023	0.061	0.0075	0.0000012	0.00001	0.00023	0.0000049	0.000091	0.00044	0.000046

¹Lithology codes as follows: 1 = mafic metavolcanics; 1 mixed = mixed mafic metavolcanics; 1oj = mafic metavolcanics with sediments; 5 = sedimentary units; 5 mixed = mixed sedimentary units; 9n = late intermediate dyke; 10a = late gabbro; 12q = quartz vein; 12q mixed = mixed quartz vein

²HCT and pulp samples of lithologies 1 (waste), 1 w. sediments and 12q were compared to samples of their respective lithologies and economic classification from the overall Boston sample set (Section 3.1.3). Due to limited sample set ore/waste samples of lithology 1 (HC-12) were compared to entire sample set of lithology 1 (irrespective of economic classification), while samples of lithology 1 mixed (HC-10) were compared to 1 (waste) samples. HCT and pulp samples of lithology 5 were compared to samples of the same lithology irrespective of economic classification.

Appendix J3 – Summary of General Parameter, Nutrient & Ionic Stable
Release Rates for Humidity Cell Tests

Appendix J-3: Summary of General Parameter, Nutrient & Ion Stable Release Rates for Humidity Cell Tests

Humidity Cell #	Lithology ¹	Total Sulphur % Rank ²	Preliminary Economic Classification	SO ₄	Alkalinity	Fluoride	Chloride	Nitrate-N	Nitrite-N	Total Ammonia	Diss.-P	TDS
				mg/kw/week								
HC-31	1	32%	W	1.1	8.1	0.0044	0.22	0.0087	0.0022	0.061	0.0078	9.4
HC-55	1	67%	W	1	6.2	0.0048	5.1	0.15	0.0024	0.039	0.0034	20
HC-12	1	33%	mixed	0.9	9.5	0.016	0.66	0.016	0.0016	0.071	0.014	16
HC-10	1 mixed	41%	W	0.84	8	0.016	0.27	0.016	0.0017	0.04	0.0067	12
HC-32	1oj	89%	W	2.2	6.5	0.0044	0.37	0.0088	0.0022	0.05	0.043	10
HC-33	1oj	47%	W	1.8	7.8	0.0045	0.23	0.0091	0.0023	0.063	0.056	12
HC-11	5	77%	W	12	8.3	0.0045	2.4	0.11	0.0023	0.017	0.0036	32
HC-35	5	55%	W	1.1	9.4	0.0045	3.3	0.024	0.12	0.044	0.0033	19
HC-34	5	92%	W	6.1	5.1	0.0083	2.2	0.0096	0.032	0.079	0.0026	17
HC-37	12q	67%	W	4.8	6.8	0.0044	0.47	0.0088	0.0022	0.072	0.044	13
HC-38	12q	86%	O	14	8.1	0.0046	0.59	0.12	0.0031	0.029	0.0029	43

¹Lithology codes as follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **1oj** = mafic metavolcanics with sediments; **5** = sedimentary units; **5 mixed** = mixed sedimentary units; **9n** = late intermediate dyke; **10a** = late gabbro; **12q** = quartz vein; **12q mixed** = mixed quartz vein

²HCT and pulp samples of lithologies 1 (waste), 1 w. sediments and 12q were compared to samples of their respective lithologies and economic classification from the overall Boston sample set (Section 3.1.3). Due to limited sample set ore/waste samples of lithology 1 (HC-12) were compared to entire sample set of lithology 1 (irrespective of economic classification), while samples of lithology 1 mixed (HC-10) were compared to 1 (waste) samples. HCT and pulp samples of lithology 5 were compared to samples of the same lithology irrespective of economic classification.

Appendix J4 – Summary of Kinetic Test Depletion Rates

Appendix J-4: Summary of Kinetic Test Depletion Rates

Humidity Cell ID	Rock Type ¹	Total Sulphur % Rank ²	Preliminary Economic Classification	Total Sulphur	NP/AP	TIC/AP	(Ca+Mg)/ SO ₄	Stable SO ₄ Release Rate	Time to Depletion			NP Depletion > AP Depletion	TIC Depletion > AP Depletion	Ca+Mg/ SO ₄ < NP/AP	Ca+Mg/ SO ₄ < TIC/AP	Prediction	
				%S					NP	TIC	Sulphide					Neutral	Acidic
									mg/kg/wk	years							
HC-31	1	32%	W	0.13	63	95	6.8	1.1	613	921	65	Yes	Yes	Yes	Yes	Likely	
HC-55	1	67%	W	0.29	34	44	13	1.0	410	535	153	Yes	Yes	Yes	Yes	Likely	
HC-12	1	33%	mixed	0.14	64	100	12	0.90	496	774	88	Yes	Yes	Yes	Yes	Likely	
	1	52%	mixed	0.22	39	57	12	0.90	479	702	134	Yes	Yes	Yes	Yes	Likely	
HC-10	1 mixed	41%	W	0.16	48	60	10	0.84	517	652	108	Yes	Yes	Yes	Yes	Likely	
	1 mixed	47%	W	0.18	43	51	10	0.84	518	610	114	Yes	Yes	Yes	Yes	Likely	
HC-32	1oj	89%	W	0.86	10	14	3.6	2.2	633	865	228	Yes	Yes	Yes	Yes	Likely	
HC-33	1oj	47%	W	0.33	34	44	4.9	1.8	745	952	106	Yes	Yes	Yes	Yes	Likely	
HC-11	5	77%	W	0.32	15	22	2.1	12	105	156	12	Yes	Yes	Yes	Yes	Likely	
	5	74%	W	0.27	19	26	2.1	12	113	161	10	Yes	Yes	Yes	Yes	Likely	
HC-35	5	55%	W	0.20	14	20	13	1.1	110	153	100	Yes	Yes	Yes	Yes	Likely	
HC-34	5	92%	W	0.81	4.5	6.8	1.9	6.1	180	270	74	Yes	Yes	Yes	Yes	Likely	
HC-37	12q	67%	W	1.5	5.9	6.5	2.2	4.8	475	524	174	Yes	Yes	Yes	Yes	Likely	
HC-38	12q	86%	O	3.0	2.1	2.9	2.5	14	97	136	117	No	Yes	No	Yes		Theoretically possible

¹Lithology codes as follows: **1** = mafic metavolcanics; **1 mixed** = mixed mafic metavolcanics; **1oj** = mafic metavolcanics with sediments; **5** = sedimentary units; **5 mixed** = mixed sedimentary units; **9n** = late intermediate dyke; **10a** = late gabbro; **12q** = quartz vein; **12q mixed** = mixed quartz vein

²HCT and pulp samples of lithologies 1 (waste), 1 w. sediments and 12q were compared to samples of their respective lithologies and economic classification from the overall Boston sample set (Section 3.1.3). Due to limited sample set ore/waste samples of lithology 1 (HC-12) were compared to entire sample set of lithology 1 (irrespective of economic classification), while samples of lithology 1 mixed (HC-10) were compared to 1 (waste) samples. HCT and pulp samples of lithology 5 were compared to samples of the same lithology irrespective of economic clasification.

Appendix J5 – Low-level Sulphate Data for Last Two Cycles of Selected
Humidity Cell Tests

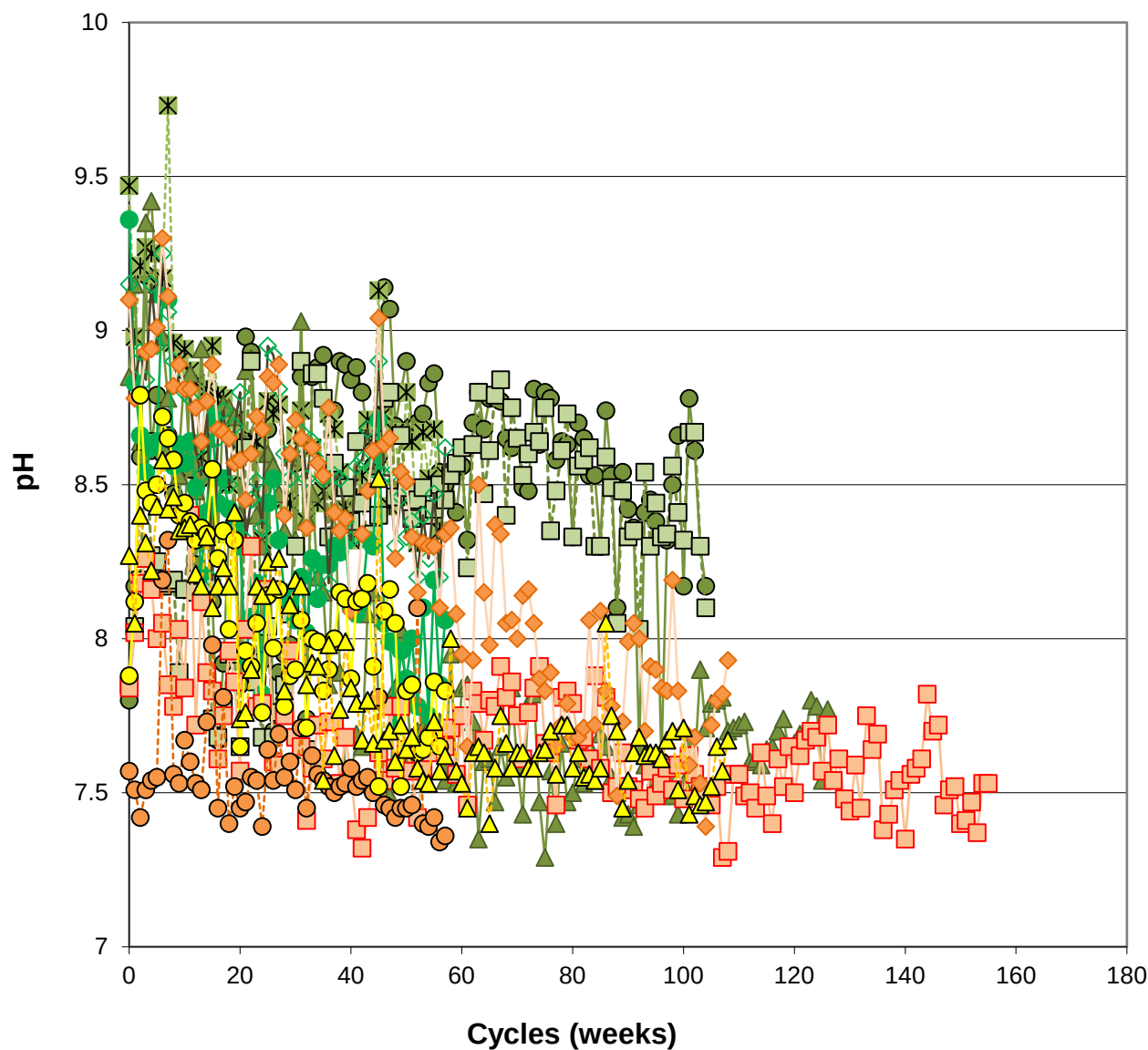
Appendix J-5: Low-Level Sulphate Data for Last Two Cycles of Humidity Cell Tests

Humidity Cell ID	Cycle	SO ₄ (mg/L)		RPD%
		Maxxam	SGS Lakefield	
HC-35	106	2.0	1.8	8.5%
	108	2.5	2.0	20.2%
Detection Limit		0.5	0.06	--

Appendix K – Humidity Cell Test Graphs and Raw Data, Boston

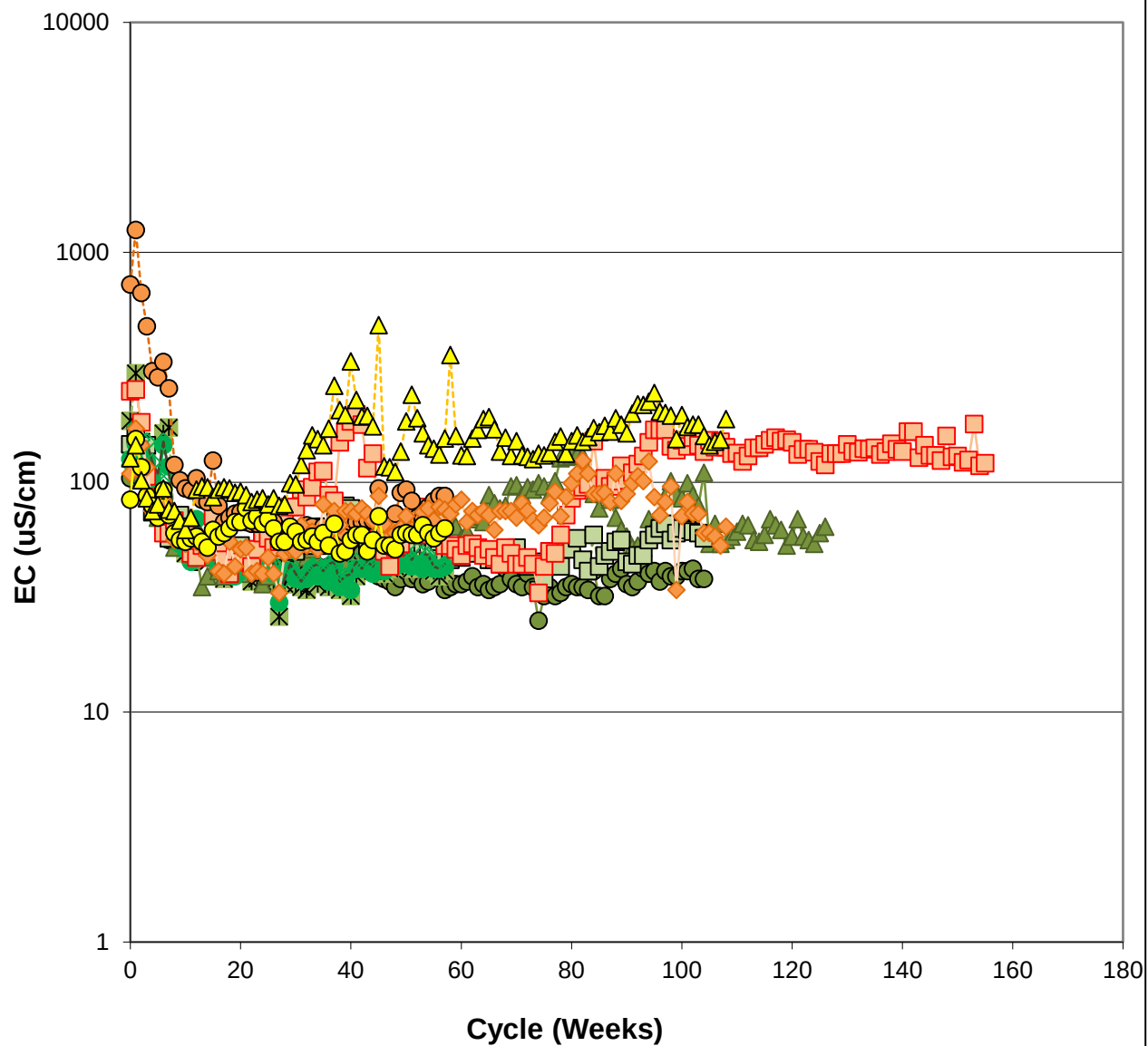
Appendix K1 – Waste Rock Humidity Cell Graphs

Hope Bay Waste Rock Humidity Cells

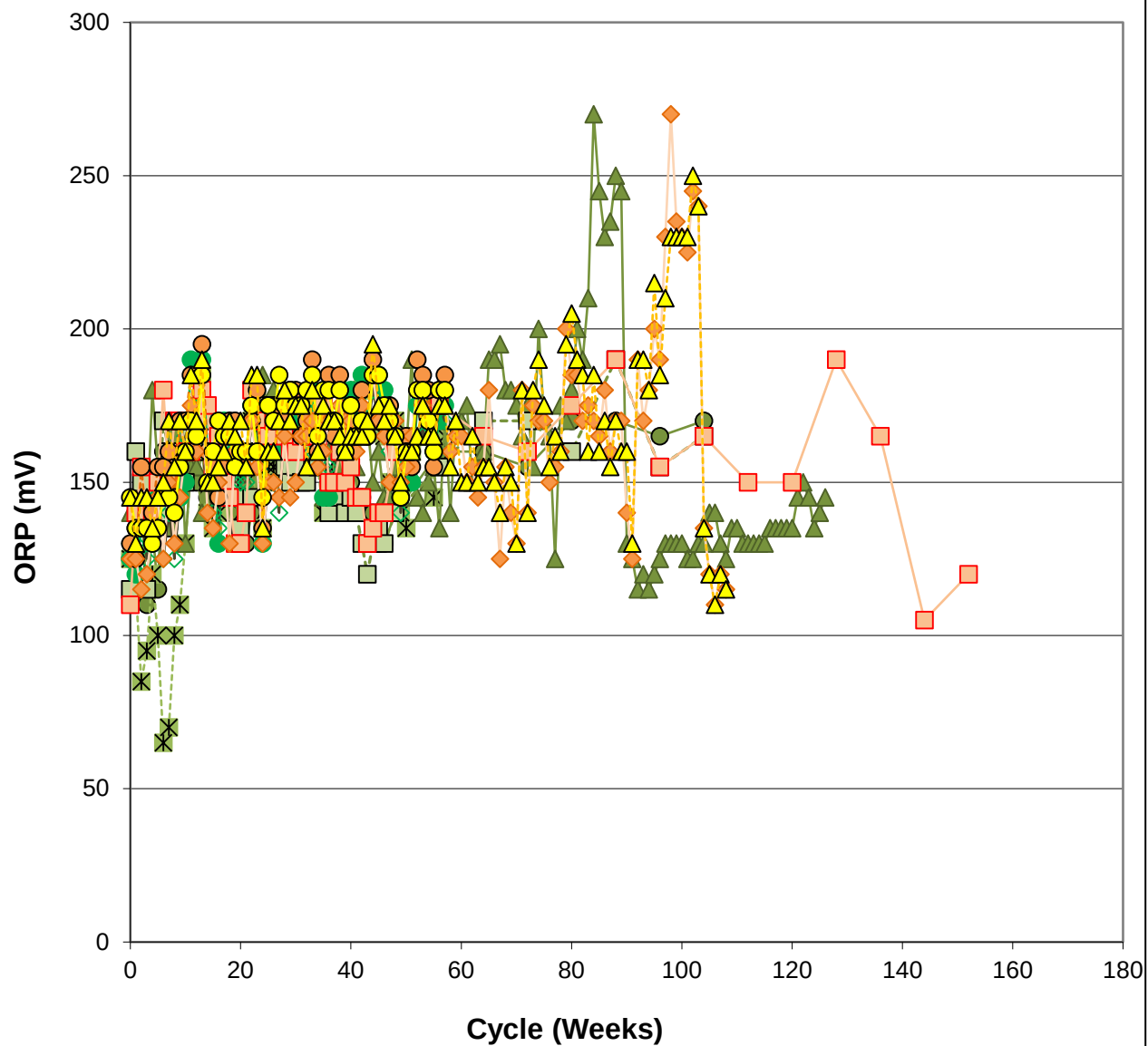


- Mafic volcanic (1 mixed), HC-10
- x--- Mafic volcanic (1), HC-31
- ▲— Mafic volcanic (1), HC-55
- Mafic volcanic (1), HC-12
- Mafic volcanic w. sediments (10j), HC-32
- ◆— Mafic volcanic w. sediments (10j), HC-33
- Sedimentary units (5), HC-11
- Sedimentary units (5), HC-34
- ◆— Sedimentary units (5), HC-35
- Quartz vein (12q), HC-37
- ▲--- Quartz vein (12q), HC-38

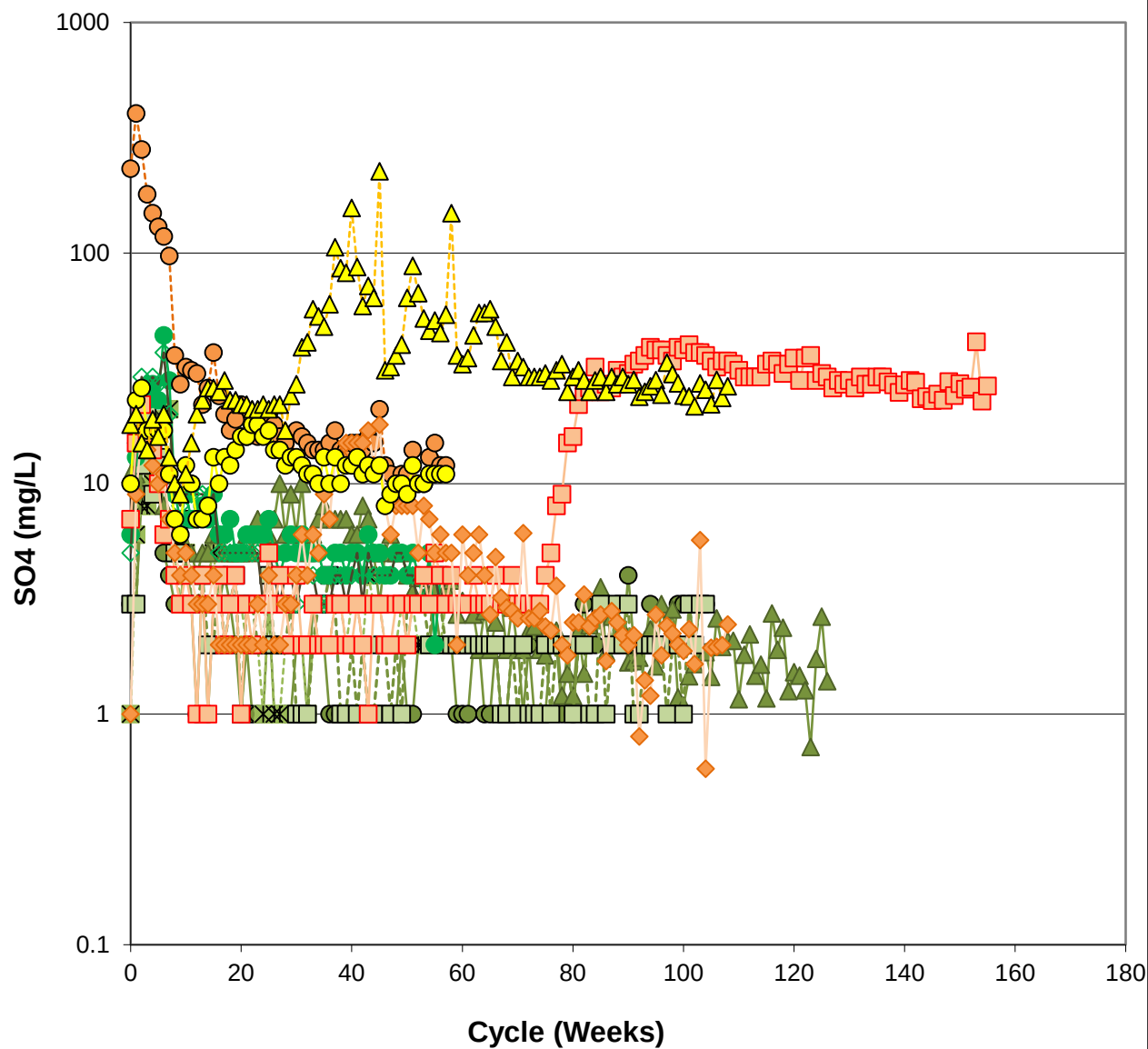
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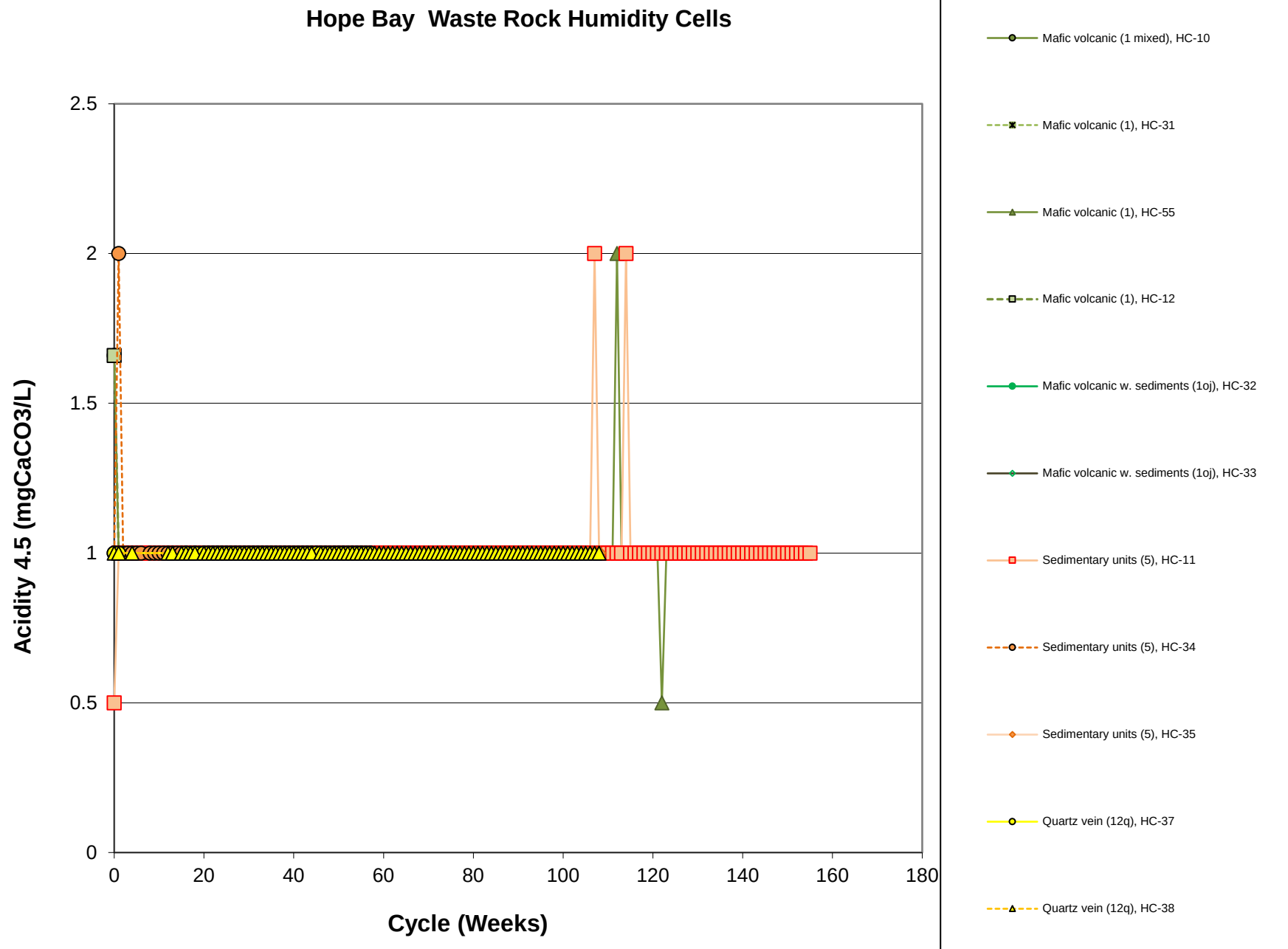


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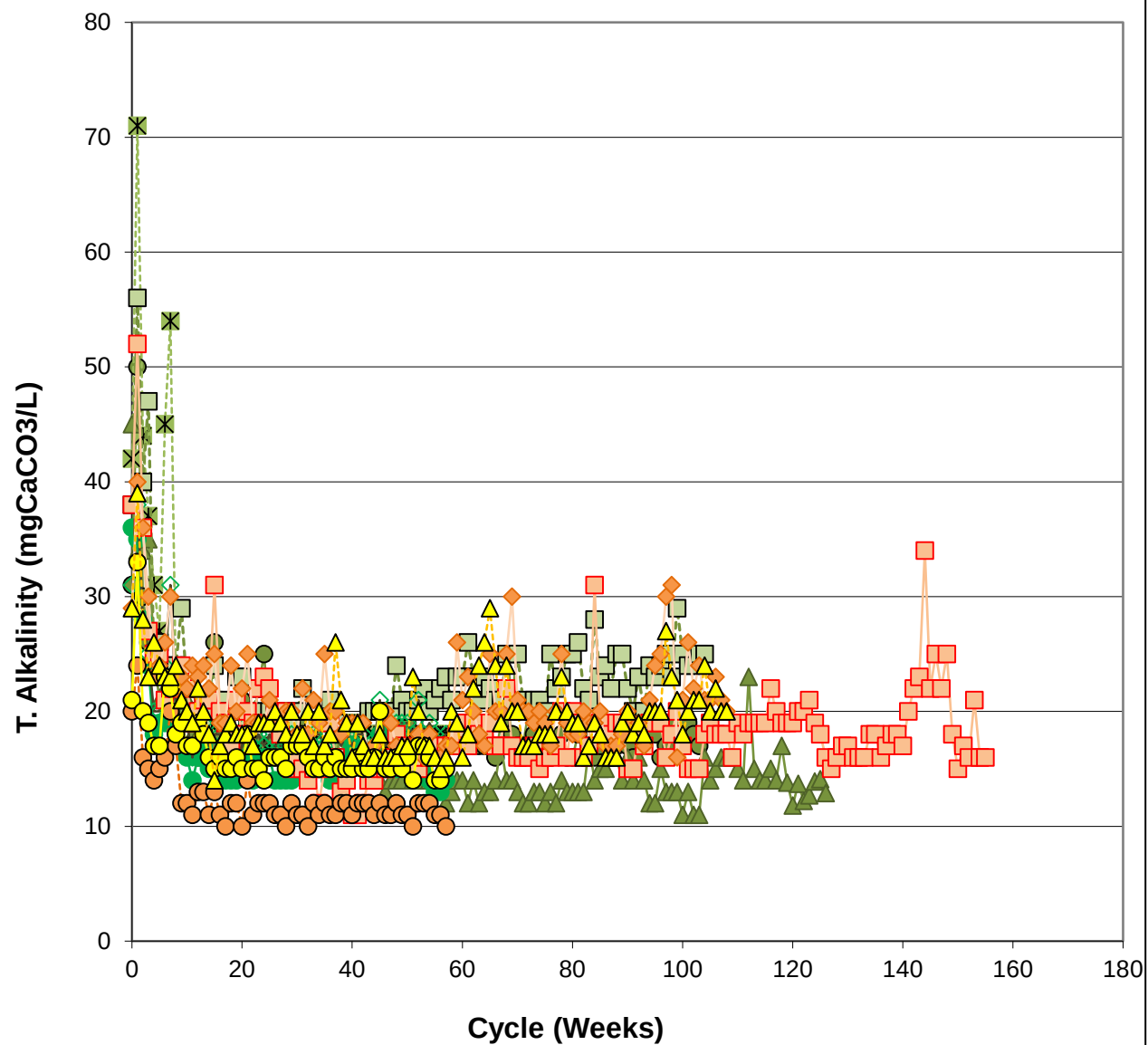


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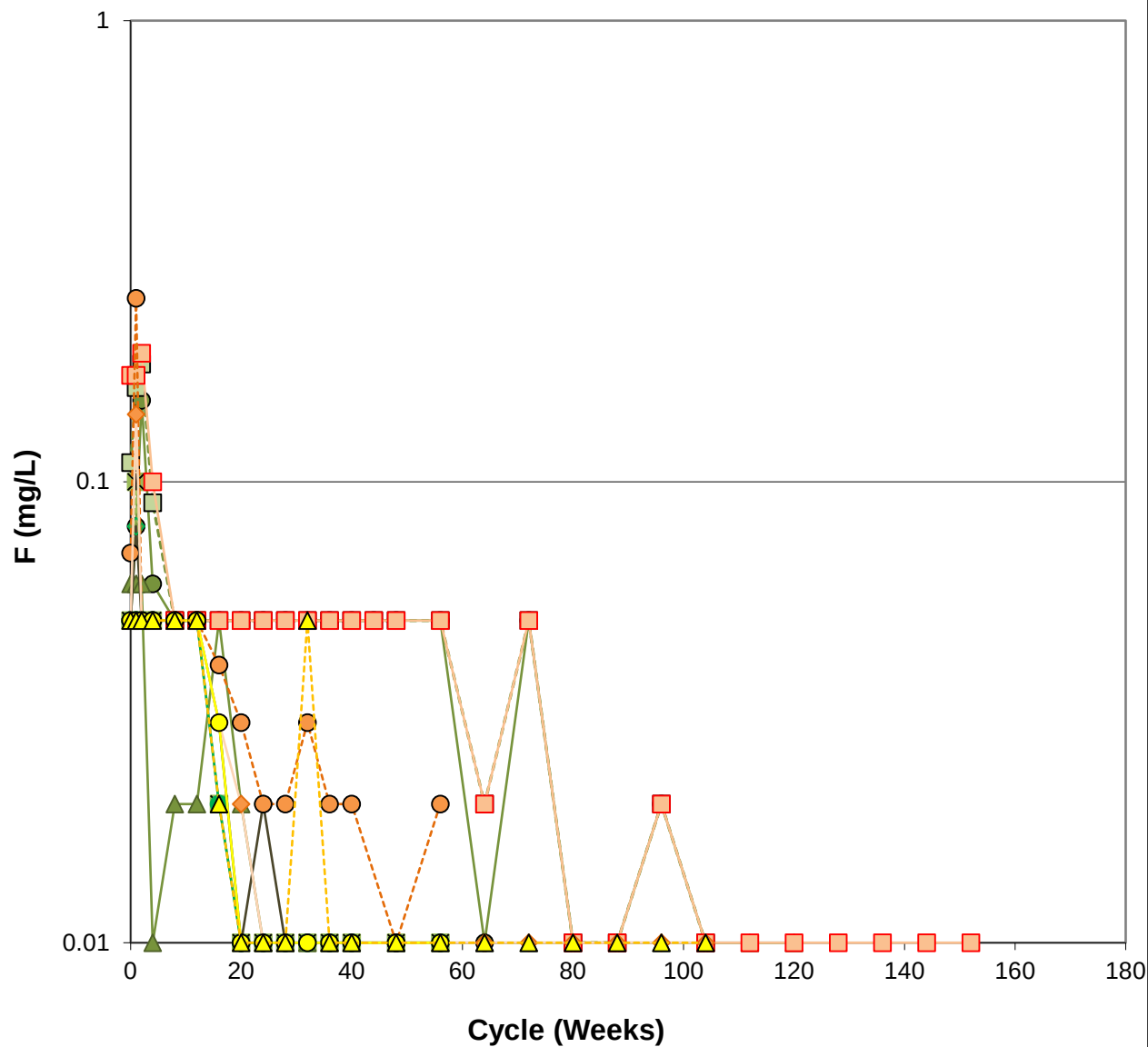




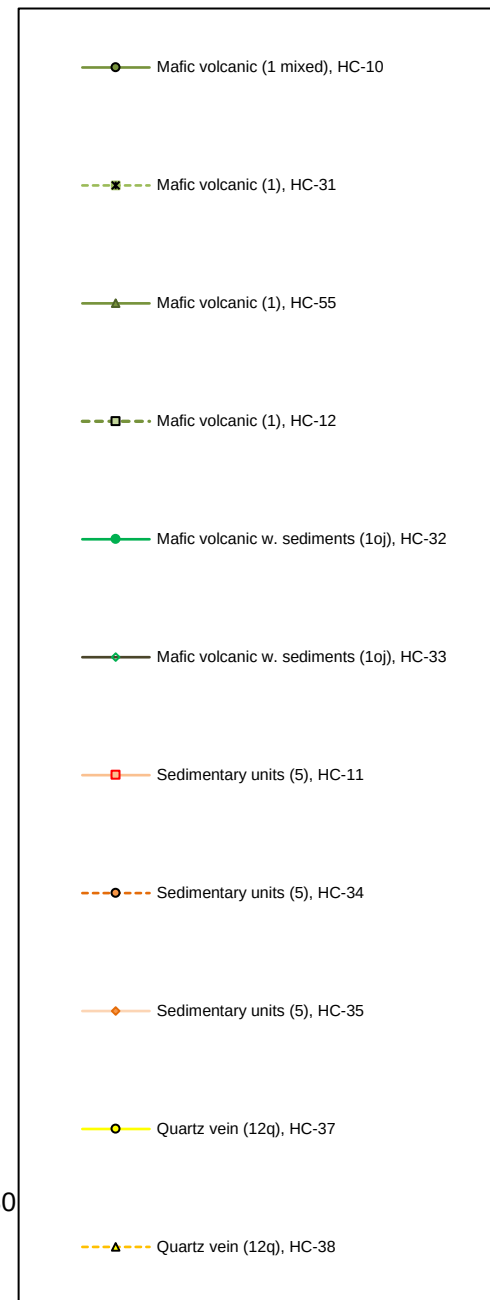
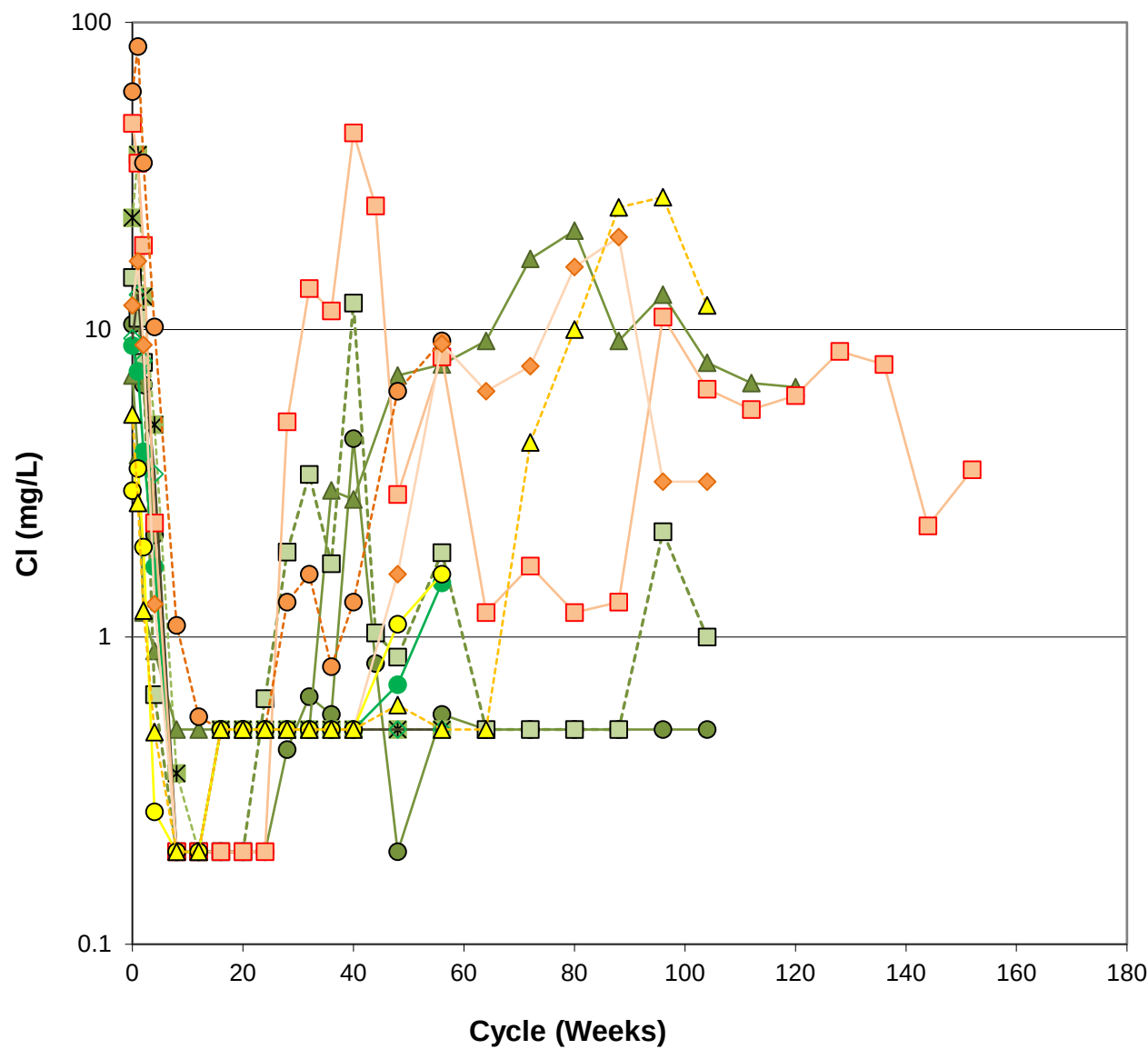
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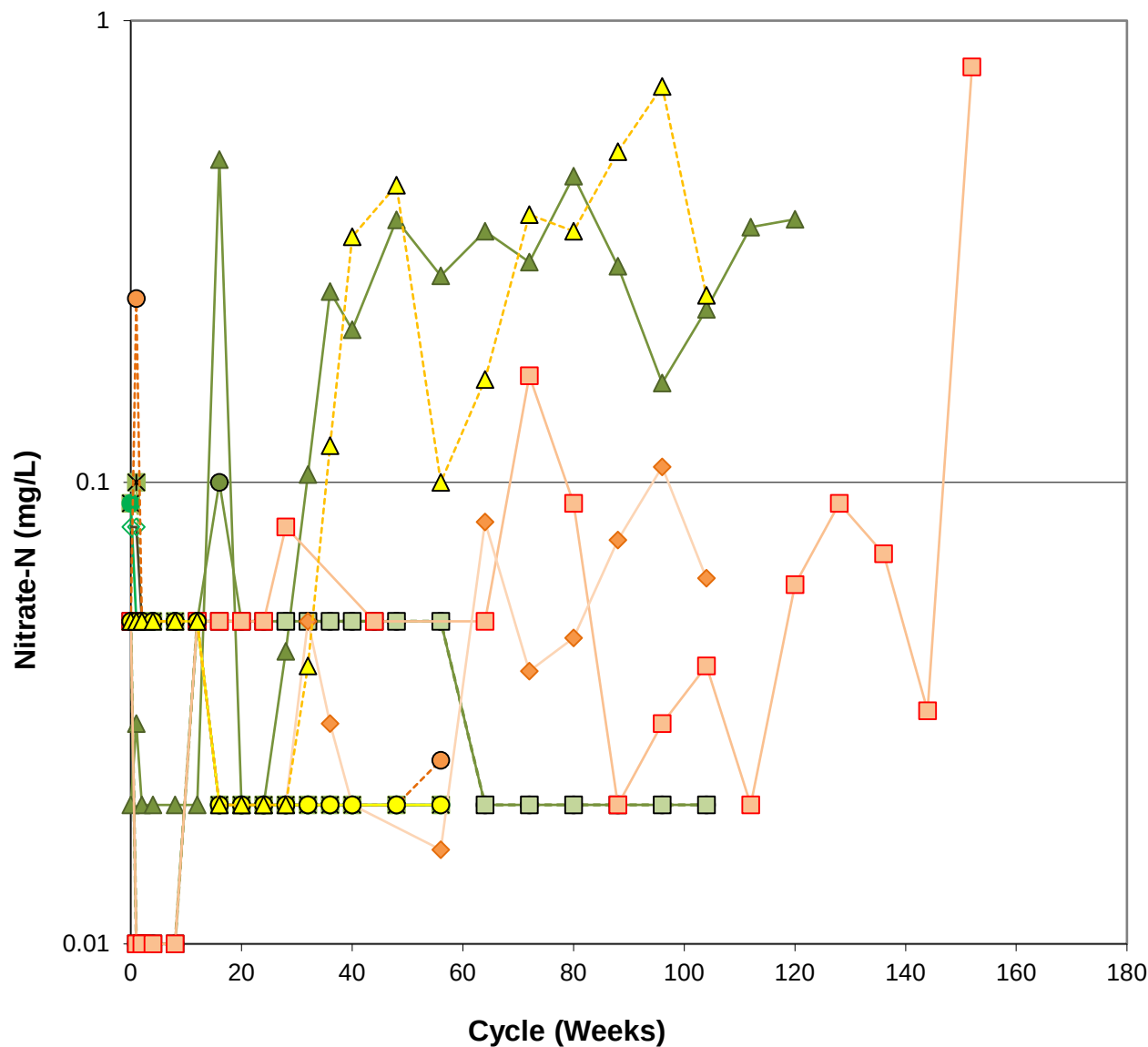
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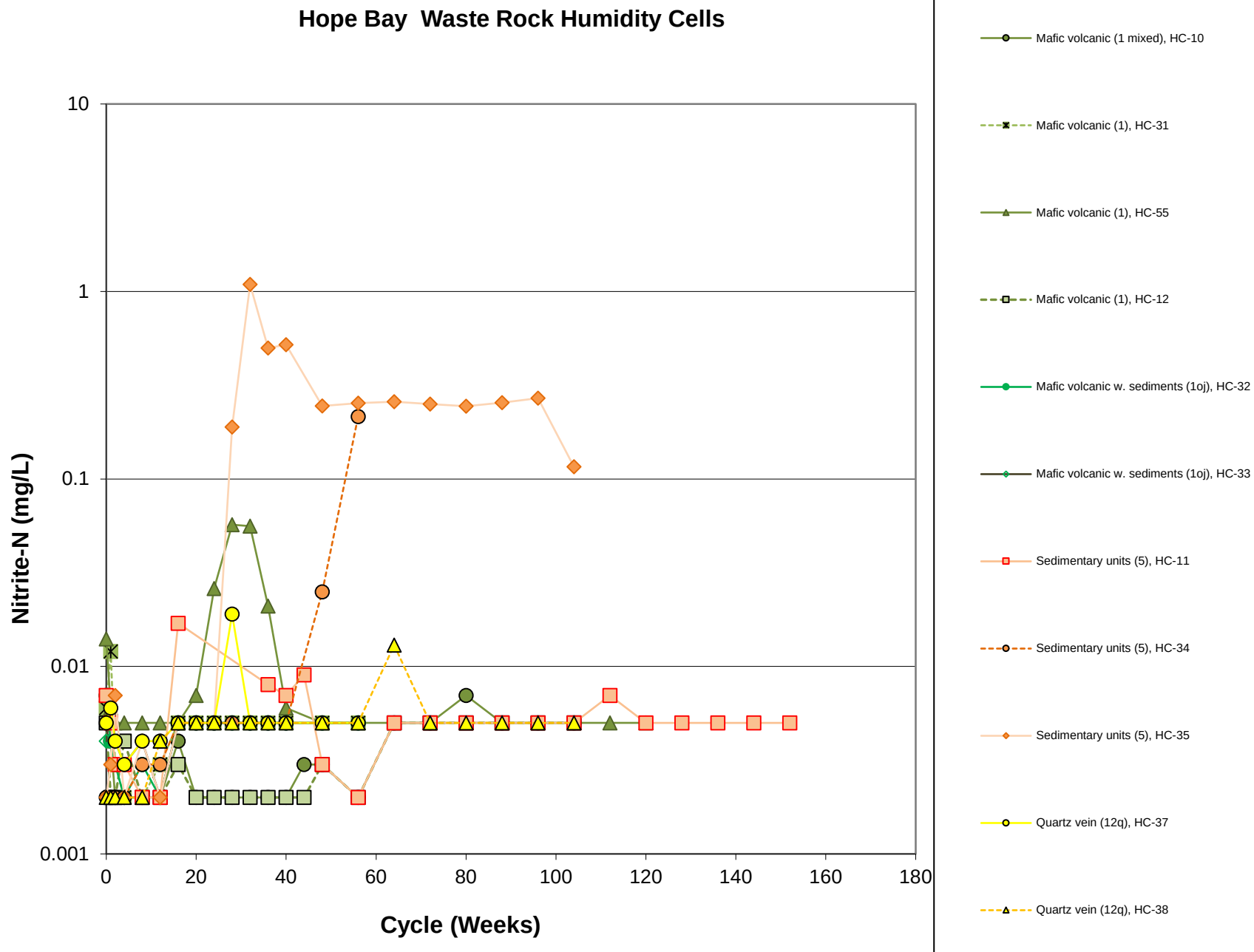


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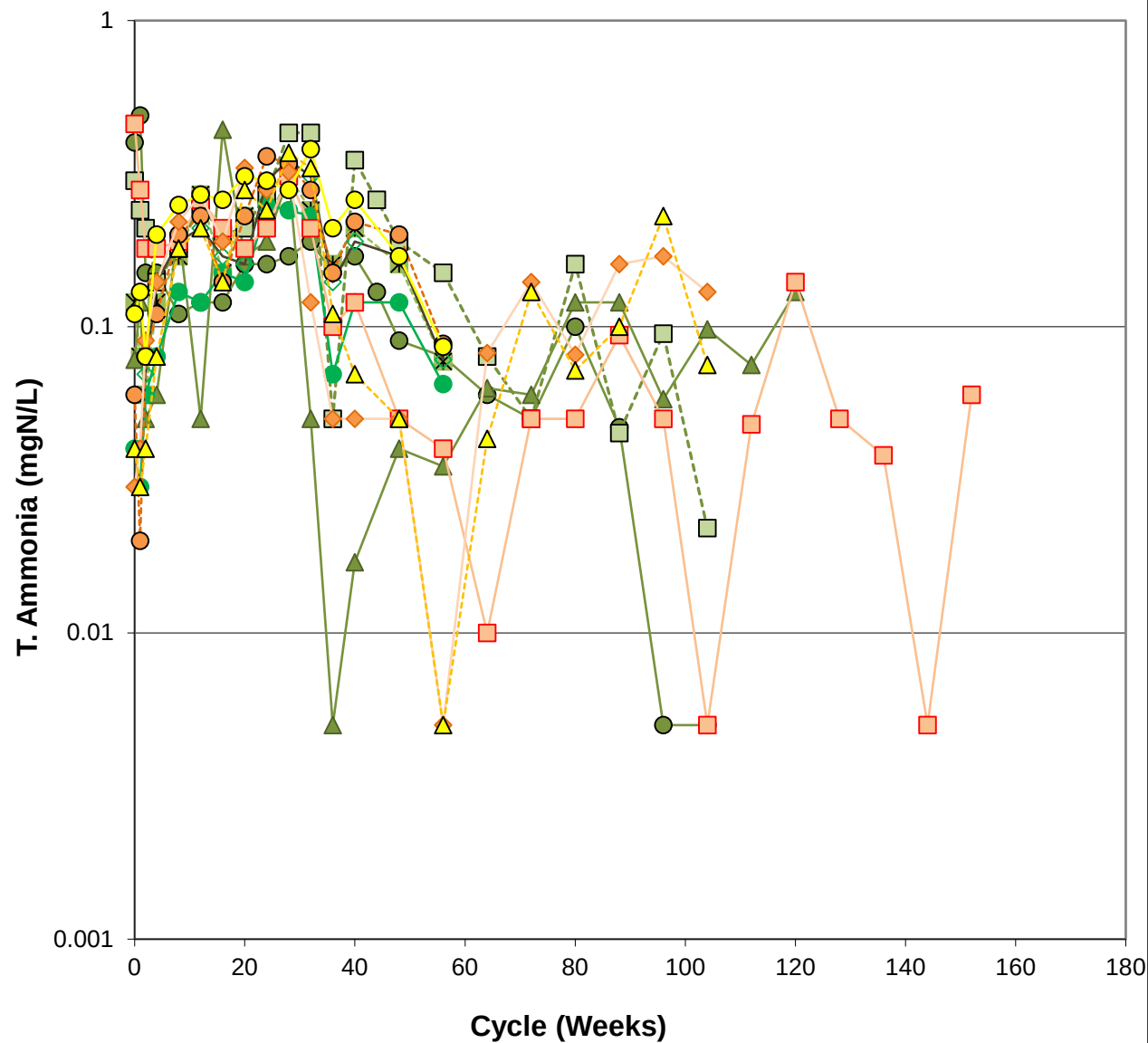


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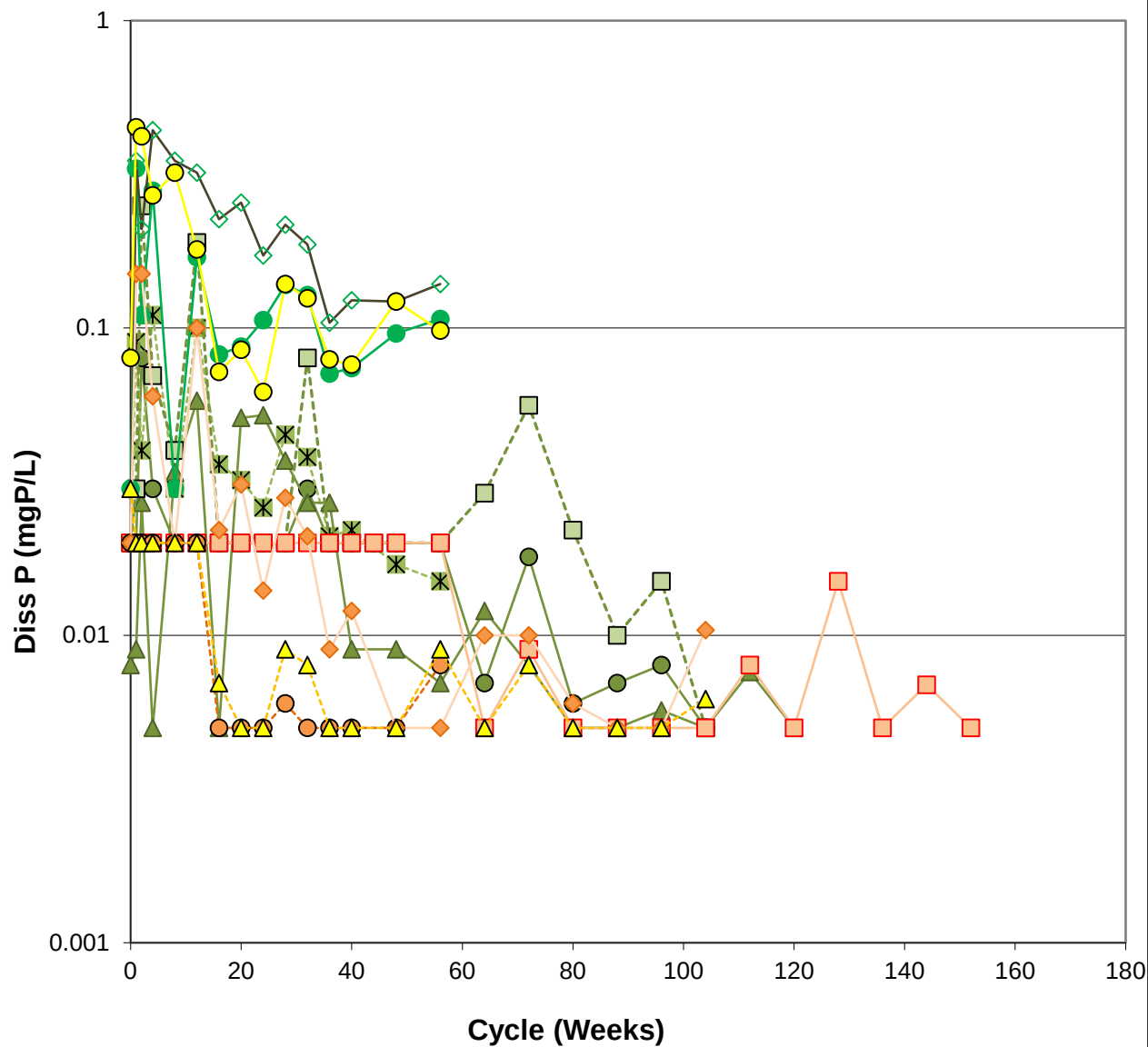




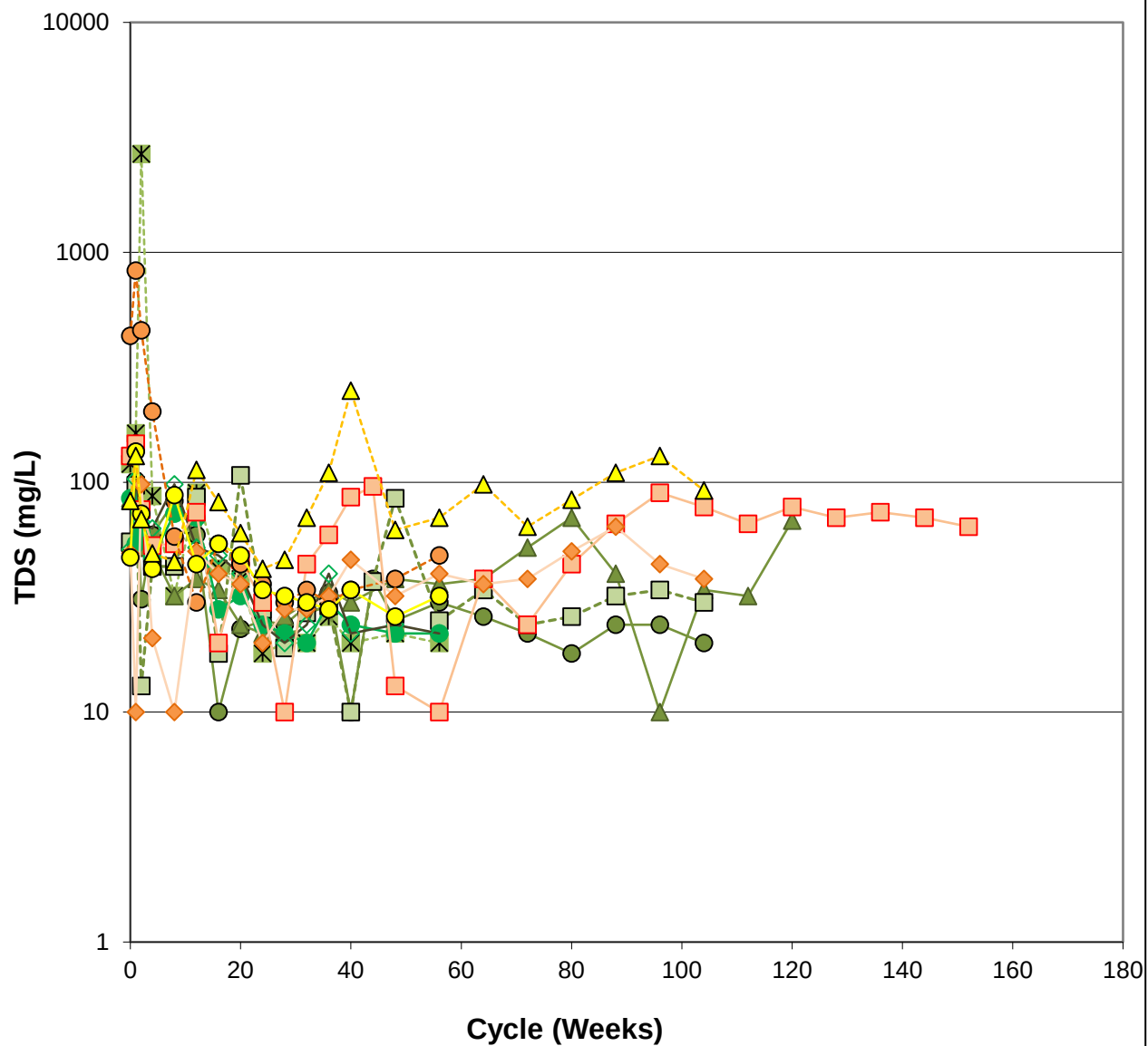
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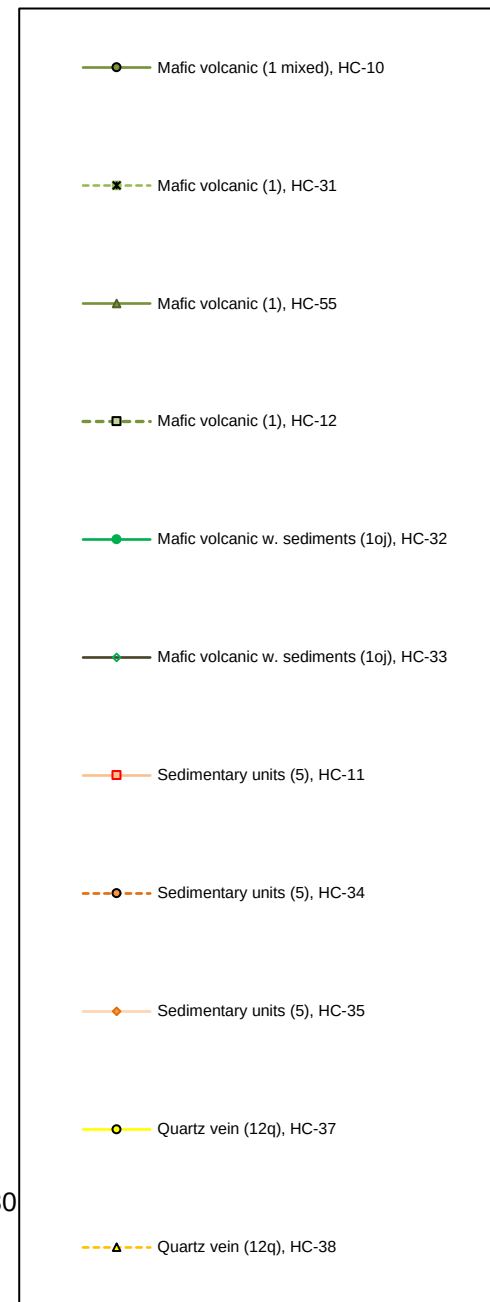
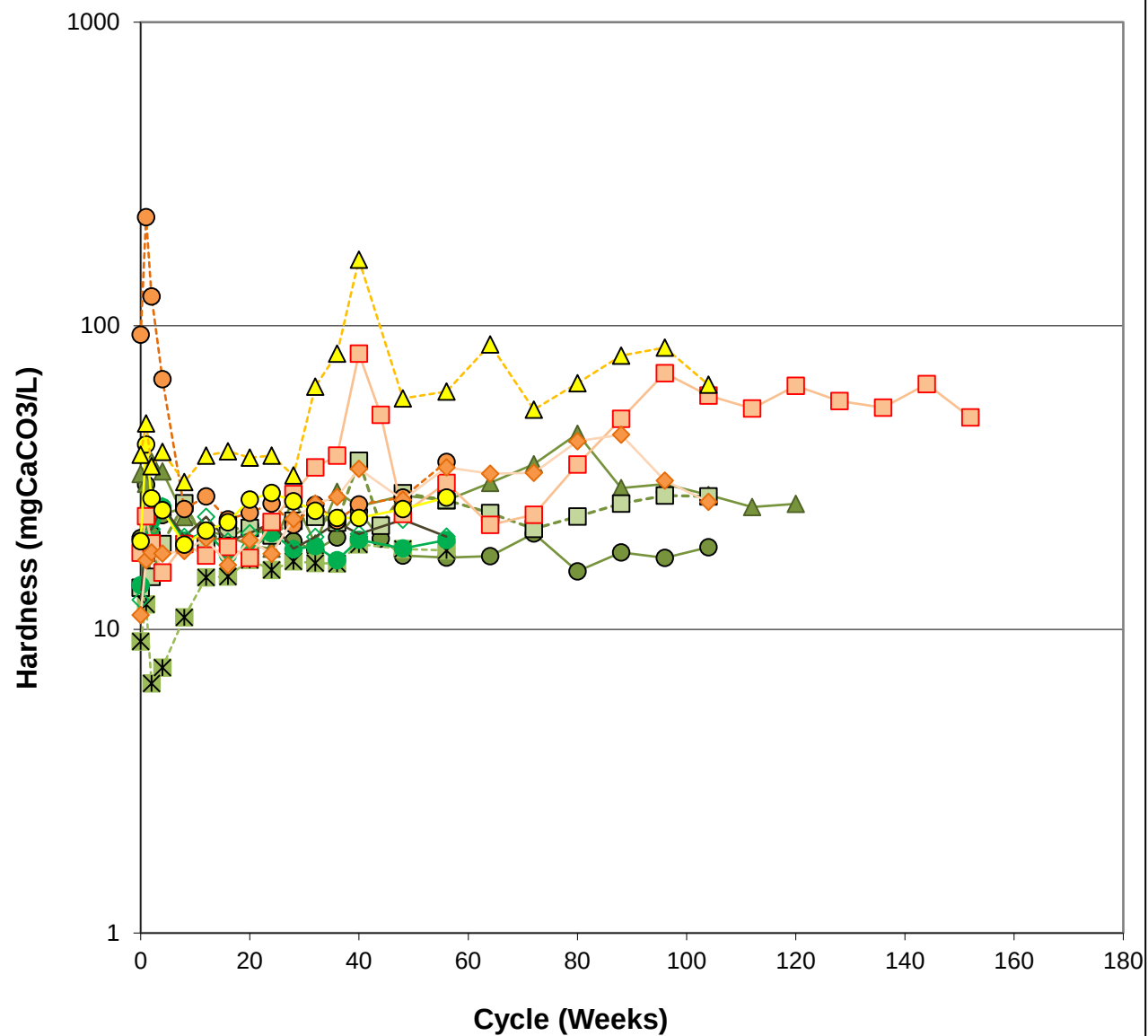
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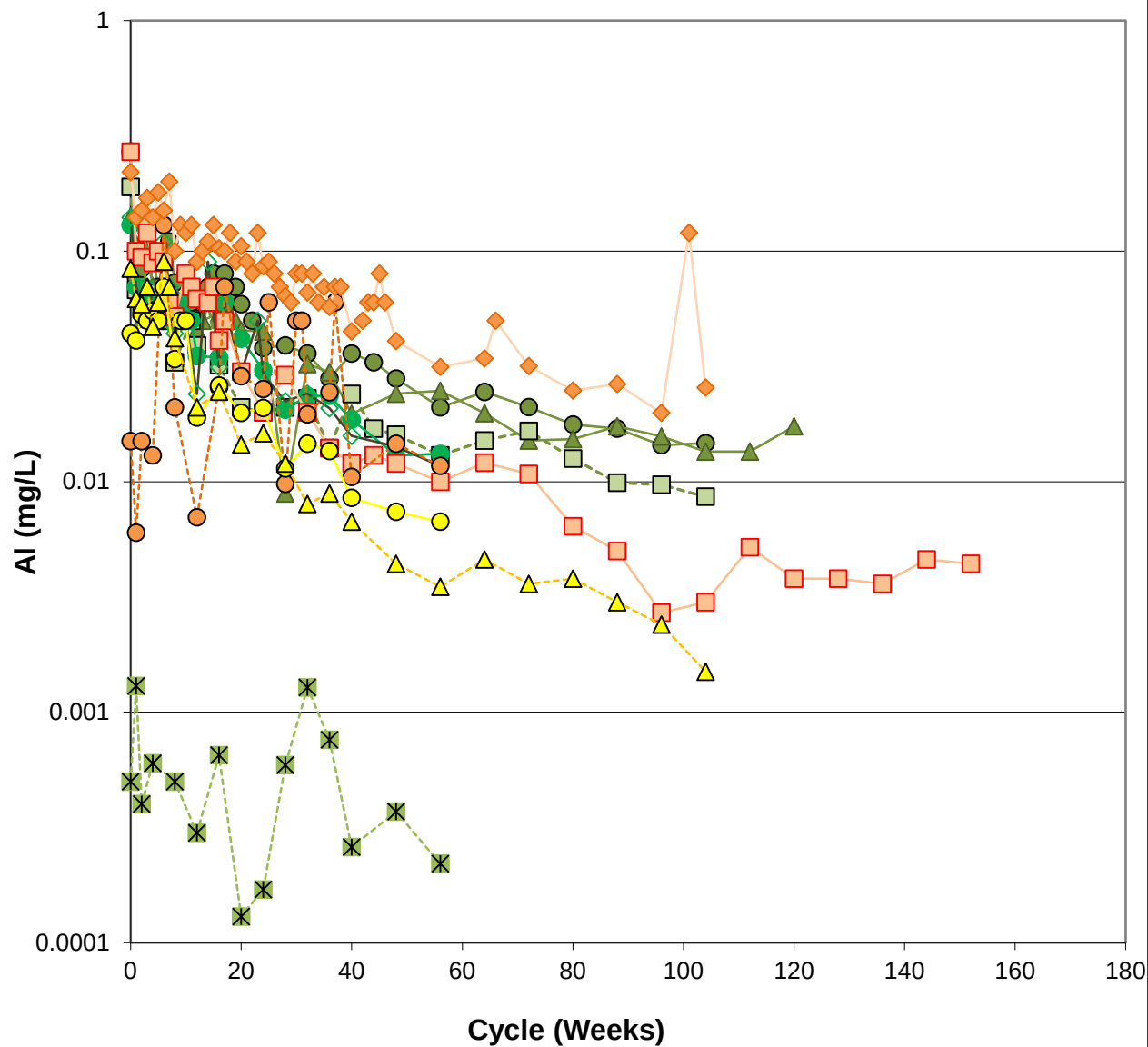
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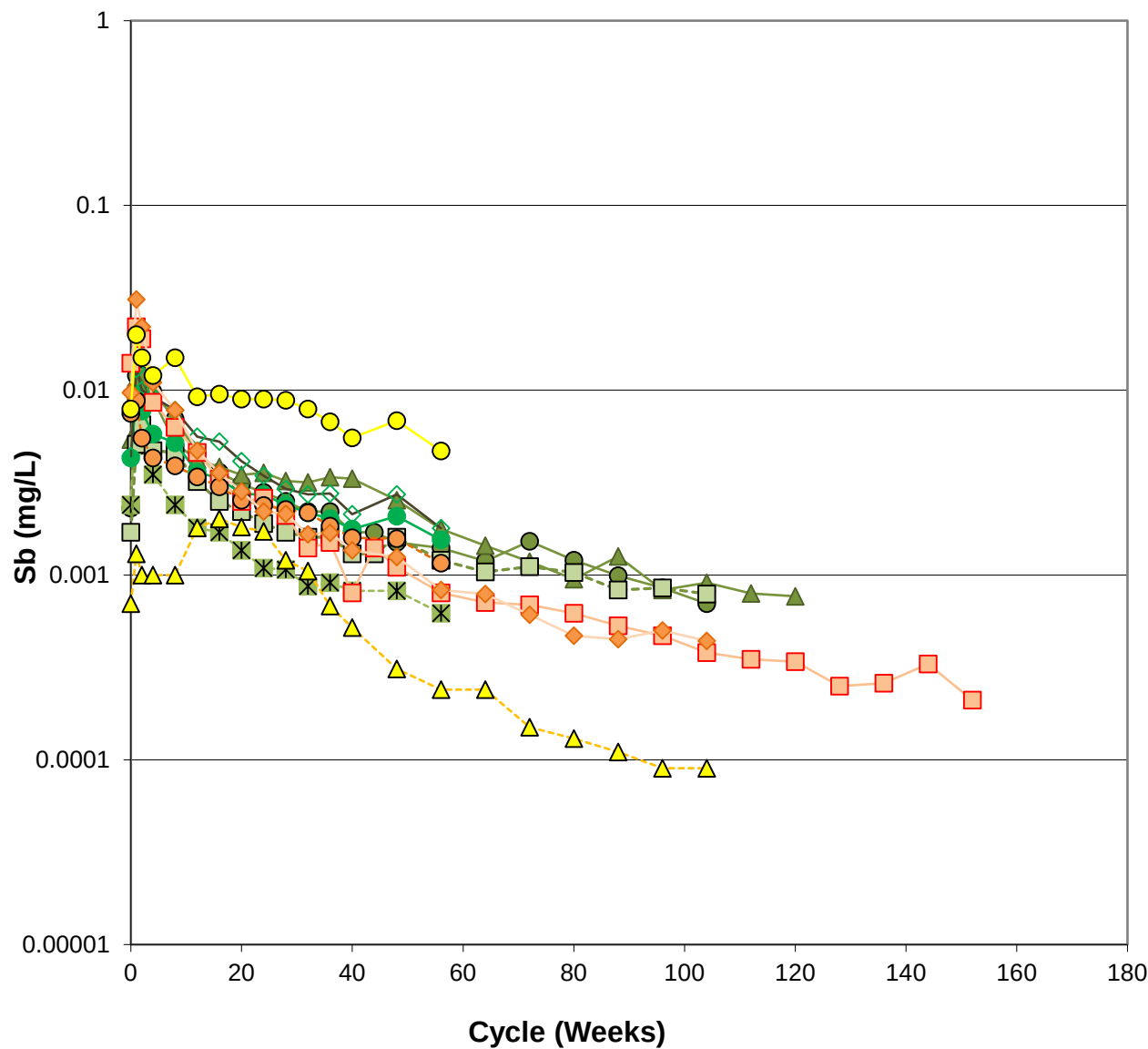
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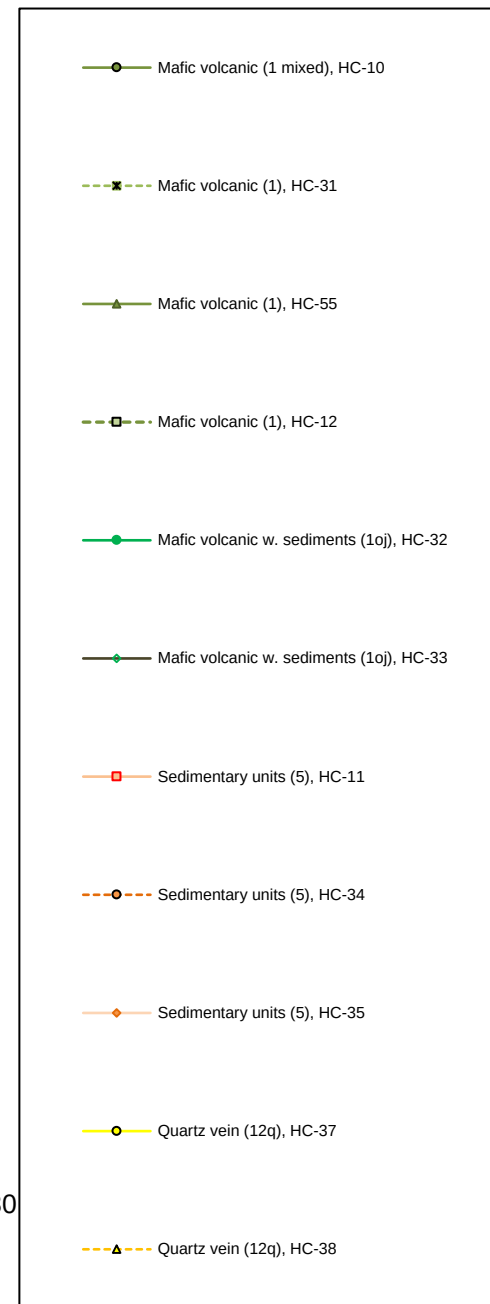
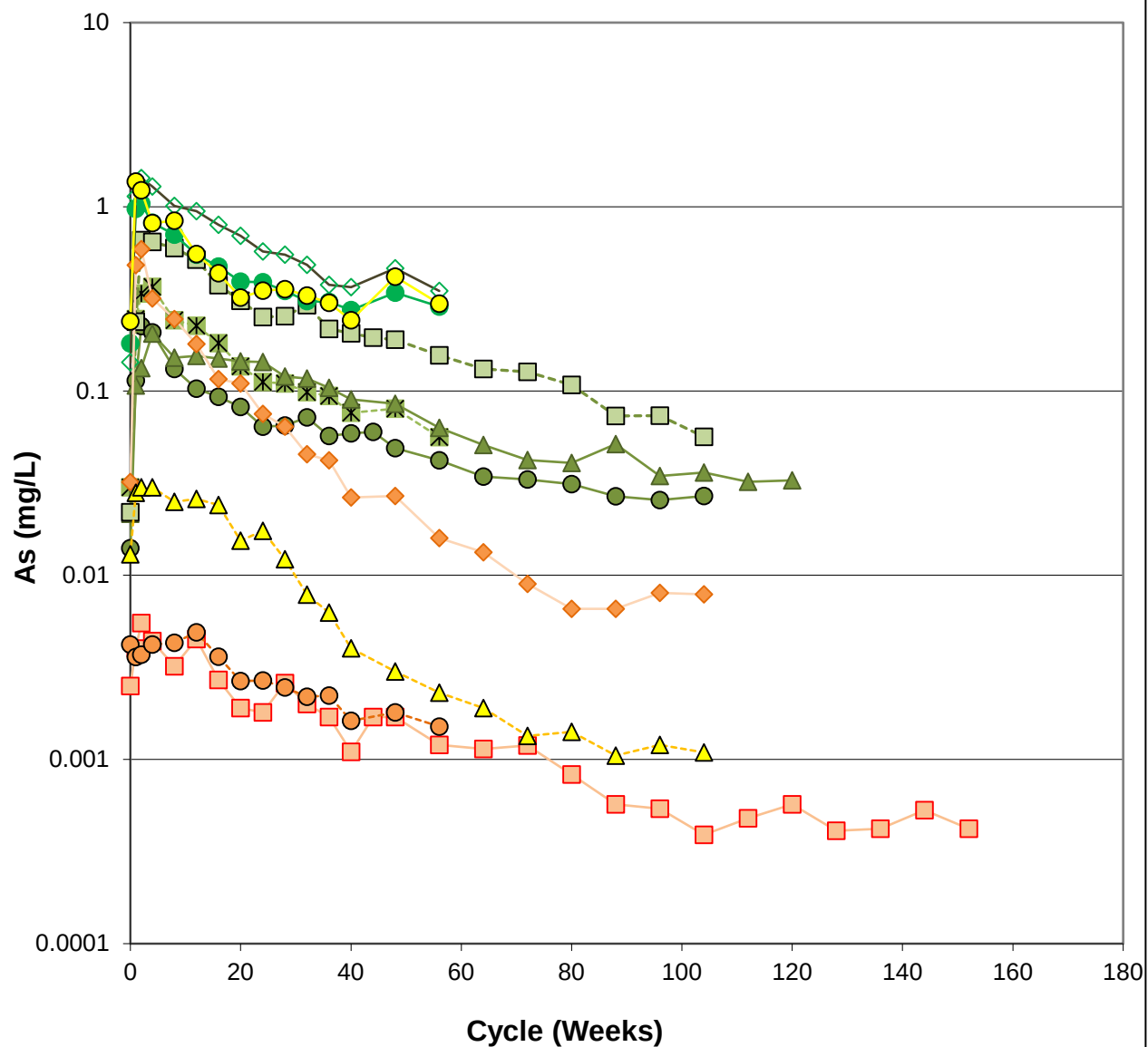
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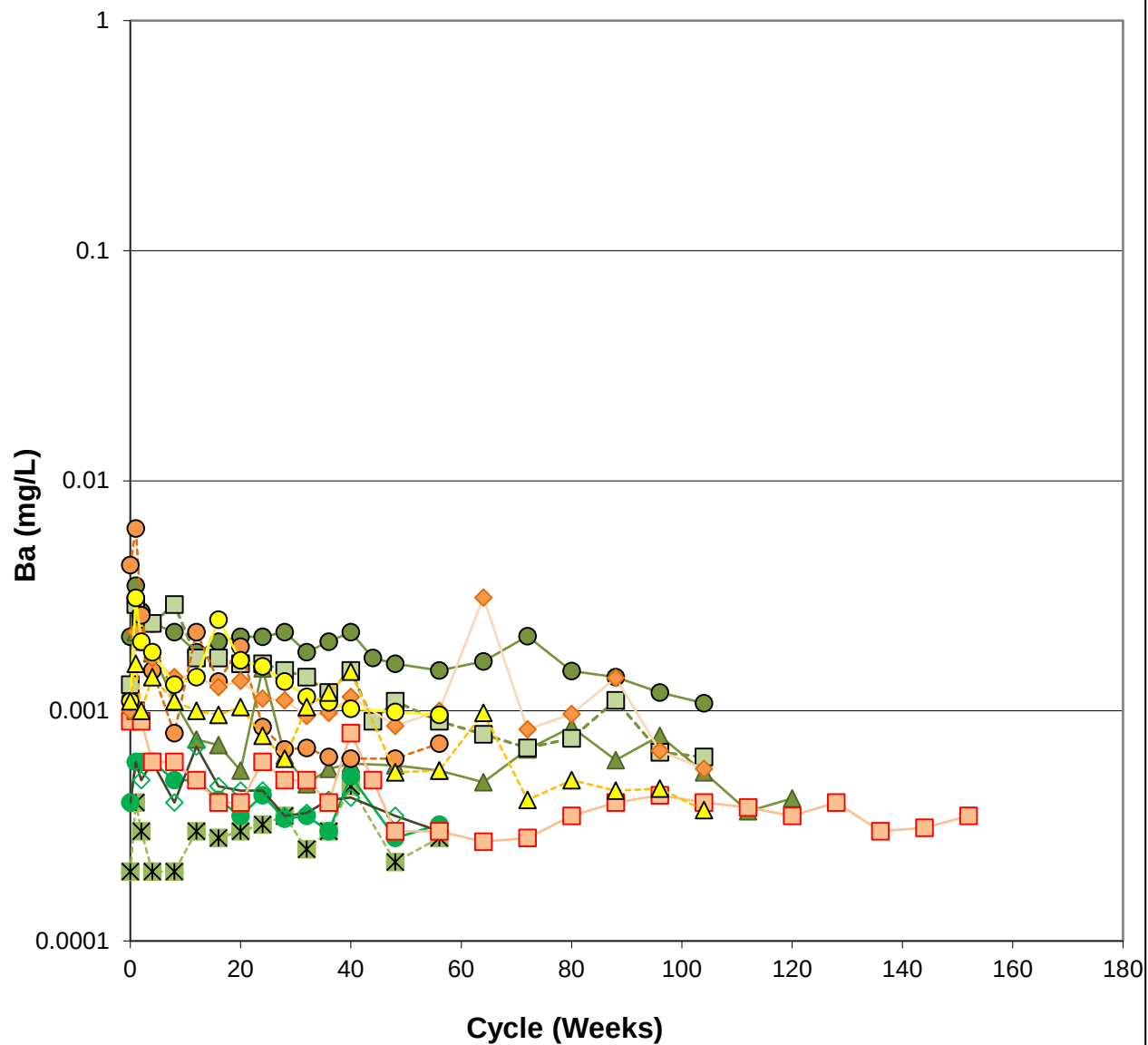
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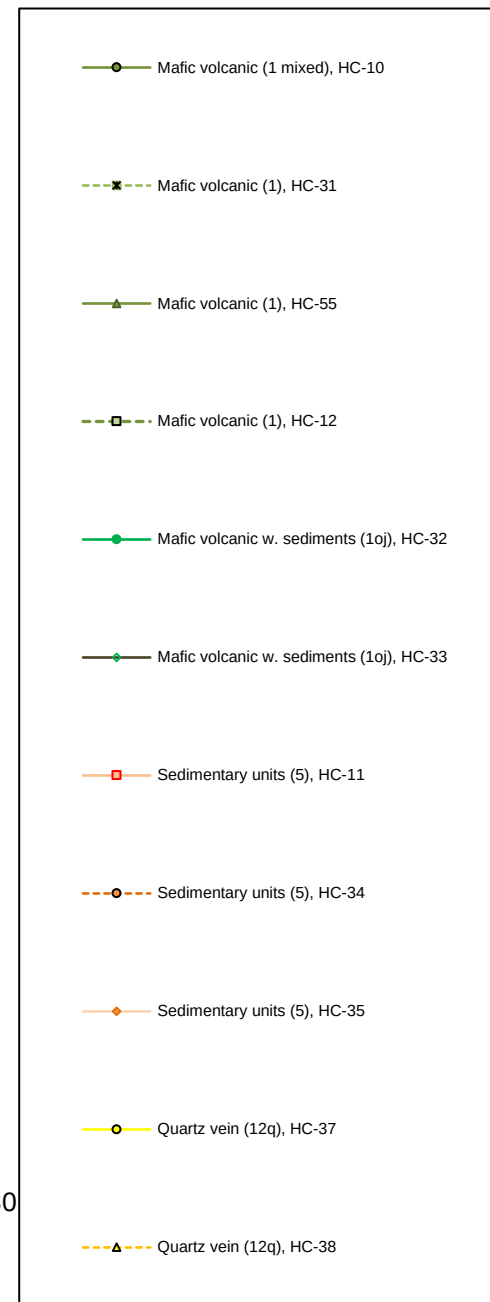
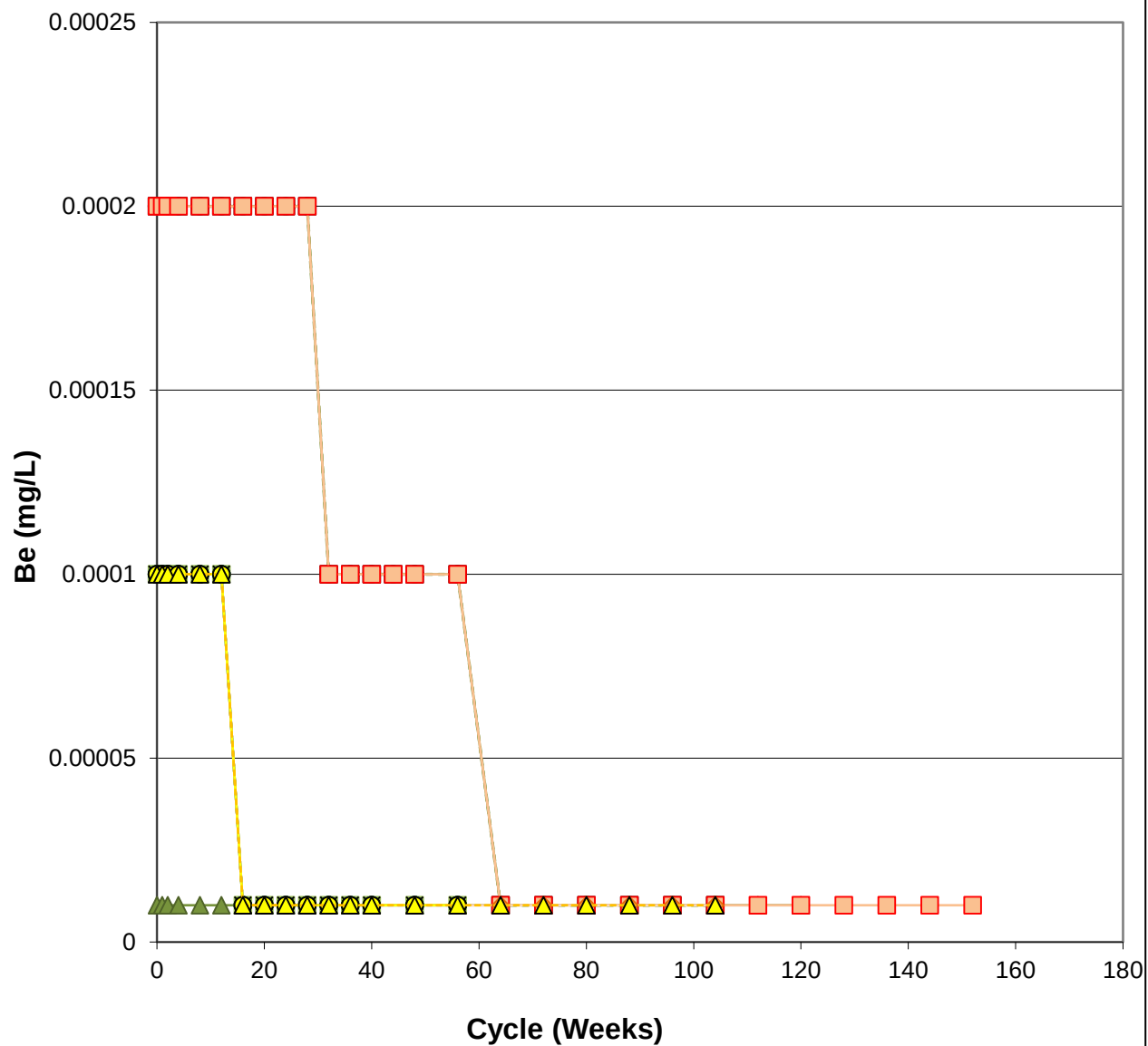
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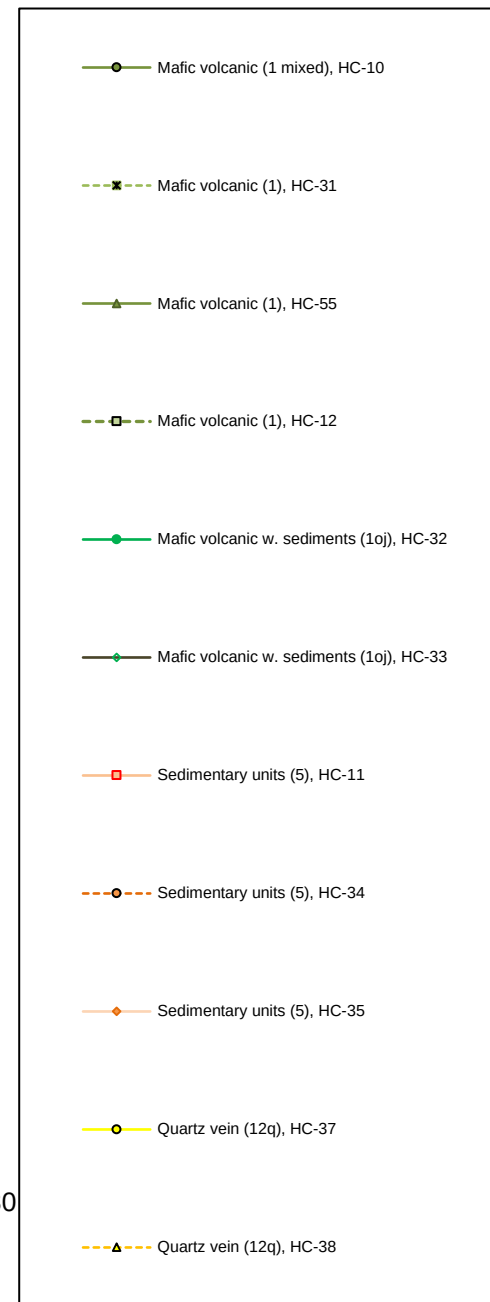
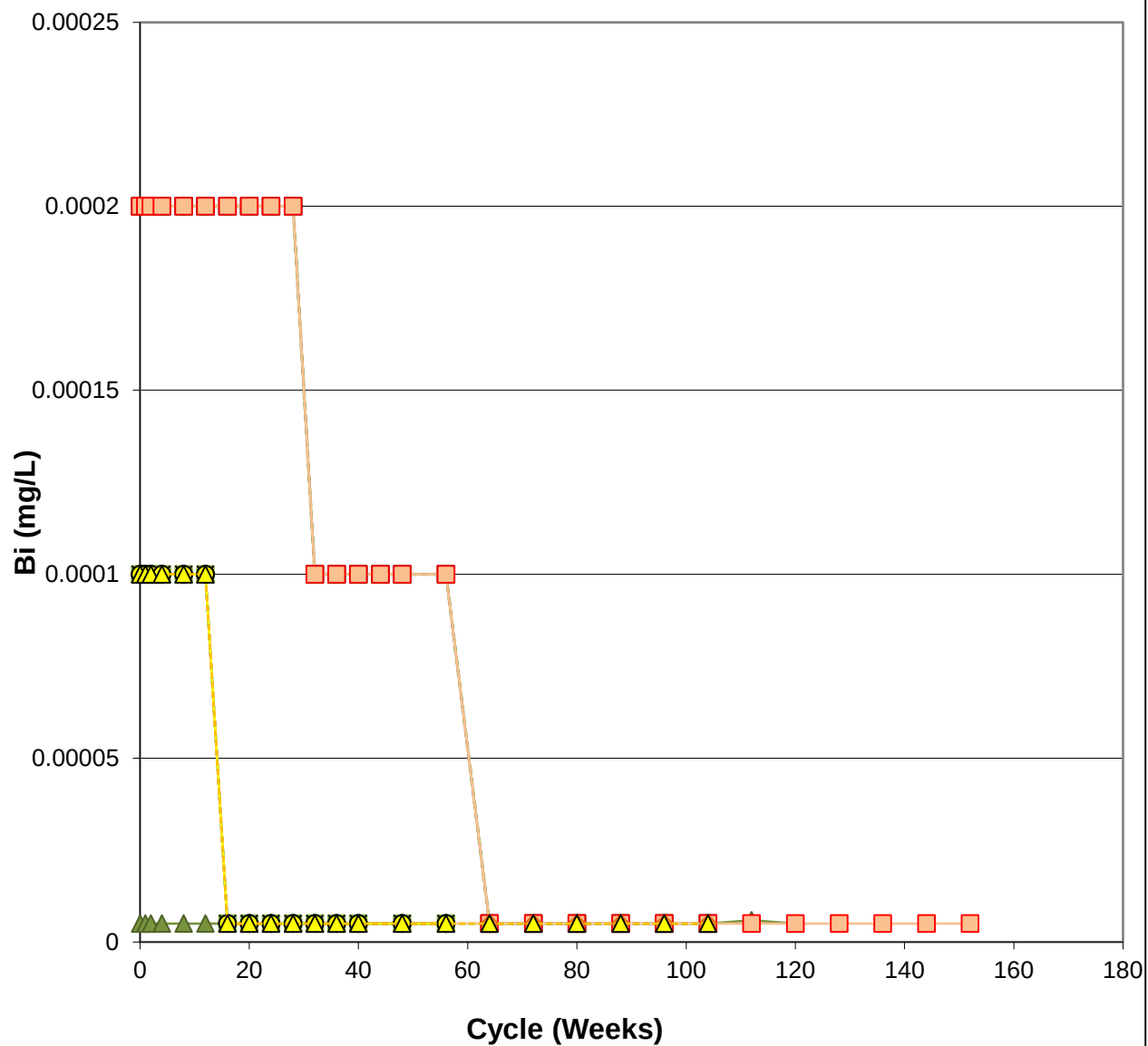
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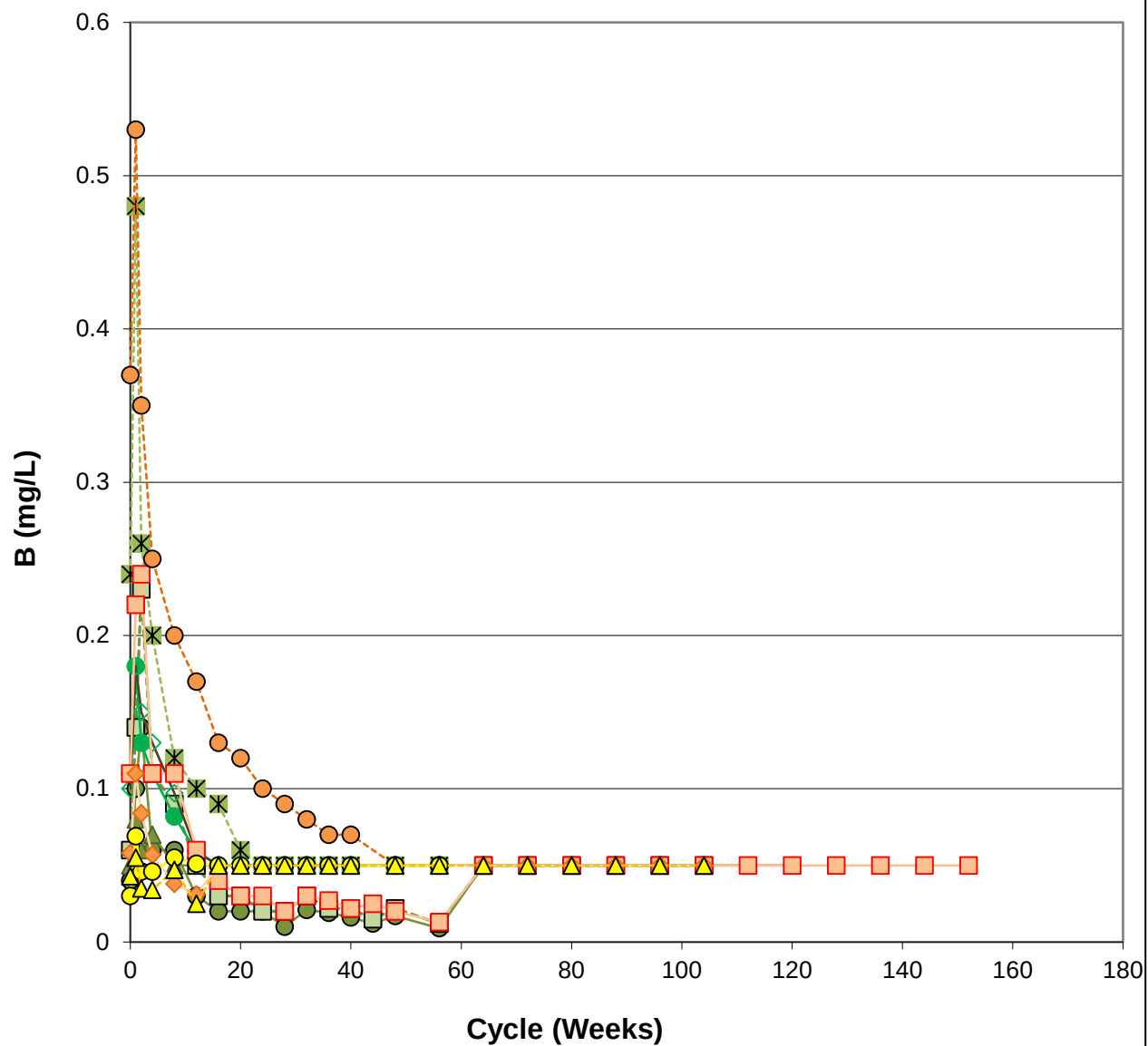
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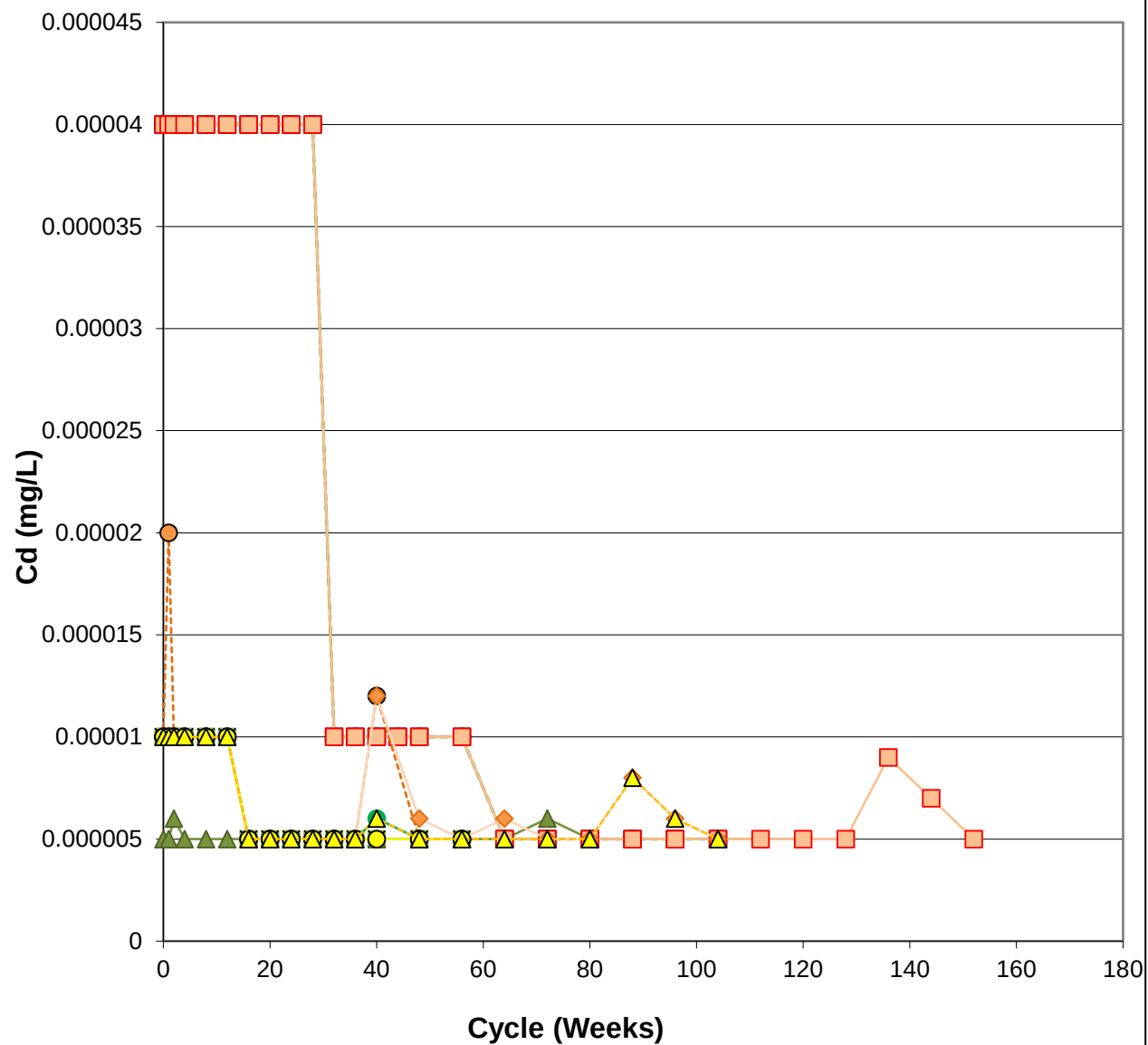
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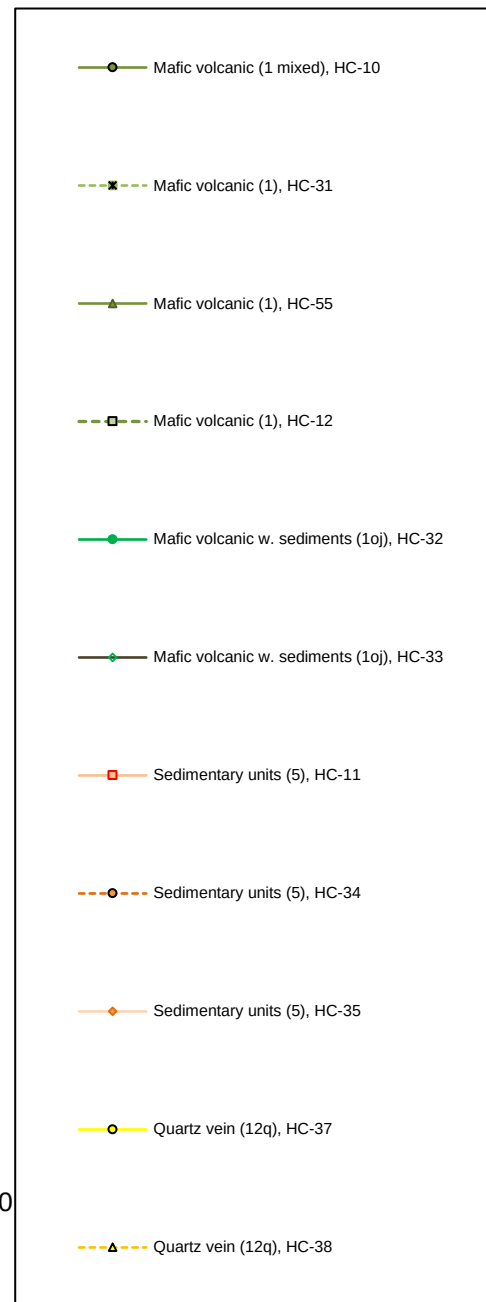
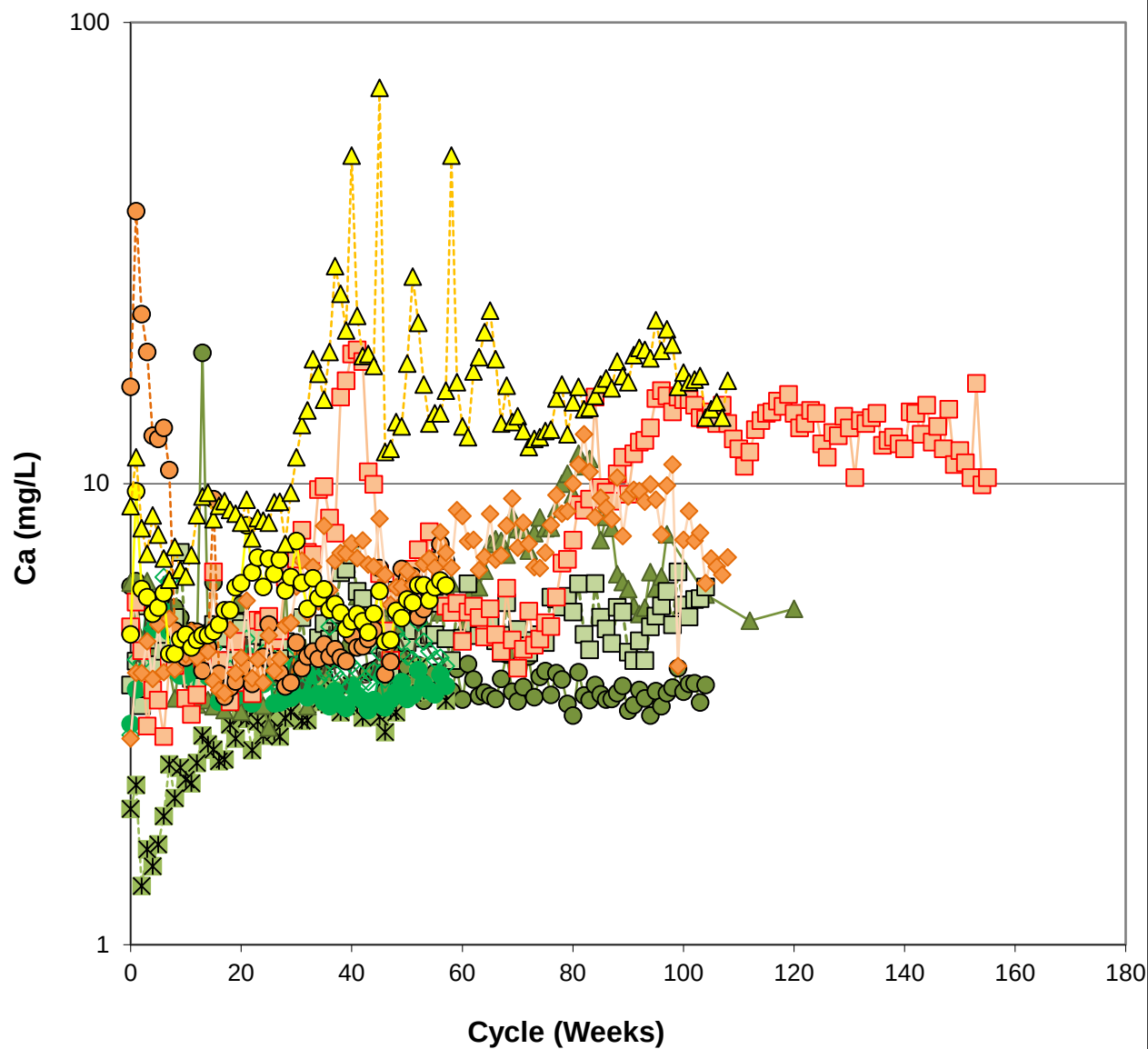
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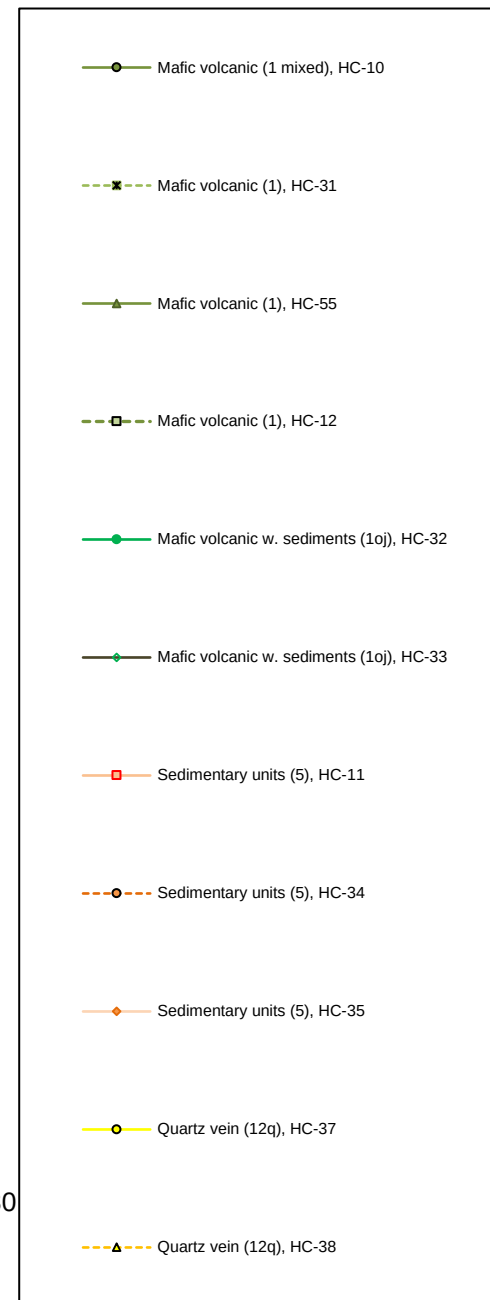
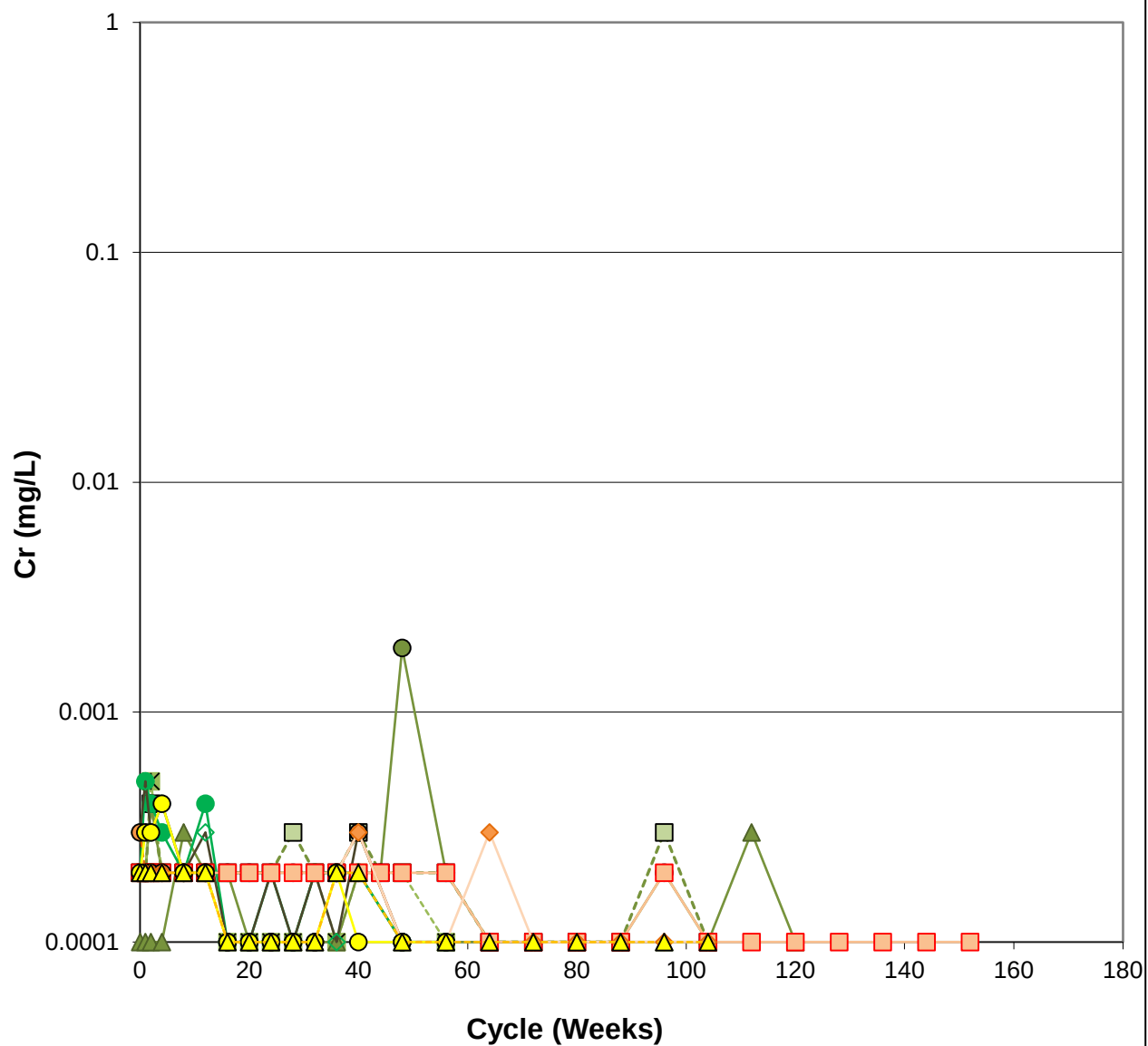
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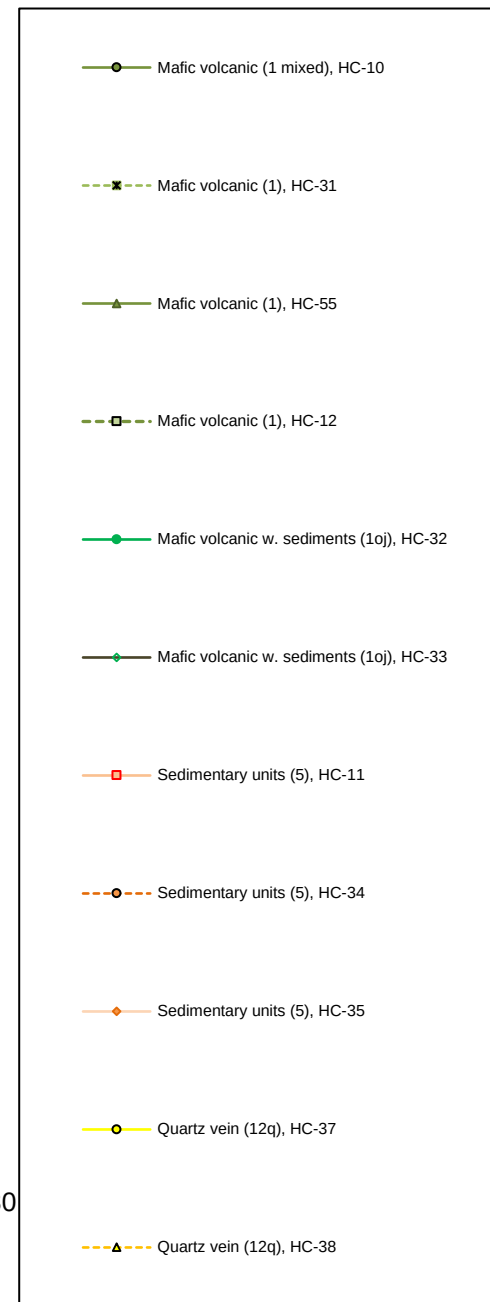
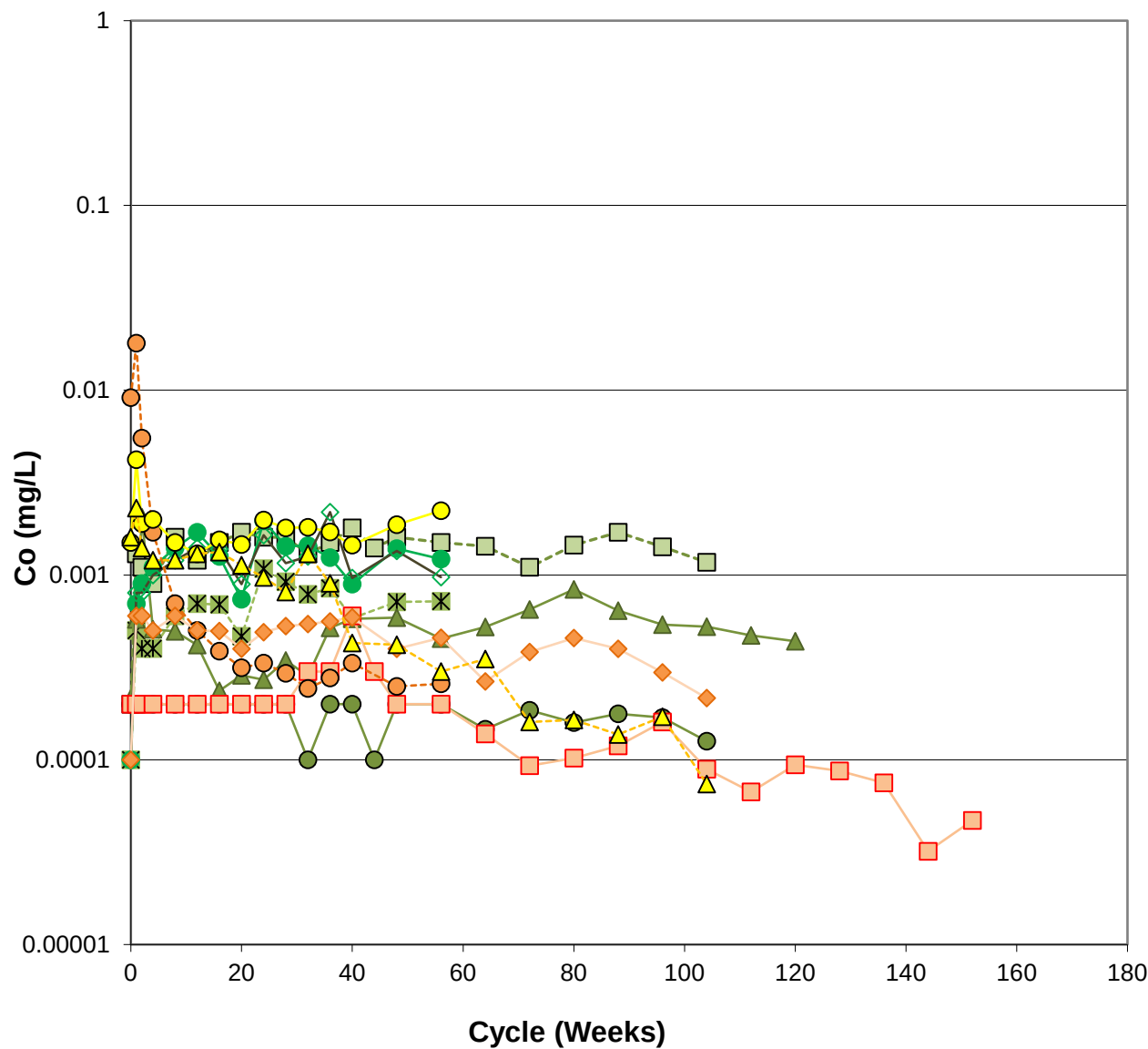
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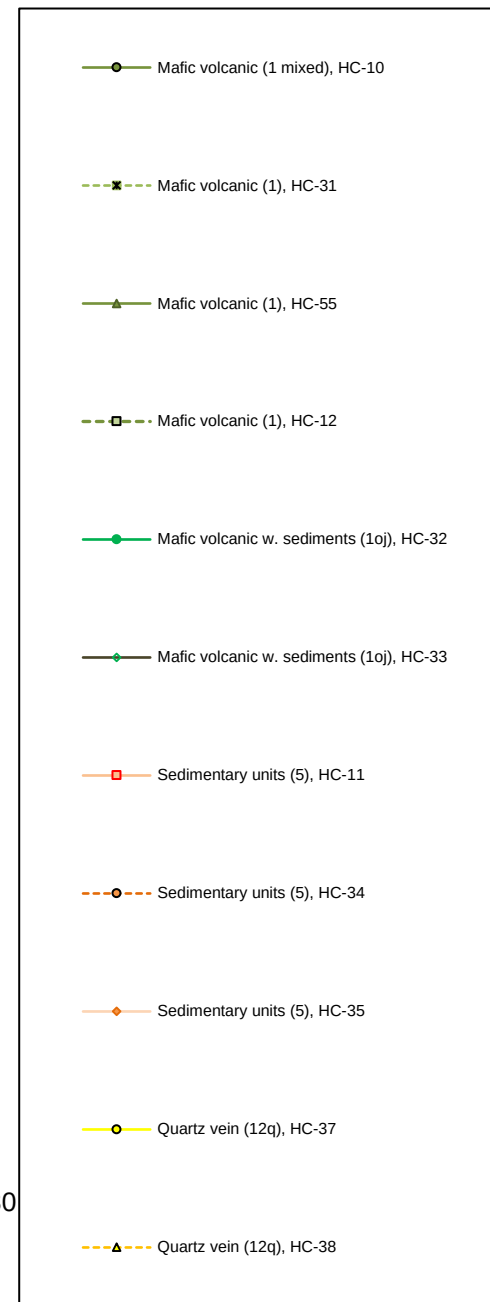
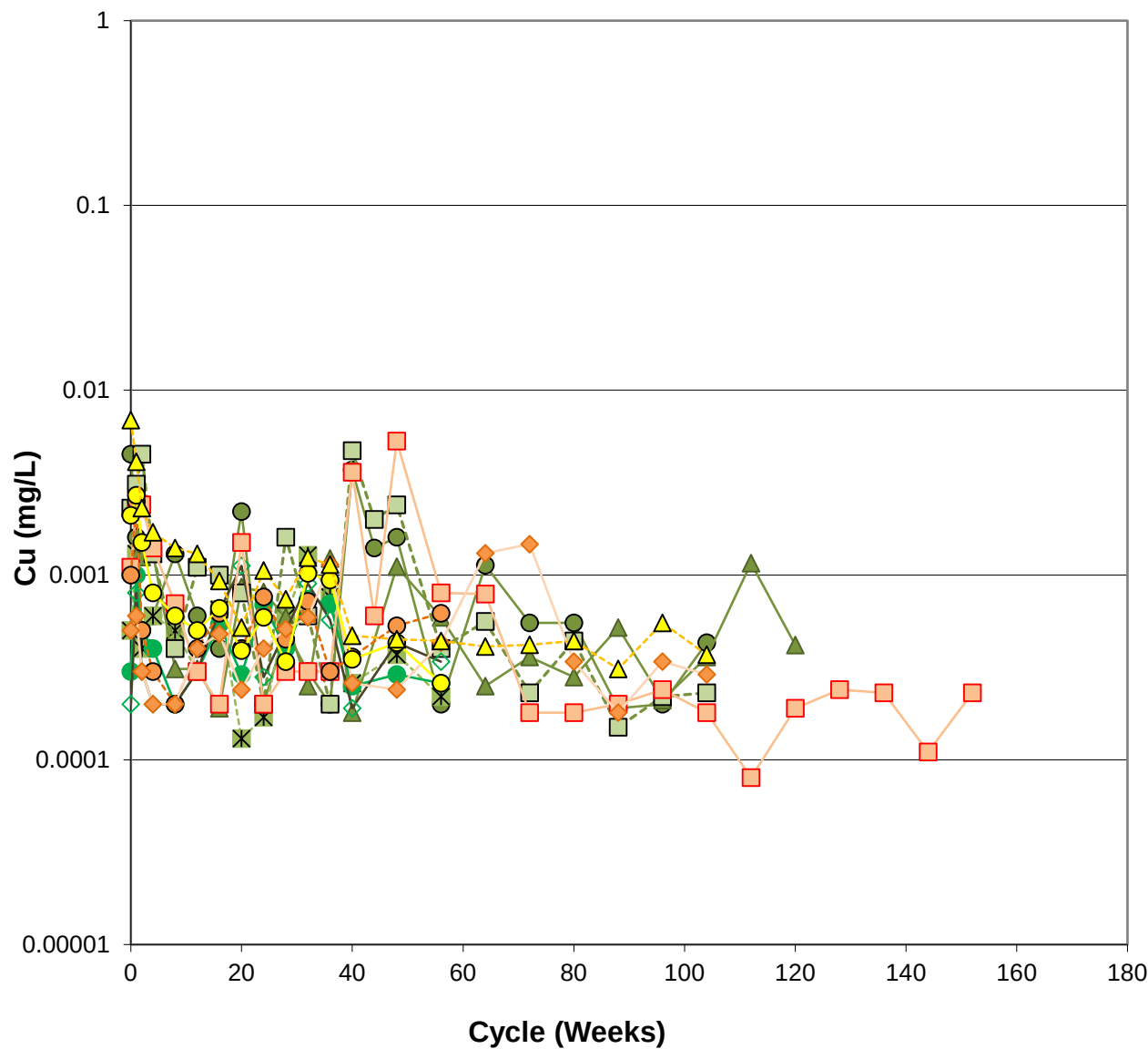
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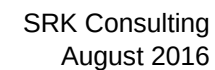


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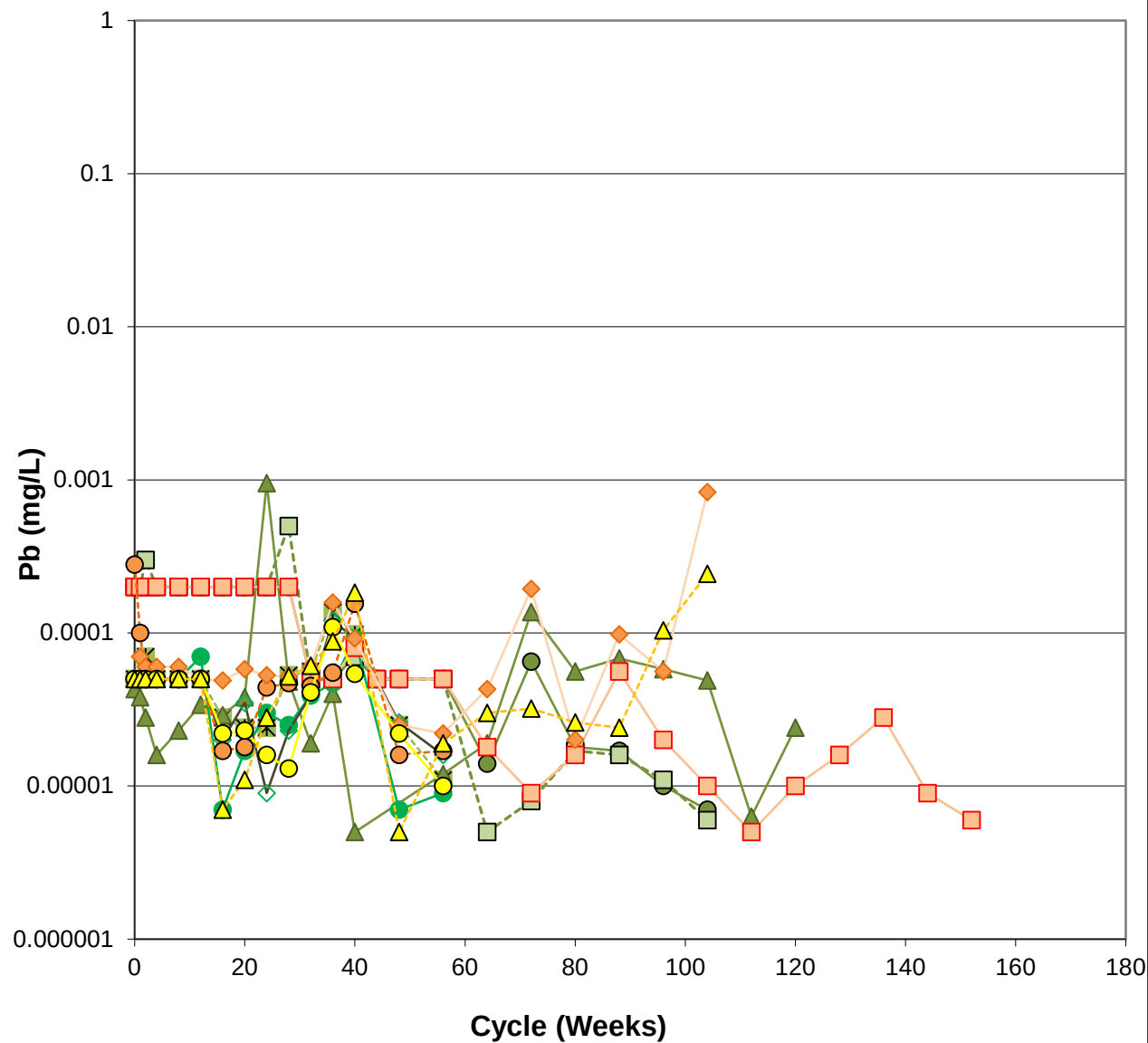


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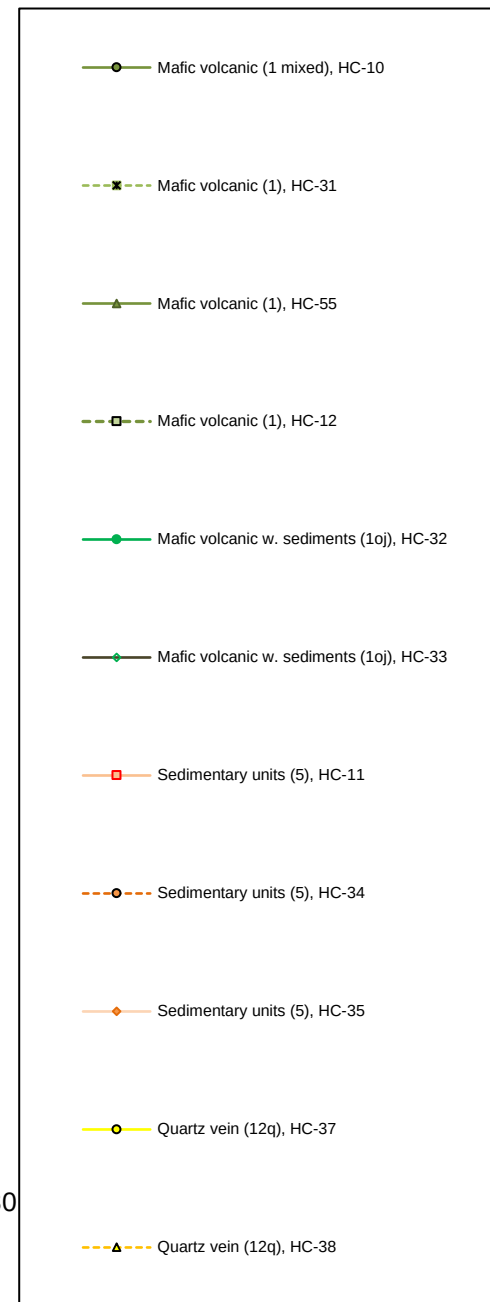
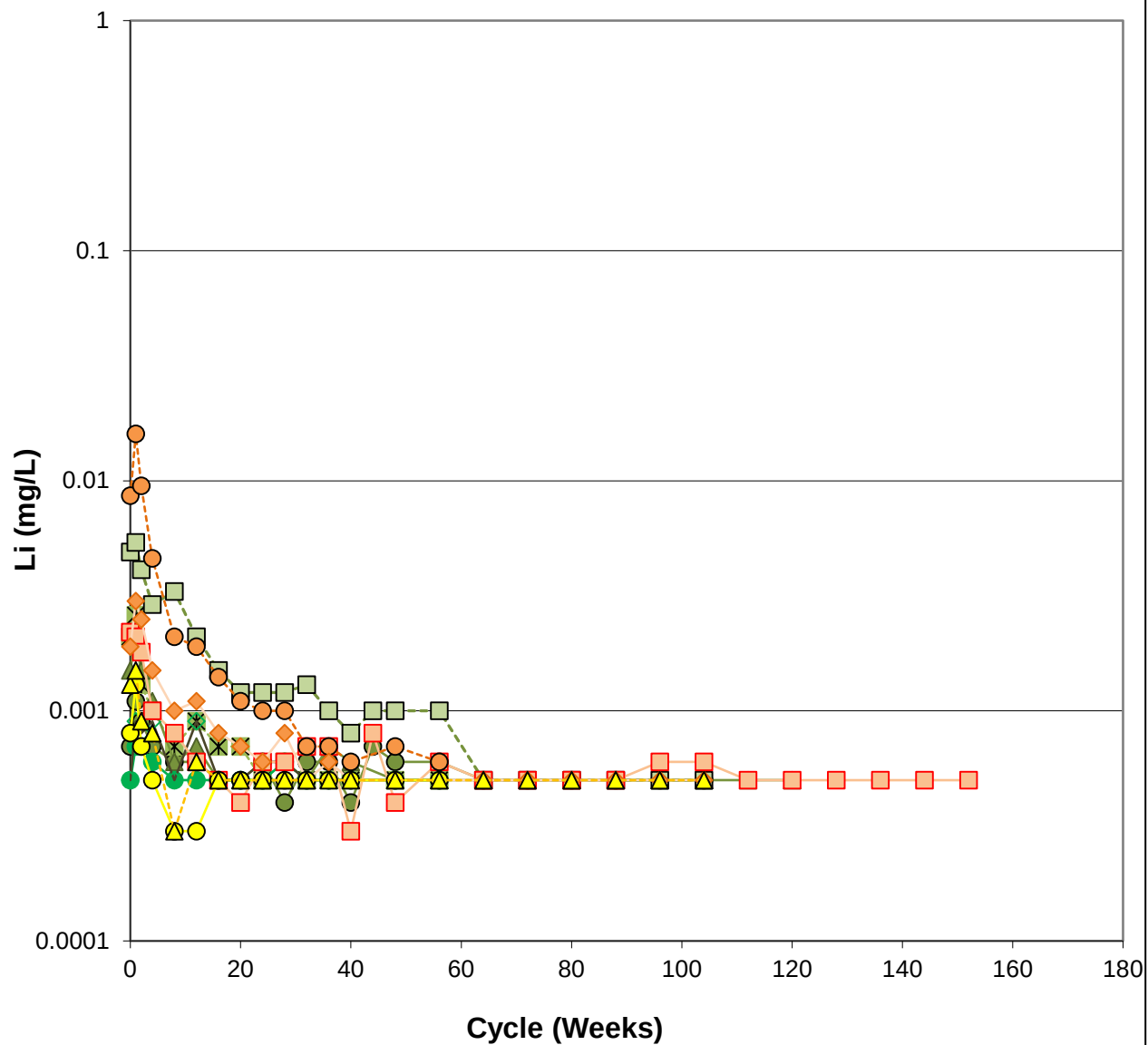




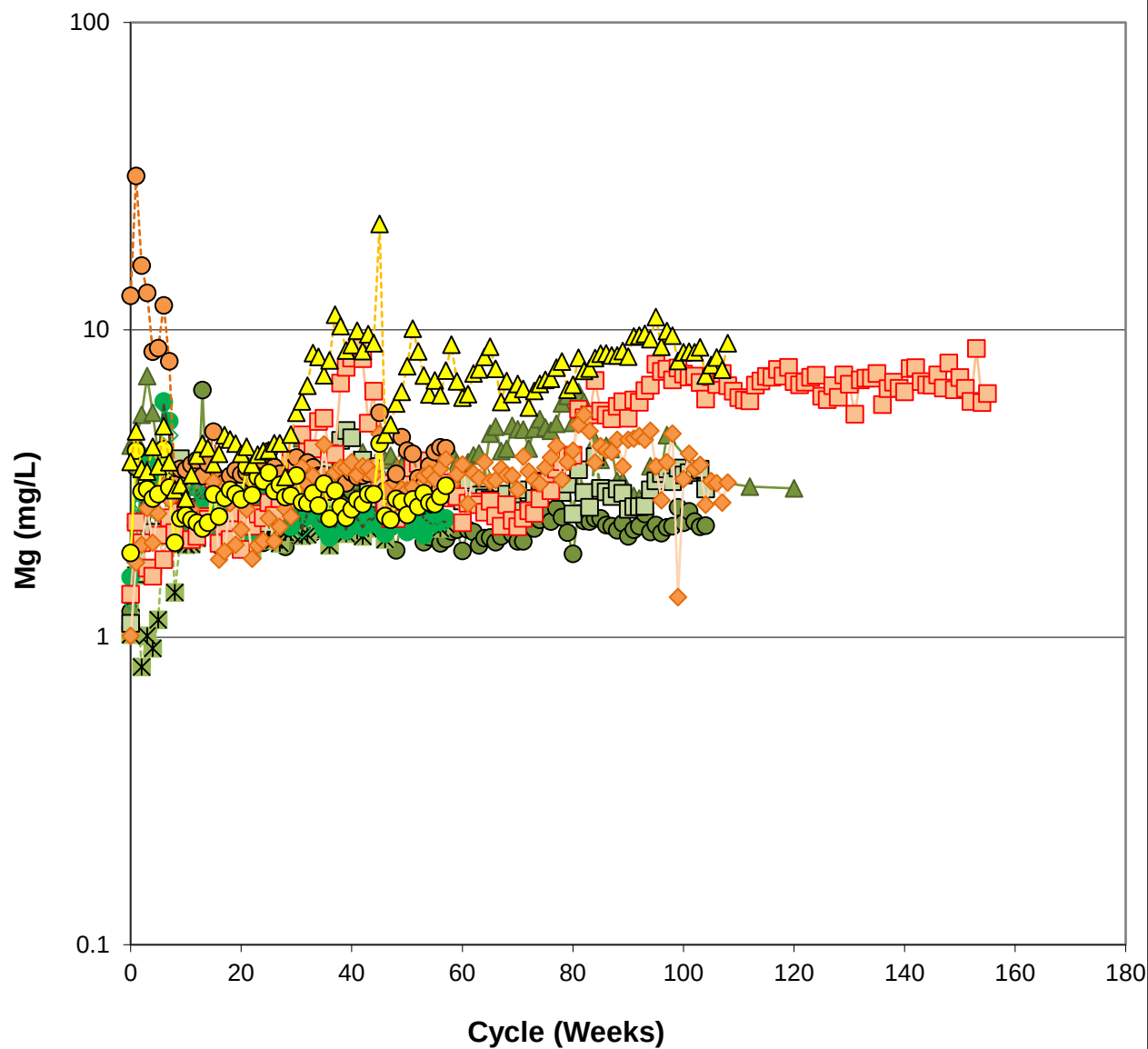
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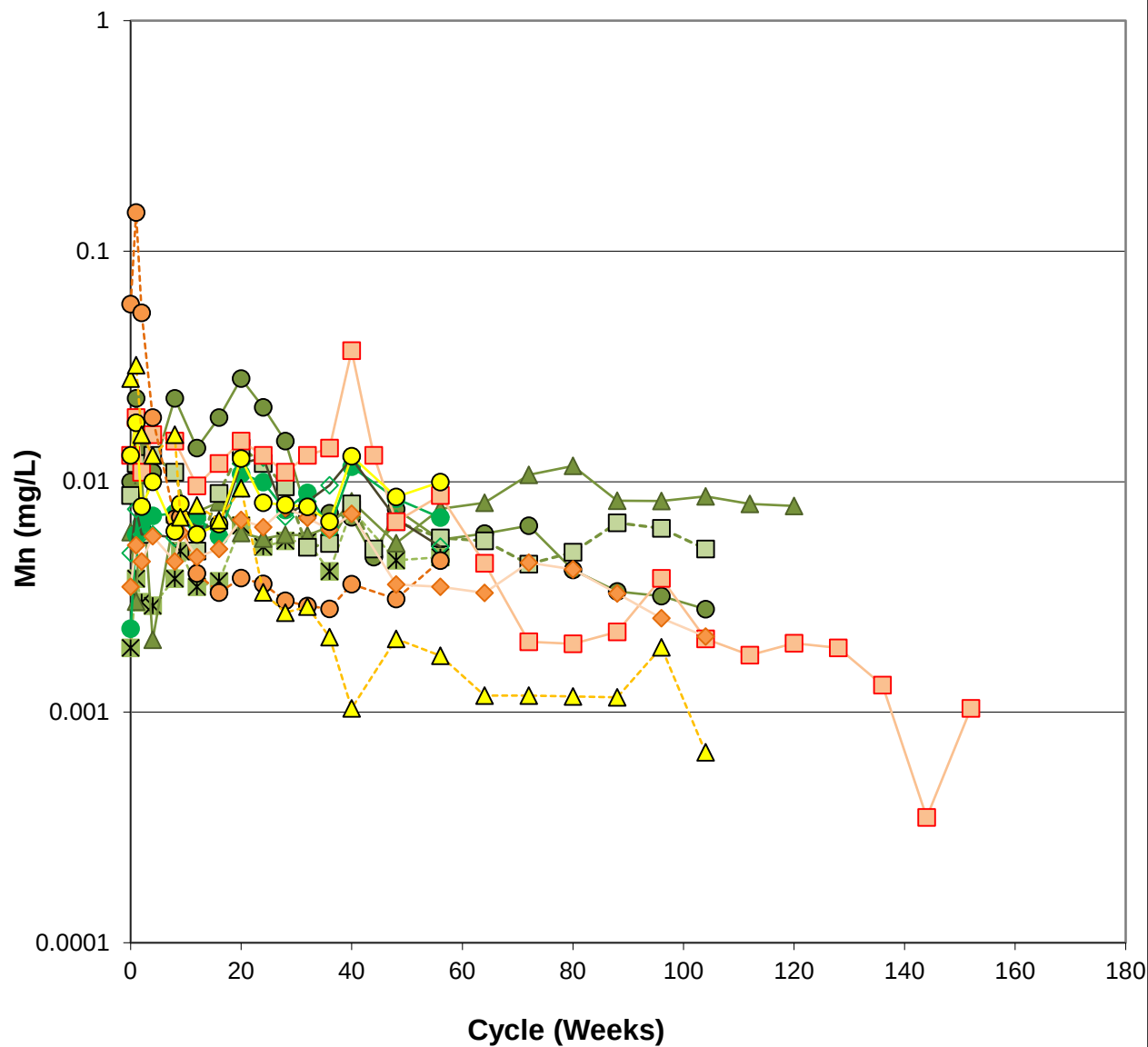
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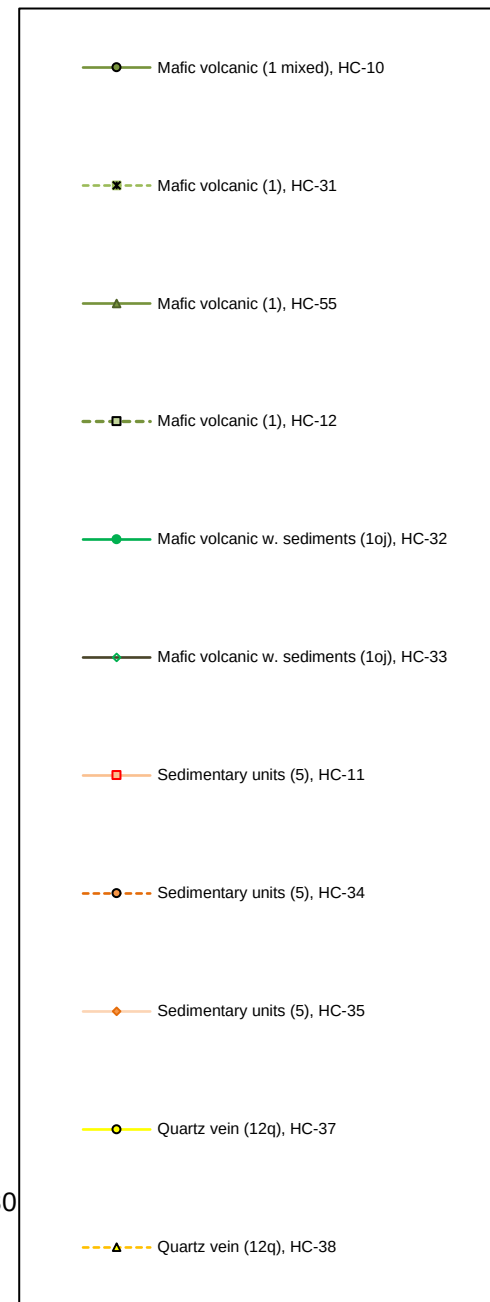
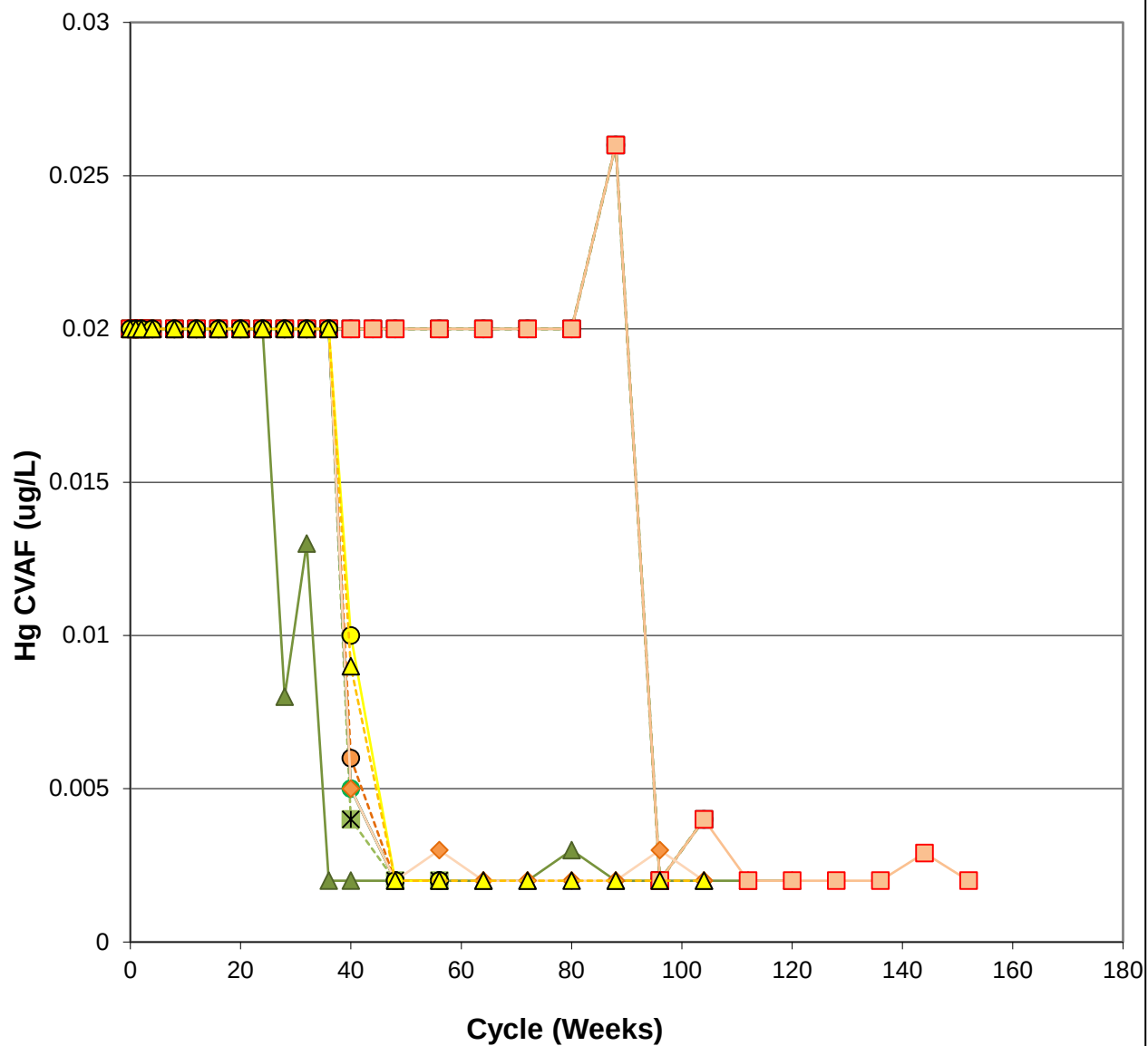
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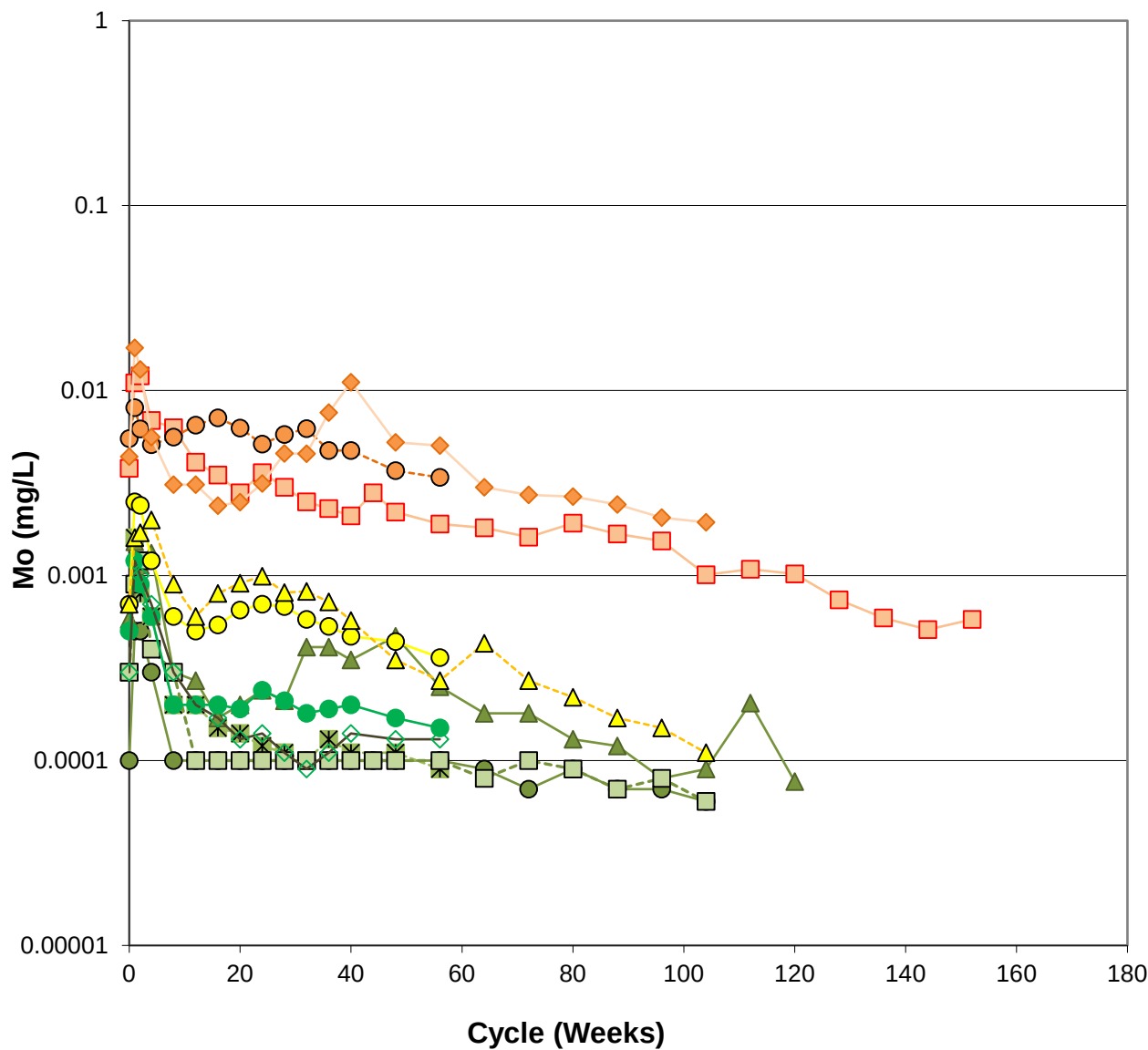
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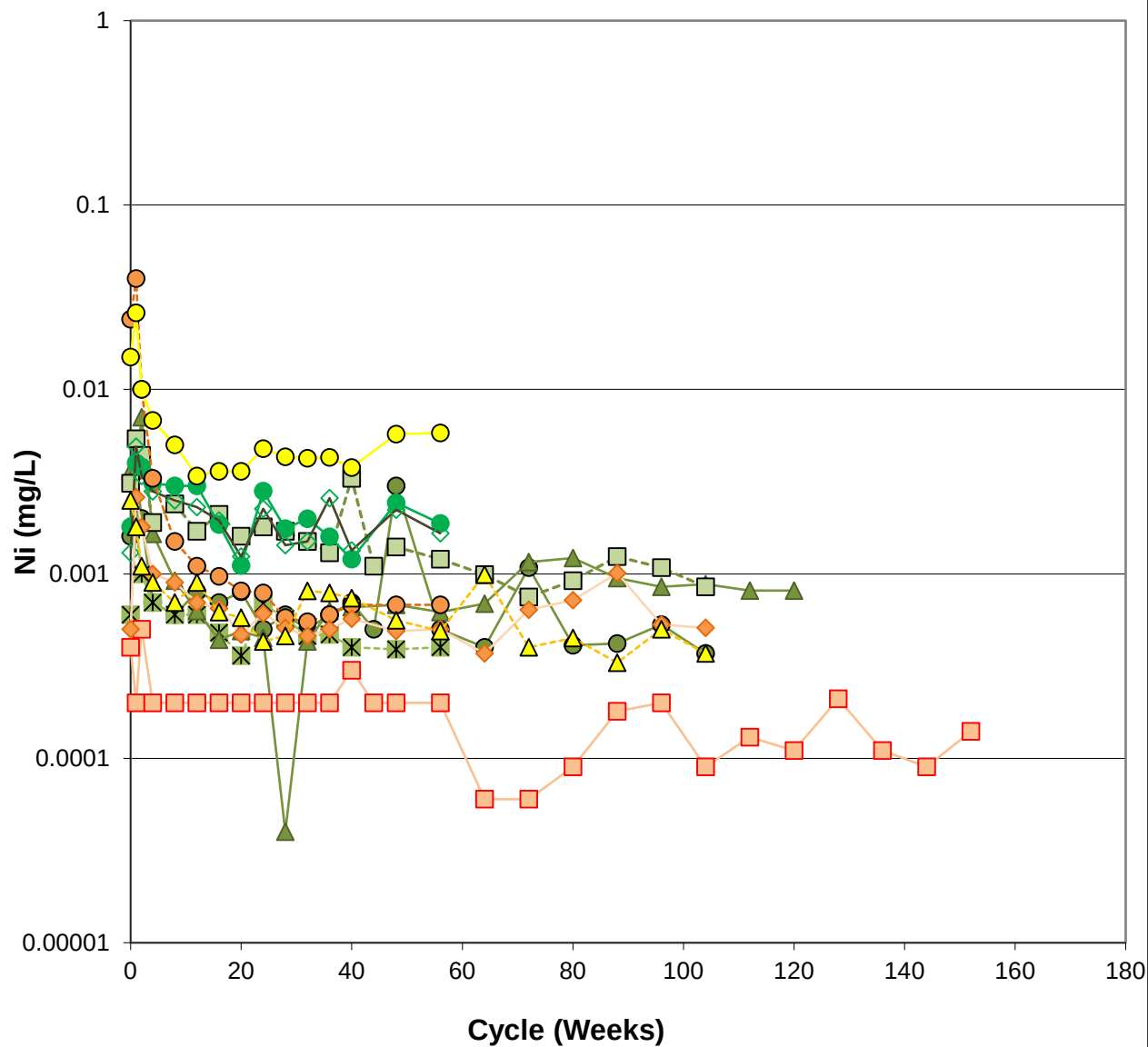
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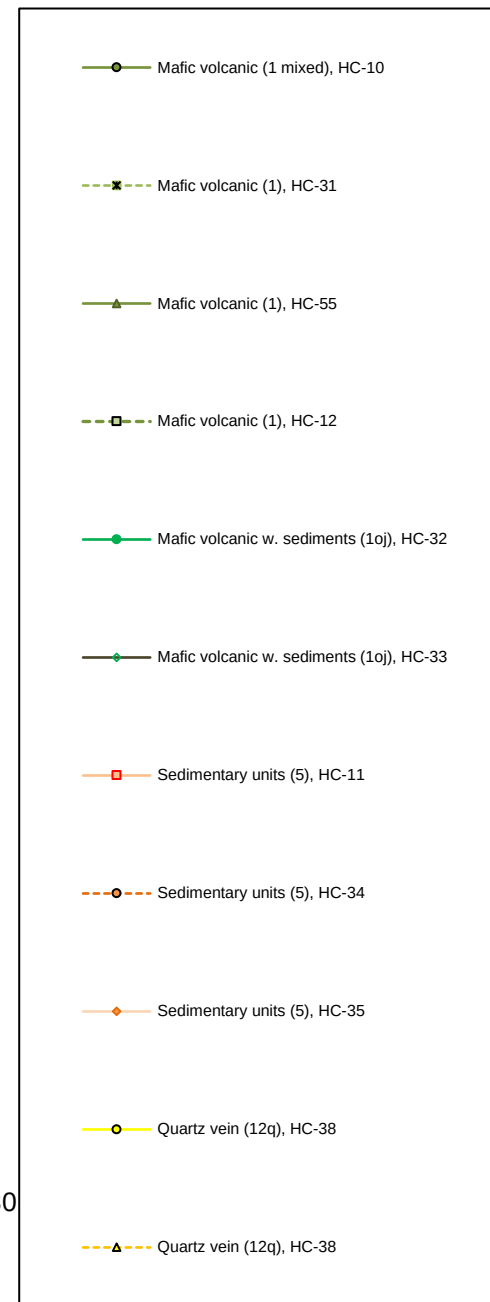
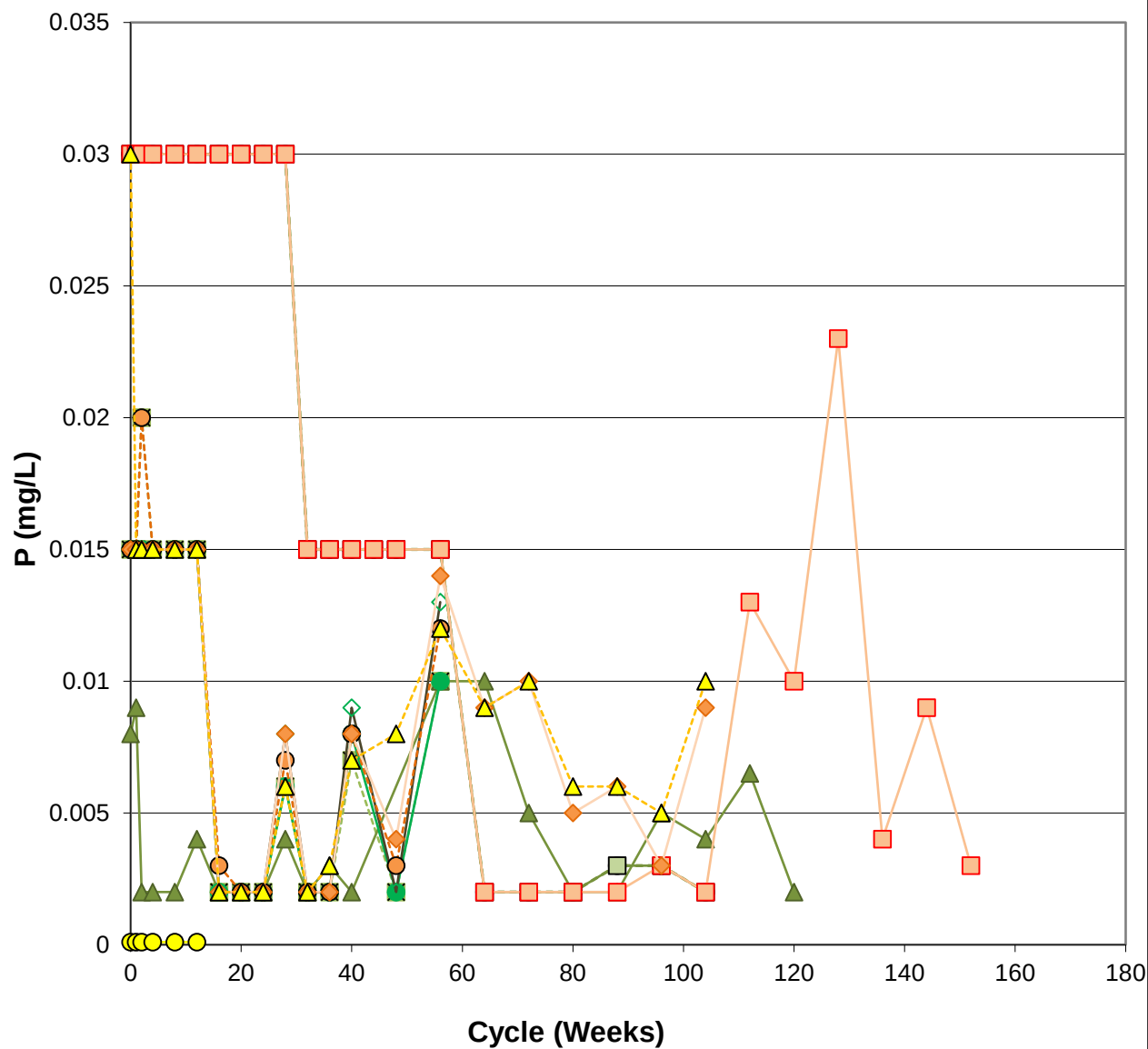
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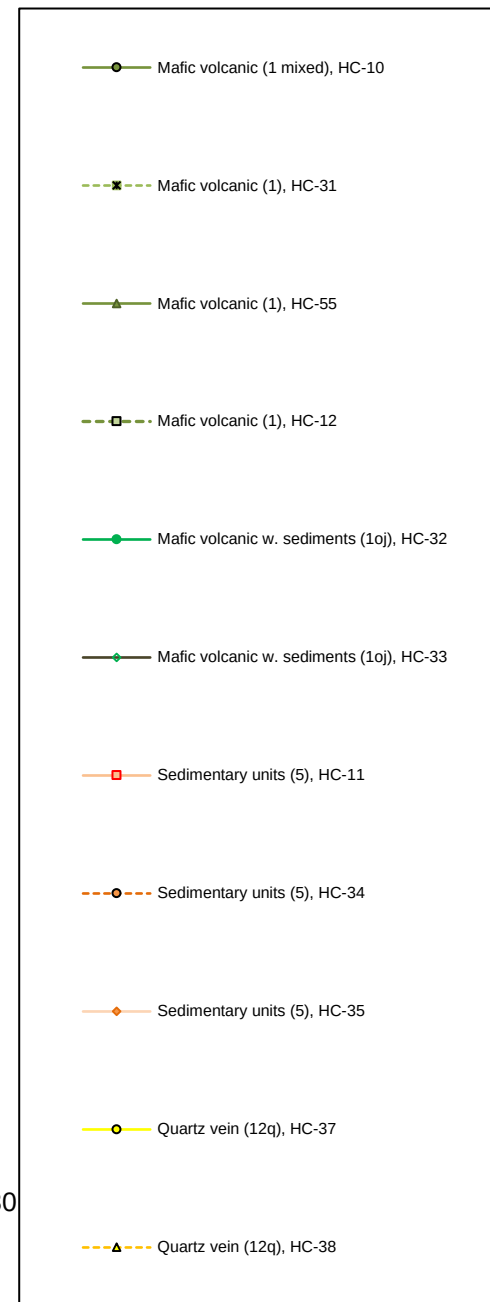
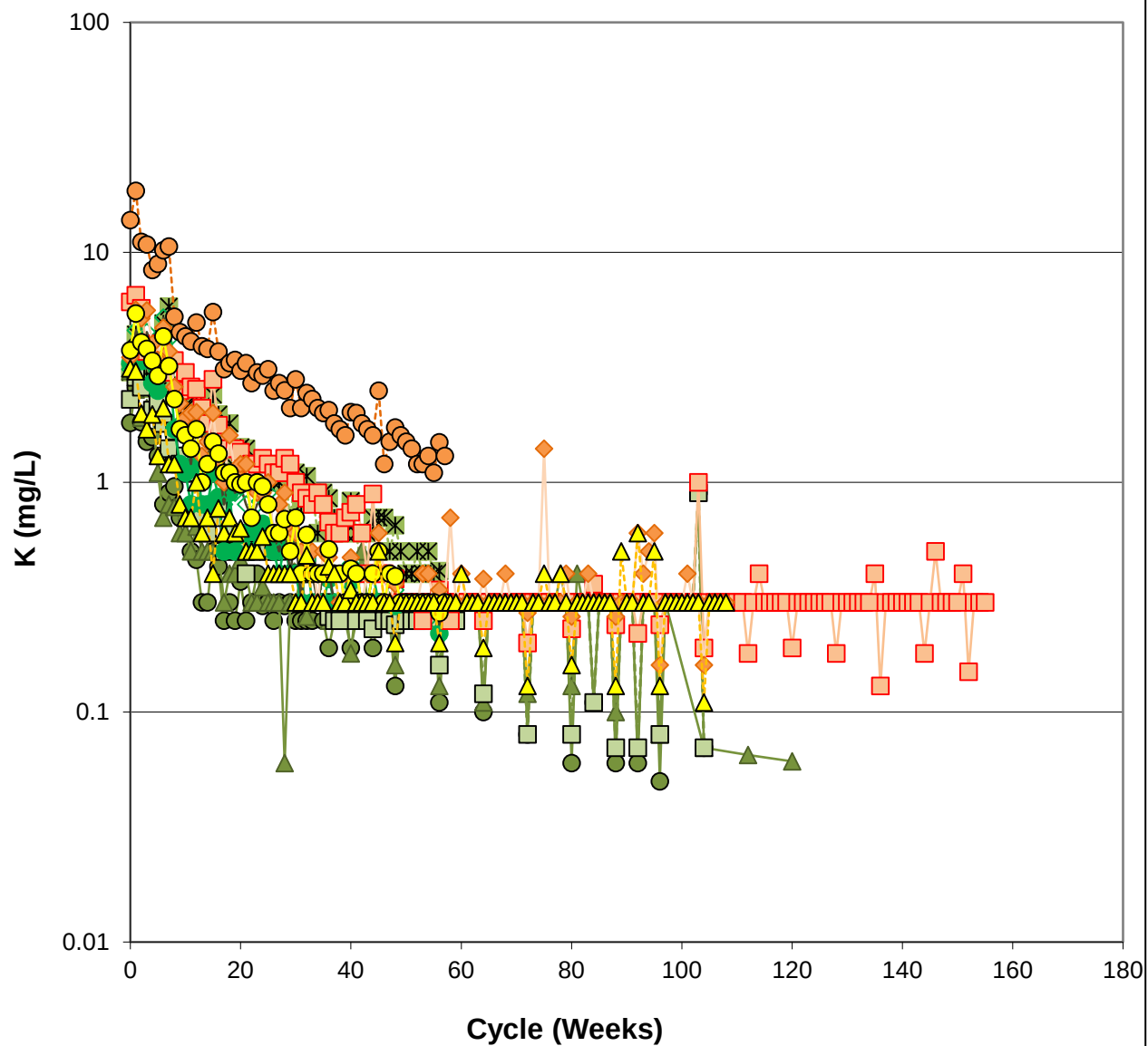
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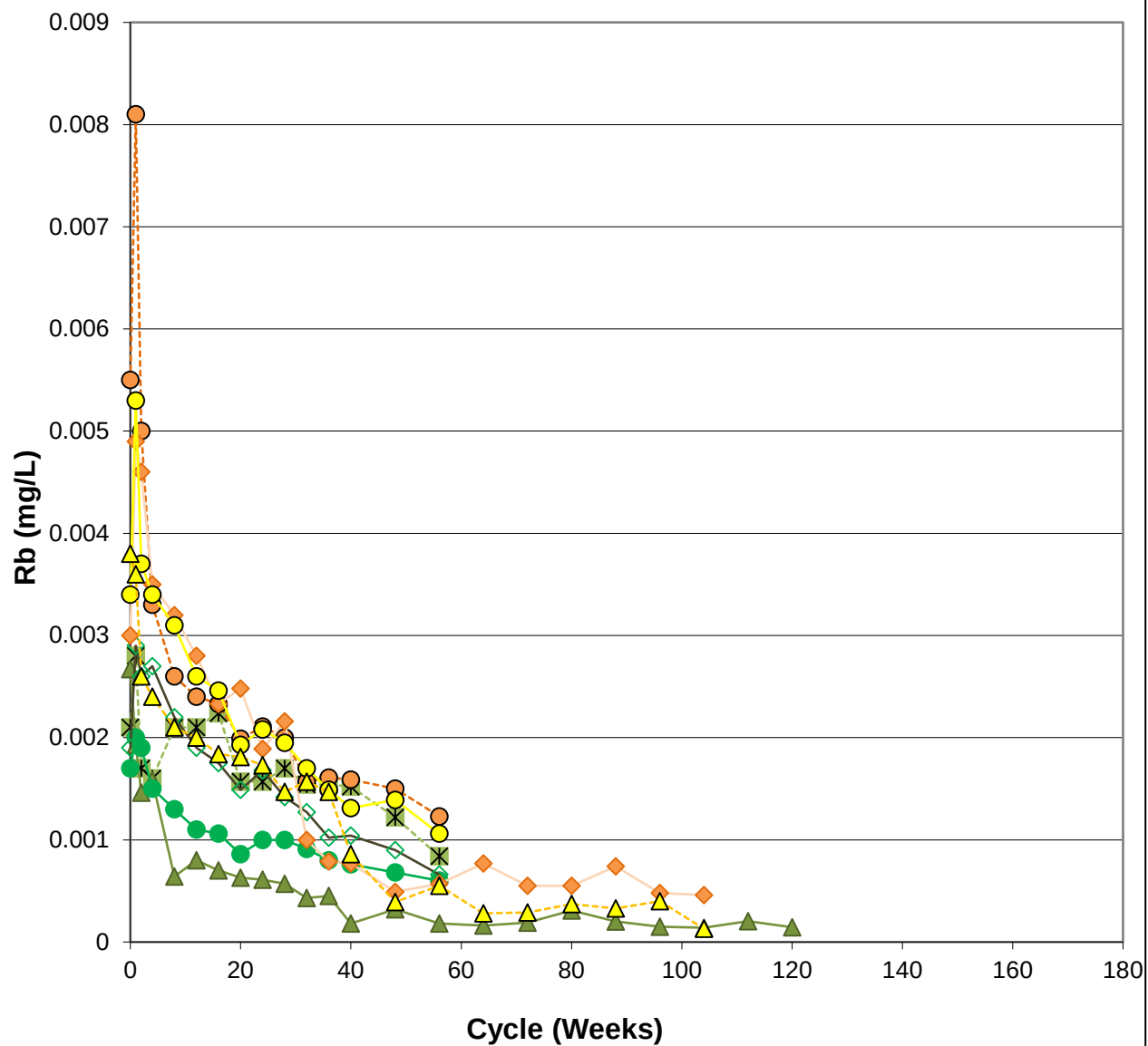
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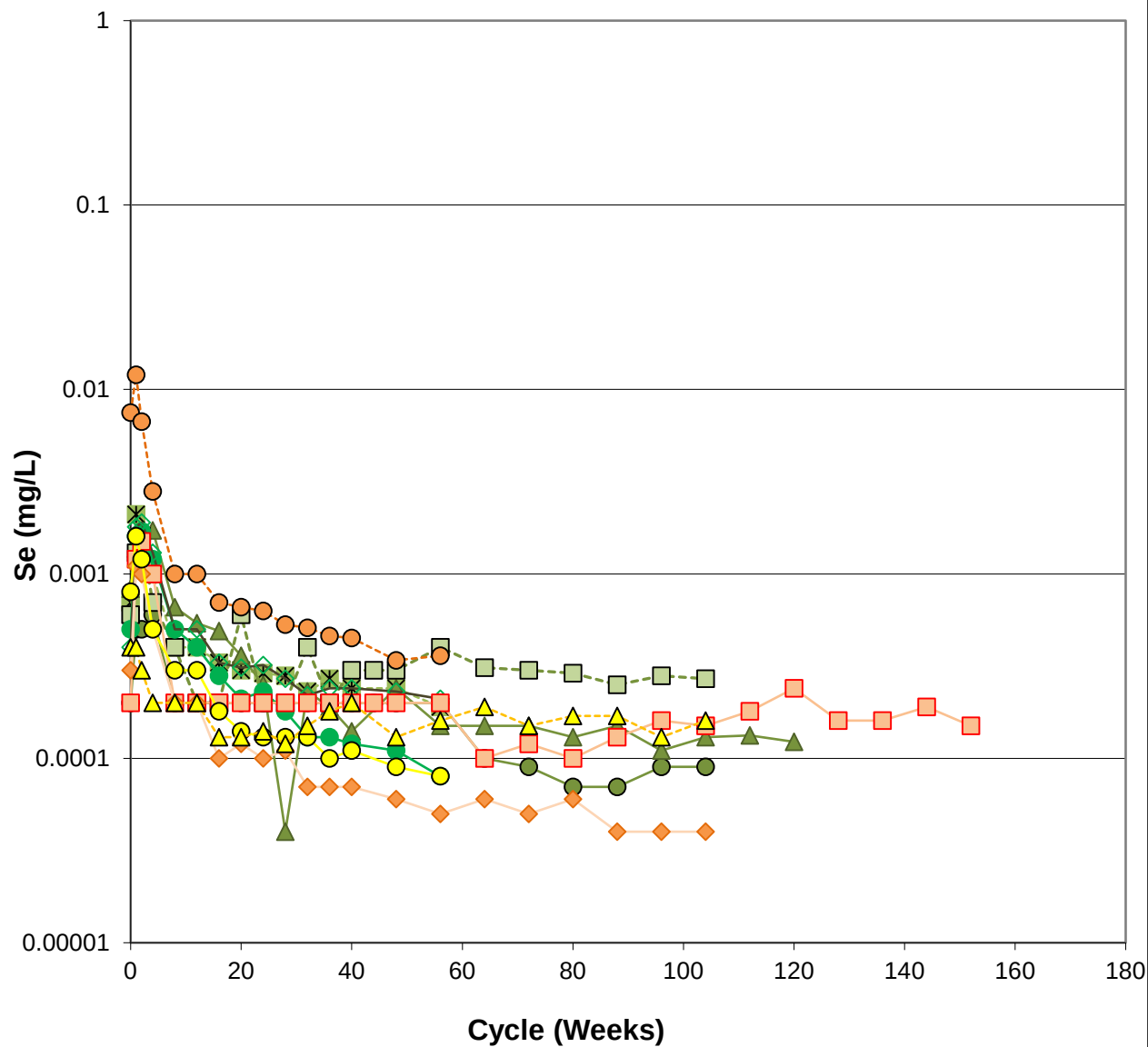
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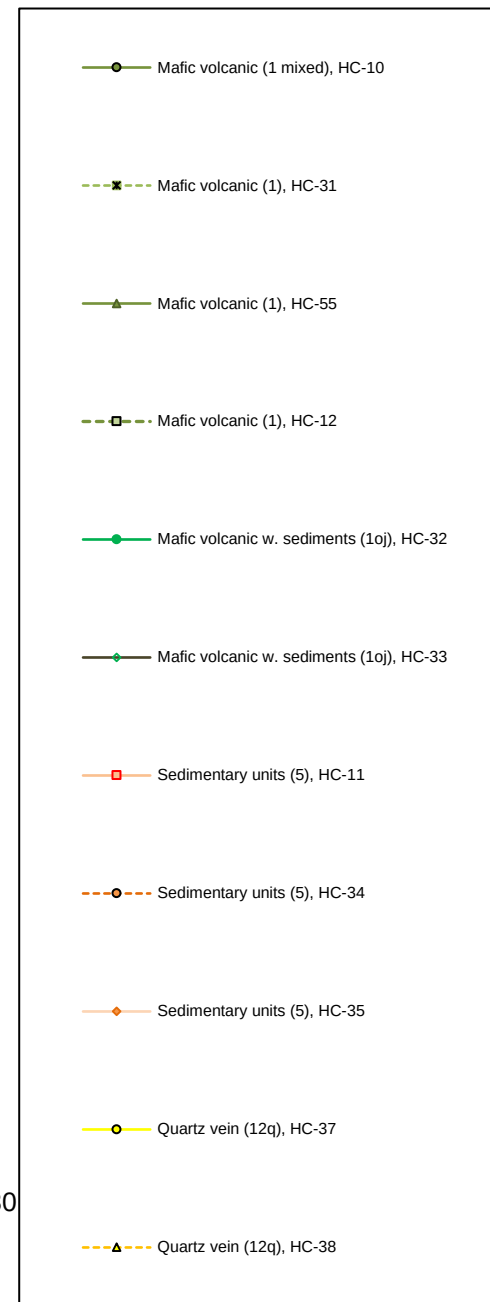
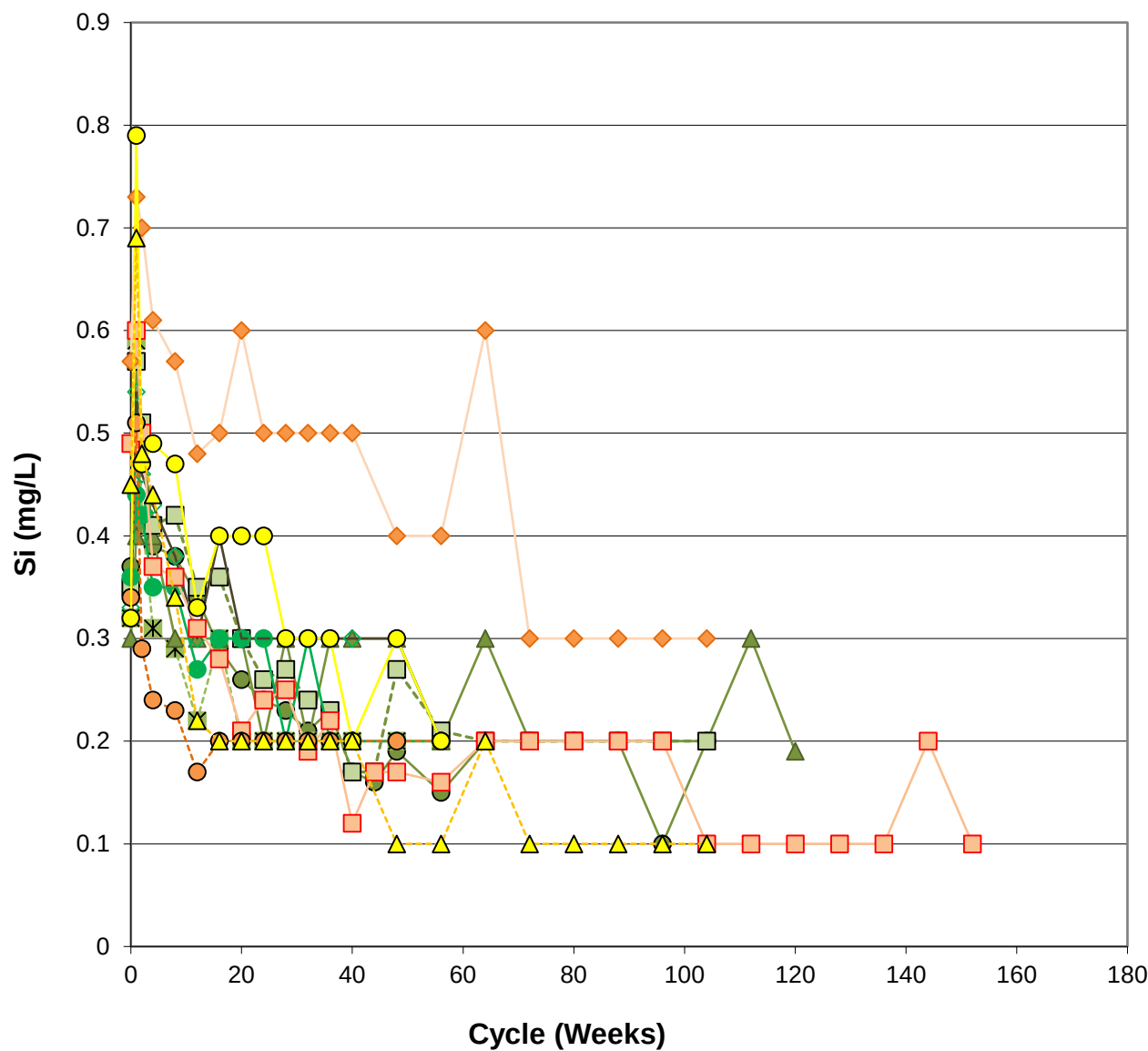
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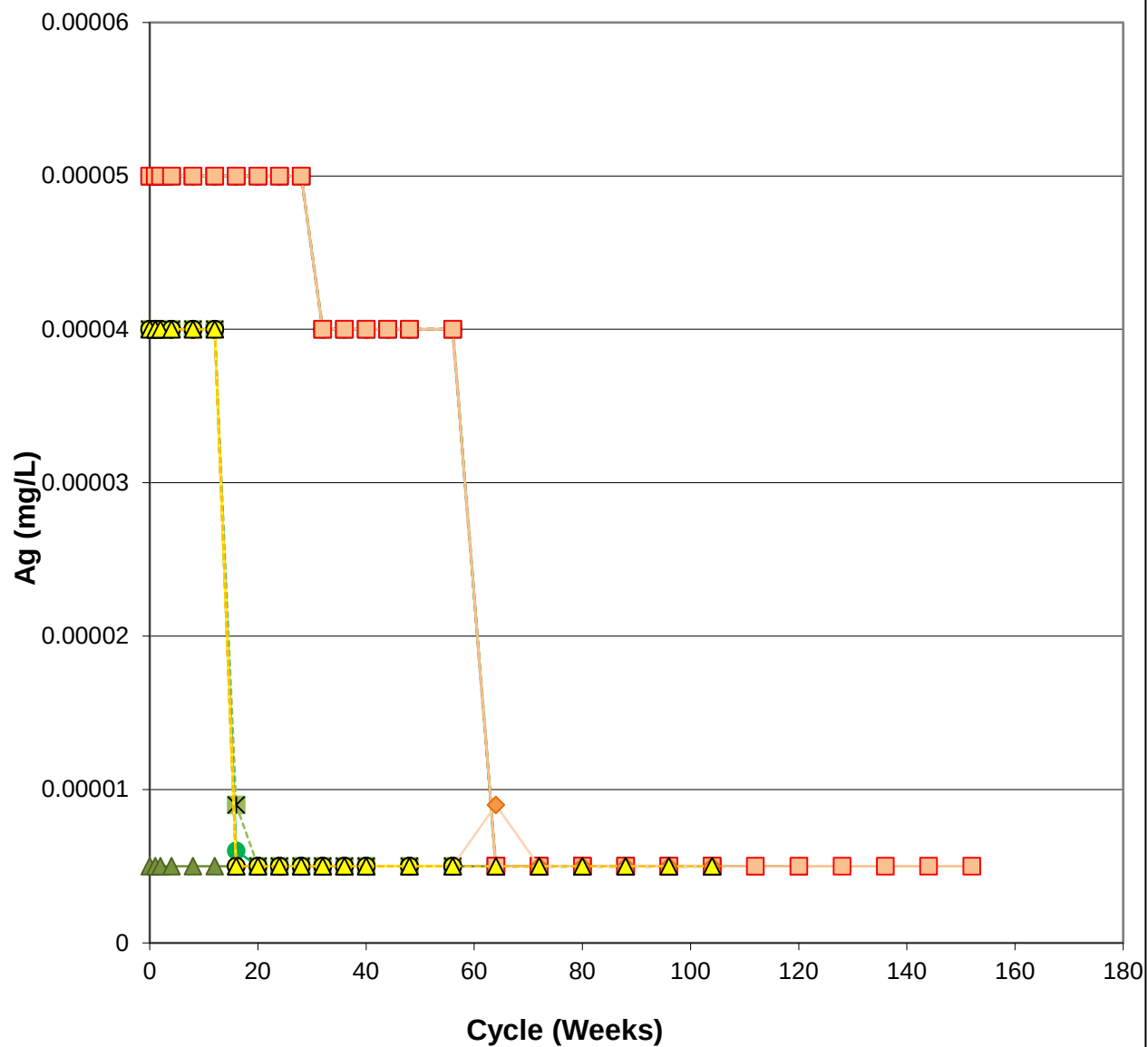
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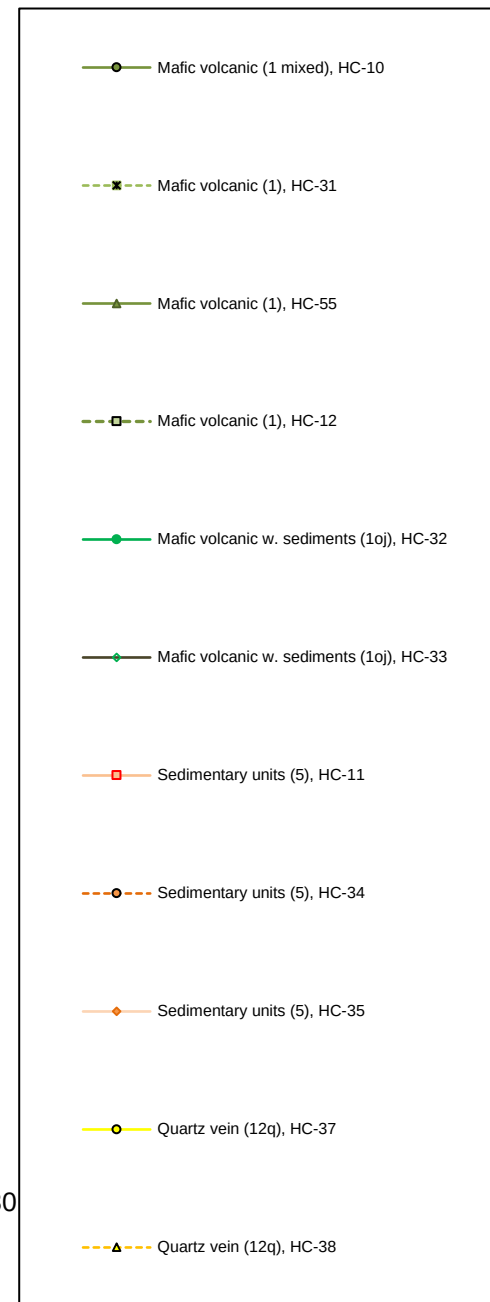
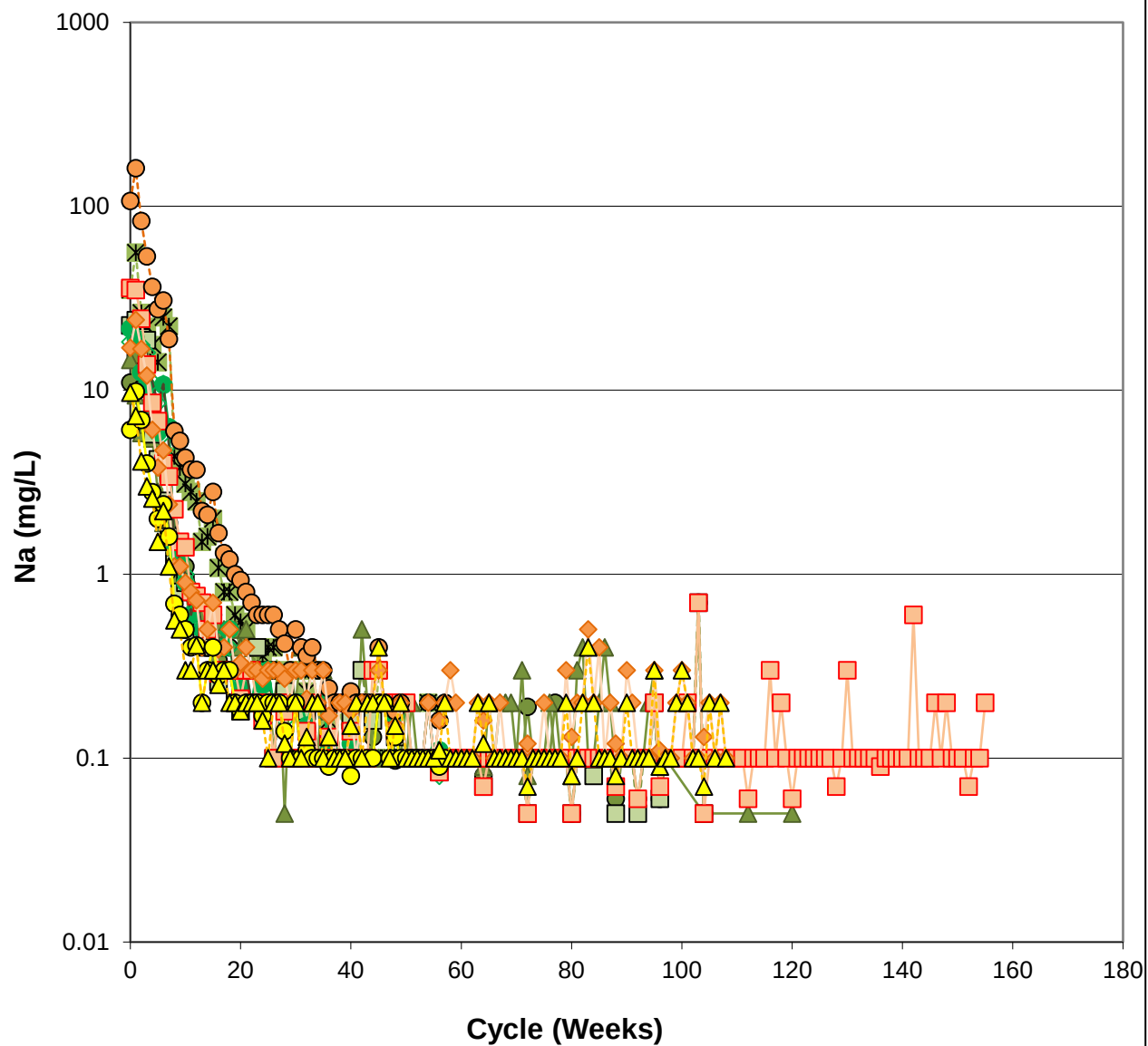
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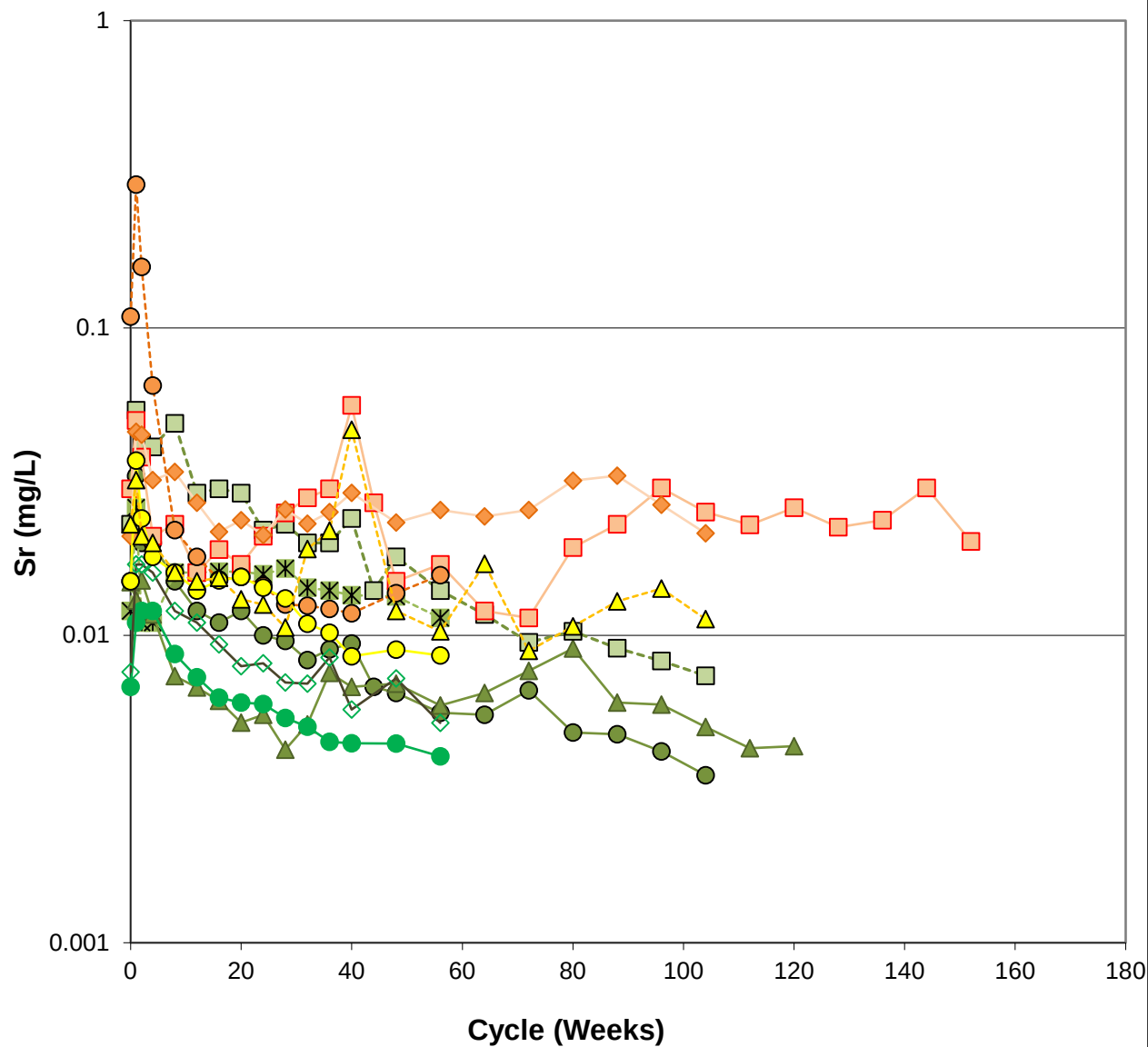
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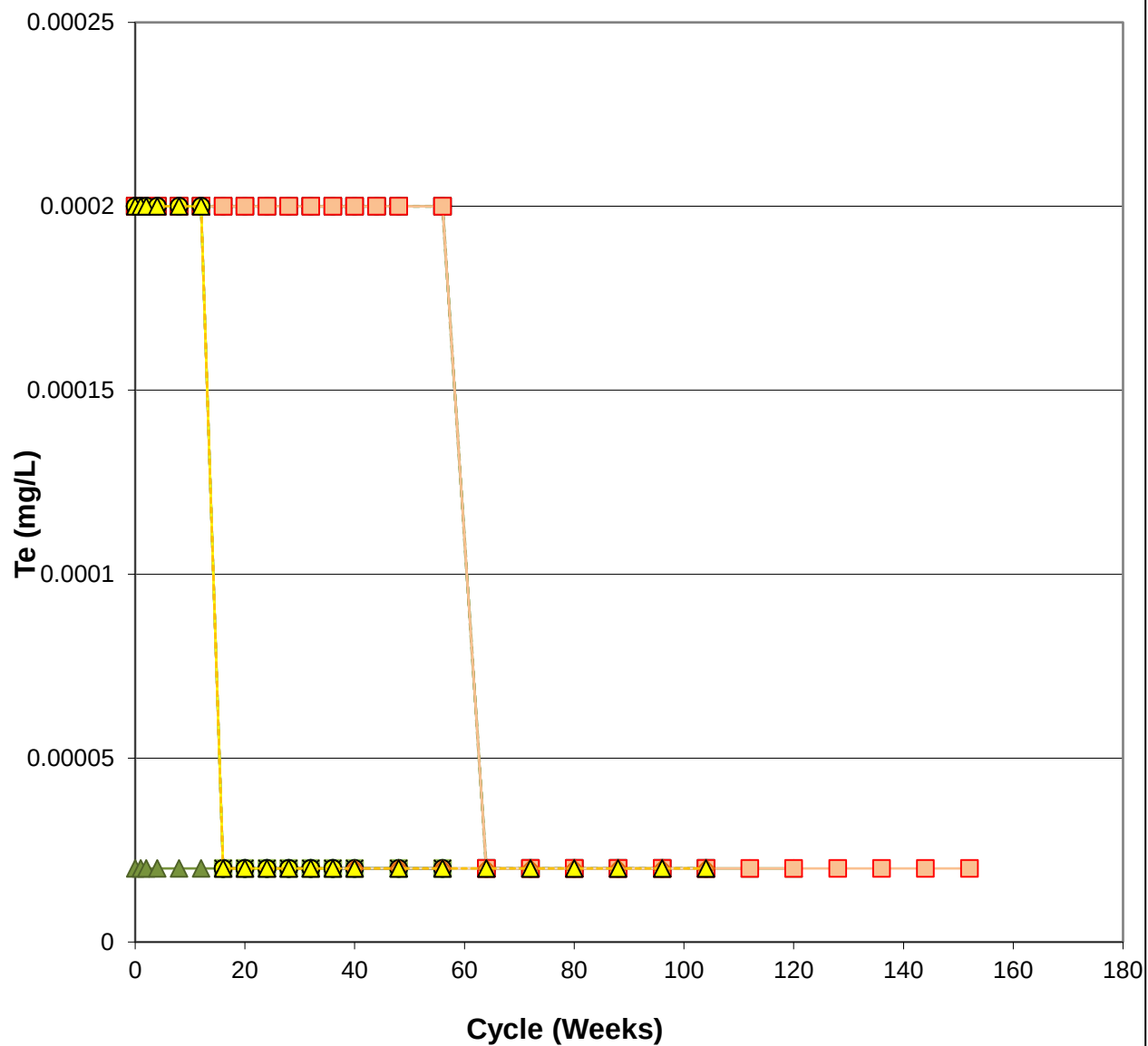
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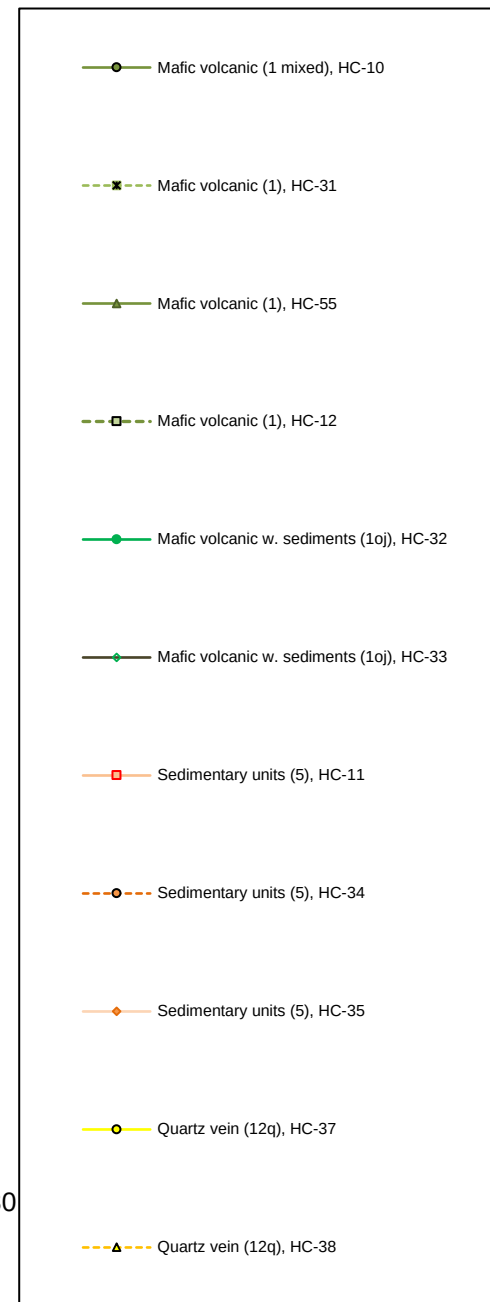
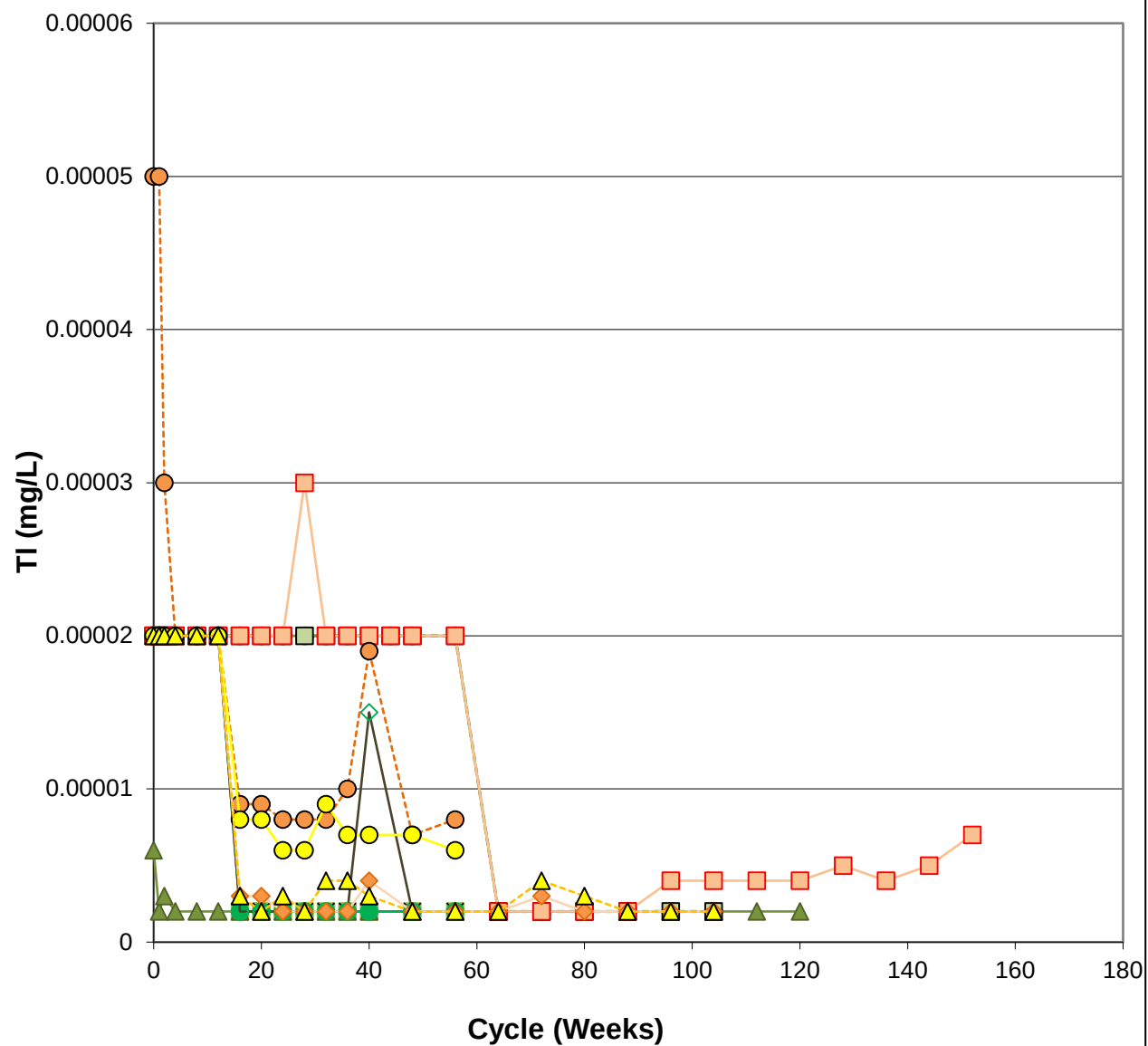
Hope Bay Waste Rock Humidity Cells



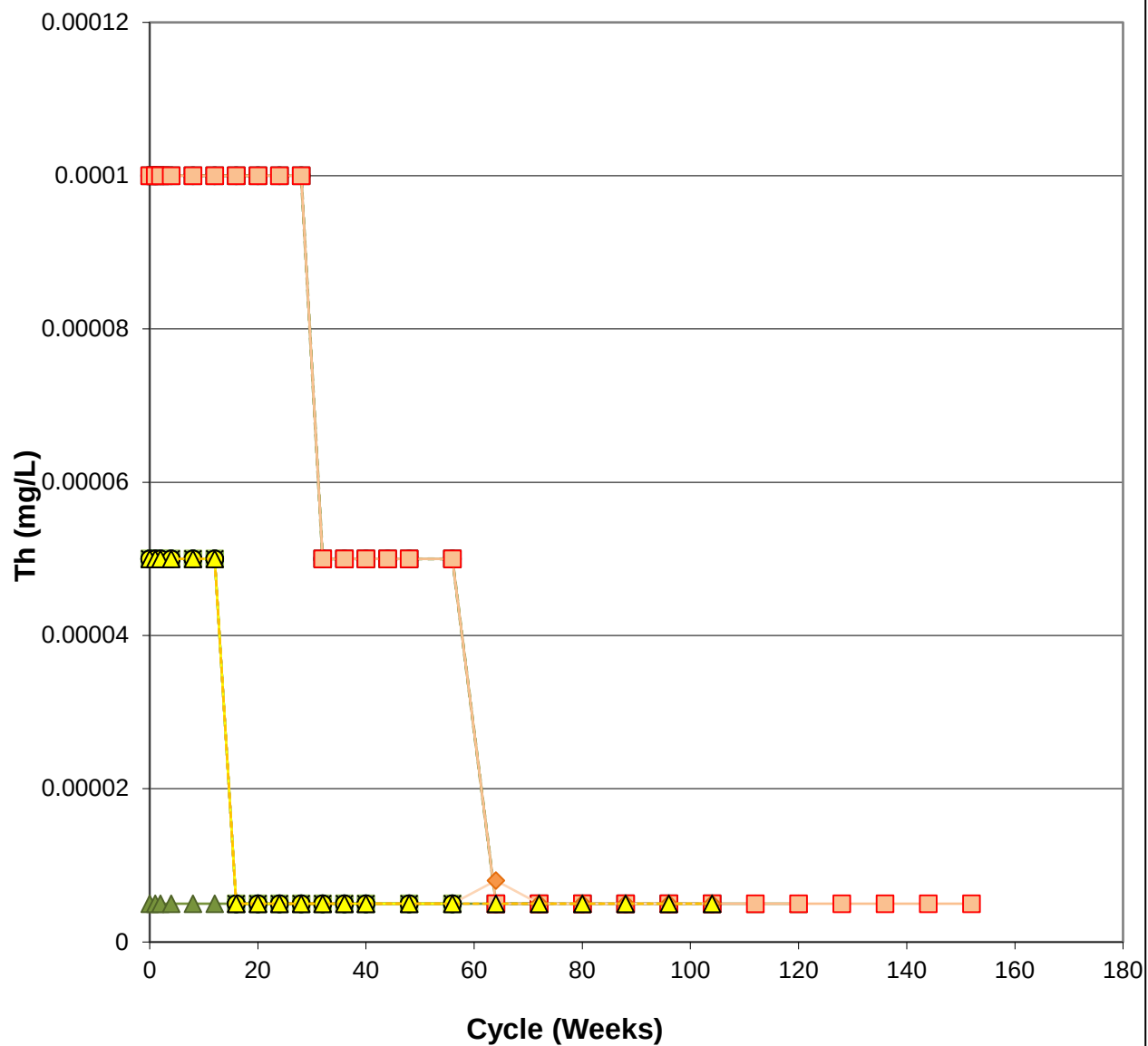
Hope Bay Waste Rock Humidity Cells



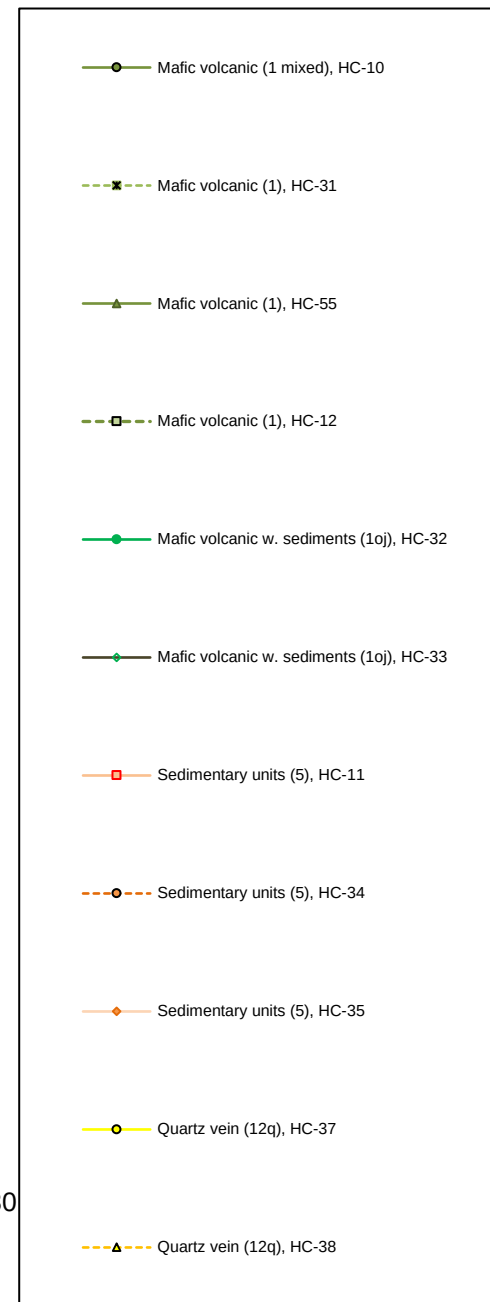
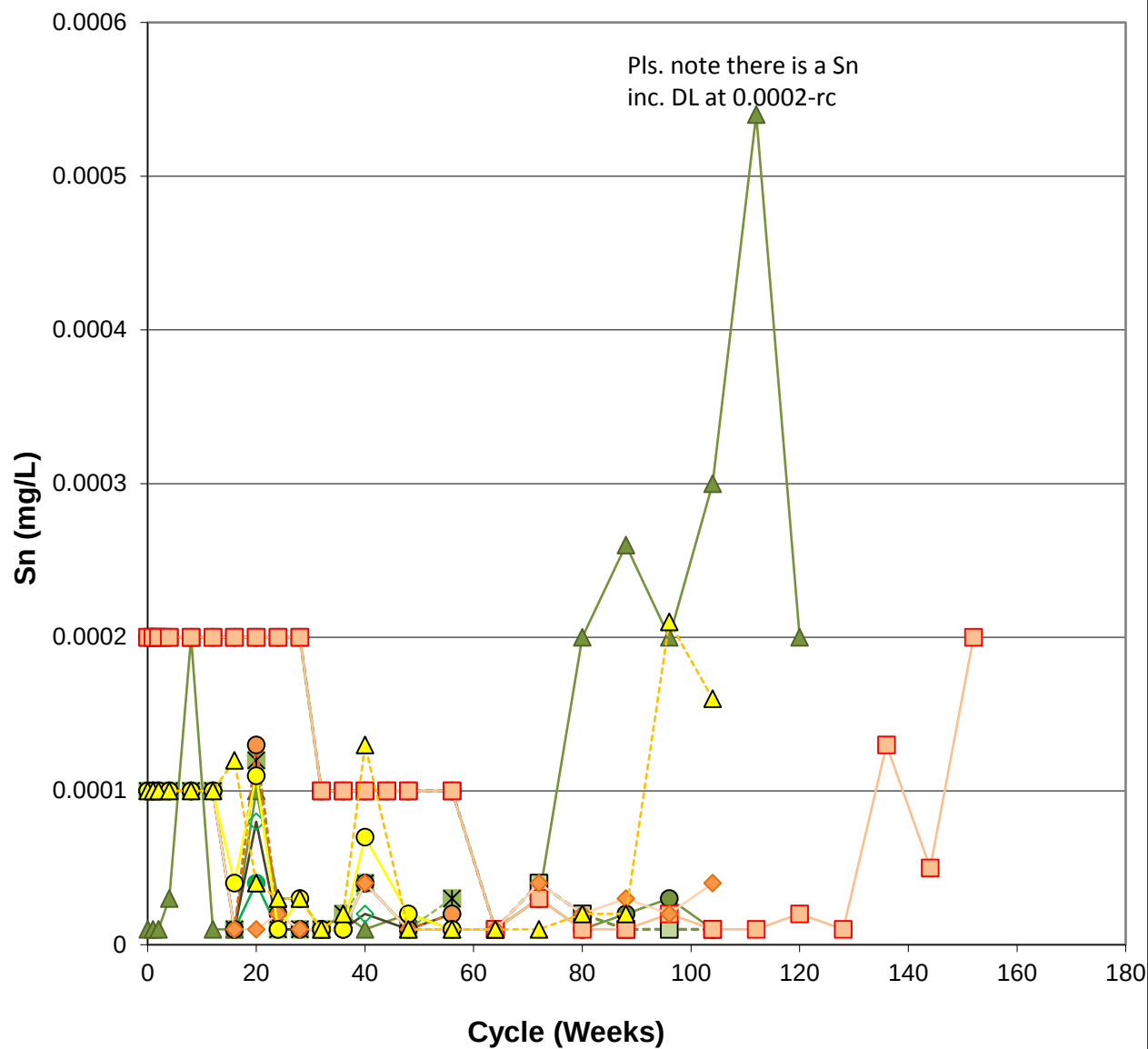
Hope Bay Waste Rock Humidity Cells



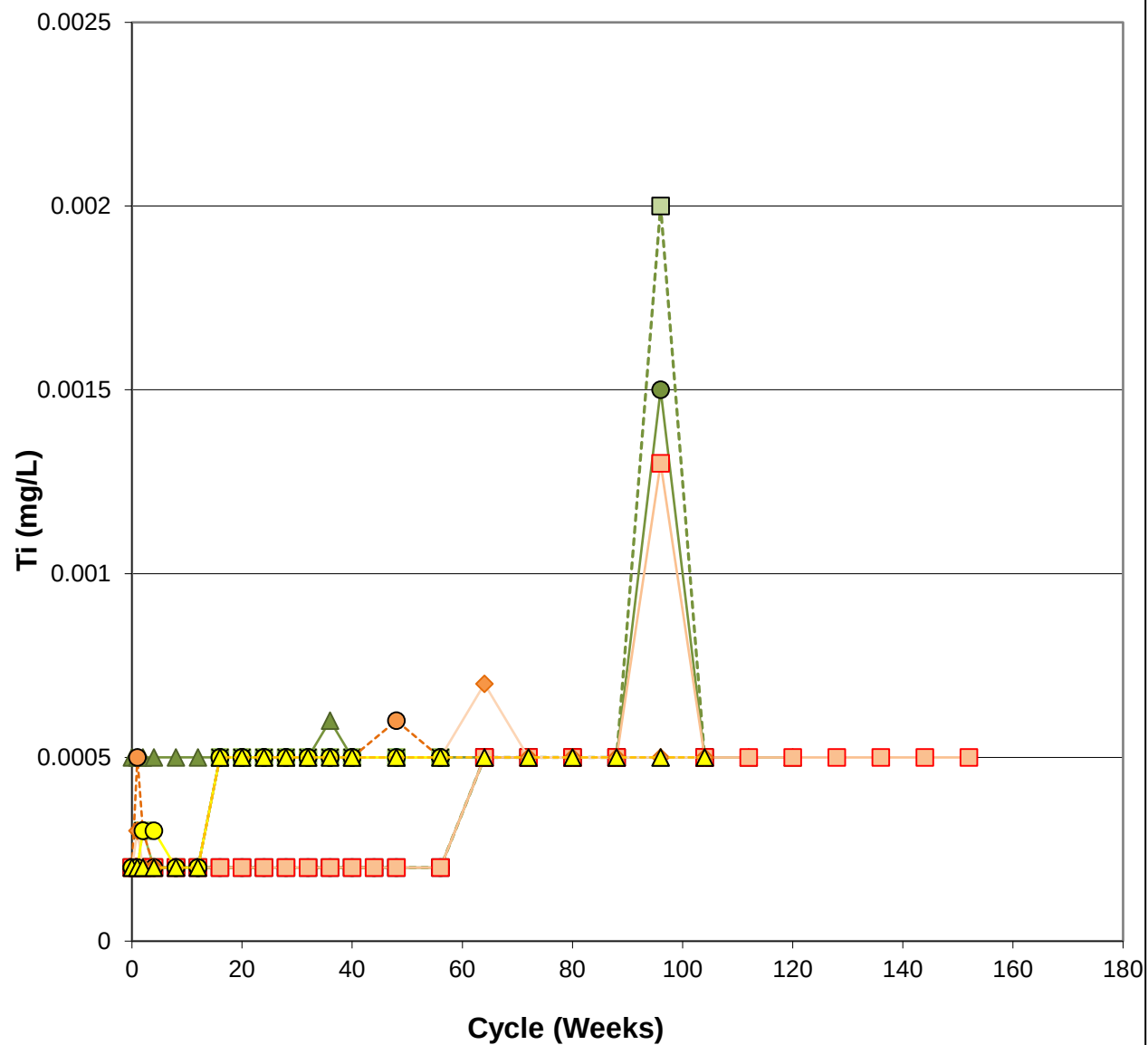
Hope Bay Waste Rock Humidity Cells



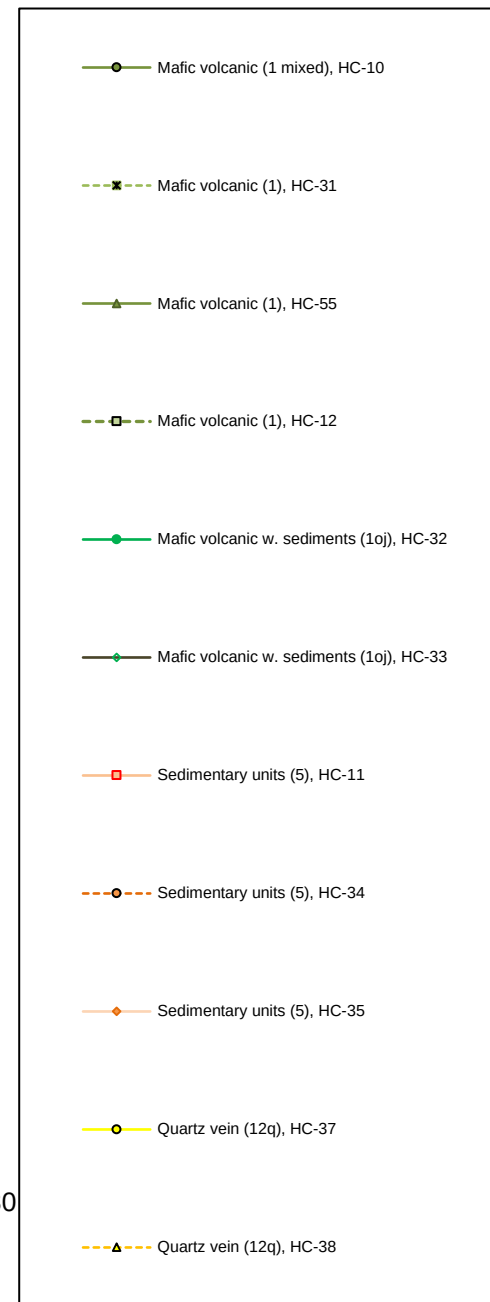
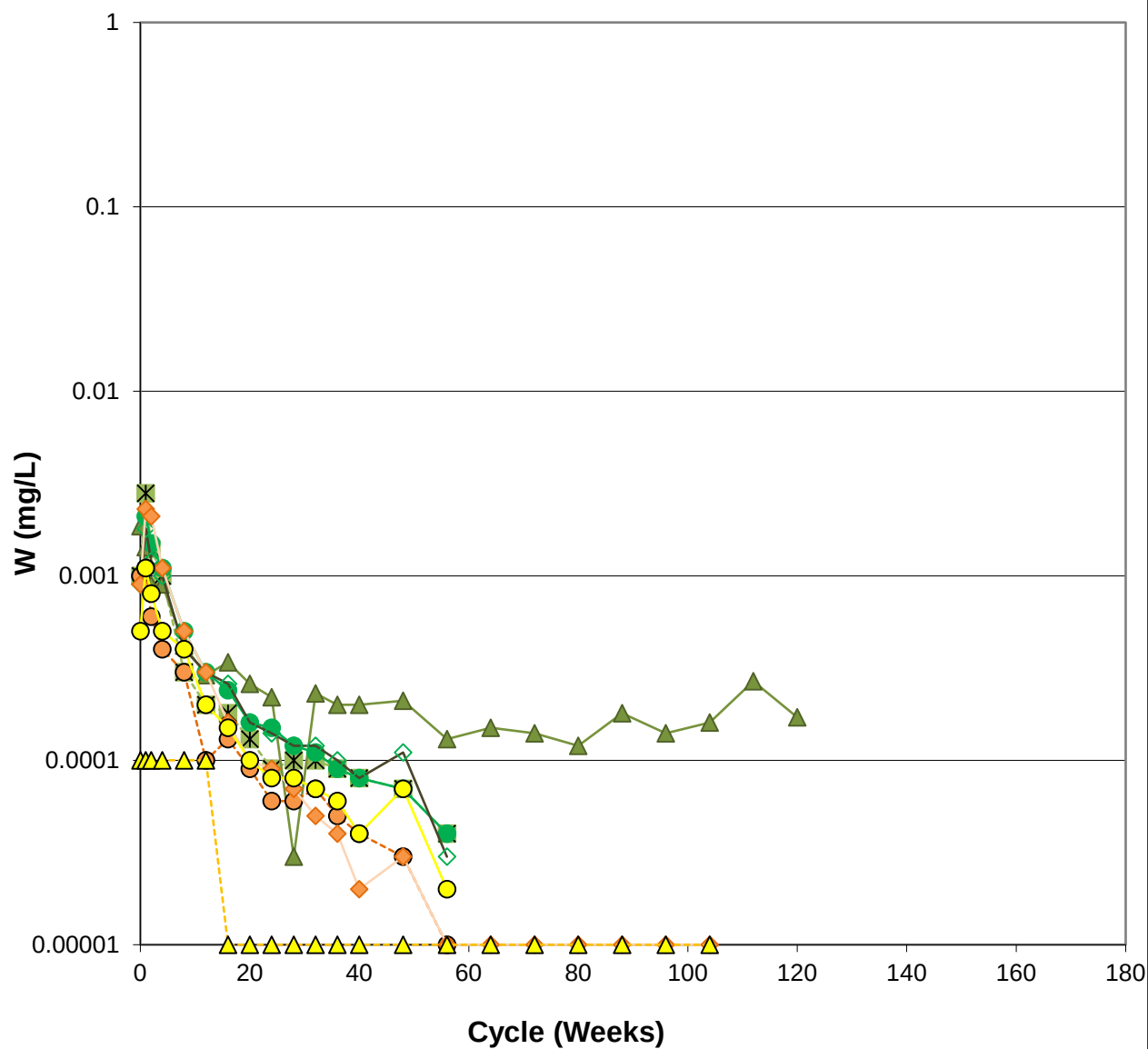
Hope Bay Waste Rock Humidity Cells



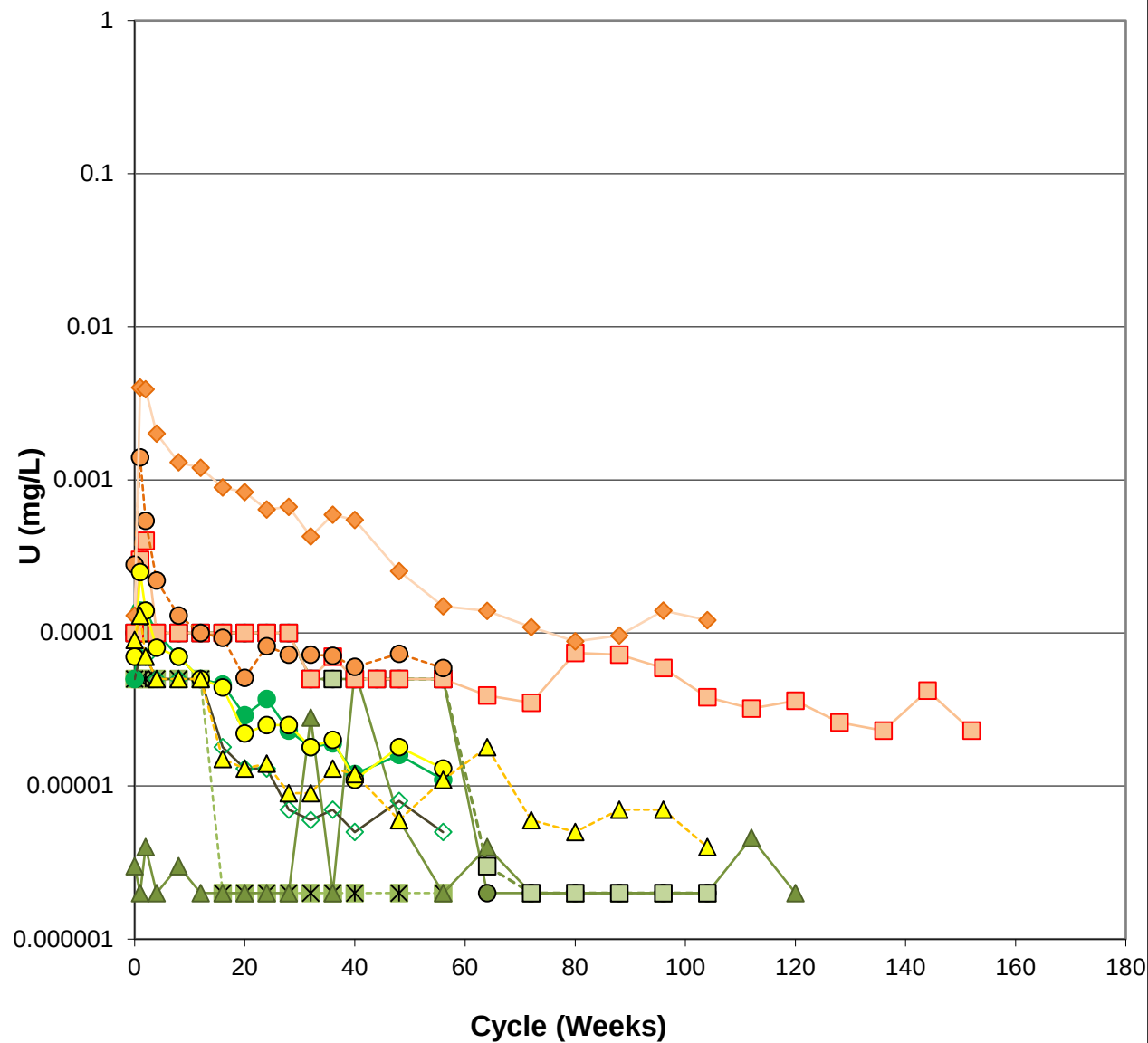
Hope Bay Waste Rock Humidity Cells



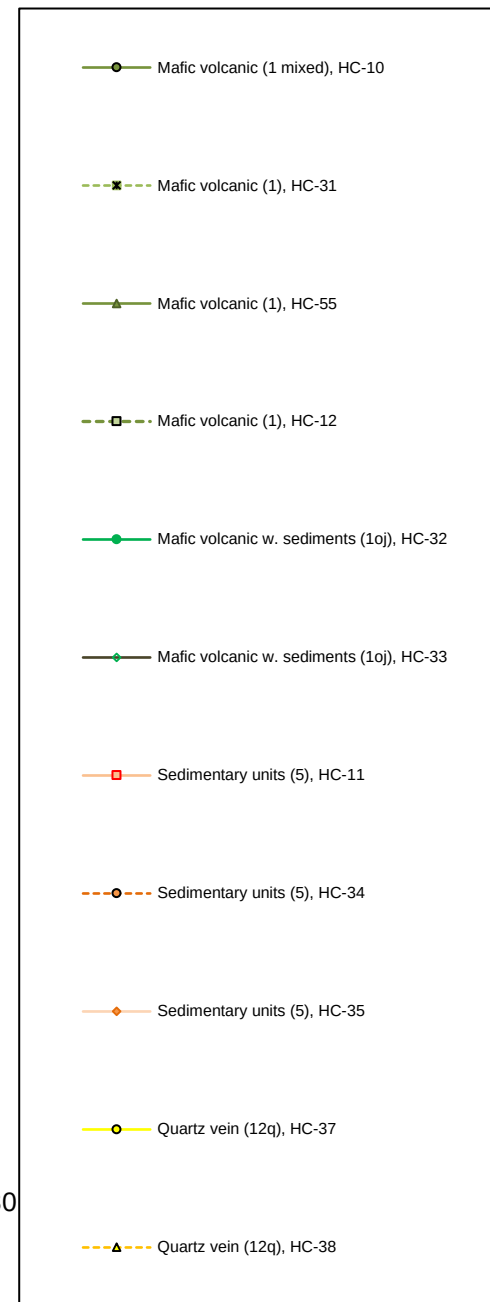
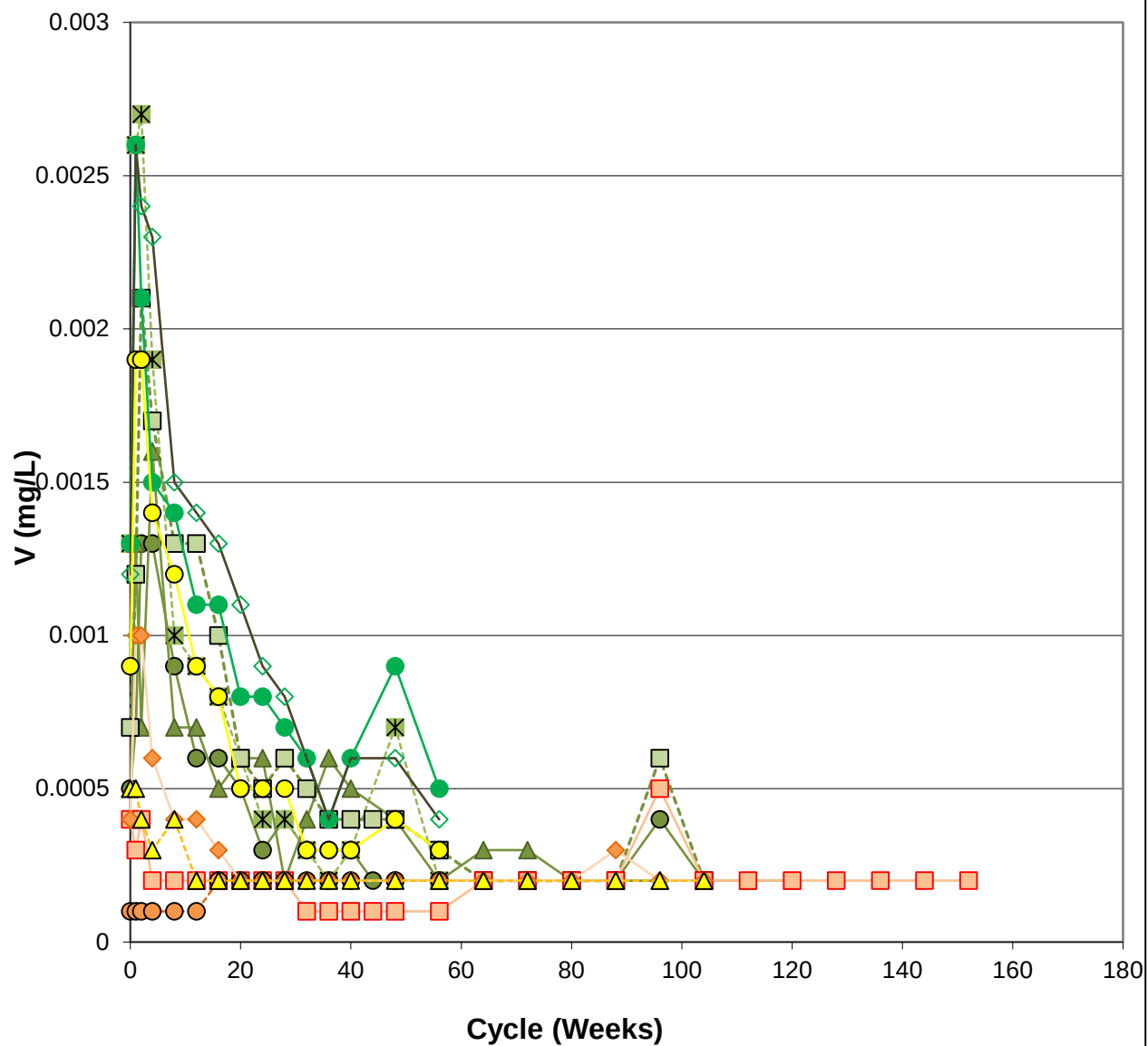
Hope Bay Waste Rock Humidity Cells



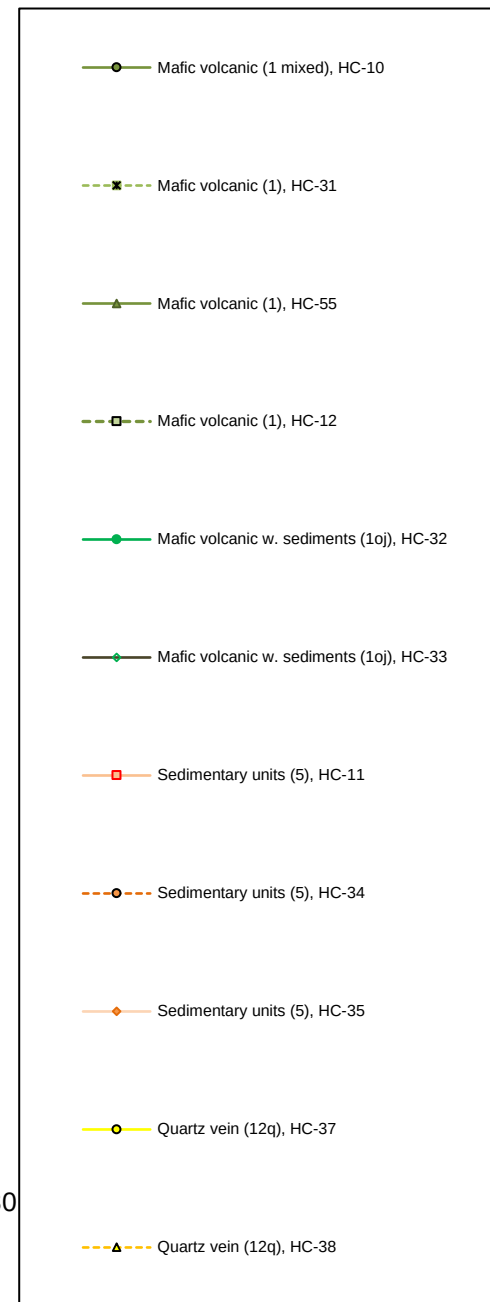
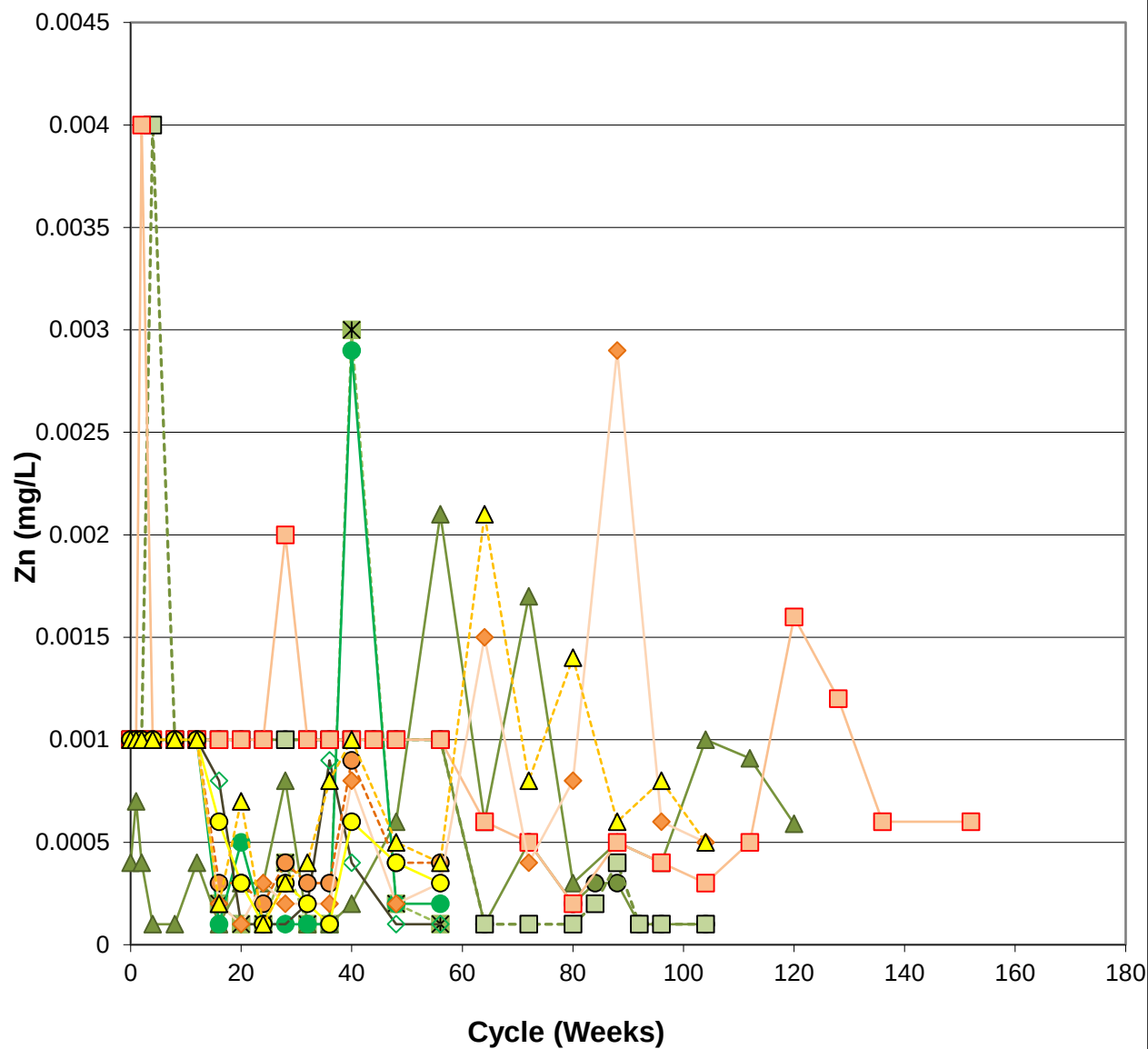
Hope Bay Waste Rock Humidity Cells



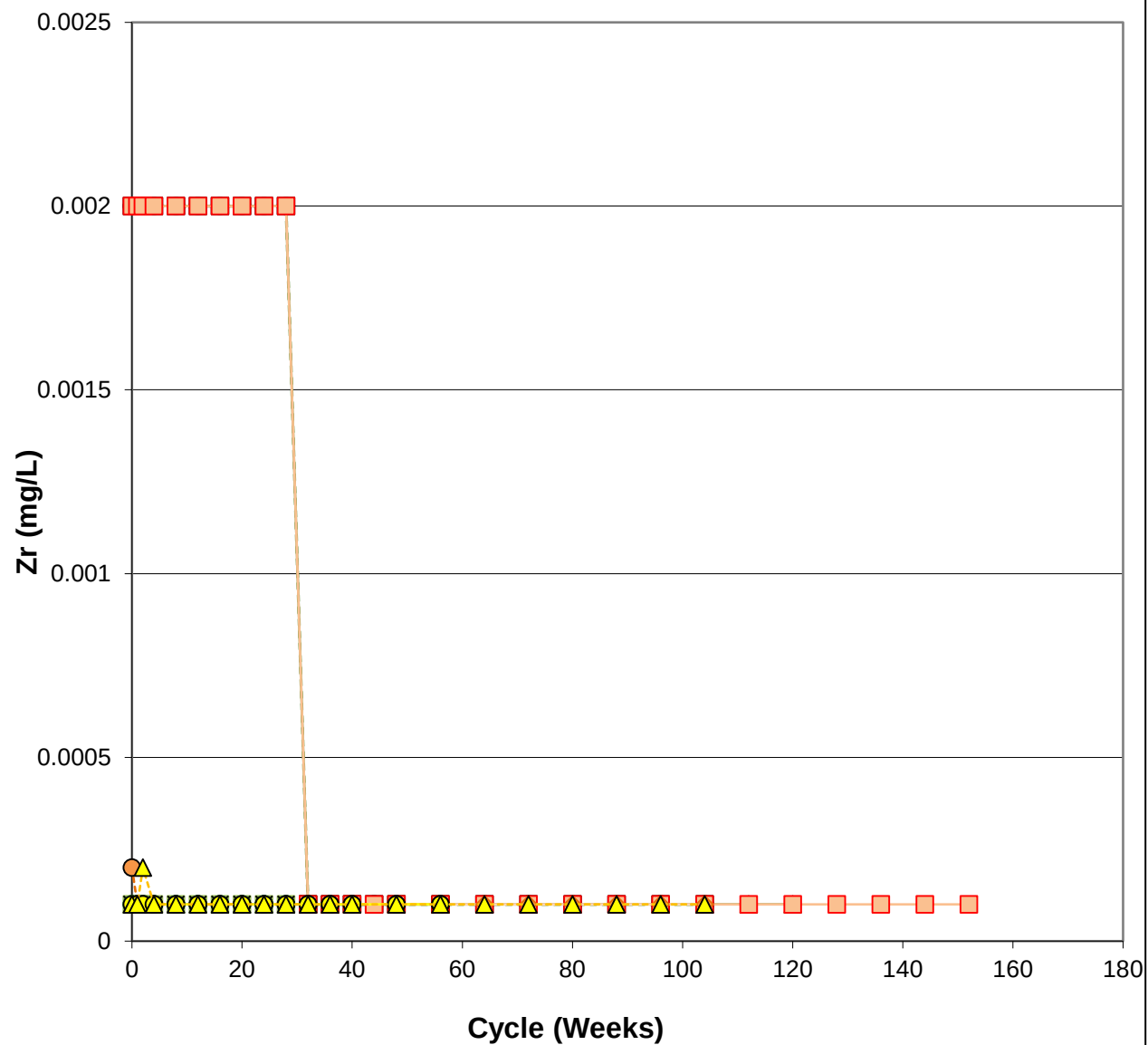
Hope Bay Waste Rock Humidity Cells



Hope Bay Waste Rock Humidity Cells



Hope Bay Waste Rock Humidity Cells



Appendix K2 – Boston Humidity Cell Test Raw Data

HC-10		Dissolved Metals by ICP-MS (Cantest)																									
Sample Weight = 1 kg		Volume (ml)		pH (pH Units)	EC (µS/cm)	ORP (mV)	SO4 (mg/l)	Acidity (mg CaCO3/l)		Total Alkalinity (mg CaCO3/l) to pH 4.5	Fluoride (mg/l)	Chloride (mg/l)	Nitrate-N (mg/l)	Nitrite-N (mg/l)	Total Ammonia (mgN/l)	Diss.-P (mgP/l)	TDS (mg/l)	Hardness CaCO3 (mg/l)	Al (mg/l)	Sb (mg/l)	As (mg/l)	Ba (mg/l)	Be (mg/l)	Bi mg/l	B mg/l	Cd mg/l	Ca mg/l
Date	Accum. Weeks	Input	Output					to pH 4.5	to pH 8.3																		
		5	5	0.01	1	50	1	1	1	1	0.1	0.2	0.02	0.002	0.01	0.001	10	0.02	0.02	0.02	0.02	0.021	0.0002	0.0002	0.04	0.00004	5.99
11-Feb-09	0	750	605	7.8	104	125	3	--	1.66	31	0.05	10.4	0.05	0.007	0.4	0.02	51	20	0.27	0.0023	0.014	0.0021	0.0002	0.0002	0.04	0.00004	5.99
18-Feb-09	1	500	490	8.17	154	135	3	--	1	50	0.08	11.6	0.01	0.004	0.49	0.02	102	30	0.076	0.012	0.114	0.0035	0.0002	0.0002	0.1	0.00004	6.14
25-Feb-09	2	500	470	8.59	103	145	9	--	--	30	0.15	6.62	0.01	0.002	0.15	0.08	31	20.6	0.084	0.012	0.225	0.0027	0.0002	0.0002	0.14	0.00004	4.28
4-Mar-09	3	500	440	9.18	104	110	12	--	--	26	--	--	--	--	--	--	--	--	0.11	--	--	--	--	--	--	--	4.4
11-Mar-09	4	500	435	8.61	85	135	13	--	--	24	0.06	2.15	0.01	0.002	0.15	0.03	59	23.8	0.095	0.0098	0.208	0.0024	0.0002	0.0002	0.06	0.00004	4.81
18-Mar-09	5	500	435	8.79	81	115	10	--	--	26	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	4.45
25-Mar-09	6	500	435	8.6	60	160	5	--	--	23	--	--	--	--	--	--	--	--	0.09	--	--	--	--	--	--	--	3.95
1-Apr-09	7	500	430	8.66	56	135	4	--	--	23	--	--	--	--	--	--	--	--	0.11	--	--	--	--	--	--	--	5.35
8-Apr-09	8	500	415	8.47	64	165	3	--	--	23	0.05	0.2	0.01	0.002	0.11	0.02	83	25.3	0.073	0.007	0.132	0.0022	0.0002	0.0002	0.06	0.00004	5.38
15-Apr-09	9	500	475	8.6	56	170	3	--	--	24	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	5.12
22-Apr-09	10	500	390	8.87	59	150	5	--	--	22	--	--	--	--	--	--	--	--	0.08	--	--	--	--	--	--	--	4.23
29-Apr-09	11	500	490	8.55	52	160	3	--	--	22	--	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--	--	4.79
6-May-09	12	500	465	8.24	45	150	1	--	1	20	0.05	0.2	0.05	0.002	0.12	0.02	59	19.8	0.051	0.0046	0.103	0.0018	0.0002	0.0002	0.03	0.00004	4.29
13-May-09	13	500	445	8.52	50	160	4	--	--	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19.2
20-May-09	14	500	470	8.38	47	145	1	--	--	20	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	4.76
27-May-09	15	500	435	8.12	59	150	3	--	1	26	--	--	--	--	--	--	--	--	0.08	--	--	--	--	--	--	--	6.1
3-Jun-09	16	500	435	7.67	48	160	3	--	1	21	0.05	0.2	0.1	0.004	0.12	0.02	10	19.9	0.06	0.0036	0.093	0.002	0.0002	0.0002	0.02	0.00004	4.68
10-Jun-09	17	500	490	7.92	47	140	4	--	1	20	--	--	--	--	--	--	--	--	0.08	--	--	--	--	--	--	--	5.08
17-Jun-09	18	500	440	8.35	40	140	3	--	--	17	--	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--	--	3.9
24-Jun-09	19	500	445	8.5	46	130	2	--	--	20	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	4.74
1-Jul-09	20	500	440	7.85	52	145	1	--	1	21	0.05	0.2	0.05	0.002	0.16	0.02	23	22	0.059	0.0031	0.082	0.0021	0.0002	0.0002	0.02	0.00004	5.47
8-Jul-09	21	500	430	8.98	40	130	2	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.05
15-Jul-09	22	500	425	8.93	43	140	1	--	--	19	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	4.03
22-Jul-09	23	500	465	8.6	48	150	1	--	--	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.92
29-Jul-09	24	500	450	7.93	52	165	1	--	1	25	0.05	0.2	0.05	0.002	0.16	0.02	25	20.7	0.038	0.0028	0.064	0.0021	0.0002	0.0002	0.02	0.00004	4.91
5-Aug-09	25	500	450	8.68	44	170	3	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.1
12-Aug-09	26	500	435	7.7	45	160	1	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.38
19-Aug-09	27	500	430	7.89	46	170	1	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.59
26-Aug-09	28	500	435	7.95	46	160	1	--	1	19	0.05	0.43	0.05	0.002	0.17	0.02	24	19.5	0.039	0.0025	0.065	0.0022	0.0002	0.0002	0.01	0.00004	4.54
2-Sep-09	29	500	420	7.98	46	160	1	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.96
9-Sep-09	30	500	445	8.57	42	150	2	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.13
16-Sep-09	31	500	420	8.85	44	160	2	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.02
23-Sep-09	32	500	420	7.74	40	160	1	--	1	18	0.05	0.64	0.05	0.002	0.19	0.03	29	18.2	0.036	0.0022	0.072	0.0018	0.0001	0.0001	0.021	0.00001	3.65
30-Sep-09	33	500	425	8.85	40	155	3	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.87
7-Oct-09	34	500	415	8.88	43	155	2	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.79
14-Oct-09	35	50																									

HC-10

Sample Weight = 1 kg		Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg (CVAF)	Mo	Ni	P	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr	
Date	Accumm. Weeks	mg/l 0.001	mg/l 0.001	mg/l 0.02	mg/l 0.0002	mg/l 0.05	mg/l 0.001	mg/l 0.001	mg/l 0.001	ug/L 0.05	mg/l 0.001	mg/l 0.001	mg/l 0.05	mg/l 0.001		mg/l 0.02	mg/l 0.0005	mg/l 0.001	mg/l 0.15	mg/l 0.1	mg/l 0.001	mg/l 0.25	mg/l 0.00025	mg/l 0.05	mg/l 0.001	mg/l 0.001	mg/l 0.001	mg/l 0.0001	mg/l 0.0005	mg/l 0.001	
11-Feb-09	0	0.0002	0.0002	0.0045	0.01	0.0002	0.0007	1.21	0.01	0.02	0.0001	0.0016	0.03	1.81		0.0002	0.37	0.00005	11	0.015	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0005	0.001	0.002	
18-Feb-09	1	0.0002	0.0002	0.0016	0.01	0.0002	0.0011	3.57	0.023	0.02	0.0005	0.0036	0.03	2.58		0.0005	0.49	0.00005	15.5	0.033	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0007	0.001	0.002	
25-Feb-09	2	0.0004	0.0002	0.0005	0.01	0.0002	0.0009	2.41	0.014	0.02	0.0005	0.002	0.03	1.82		0.0005	0.41	0.00005	10.2	0.02	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0013	0.001	0.002	
4-Mar-09	3	--	--	--	0.01	--	--	3.33	--	--	--	--	--	1.5		--	--	--	10.4	--	--	--	--	--	--	--	--	--	--	--	--
11-Mar-09	4	0.0002	0.0002	0.0006	0.01	0.0002	0.0007	2.85	0.011	0.02	0.0003	0.0007	0.03	1.57		0.0006	0.39	0.00005	5.99	0.02	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0013	0.001	0.002	
18-Mar-09	5	--	--	--	0.01	--	--	3.91	--	--	--	--	--	1.3		--	--	--	4.2	--	--	--	--	--	--	--	--	--	--	--	--
25-Mar-09	6	--	--	--	0.01	--	--	2.96	--	--	--	--	--	0.8		--	--	--	2.3	--	--	--	--	--	--	--	--	--	--	--	--
1-Apr-09	7	--	--	--	0.02	--	--	3.33	--	--	--	--	--	0.9		--	--	--	1.9	--	--	--	--	--	--	--	--	--	--	--	--
8-Apr-09	8	0.0002	0.0002	0.0013	0.01	0.0002	0.0006	2.87	0.023	0.02	0.0001	0.0006	0.03	0.96		0.0002	0.38	0.00005	1.29	0.015	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0009	0.001	0.002	
15-Apr-09	9	--	--	--	0.01	--	--	3.08	--	--	--	--	--	0.7		--	--	--	0.9	--	--	--	--	--	--	--	--	--	--	--	--
22-Apr-09	10	--	--	--	0.01	--	--	3.29	--	--	--	--	--	0.7		--	--	--	1.1	--	--	--	--	--	--	--	--	--	--	--	--
29-Apr-09	11	--	--	--	0.01	--	--	2.63	--	--	--	--	--	0.5		--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
6-May-09	12	0.0002	0.0002	0.0006	0.01	0.0002	0.0006	2.21	0.014	0.02	0.0001	0.0008	0.03	0.46		0.0002	0.34	0.00005	0.45	0.012	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0006	0.001	0.002	
13-May-09	13	--	--	--	6.25	--	--	6.37	--	--	--	--	--	0.3		--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--	--
20-May-09	14	--	--	--	0.01	--	--	2.42	--	--	--	--	--	0.3		--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
27-May-09	15	--	--	--	0.01	--	--	3.04	--	--	--	--	--	0.5		--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--	--
3-Jun-09	16	0.0002	0.0002	0.0004	0.01	0.0002	0.0005	1.99	0.019	0.02	0.0001	0.0007	0.03	0.43		0.0002	0.29	0.00005	0.34	0.011	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0006	0.001	0.002	
10-Jun-09	17	--	--	--	0.01	--	--	2.31	--	--	--	--	--	0.25		--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
17-Jun-09	18	--	--	--	0.01	--	--	2.08	--	--	--	--	--	0.3		--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
24-Jun-09	19	--	--	--	0.01	--	--	2.37	--	--	--	--	--	0.25		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
1-Jul-09	20	0.0002	0.0002	0.0022	0.02	0.0002	0.0005	2.01	0.028	0.02	0.0001	0.0008	0.03	0.37		0.0002	0.26	0.00005	0.29	0.012	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0005	0.001	0.002	
8-Jul-09	21	--	--	--	0.01	--	--	2.21	--	--	--	--	--	0.25		--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
15-Jul-09	22	--	--	--	0.01	--	--	2.32	--	--	--	--	--	0.3		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
22-Jul-09	23	--	--	--	0.01	--	--	2.64	--	--	--	--	--	0.4		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
29-Jul-09	24	0.0002	0.0002	0.0002	0.01	0.0002	0.0006	2.03	0.021	0.02	0.0001	0.0005	0.03	0.29		0.0002	0.24	0.00005	0.18	0.01	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0003	0.001	0.002	
5-Aug-09	25	--	--	--	0.01	--	--	2.26	--	--	--	--	--	0.3		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
12-Aug-09	26	--	--	--	0.01	--	--	2.18	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
19-Aug-09	27	--	--	--	0.02	--	--	2.49	--	--	--	--	--	0.3		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
26-Aug-09	28	0.0002	0.0002	0.0005	0.01	0.0002	0.0004	1.97	0.015	0.02	0.0001	0.0006	0.03	0.29		0.0002	0.23	0.00005	0.22	0.0096	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0004	0.001	0.002	
2-Sep-09	29	--	--	--	0.01	--	--	2.54	--	--	--	--	--	0.3		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
9-Sep-09	30	--	--	--	0.01	--	--	2.36	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
16-Sep-09	31	--	--	--	0.01	--	--	2.45	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
23-Sep-09	32	0.0002	0.0001	0.0003	0.01	0.00005	0.0006	2.19	0.0072	0.02	0.0001	0.0005	0.015	0.25		0.0002	0.21	0.00004	0.18	0.0083	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0003	0.001	0.0001	
30-Sep-09	33	--	--	--	0.02	--	--	2.19	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
7-Oct-09	34	--	--	--	0.01	--	--	2.43	--	--	--	--	--	0.3		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
14-Oct-09	35	--	--	--	0.01	--	--	2.38	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
21-Oct-09	36	0.0002	0.0002	0.0002	0.01	0.00005	0.0006	2.38	0.0073	0.02	0.0001	0.0006	0.015	0.19		0.0002	0.23	0.00004	0.15	0.009	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0003	0.001	0.0001	
28-Oct-09	37	--	--	--	0.01	--	--	2.39	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
4-Nov-09	38	--	--	--	0.07	--	--	2.43	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
11-Nov-09	39	--	--	--	0.01	--	--	2.72	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
18-Nov-09	40	0.0002	0.0002	0.0037	0.01	0.00007	0.0004	2.99	0.007	0.02	0.0001	0.0007	0.015	0.19		0.0002	0.17	0.00004	0.15	0.0094	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0003	0.001	0.0001	
25-Nov-09	41	--	--	--	0.01	--	--	3.26	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
2-Dec-09	42	--	--	--	0.01	--	--	3.04	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
9-Dec-09	43	--	--	--	0.01	--	--	2.79	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
16-Dec-09	44	0.0002	0.0001	0.0014	0.01	0.00005	0.0007	2.45	0.0047	0.02	0.0001	0.0005	0.015	0.19		0.0002	0.16	0.00004	0.13	0.0068	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0002	0.001	0.0001	
23-Dec-09	45	--	--	--	0.01	--	--	2.3	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
30-Dec-09	46	--	--	--	0.01	--	--	2.41	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
6-Jan-10	47	--	--	--	0.01	--	--	2.29	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
13-Jan-10	48	0.0019	0.0002	0.0016	0.01	0.00005	0.0006	1.92	0.0076	0.02	0.0001	0.003	0.015	0.13		0.0002	0.19	0.00004	0.097	0.0065	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0002	0.001	0.0001	
20-Jan-10	49	--	--	--	0.01	--	--	2.45	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
27-Jan-10	50	--	--	--	0.01	--	--	2.69	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
3-Feb-10	51	--	--	--	0.01	--	--	2.25	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
10-Feb-10	52	--	--	--	0.01	--	--	2.49	--	--	--																				

HC-10

HC-10				Dissolved Metals by ICP-MS (Cantest)																									
Sample Weight = 1 kg				Volume (ml)		pH (pH Units)	EC (µS/cm)	ORP (mV)	SO4 (mg/l)	Acidity (mg CaCO3/l)		Total Alkalinity (mg CaCO3/l)	Fluoride (mg/l)	Chloride (mg/l)	Nitrate-N (mg/l)	Nitrite-N (mg/l)	Total Ammonia (mgN/l)	Diss.-P (mgP/l)	TDS (mg/l)	Hardness CaCO3 (mg/l)	Al (mg/l)	Sb (mg/l)	As (mg/l)	Ba (mg/l)	Be (mg/l)	Bi mg/l	B mg/l	Cd mg/l	Ca mg/l
Date	Accum. Weeks	Input	Output	to pH 4.5	to pH 8.3					to pH 4.5																			
		5	5	0.01	1					50	1	1																	
9-Jun-10	69	500	455	8.62	38	--	2	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.54
16-Jun-10	70	500	430	8.65	36	--	2	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.37
23-Jun-10	71	500	440	8.49	35	--	1	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.62
30-Jun-10	72	500	500	8.48	40	155	2	--	--	20	0.05	0.5	0.02	0.005	0.05	0.018	22	20.70386	0.0211	0.00152	0.0331	0.00211	0.00001	0.000005	0.05	0.000005	4.22		
7-Jul-10	73	500	490	8.81	35	--	1	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.44
14-Jul-10	74	500	420	8.63	25	--	1	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.81
21-Jul-10	75	500	425	8.8	32	--	1	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.92
28-Jul-10	76	500	440	8.78	35	--	2	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.48
4-Aug-10	77	500	440	8.58	32	--	2	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.88
11-Aug-10	78	500	460	8.64	33	--	1	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.76
18-Aug-10	79	500	440	8.63	35	--	2	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.33
25-Aug-10	80	500	435	8.33	36	170	1	--	--	16	0.01	0.5	0.02	0.007	0.1	0.006	18	15.5375	0.0177	0.0012	0.0312	0.00149	0.00001	0.000005	0.05	0.000005	3.14		
1-Sep-10	81	500	435	8.7	35	--	2	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.9
8-Sep-10	82	500	440	8.65	35	--	3	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.47
15-Sep-10	83	500	445	8.53	34	--	2	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.39
22-Sep-10	84	500	440	8.53	41	--	2	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.66
29-Sep-10	85	500	445	8.3	32	--	3	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.49
6-Oct-10	86	500	465	8.74	32	--	3	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4
13-Oct-10	87	500	435	8.53	38	--	2	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.41
20-Oct-10	88	500	455	8.1	40	170	3	--	1	17	0.01	0.5	0.02	0.005	0.047	0.007	24	17.94315	0.017	0.00099	0.0268	0.0014	0.00001	0.000005	0.05	0.000005	3.51		
27-Oct-10	89	500	455	8.54	42	--	2	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.64
3-Nov-10	90	500	430	8.42	36	--	4	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.22
10-Nov-10	91	500	430	8.36	35	--	2	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.31
17-Nov-10	92	500	460	7.64	37	--	2	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.57
24-Nov-10	93	500	420	8.41	42	--	2	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.42
1-Dec-10	94	500	440	8.45	40	--	3	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.14
8-Dec-10	95	500	445	8.38	41	--	2	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.55
15-Dec-10	96	500	435	7.6	37	165	2	--	1	16	0.02	0.5	0.02	0.005	0.005	0.008	24	17.18801	0.0144	0.00085	0.0256	0.0012	0.00001	0.000005	0.05	0.000005	3.29		
22-Dec-10	97	500	440	8.32	41	--	2	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.51
29-Dec-10	98	500	445	8.5	39	--	2	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.61
5-Jan-11	99	500	440	8.66	39	--	3	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.98
12-Jan-11	100	500	436	8.17	41	--	3	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.54
19-Jan-11	101	500	425	8.78	41	--	3	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.68
26-Jan-11	102	500	430	8.61	42	--	2	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.69
2-Feb-11	103	500	445	8.3	38	--	3	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.35
9-Feb-11	104	500	440	8.17	38	170	3	--	1	18	0.01	0.5	0.02	0.005	0.005	0.005	20	18.64698	0.0147	0.0007	0.0269	0.00108	0.00001	0.000005	0.05	0.000005	3.66		
Terminated																													

HC-10

Sample Weight = 1 kg

Sample Weight = 1 kg		Cr	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg (CVAF)	Mo	Ni	P	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr	
Date	Accum. Weeks	mg/l 0.001	mg/l 0.001	mg/l 0.02	mg/l 0.0002	mg/l 0.05	mg/l 0.001	mg/l 0.001	mg/l 0.001	ug/L 0.05	mg/l 0.001	mg/l 0.001	mg/l 0.05	mg/l 0.001		mg/l 0.02	mg/l 0.0005	mg/l 0.001	mg/l 0.15	mg/l 0.1	mg/l 0.001	mg/l 0.25	mg/l 0.00025	mg/l 0.05	mg/l 0.001	mg/l	mg/l 0.001	mg/l 0.0001	mg/l 0.0005	mg/l 0.001	
9-Jun-10	69	--	--	--	0.01	--	--	2.17	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
16-Jun-10	70	--	--	--	0.01	--	--	2.05	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
23-Jun-10	71	--	--	--	0.01	--	--	2.05	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
30-Jun-10	72	0.0001	0.000185	0.00055	0.003	0.000065	0.0005	2.47	0.00644	0.02	0.00007	0.00108	0.002	0.08		0.00009	0.2	0.000005	0.19	0.00662	0.00002	0.000002	0.000005	0.00003	0.0005	--	0.000002	0.0002	0.0005	0.0001	
7-Jul-10	73	--	--	--	0.01	--	--	2.26	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
14-Jul-10	74	--	--	--	0.01	--	--	2.41	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
21-Jul-10	75	--	--	--	0.01	--	--	2.6	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
28-Jul-10	76	--	--	--	0.01	--	--	2.38	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
4-Aug-10	77	--	--	--	0.01	--	--	2.63	--	--	--	--	--	0.3		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
11-Aug-10	78	--	--	--	0.01	--	--	2.46	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
18-Aug-10	79	--	--	--	0.01	--	--	2.19	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
25-Aug-10	80	0.0001	0.000159	0.00055	0.003	0.000018	0.0005	1.87	0.00414	0.02	0.00009	0.00041	0.002	0.06		0.00007	0.2	0.000005	0.05	0.00483	0.00002	0.000002	0.000005	0.00001	0.0005	--	0.000002	0.0002	0.0002	0.0001	
1-Sep-10	81	--	--	--	0.01	--	--	2.53	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
8-Sep-10	82	--	--	--	0.01	--	--	2.39	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
15-Sep-10	83	--	--	--	0.01	--	--	2.38	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
22-Sep-10	84	--	--	--	0.01	--	--	2.44	--	--	--	--	--	0.11		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	0.0003	--
29-Sep-10	85	--	--	--	0.03	--	--	2.44	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
6-Oct-10	86	--	--	--	0.03	--	--	2.32	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
13-Oct-10	87	--	--	--	0.03	--	--	2.3	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
20-Oct-10	88	0.0001	0.000177	0.00019	0.001	0.000017	0.0005	2.23	0.00334	0.026	0.00007	0.00042	0.003	0.06		0.00007	0.2	0.000005	0.06	0.00477	0.00002	0.000002	0.000005	0.00002	0.0005	--	0.000002	0.0002	0.0003	0.0001	
27-Oct-10	89	--	--	--	0.01	--	--	2.35	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
3-Nov-10	90	--	--	--	0.01	--	--	2.13	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
10-Nov-10	91	--	--	--	0.01	--	--	2.24	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
17-Nov-10	92	--	--	--	0.01	--	--	2.3	--	--	--	--	--	0.06		--	--	--	0.06	--	--	--	--	--	--	--	--	--	--	0.0001	--
24-Nov-10	93	--	--	--	0.01	--	--	2.52	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
1-Dec-10	94	--	--	--	0.01	--	--	2.2	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
8-Dec-10	95	--	--	--	0.01	--	--	2.32	--	--	--	--	--	0.3		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
15-Dec-10	96	0.0002	0.000169	0.0002	0.002	0.00001	0.0005	2.18	0.00319	0.002	0.00007	0.00053	0.003	0.05		0.00009	0.1	0.000005	0.06	0.00419	0.00002	0.000002	0.000005	0.00003	0.0015	--	0.000002	0.0004	0.0001	0.0001	
22-Dec-10	97	--	--	--	0.01	--	--	2.28	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
29-Dec-10	98	--	--	--	0.01	--	--	2.3	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
5-Jan-11	99	--	--	--	0.01	--	--	2.65	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
12-Jan-11	100	--	--	--	0.01	--	--	2.36	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
19-Jan-11	101	--	--	--	0.01	--	--	2.57	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
26-Jan-11	102	--	--	--	0.01	--	--	2.38	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
2-Feb-11	103	--	--	--	0.01	--	--	2.29	--	--	--	--	--	0.9		--	--	--	0.7	--	--	--	--	--	--	--	--	--	--	--	--
9-Feb-11	104	0.0001	0.000126	0.00043	0.001	0.000007	0.0005	2.31	0.0028	0.004	0.00006	0.00037	0.002	0.07		0.00009	0.2	0.000005	0.05	0.00351	0.00002	0.000002	0.000005	0.00001	0.0005	--	0.000002	0.0002	0.0001	0.0001	
Terminated																															

HC-11		Dissolved Metals by ICP-MS (Cantest)																												
Sample Weight = 1 kg		Volume (ml)		pH	EC	ORP	SO4	Acidity (mg CaCO3/l)		Total Alkalinity (mg CaCO3/l)	Fluoride	Chloride	Nitrate-N	Nitrite-N	Total Ammonia	Diss.-P	TDS	Hardness CaCO3	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cr	Co	
Date	Accum. Weeks	Input	Output	(pH Units)	(µS/cm)	(mV)	(mg/l)	to pH 4.5	to pH 8.3	to pH 4.5	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mgN/l)	(mgP/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	Calculation	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
11-Feb-09	0	750	585	7.84	249	110	7	--	0.5	38	0.17	46.9	0.05	0.007	0.46	0.02	130	17.9	0.27	0.014	0.0025	0.0009	0.0002	0.11	0.00004	4.89	0.0002	0.0002		
18-Feb-09	1	500	465	8.02	253	140	15	--	1	52	0.17	34.8	0.01	0.005	0.28	0.02	147	23.6	0.1	0.022	0.004	0.001	0.0002	0.22	0.00004	5.53	0.0002	0.0002		
25-Feb-09	2	500	465	8.18	182	155	22	--	1	36	0.19	18.8	0.01	0.003	0.18	0.02	76	19.2	0.094	0.019	0.0055	0.0009	0.0002	0.24	0.00004	4.34	0.0002	0.0002		
4-Mar-09	3	500	435	8.26	106	140	16	--	1	27	--	--	--	--	--	--	--	--	0.12	--	--	--	--	--	--	--	2.98	--	--	
11-Mar-09	4	500	435	8.16	86	140	14	--	1	25	0.1	2.35	0.01	0.003	0.18	0.02	53	15.4	0.089	0.0086	0.0044	0.0006	0.0002	0.11	0.00004	3.57	0.0002	0.0002		
18-Mar-09	5	500	435	8	84	150	10	--	1	25	--	--	--	--	--	--	--	--	0.1	--	--	--	--	--	--	--	3.39	--	--	
25-Mar-09	6	500	425	8.05	60	180	6	--	1	21	--	--	--	--	--	--	--	--	0.09	--	--	--	--	--	--	--	2.83	--	--	
1-Apr-09	7	500	425	7.85	60	150	7	--	1	22	--	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--	--	4.04	--	--	
8-Apr-09	8	500	415	7.78	68	170	4	--	1	22	0.05	0.2	0.01	0.002	0.19	0.02	54	19.1	0.052	0.0063	0.0032	0.0006	0.0002	0.11	0.00004	4.03	0.0002	0.0002		
15-Apr-09	9	500	470	8.03	62	170	3	--	1	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.47	--	--	
22-Apr-09	10	500	400	7.84	59	160	4	--	1	22	--	--	--	--	--	--	--	--	0.08	--	--	--	--	--	--	--	3.42	--	--	
29-Apr-09	11	500	435	8.4	49	160	3	--	--	19	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	3.16	--	--	
6-May-09	12	500	440	7.72	47	170	1	--	1	20	0.05	0.2	0.05	0.002	0.26	0.02	74	17.5	0.062	0.0046	0.0045	0.0005	0.0002	0.06	0.00004	3.48	0.0002	0.0002		
13-May-09	13	500	440	8.12	53	180	4	--	1	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.16	--	--	
20-May-09	14	500	440	7.89	52	175	1	--	1	21	--	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--	--	4.24	--	--	
27-May-09	15	500	455	7.83	71	155	3	--	1	31	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	6.44	--	--	
3-Jun-09	16	500	450	7.61	50	165	4	--	1	20	0.05	0.2	0.05	0.017	0.21	0.02	20	18.7	0.041	0.0033	0.0027	0.0004	0.0002	0.04	0.00004	4.13	0.0002	0.0002		
10-Jun-09	17	500	475	7.75	46	150	2	--	1	19	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	3.83	--	--	
17-Jun-09	18	500	430	7.96	40	145	3	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.36	--	--	
24-Jun-09	19	500	440	7.86	50	130	4	--	1	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.55	--	--	
1-Jul-09	20	500	445	7.57	45	130	1	--	1	18	0.05	0.2	0.05	--	0.18	0.02	46	17.2	0.03	0.0025	0.0019	0.0004	0.0002	0.03	0.00004	3.7	0.0002	0.0002		
8-Jul-09	21	500	430	8.03	46	140	3	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.09	--	--	
15-Jul-09	22	500	420	8.3	43	180	2	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.5	--	--	
22-Jul-09	23	500	470	7.78	51	170	3	--	1	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.06	--	--	
29-Jul-09	24	500	440	7.79	60	170	3	--	1	23	0.05	0.2	0.05	--	0.21	0.02	30	22.6	0.02	0.0026	0.0018	0.0006	0.0002	0.03	0.00004	5.02	0.0002	0.0002		
5-Aug-09	25	500	440	8.16	57	165	5	--	1	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.15	--	--	
12-Aug-09	26	500	425	7.6	52	170	3	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.57	--	--	
19-Aug-09	27	500	420	7.59	55	170	4	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.79	--	--	
26-Aug-09	28	500	425	7.75	71	165	3	--	1	20	0.05	5.02	0.08	--	0.31	0.02	10	27.9	0.029	0.0021	0.0026	0.0005	0.0002	0.0002	0.02	0.00004	6.26	0.0002	0.0002	
2-Sep-09	29	500	420	7.96	78	160	2	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.49	--	--	
9-Sep-09	30	500	435	7.68	78	160	4	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.86	--	--	
16-Sep-09	31	500	415	7.65	93	165	2	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.92	--	--	
23-Sep-09	32	500	415	7.41	86	165	2	--	1	14	0.05	13.6	--	--	0.21	0.02	44	34.2	0.02	0.0014	0.002	0.0005	0.0001	0.0001	0.03	0.00001	7.09	0.0002	0.0003	
30-Sep-09	33	500	425	7.58	95	165	3	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.01	--	--	
7-Oct-09	34	500	410	7.72	111	165	2	--																						

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Sample Weight = 1 kg		Cu	Fe	Pb	Li	Mg	Mn	Hg (CVAF)	Mo	Ni	P	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr
Date	Accum. Weeks	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/L	mg/l	mg/l	mg/l	mg/l		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
		0.02	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001		0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001		0.001	0.0001	0.0005	0.001
11-Feb-09	0	0.0011	0.01	0.0002	0.0022	1.38	0.013	0.02	0.0038	0.0004	0.03	6.08		0.0002	0.49	0.00005	36	0.03	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0004	0.001	0.002
18-Feb-09	1	0.0023	0.02	0.0002	0.0021	2.37	0.019	0.02	0.011	0.0002	0.03	6.51		0.0012	0.6	0.00005	35	0.05	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0003	0.0003	0.001	0.002
25-Feb-09	2	0.0024	0.01	0.0002	0.0018	2.03	0.011	0.02	0.012	0.0005	0.03	5.7		0.0015	0.5	0.00005	24.5	0.038	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0004	0.0004	0.004	0.002
4-Mar-09	3	--	0.01	--	--	1.68	--	--	--	--	--	3.7		--	--	--	13.8	--	--	--	--	--	--	--	--	--	--	--
11-Mar-09	4	0.0014	0.01	0.0002	0.001	1.58	0.016	0.02	0.0069	0.0002	0.03	3.79		0.001	0.37	0.00005	8.53	0.021	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0002	0.001	0.002
18-Mar-09	5	--	0.01	--	--	2.15	--	--	--	--	--	4		--	--	--	6.8	--	--	--	--	--	--	--	--	--	--	--
25-Mar-09	6	--	0.01	--	--	1.79	--	--	--	--	--	3		--	--	--	4	--	--	--	--	--	--	--	--	--	--	--
1-Apr-09	7	--	0.01	--	--	2.45	--	--	--	--	--	3.4		--	--	--	3.4	--	--	--	--	--	--	--	--	--	--	--
8-Apr-09	8	0.0007	0.01	0.0002	0.0008	2.19	0.015	0.02	0.0063	0.0002	0.03	3.38		0.0002	0.36	0.00005	2.25	0.023	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0002	0.001	0.002
15-Apr-09	9	--	0.01	--	--	2.56	--	--	--	--	--	2.5		--	--	--	1.5	--	--	--	--	--	--	--	--	--	--	--
22-Apr-09	10	--	0.01	--	--	2.59	--	--	--	--	--	3		--	--	--	1.4	--	--	--	--	--	--	--	--	--	--	--
29-Apr-09	11	--	0.01	--	--	2.08	--	--	--	--	--	2.6		--	--	--	0.8	--	--	--	--	--	--	--	--	--	--	--
6-May-09	12	0.0003	0.02	0.0002	0.0006	2.13	0.0096	0.02	0.0041	0.0002	0.03	2.54		0.0002	0.31	0.00005	0.76	0.016	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0002	0.001	0.002
13-May-09	13	--	0.01	--	--	2.47	--	--	--	--	--	2.1		--	--	--	0.7	--	--	--	--	--	--	--	--	--	--	--
20-May-09	14	--	0.01	--	--	2.42	--	--	--	--	--	1.8		--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--
27-May-09	15	--	0.01	--	--	3.27	--	--	--	--	--	2.8		--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--
3-Jun-09	16	0.0002	0.01	0.0002	0.0005	2.02	0.012	0.02	0.0035	0.0002	0.03	1.77		0.0002	0.28	0.00005	0.29	0.019	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0002	0.001	0.002
10-Jun-09	17	--	0.01	--	--	2.31	--	--	--	--	--	1.4		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
17-Jun-09	18	--	0.01	--	--	2.08	--	--	--	--	--	1.4		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
24-Jun-09	19	--	0.01	--	--	2.54	--	--	--	--	--	1.4		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
1-Jul-09	20	0.0015	0.01	0.0002	0.0004	1.93	0.015	0.02	0.0028	0.0002	0.03	1.35		0.0002	0.21	0.00005	0.21	0.017	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0002	0.001	0.002
8-Jul-09	21	--	0.01	--	--	2.44	--	--	--	--	--	1.1		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
15-Jul-09	22	--	0.01	--	--	2.3	--	--	--	--	--	1.2		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
22-Jul-09	23	--	0.01	--	--	2.52	--	--	--	--	--	1.2		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
29-Jul-09	24	0.0002	0.01	0.0002	0.0006	2.45	0.013	0.02	0.0036	0.0002	0.03	1.27		0.0002	0.24	0.00005	0.16	0.021	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0002	0.001	0.002
5-Aug-09	25	--	0.01	--	--	2.74	--	--	--	--	--	1.2		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
12-Aug-09	26	--	0.01	--	--	2.49	--	--	--	--	--	1.1		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
19-Aug-09	27	--	0.01	--	--	2.83	--	--	--	--	--	1.1		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
26-Aug-09	28	0.0003	0.01	0.0002	0.0006	2.98	0.011	0.02	0.003	0.0002	0.03	1.27		0.0002	0.25	0.00005	0.18	0.025	0.0002	0.00003	0.0001	0.0002	0.0002	--	0.0001	0.0002	0.002	0.002
2-Sep-09	29	--	0.01	--	--	3.8	--	--	--	--	--	1.2		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
9-Sep-09	30	--	0.01	--	--	3.73	--	--	--	--	--	1		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
16-Sep-09	31	--	0.01	--	--	4.56	--	--	--	--	--	0.9		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
23-Sep-09	32	0.0003	0.01	0.00005	0.0007	4.01	0.013	0.02	0.0025	0.0002	0.015	0.85		0.0002	0.19	0.00004	0.14	0.028	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0001	0.001	0.0001
30-Sep-09	33	--	0.01	--	--	4.1	--	--	--	--	--	0.8		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
7-Oct-09	34	--	0.01	--	--	5.04	--	--	--	--	--	0.9		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
14-Oct-09	35	--	0.01	--	--	5.16	--	--	--	--	--	0.8		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
21-Oct-09	36	0.0003	0.01	0.00005	0.0007	3.96	0.014	0.02	0.0023	0.0002	0.015	0.67		0.0002	0.22	0.00004	0.13	0.03	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00007	0.0001	0.001	0.0001
28-Oct-09	37	--	0.01	--	--	3.94	--	--	--	--	--	0.6		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
4-Nov-09	38	--	0.01	--	--	6.72	--	--	--	--	--	0.6		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
11-Nov-09	39	--	0.01	--	--	7.56	--	--	--	--	--	0.7		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
18-Nov-09	40	0.0036	0.01	0.00008	0.0003	8.09	0.037	0.02	0.0021	0.0003	0.015	0.74		0.0002	0.12	0.00004	0.14	0.056	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0001	0.001	0.0001
25-Nov-09	41	--	0.01	--	--	8.74	--	--	--	--	--	0.8		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
2-Dec-09	42	--	0.01	--	--	8.07	--	--	--	--	--	0.6		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
9-Dec-09	43	--	0.01	--	--	4.97	--	--	--	--	--	0.4		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
16-Dec-09	44	0.0006	0.01	0.00005	0.0008	6.32	0.013	0.02	0.0028	0.0002	0.015	0.89		0.0002	0.17	0.00004	0.3	0.027	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0001	0.001	0.0001
23-Dec-09	45	--	0.01	--	--	3.16	--	--	--	--	--	0.4		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
30-Dec-09	46	--	0.01	--	--	2.72	--	--	--	--	--	0.4		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
6-Jan-10	47	--	0.01	--	--	2.43	--	--	--	--	--	0.3		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
13-Jan-10	48	0.0053	0.01	0.00005	0.0004	2.43	0.0067	0.02	0.0022	0.0002	0.015	0.38		0.0002	0.17	0.00004	0.14	0.015	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0001	0.001	0.0001
20-Jan-10	49	--	0.01	--	--	2.93	--	--	--	--	--	0.3		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
27-Jan-10	50	--	0.01	--	--	3.32	--	--	--	--	--	0.3		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
3-Feb-10	51	--	0.01	--	--	3.55	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
10-Feb-10	52	--	0.01	--	--	3.68	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
17-Feb-10	53	--	0.01	--	--	2.84	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
24-Feb-10	54	--	0.01	--	--	3.75	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
3-Mar-10	55	--	0.01	--	--	3.53	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
10-Mar-10	56	0.0008	0.01	0.00005	0.0006	3.18	0.0087	0.02	0.0019	0.0002	0.015	0.34		0.0002	0.16	0.00004	0.084	0.017	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0001	0.001	

HC-11

HC-11		Dissolved Metals by ICP-MS (Cantest)																												
Sample Weight = 1 kg		Volume (ml)		pH	EC	ORP	SO4	Acidity (mg CaCO3/l)		Total Alkalinity	Fluoride	Chloride	Nitrate-N	Nitrite-N	Total Ammonia	Diss.-P	TDS	Hardness CaCO3	Al	Sb	As	Ba	Be	Bi	B	Cd	Ca	Cr	Co	
Date	Accum. Weeks	Input	Output	(pH Units)	(µS/cm)	(mV)	(mg/l)	to pH 4.5	to pH 8.3	to pH 4.5	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mgN/l)	(mgP/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	Calculation	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
8-Sep-10	82	500	465	7.68	95	--	25	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.75	--	--	
15-Sep-10	83	500	440	7.61	98	--	26	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.25	--	--	
22-Sep-10	84	500	440	7.88	151	--	32	--	1	31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.4	--	--	
29-Sep-10	85	500	430	7.58	98	--	25	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.8	--	--	
6-Oct-10	86	500	450	7.81	104	--	27	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.58	--	--	
13-Oct-10	87	500	435	7.5	96	--	26	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.16	--	--	
20-Oct-10	88	500	460	7.52	101	190	31	--	1	19	0.01	1.3	0.02	0.005	0.094	0.005	66	49.43274	0.005	0.00053	0.00057	0.0004	0.00001	0.000005	0.05	0.000005	10.5	0.0001	0.000119	
27-Oct-10	89	500	450	7.63	118	--	29	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11.4	--	--	
3-Nov-10	90	500	425	7.52	102	--	30	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.48	--	--	
10-Nov-10	91	500	440	7.51	110	--	33	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11.6	--	--	
17-Nov-10	92	500	455	7.48	120	--	34	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12.3	--	--	
24-Nov-10	93	500	430	7.45	130	--	36	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12.4	--	--	
1-Dec-10	94	500	410	7.57	149	--	39	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13.2	--	--	
8-Dec-10	95	500	440	7.49	169	--	38	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.3	--	--	
15-Dec-10	96	500	440	7.53	169	155	38	--	1	19	0.02	11	0.03	0.005	0.05	0.005	90	69.83142	0.0027	0.00047	0.00054	0.00043	0.00001	0.000005	0.05	0.000005	15.9	0.0002	0.00016	
22-Dec-10	97	500	435	7.58	169	--	36	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.5	--	--	
29-Dec-10	98	500	435	7.51	143	--	34	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.3	--	--	
5-Jan-11	99	500	440	7.59	138	--	39	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.4	--	--	
12-Jan-11	100	500	430	7.48	152	--	38	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.2	--	--	
19-Jan-11	101	500	425	7.62	143	--	40	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.2	--	--	
26-Jan-11	102	500	425	7.56	156	--	37	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.8	--	--	
2-Feb-11	103	500	440	7.52	145	--	37	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13.9	--	--	
9-Feb-11	104	500	430	7.5	136	165	36	--	1	18	0.01	6.4	0.04	0.005	0.005	0.005	78	58.9488	0.003	0.00038	0.00039	0.0004	0.00001	0.000005	0.05	0.000005	13.8	0.0001	0.000089	
16-Feb-11	105	500	435	7.46	152	--	34	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.3	--	--	
23-Feb-11	106	500	425	7.52	142	--	32	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13.5	--	--	
2-Mar-11	107	500	435	7.29	150	--	34	--	2	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.8	--	--	
9-Mar-11	108	500	435	7.31	142	--	34	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13.5	--	--	
16-Mar-11	109	500	420	7.56	133	--	33	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12.5	--	--	
23-Mar-11	110	500	430	7.56	134	--	31	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11.9	--	--	
30-Mar-11	111	500	425	7.49	123	--	29	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.9	--	--	
6-Apr-11	112	500	435	7.5	130	150	29	--	1	19	0.01	5.5	0.02	0.007	0.048	0.008	66	53.41698	0.0052	0.00035	0.00048	0.00038	0.00001	0.000005	0.05	0.000005	11.7	0.0001	0.000067	
13-Apr-11	113	500	455	7.45	141	--	29	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13.1	--	--	
20-Apr-11	114	500	450	7.63	141	--	29	--	2	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13.7	--	--	
27-Apr-11	115	500	435	7.49	146	--	33	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.2	--	--	
4-May-11	116	500	445	7.4	152	--	34	--	1	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.3	--	--	
11-May-11	117	500	445	7.61	156	--	33	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.1	--	--	
18-May-11	118	500	435	7.52	151	--	30	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.7	--	--	
25-May-11	119	500	445	7.65	153	--	33	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.6	--	--	
1-Jun-11	120	500	445	7.5	149	150	35	--	1	19	0.01	6.1	0.06	0.005	0.14	0.005	78	63.4	0.0038	0.00034	0.00057	0.00035								

HC-12		Dissolved Metals by ICP-MS (Cantest)																										
Sample Weight = 1 kg		Volume (ml)		pH (pH Units)	EC (µS/cm)	ORP (mV)	SO4 (mg/l)	Acidity (mg CaCO3/l)		Total Alkalinity (mg CaCO3/l) to pH 4.5	Fluoride (mg/l)	Chloride (mg/l)	Nitrate-N (mg/l)	Nitrite-N (mg/l)	Total Ammonia (mgN/l)	Diss.-P (mgP/l)	TDS (mg/l)	Hardness CaCO3 (mg/l)	Al (mg/l)	Sb (mg/l)	As (mg/l)	Ba (mg/l)	Be (mg/l)	Bi mg/l	B mg/l	Cd mg/l	Ca mg/l	Cr mg/l
Date	Accum. Weeks	Input	Output					to pH 4.5	to pH 8.3																			
		5	5					0.01	1																			
11-Feb-09	0	750	625	7.85	146	115	3	--	1.66	38	0.11	14.8	0.05	0.005	0.3	0.02	55	13.7	0.19	0.0017	0.022	0.0013	0.0002	0.0002	0.06	0.00004	3.66	0.0002
18-Feb-09	1	500	480	8.04	161	160	3	--	1	56	0.16	10.9	0.01	0.002	0.24	0.03	97	17.9	0.068	0.0051	0.238	0.0029	0.0002	0.0002	0.14	0.00004	4.12	0.0002
25-Feb-09	2	500	480	8.19	139	150	12	--	1	40	0.18	7.83	0.01	0.002	0.21	0.25	13	14.9	0.056	0.0065	0.659	0.0025	0.0002	0.0002	0.23	0.00004	3.3	0.0004
4-Mar-09	3	500	460	8.64	145	115	20	--	--	47	--	--	--	--	--	--	--	--	0.13	--	--	--	--	--	--	--	5.43	--
11-Mar-09	4	500	440	8.27	74	135	9	--	1	24	0.09	0.65	0.01	0.004	0.14	0.07	43	19.1	0.066	0.0047	0.644	0.0024	0.0002	0.0002	0.11	0.00004	4.05	0.0002
18-Mar-09	5	500	440	8.25	82	140	13	--	1	26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.58	--
25-Mar-09	6	500	435	8.17	69	170	12	--	1	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.33	--
1-Apr-09	7	500	430	8.18	57	160	6	--	1	21	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	4.95	--
8-Apr-09	8	500	430	8.19	65	170	5	--	1	24	0.05	0.2	0.01	0.002	0.18	0.04	43	26	0.033	0.0046	0.597	0.0029	0.0002	0.0002	0.09	0.00004	5.12	0.0002
15-Apr-09	9	500	485	7.89	72	150	5	--	1	29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.09	--
22-Apr-09	10	500	405	8.16	64	150	7	--	1	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.45	--
29-Apr-09	11	500	440	8.37	50	165	3	--	--	19	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	3.78	--
6-May-09	12	500	440	8.15	49	160	3	--	1	20	0.05	0.2	0.05	0.002	0.25	0.19	86	19.3	0.039	0.0032	0.517	0.0017	0.0002	0.0002	0.05	0.00004	3.63	0.0002
13-May-09	13	500	430	8.33	49	170	4	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.01	--
20-May-09	14	500	450	8.18	50	170	2	--	1	20	--	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--	--	4.51	--
27-May-09	15	500	455	7.74	53	160	2	--	1	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.95	--
3-Jun-09	16	500	455	7.68	52	160	4	--	1	21	0.05	0.2	0.05	0.003	0.2	0.02	18	21.4	0.032	0.0025	0.376	0.0017	0.0002	0.0002	0.03	0.00004	4.61	0.0002
10-Jun-09	17	500	465	7.78	50	160	2	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.62	--
17-Jun-09	18	500	435	7.95	48	150	3	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.13	--
24-Jun-09	19	500	445	7.95	50	145	4	--	1	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5	--
1-Jul-09	20	500	480	7.65	53	135	1	--	1	23	0.05	0.2	0.05	0.002	0.21	0.02	107	21.6	0.021	0.0022	0.309	0.0016	0.0002	0.0002	0.03	0.00004	4.85	0.0002
8-Jul-09	21	500	435	8.62	44	140	3	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.87	--
15-Jul-09	22	500	420	8.9	46	145	3	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.92	--
22-Jul-09	23	500	445	7.86	51	160	2	--	1	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.68	--
29-Jul-09	24	500	435	7.68	55	170	2	--	1	22	0.05	0.63	0.05	0.002	0.27	0.02	28	20.4	0.02	0.0019	0.252	0.0016	0.0002	0.0002	0.02	0.00004	4.28	0.0002
5-Aug-09	25	500	435	8.04	51	175	4	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.4	--
12-Aug-09	26	500	420	7.68	50	165	2	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.12	--
19-Aug-09	27	500	415	7.76	52	165	2	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.28	--
26-Aug-09	28	500	410	7.85	57	155	2	--	1	20	0.05	1.89	0.05	0.002	0.43	0.02	19	22.8	0.021	0.0017	0.255	0.0015	0.0002	0.0002	0.02	0.00004	4.54	0.0003
2-Sep-09	29	500	425	8.08	54	150	3	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4	--
9-Sep-09	30	500	430	8.3	50	155	1	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.39	--
16-Sep-09	31	500	410	8.9	62	150	1	--	--	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.12	--
23-Sep-09	32	500	410	7.64	54	150	1	--	1	18	0.05	3.38	0.05	0.002	0.43	0.08	27	23.5	0.023	0.0016	0.293	0.0014	0.0001	0.0001	0.03	0.00001	4.13	0.0002
30-Sep-09	33	500	405	8.86	53	160	2	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.14	--
7-Oct-09	34	500	410	8.86	60	155	3	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--</						

HC-12

Sample Weight = 1 kg		Co	Cu	Fe	Pb	Li	Mg	Mn	Hg (CVAF)	Mo	Ni	P	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr	
Date	Accum. Weeks	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/L	mg/l	mg/l	mg/l	mg/l		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l		
		0.001	0.02	0.0002	0.05	0.001	0.001	0.001	0.05	0.001	0.001	0.05	0.001		0.02	0.0005	0.001	0.15	0.1	0.001	0.25	0.00025	0.05	0.001		0.001	0.0001	0.001		
11-Feb-09	0	0.0002	0.0023	0.01	0.0002	0.0049	1.11	0.0087	0.02	0.0003	0.0031	0.03	2.29		0.0006	0.35	0.00005	22.5	0.023	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0007	0.001	0.002	
18-Feb-09	1	0.0013	0.0031	0.03	0.0002	0.0054	1.86	0.012	0.02	0.0009	0.0054	0.03	2.86		0.0013	0.57	0.00005	24	0.054	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0012	0.001	0.002	
25-Feb-09	2	0.0011	0.0045	0.01	0.0003	0.0041	1.61	0.0059	0.02	0.0012	0.0044	0.03	2.59		0.0016	0.51	0.00005	19.3	0.042	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0021	0.001	0.002	
4-Mar-09	3	--	--	0.01	--	--	3.15	--	--	--	--	--	3.5		--	--	--	18.7	--	--	--	--	--	--	--	--	--	--	--	--
11-Mar-09	4	0.0009	0.0013	0.02	0.0002	0.0029	2.19	0.013	0.02	0.0004	0.0019	0.03	2.06		0.0007	0.41	0.00005	5.76	0.041	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0017	0.004	0.002	
18-Mar-09	5	--	--	0.01	--	--	3.45	--	--	--	--	--	2.2		--	--	--	4.2	--	--	--	--	--	--	--	--	--	--	--	--
25-Mar-09	6	--	--	0.01	--	--	3.28	--	--	--	--	--	1.8		--	--	--	2.5	--	--	--	--	--	--	--	--	--	--	--	--
1-Apr-09	7	--	--	0.01	--	--	3.3	--	--	--	--	--	1.4		--	--	--	1.6	--	--	--	--	--	--	--	--	--	--	--	--
8-Apr-09	8	0.0016	0.0004	0.01	0.0002	0.0033	3.21	0.011	0.02	0.0003	0.0024	0.03	1.67		0.0004	0.42	0.00005	1.14	0.049	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0013	0.001	0.002	
15-Apr-09	9	--	--	0.01	--	--	3.81	--	--	--	--	--	1.2		--	--	--	0.8	--	--	--	--	--	--	--	--	--	--	--	--
22-Apr-09	10	--	--	0.02	--	--	3.35	--	--	--	--	--	1.3		--	--	--	0.9	--	--	--	--	--	--	--	--	--	--	--	--
29-Apr-09	11	--	--	0.01	--	--	2.64	--	--	--	--	--	1.1		--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
6-May-09	12	0.0012	0.0011	0.02	0.0002	0.0021	2.48	0.005	0.02	0.0001	0.0017	0.03	1.18		0.0002	0.35	0.00005	0.47	0.029	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0013	0.001	0.002	
13-May-09	13	--	--	0.02	--	--	2.52	--	--	--	--	--	0.7		--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
20-May-09	14	--	--	0.01	--	--	2.59	--	--	--	--	--	0.6		--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
27-May-09	15	--	--	0.01	--	--	2.77	--	--	--	--	--	0.7		--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
3-Jun-09	16	0.0015	0.001	0.01	0.0002	0.0015	2.4	0.0089	0.02	0.0001	0.0021	0.03	0.77		0.0002	0.36	0.00005	0.26	0.03	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.001	0.001	0.002	
10-Jun-09	17	--	--	0.01	--	--	2.78	--	--	--	--	--	0.5		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
17-Jun-09	18	--	--	0.01	--	--	2.63	--	--	--	--	--	0.6		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
24-Jun-09	19	--	--	0.04	--	--	2.99	--	--	--	--	--	0.5		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
1-Jul-09	20	0.0017	0.0008	0.01	0.0002	0.0012	2.29	0.014	0.02	0.0001	0.0016	0.03	0.51		0.0006	0.3	0.00005	0.18	0.029	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0006	0.001	0.002	
8-Jul-09	21	--	--	0.01	--	--	2.5	--	--	--	--	--	0.4		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
15-Jul-09	22	--	--	0.01	--	--	2.74	--	--	--	--	--	0.6		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
22-Jul-09	23	--	--	0.01	--	--	2.76	--	--	--	--	--	0.6		--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
29-Jul-09	24	0.0016	0.0002	0.01	0.0002	0.0012	2.35	0.012	0.02	0.0001	0.0018	0.03	0.53		0.0002	0.26	0.00005	0.21	0.022	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0005	0.001	0.002	
5-Aug-09	25	--	--	0.01	--	--	2.66	--	--	--	--	--	0.5		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
12-Aug-09	26	--	--	0.02	--	--	2.79	--	--	--	--	--	0.5		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
19-Aug-09	27	--	--	0.02	--	--	3.14	--	--	--	--	--	0.5		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
26-Aug-09	28	0.0016	0.0016	0.01	0.0005	0.0012	2.78	0.0095	0.02	0.0001	0.0017	0.03	0.6		0.0002	0.27	0.00005	0.23	0.023	0.0002	0.00002	0.0001	0.0002	0.0002	--	0.0001	0.0006	0.001	0.002	
2-Sep-09	29	--	--	0.01	--	--	3.07	--	--	--	--	--	0.6		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
9-Sep-09	30	--	--	0.01	--	--	2.81	--	--	--	--	--	0.4		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
16-Sep-09	31	--	--	0.02	--	--	3.54	--	--	--	--	--	0.4		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
23-Sep-09	32	0.0013	0.0006	0.01	0.00005	0.0013	3.2	0.0052	0.02	0.0001	0.0015	0.015	0.46		0.0004	0.24	0.00004	0.18	0.02	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0005	0.001	0.0001	
30-Sep-09	33	--	--	0.01	--	--	3.11	--	--	--	--	--	0.4		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
7-Oct-09	34	--	--	0.01	--	--	3.36	--	--	--	--	--	0.4		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
14-Oct-09	35	--	--	0.01	--	--	3.69	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
21-Oct-09	36	0.0015	0.0002	0.01	0.00005	0.001	2.67	0.0054	0.02	0.0001	0.0013	0.015	0.26		0.0002	0.23	0.00004	0.13	0.02	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0004	0.001	0.0001	
28-Oct-09	37	--	--	0.01	--	--	3.33	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
4-Nov-09	38	--	--	0.02	--	--	4.37	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
11-Nov-09	39	--	--	0.02	--	--	4.71	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
18-Nov-09	40	0.0018	0.0047	0.01	0.00007	0.0008	4.46	0.008	0.02	0.0001	0.0033	0.015	0.36		0.0003	0.17	0.00004	0.16	0.024	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0004	0.001	0.0001	
25-Nov-09	41	--	--	0.01	--	--	3.5	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
2-Dec-09	42	--	--	0.01	--	--	3.77	--	--	--	--	--	0.3		--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
9-Dec-09	43	--	--	0.01	--	--	3.12	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
16-Dec-09	44	0.0014	0.002	0.01	0.00005	0.001	2.62	0.0051	0.02	0.0001	0.0011	0.015	0.23		0.0003	0.17	0.00004	0.16	0.014	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0004	0.001	0.0001	
23-Dec-09	45	--	--	0.01	--	--	2.82	--	--	--	--	--	0.3		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
30-Dec-09	46	--	--	0.01	--	--	3	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
6-Jan-10	47	--	--	0.01	--	--	2.83	--	--	--	--	--	0.25		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
13-Jan-10	48	0.0016	0.0024	0.01	0.00005	0.001	3.26	0.0067	0.02	0.0001	0.0014	0.015	0.24		0.0003	0.27	0.00004	0.13	0.018	0.0002	0.00002	0.00005	0.0001	0.0002	--	0.00005	0.0004	0.001	0.0001	
20-Jan-10	49	--	--	0.01	--	--	3.13	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
27-Jan-10	50	--	--	0.01	--	--	3.21	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
3-Feb-10	51	--	--	0.01	--	--	3.29	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
10-Feb-10	52	--	--	0.02	--	--	3.32	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
17-Feb-10	53	--	--	0.01	--	--	2.84	--	--	--	--	--	0.25		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
24-Feb-10	54	--	--	0.01																										

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Dissolved Metals by ICP-MS (Cantest)

Sample Weight = 1 kg		Volume (ml)		pH (pH Units)	EC (µS/cm)	ORP (mV)	SO4 (mg/l)	Acidity (mg CaCO3/l)		Total Alkalinity (mg CaCO3/l) to pH 4.5	Fluoride (mg/l)	Chloride (mg/l)	Nitrate-N (mg/l)	Nitrite-N (mg/l)	Total Ammonia (mgN/l)	Diss.-P (mgP/l)	TDS (mg/l)	Hardness CaCO3 (mg/l)	Al (mg/l)	Sb (mg/l)	As (mg/l)	Ba (mg/l)	Be (mg/l)	Bi (mg/l)	B mg/l	Cd mg/l	Ca mg/l	Cr mg/l
Date	Accum. Weeks	Input	Output					to pH 4.5	to pH 8.3																			
		5	5	0.01	1	50	1	1	1	1	0.1	0.2	0.02	0.002	0.01	0.001	10	0.02	0.02	0.02			Calculation	0.005	0.001	0.001	0.001	0.001
9-Jun-10	69	500	455	8.75	50	--	2	--	--	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.69	--
16-Jun-10	70	500	430	8.65	52	--	1	--	--	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.83	--
23-Jun-10	71	500	450	8.53	44	--	2	--	--	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.45	--
30-Jun-10	72	500	440	8.6	43	170	1	--	--	20	0.05	0.5	0.02	0.005	0.05	0.056	24	21.4387	0.0166	0.00111	0.127	0.00069	0.00001	0.000005	0.05	0.000005	4.3	0.000
7-Jul-10	73	500	455	8.67	45	--	1	--	--	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.57	--
14-Jul-10	74	500	425	8.64	34	--	1	--	--	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.7	--
21-Jul-10	75	500	430	8.75	38	--	2	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.52	--
28-Jul-10	76	500	450	8.35	50	--	1	--	--	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.67	--
4-Aug-10	77	500	440	8.48	44	--	2	--	--	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.62	--
11-Aug-10	78	500	450	8.61	43	--	2	--	--	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.4	--
18-Aug-10	79	500	445	8.73	54	--	2	--	--	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.7	--
25-Aug-10	80	500	450	8.33	51	160	1	--	--	25	0.01	0.5	0.02	0.005	0.16	0.022	26	23.53151	0.0126	0.00103	0.108	0.00076	0.00001	0.000005	0.05	0.000005	5.27	0.0001
1-Sep-10	81	500	465	8.56	57	--	2	--	--	26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.06	--
8-Sep-10	82	500	430	8.58	46	--	2	--	--	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.71	--
15-Sep-10	83	500	450	8.62	41	--	1	--	--	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.36	--
22-Sep-10	84	500	420	8.3	59	--	1	--	--	28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.07	--
29-Sep-10	85	500	440	8.3	43	--	3	--	--	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.13	--
6-Oct-10	86	500	455	8.59	48	--	1	--	--	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.84	--
13-Oct-10	87	500	435	8.49	50	--	2	--	--	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.5	--
20-Oct-10	88	500	455	8.05	55	190	3	--	1	25	0.01	0.5	0.02	0.005	0.045	0.01	32	25.97147	0.0099	0.00083	0.0732	0.00111	0.00001	0.000005	0.05	0.000005	5.39	0.0001
27-Oct-10	89	500	465	8.48	56	--	2	--	--	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.27	--
3-Nov-10	90	500	445	8.33	45	--	3	--	--	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.31	--
10-Nov-10	91	500	445	8.35	44	--	1	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.13	--
17-Nov-10	92	500	455	8.03	48	--	1	--	1	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.56	--
24-Nov-10	93	500	420	8.54	48	--	2	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.13	--
1-Dec-10	94	500	450	8.3	56	--	2	--	--	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.89	--
8-Dec-10	95	500	465	8.44	59	--	2	--	--	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.16	--
15-Dec-10	96	500	425	8.33	63	155	2	--	--	24	0.02	2.2	0.02	0.005	0.095	0.015	34	27.59427	0.0097	0.00085	0.0734	0.00066	0.00001	0.000005	0.05	0.000005	5.43	0.0003
22-Dec-10	97	500	455	8.34	66	--	1	--	--	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.84	--
29-Dec-10	98	500	425	8.56	56	--	2	--	--	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.94	--
5-Jan-11	99	500	500	8.41	60	--	2	--	--	29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.44	--
12-Jan-11	100	500	430	8.32	63	--	1	--	--	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.45	--
19-Jan-11	101	500	425	8.67	62	--	3	--	--	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.14	--
26-Jan-11	102	500	440	8.67	61	--	2	--	--	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.61	--
2-Feb-11	103	500	435	8.3	60	--	3	--	--	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.63	--
9-Feb-11	104	500	440	8.1	57	165	3	--	1	25	0.01	1	0.02	0.005	0.022	0.005	30	27.41973	0.0086	0.00079	0.0565	0.00063	0.00001	0.000005	0.05	0.000005	5.97	0.0001
Terminated																												

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Sample Weight = 1 kg

Date	Accum. Weeks	Co	Cu	Fe	Pb	Li	Mg	Mn	Hg (CVAF)	Mo	Ni	P	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr
		mg/l 0.001	mg/l 0.02	mg/l 0.0002	mg/l 0.05	mg/l 0.001	mg/l 0.001	mg/l 0.001	ug/L 0.05	mg/l 0.001	mg/l 0.001	mg/l 0.05	mg/l 0.001		mg/l 0.02	mg/l 0.0005	mg/l 0.001	mg/l 0.15	mg/l 0.1	mg/l 0.001	mg/l 0.25	mg/l 0.00025	mg/l 0.05	mg/l 0.001	mg/l	mg/l 0.001	mg/l 0.0001	mg/l 0.0005	mg/l 0.001
9-Jun-10	69	--	--	0.01	--	--	2.7	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
16-Jun-10	70	--	--	0.01	--	--	3.02	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
23-Jun-10	71	--	--	0.01	--	--	2.58	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
30-Jun-10	72	0.0011	0.00023	0.003	0.000008	0.0005	2.6	0.00439	0.02	0.0001	0.00075	0.002	0.08		0.0003	0.2	0.000005	0.05	0.00948	0.00002	0.000002	0.000005	0.00004	0.0005	--	0.000002	0.0002	0.0001	0.0001
7-Jul-10	73	--	--	0.01	--	--	2.83	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
14-Jul-10	74	--	--	0.01	--	--	3.22	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
21-Jul-10	75	--	--	0.01	--	--	3.09	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
28-Jul-10	76	--	--	0.01	--	--	3.1	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
4-Aug-10	77	--	--	0.01	--	--	3.3	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
11-Aug-10	78	--	--	0.01	--	--	2.96	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
18-Aug-10	79	--	--	0.01	--	--	3.15	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
25-Aug-10	80	0.00145	0.00044	0.002	0.000017	0.0005	2.52	0.00495	0.02	0.00009	0.00092	0.002	0.08		0.00029	0.2	0.000005	0.05	0.0103	0.00002	0.000002	0.000005	0.00002	0.0005	--	0.000002	0.0002	0.0001	0.0001
1-Sep-10	81	--	--	0.01	--	--	3.51	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
8-Sep-10	82	--	--	0.01	--	--	2.96	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
15-Sep-10	83	--	--	0.01	--	--	2.65	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
22-Sep-10	84	--	--	0.01	--	--	3.87	--	--	--	--	--	0.11		--	--	--	0.08	--	--	--	--	--	--	--	--	--	0.0002	--
29-Sep-10	85	--	--	0.03	--	--	3.05	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
6-Oct-10	86	--	--	0.03	--	--	2.97	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
13-Oct-10	87	--	--	0.03	--	--	2.87	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
20-Oct-10	88	0.0017	0.00015	0.002	0.000016	0.0005	3.04	0.00664	0.026	0.00007	0.00124	0.003	0.07		0.00025	0.2	0.000005	0.05	0.00908	0.00002	0.000002	0.000005	0.00001	0.0005	--	0.000002	0.0002	0.0004	0.0001
27-Oct-10	89	--	--	0.01	--	--	2.94	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
3-Nov-10	90	--	--	0.01	--	--	2.61	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
10-Nov-10	91	--	--	0.01	--	--	2.66	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
17-Nov-10	92	--	--	0.01	--	--	2.66	--	--	--	--	--	0.07		--	--	--	0.05	--	--	--	--	--	--	--	--	--	0.0001	--
24-Nov-10	93	--	--	0.01	--	--	2.67	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
1-Dec-10	94	--	--	0.01	--	--	3.02	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
8-Dec-10	95	--	--	0.01	--	--	3.23	--	--	--	--	--	0.3		--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
15-Dec-10	96	0.00142	0.00022	0.003	0.000011	0.0005	3.41	0.00628	0.002	0.00008	0.00108	0.003	0.08		0.00028	0.2	0.000005	0.06	0.00825	0.00002	0.000002	0.000005	0.00001	0.002	--	0.000002	0.0006	0.0001	0.0001
22-Dec-10	97	--	--	0.01	--	--	3.53	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
29-Dec-10	98	--	--	0.01	--	--	3.21	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
5-Jan-11	99	--	--	0.01	--	--	3.55	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
12-Jan-11	100	--	--	0.01	--	--	3.37	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
19-Jan-11	101	--	--	0.01	--	--	3.43	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
26-Jan-11	102	--	--	0.01	--	--	3.49	--	--	--	--	--	0.3		--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
2-Feb-11	103	--	--	0.01	--	--	3.52	--	--	--	--	--	0.9		--	--	--	0.7	--	--	--	--	--	--	--	--	--	--	--
9-Feb-11	104	0.00117	0.00023	0.001	0.000006	0.0005	3.04	0.00511	0.004	0.00006	0.00085	0.002	0.07		0.00027	0.2	0.000005	0.05	0.00739	0.00002	0.000002	0.000005	0.00001	0.0005	--	0.000002	0.0002	0.0001	0.0001
Terminated																													

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Sample Weight = 1 kg		Co	Cu	La	Fe	Pb	Li	Mg	Mn	P	Hg	Mo	Ni	Re	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr	
Date	Accum. Weeks	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	(CVAF) µg/L	mg/l	mg/l	mg/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
		0.0001	0.0001	0.0001	0.01	0.00005	0.0001	0.005	0.0001	0.015	0.02	0.0001	0.0002	0.0001	0.01	0.0001	0.0002	0.05	0.00004	0.005	0.0001	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0001	0.001	0.0001	
5-Jan-10	0	0.0001	0.0005	0.0001	0.01	0.00005	0.0021	1.02	0.0019	0.015	0.02	0.0003	0.0006	0.0001	3.01	0.0021	0.0007	0.32	0.00004	35.2	0.012	0.0002	0.00002	0.00005	0.0001	0.0002	0.001	0.00005	0.0013	0.001	0.0001	
12-Jan-10	1	0.0005	0.0013	0.0001	0.02	0.00005	0.0026	1.59	0.0038	0.015	0.02	0.0016	0.0018	0.0001	4.39	0.0028	0.0021	0.59	0.00004	56	0.026	0.0002	0.00002	0.00005	0.0001	0.0002	0.0028	0.00005	0.0026	0.001	0.0001	
19-Jan-10	2	0.0004	0.0004	0.0001	0.05	0.00007	0.0013	0.8	0.003	0.02	0.02	0.0008	0.001	0.0001	2.55	0.0017	0.0014	0.42	0.00004	26.3	0.011	0.0002	0.00002	0.00005	0.0001	0.0003	0.0014	0.00005	0.0027	0.001	0.0001	
26-Jan-10	3	--	--	--	0.01	--	--	1.01	--	--	--	--	--	--	3	--	--	--	--	22.1	--	--	--	--	--	--	--	--	--	--	--	--
2-Feb-10	4	0.0004	0.0006	0.0001	0.01	0.00005	0.001	0.92	0.0029	0.015	0.02	0.0006	0.0007	0.0001	2.63	0.0016	0.001	0.31	0.00004	17.6	0.011	0.0002	0.00002	0.00005	0.0001	0.0002	0.001	0.00005	0.0019	0.001	0.0001	
9-Feb-10	5	--	--	--	0.04	--	--	1.14	--	--	--	--	--	--	2.5	--	--	--	--	14.2	--	--	--	--	--	--	--	--	--	--	--	--
16-Feb-10	6	--	--	--	0.01	--	--	2.26	--	--	--	--	--	--	4.9	--	--	--	--	24.9	--	--	--	--	--	--	--	--	--	--	--	--
23-Feb-10	7	--	--	--	0.01	--	--	3.6	--	--	--	--	--	--	5.8	--	--	--	--	22.3	--	--	--	--	--	--	--	--	--	--	--	--
2-Mar-10	8	0.0006	0.0005	0.0001	0.01	0.00005	0.0007	1.4	0.0038	0.015	0.02	0.0002	0.0006	0.0001	2.64	0.0021	0.0004	0.29	0.00004	4.37	0.016	0.0002	0.00002	0.00005	0.0001	0.0002	0.0003	0.00005	0.001	0.001	0.0001	
9-Mar-10	9	--	--	--	0.01	--	--	2.08	0.005	--	--	--	--	--	2.4	--	--	--	--	3.8	--	--	--	--	--	--	--	--	--	--	--	--
16-Mar-10	10	--	--	--	0.01	--	--	2	--	--	--	--	--	--	2.1	--	--	--	--	3.1	--	--	--	--	--	--	--	--	--	--	--	--
23-Mar-10	11	--	--	--	0.01	--	--	2.01	--	--	--	--	--	--	2	--	--	--	--	2.8	--	--	--	--	--	--	--	--	--	--	--	--
30-Mar-10	12	0.0007	0.0003	0.0001	0.01	0.00005	0.0009	2.1	0.0035	0.015	0.02	0.0002	0.0006	0.0001	2.41	0.0021	0.0004	0.22	0.00004	2.48	0.016	0.0002	0.00002	0.00005	0.0001	0.0002	0.0002	0.00005	0.0009	0.001	0.0001	
6-Apr-10	13	--	--	--	0.01	--	--	2.34	--	--	--	--	--	--	1.7	--	--	--	--	1.5	--	--	--	--	--	--	--	--	--	--	--	--
13-Apr-10	14	--	--	--	0.02	--	--	2.33	--	--	--	--	--	--	2	--	--	--	--	1.6	--	--	--	--	--	--	--	--	--	--	--	--
20-Apr-10	15	--	--	--	0.01	--	--	2.64	--	--	--	--	--	--	2.4	--	--	--	--	2	--	--	--	--	--	--	--	--	--	--	--	--
27-Apr-10	16	0.000692	0.00065	0.00005	0.005	0.000028	0.0007	2.11	0.0037	0.002	0.02	0.00015	0.00048	--	1.97	0.00224	0.00033	0.3	0.000009	1.08	0.0161	0.00002	0.000002	0.000005	0.00001	0.0005	0.00018	0.000002	0.0008	0.0002	0.0001	
4-May-10	17	--	--	--	0.01	--	--	2.06	--	--	--	--	--	--	1.3	--	--	--	--	0.8	--	--	--	--	--	--	--	--	--	--	--	--
11-May-10	18	--	--	--	0.01	--	--	2.34	--	--	--	--	--	--	1.8	--	--	--	--	0.8	--	--	--	--	--	--	--	--	--	--	--	--
18-May-10	19	--	--	--	0.01	--	--	2.11	--	--	--	--	--	--	1.4	--	--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--	--
25-May-10	20	0.000465	0.00013	0.00005	0.007	0.000024	0.0007	2.22	0.00646	0.002	0.02	0.00014	0.00036	--	1.42	0.00157	0.0003	0.2	0.000005	0.55	0.0161	0.00002	0.000002	0.000005	0.00012	0.0005	0.00013	0.000002	0.0006	0.0001	0.0001	
1-Jun-10	21	--	--	--	0.01	--	--	2.38	--	--	--	--	--	--	1.4	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
8-Jun-10	22	--	--	--	0.01	--	--	1.92	--	--	--	--	--	--	1.1	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
15-Jun-10	23	--	--	--	0.01	--	--	2.14	--	--	--	--	--	--	1.2	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
22-Jun-10	24	0.00108	0.00017	0.00005	0.011	0.000024	0.0005	2.09	0.00523	0.002	0.02	0.00012	0.00069	--	1.21	0.00157	0.00029	0.2	0.000005	0.36	0.0158	0.00002	0.000002	0.000005	0.00001	0.0005	0.00009	0.000002	0.0004	0.0001	0.0001	
29-Jun-10	25	--	--	--	0.01	--	--	2.25	--	--	--	--	--	--	1.2	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
6-Jul-10	26	--	--	--	0.01	--	--	2.07	--	--	--	--	--	--	1	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
13-Jul-10	27	--	--	--	0.01	--	--	2.02	--	--	--	--	--	--	1	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
20-Jul-10	28	0.000918	0.00059	0.00005	0.009	0.000053	0.0006	2.19	0.00554	0.006	0.02	0.00011	0.00057	--	1.11	0.0017	0.00028	0.2	0.000005	0.28	0.0165	0.00002	0.000002	0.000005	0.00001	0.0005	0.0001	0.000002	0.0004	0.0004	0.0001	
27-Jul-10	29	--	--	--	0.01	--	--	2.19	--	--	--	--	--	--	0.7	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
3-Aug-10	30	--	--	--	0.01	--	--	2.53	--	--	--	--	--	--	1.1	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
10-Aug-10	31	--	--	--	0.01	--	--	2.14	--	--	--	--	--	--	0.8	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
17-Aug-10	32	0.000786	0.00128	0.00005	0.006	0.000056	0.0005	2.16	0.0055	0.002	0.02	0.0001	0.00046	--	1.06	0.00154	0.00023	0.2	0.000005	0.23	0.0143	0.00002	0.000002	0.000005	0.00001	0.0005	0.0001	0.000002	0.0003	0.0001	0.0001	
24-Aug-10	33	--	--	--	0.01	--	--	2.44	--	--	--	--	--	--	0.9	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
31-Aug-10	34	--	--	--	0.01	--	--	2.24	--	--	--	--	--	--	0.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
7-Sep-10	35	--	--	--	0.01	--	--	2.32	--	--	--	--	--	--	0.9	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
14-Sep-10	36	0.000849	0.00076	0.00005	0.013	0.000137	0.0005	1.99	0.00408	0.002	0.02	0.00013	0.00047	--	0.85	0.00154	0.00027	0.2	0.000005	0.16	0.014	0.00002	0.000002	0.000005	0.00002	0.0005	0.00009	0.000002	0.0002	0.0001	0.0001	
21-Sep-10	37	--	--	--	0.01	--	--	2.36	--	--	--	--	--	--	0.7	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
28-Sep-10	38	--	--	--	0.01	--	--	2.21	--	--	--	--	--	--	0.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
5-Oct-10	39	--	--	--	0.01	--	--	2.17	--	--	--	--	--	--	0.6	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
12-Oct-10	40	0.000583	0.00026	0.00005	0.003	0.000098	0.0005	2.42	0.00757	0.007	0.004	0.00011	0.0004	--	0.83	0.00152	0.00024	0.2	0.000005	0.16	0.0135	0.00002	0.000002	0.000005	0.00004	0.0005	0.00008	0.000002	0.0003	0.003	0.0001	
19-Oct-10	41	--	--	--	0.01	--	--	2.22	--	--	--	--	--	--	0.6	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
26-Oct-10	42	--	--	--	0.01	--	--	2.13	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
2-Nov-10	43	--	--	--	0.01	--	--	2.26	--	--	--	--	--	--	0.6	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
9-Nov-10	44	--	--	--	0.01	--	--	2.29	--	--	--	--	--	--	0.7	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
16-Nov-10	45	--	--	--	0.01	--	--	2.79	--	--	--	--	--	--	0.7	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
23-Nov-10	46	--	--	--	0.01	--	--	2.08	--	--	--	--	--	--	0.7	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
30-Nov-10	47	--	--	--	0.01	--	--	2.38	--	--	--	--	--	--	0.5	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
7-Dec-10	48	0.000716	0.00037	0.00005	0.002	0.000025	0.0005	2.52	0.00456	0.002	0.002	0.00011	0.00039	--	0.65	0.00122	0.00024	0.2	0.000005	0.17	0.0134	0.00002	0.000002	0.000005	0.00001	0.0005						

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Sample Weight = 1 kg

Date	Accum. Weeks	Cr	Co	Cu	La	Fe	Pb	Li	Mg	Mn	P	Hg	Mo	Ni	Re	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr
		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	(CVAF) µg/L	mg/l	mg/l	mg/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
5-Jan-10	0	0.0002	0.0001	0.0001	0.0001	0.01	0.00005	0.0001	0.005	0.0001	0.015	0.02	0.0001	0.0002	0.0001	0.01	0.0001	0.0002	0.05	0.00004	0.005	0.0001	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0001	0.001	0.0001
12-Jan-10	1	0.0005	0.0007	0.001	0.0001	0.02	0.00005	0.0007	2.31	0.0059	0.015	0.02	0.0012	0.004	0.0001	3.82	0.002	0.0016	0.44	0.00004	19.1	0.011	0.0002	0.00002	0.00005	0.0001	0.0002	0.0021	0.00014	0.0026	0.001	0.0001
19-Jan-10	2	0.0004	0.0009	0.0005	0.0001	0.01	0.00005	0.0007	2.94	0.0066	0.015	0.02	0.0009	0.0038	0.0001	3.36	0.0019	0.0017	0.42	0.00004	12.5	0.012	0.0002	0.00002	0.00005	0.0001	0.0002	0.0015	0.00014	0.0021	0.001	0.0001
26-Jan-10	3	--	--	--	--	0.01	--	--	3.86	--	--	--	--	--	--	3.4	--	--	--	--	10.5	--	--	--	--	--	--	--	--	--	--	--
2-Feb-10	4	0.0003	0.0011	0.0004	0.0001	0.02	0.00005	0.0006	3.22	0.0071	0.015	0.02	0.0006	0.0031	0.0001	2.7	0.0015	0.0012	0.35	0.00004	7.13	0.012	0.0002	0.00002	0.00005	0.0001	0.0002	0.0011	0.0001	0.0015	0.001	0.0001
9-Feb-10	5	--	--	--	--	0.03	--	--	3.72	--	--	--	--	--	--	2.5	--	--	--	--	5.9	--	--	--	--	--	--	--	--	--	--	--
16-Feb-10	6	--	--	--	--	0.01	--	--	5.85	--	--	--	--	--	--	4	--	--	--	--	10.7	--	--	--	--	--	--	--	--	--	--	--
23-Feb-10	7	--	--	--	--	0.01	--	--	5.05	--	--	--	--	--	--	3.5	--	--	--	--	6.3	--	--	--	--	--	--	--	--	--	--	--
2-Mar-10	8	0.0002	0.0014	0.0002	0.0001	0.07	0.00005	0.0005	2.38	0.0073	0.015	0.02	0.0002	0.003	0.0001	1.7	0.0013	0.0005	0.35	0.00004	1.38	0.0087	0.0002	0.00002	0.00005	0.0001	0.0002	0.0005	0.00007	0.0014	0.001	0.0001
9-Mar-10	9	--	--	--	--	0.03	--	--	2.65	0.007	--	--	--	--	--	1.2	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--	--	--
16-Mar-10	10	--	--	--	--	0.03	--	--	2.63	--	--	--	--	--	--	1.1	--	--	--	--	0.9	--	--	--	--	--	--	--	--	--	--	--
23-Mar-10	11	--	--	--	--	0.02	--	--	2.33	--	--	--	--	--	--	0.8	--	--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--
30-Mar-10	12	0.0004	0.0017	0.0003	0.0001	0.04	0.00007	0.0005	2.64	0.007	0.015	0.02	0.0002	0.003	0.0001	1.21	0.0011	0.0004	0.27	0.00004	0.72	0.0073	0.0002	0.00002	0.00005	0.0001	0.0002	0.0003	0.00005	0.0011	0.001	0.0001
6-Apr-10	13	--	--	--	--	0.03	--	--	2.63	--	--	--	--	--	--	0.8	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--
13-Apr-10	14	--	--	--	--	0.02	--	--	2.59	--	--	--	--	--	--	0.8	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--
20-Apr-10	15	--	--	--	--	0.01	--	--	2.9	--	--	--	--	--	--	1.1	--	--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--
27-Apr-10	16	0.0001	0.00126	0.00054	0.00005	0.009	0.000007	0.0005	2.24	0.00579	0.002	0.02	0.0002	0.00185	--	0.86	0.00106	0.00028	0.3	0.000006	0.4	0.00628	0.00002	0.000002	0.000005	0.00001	0.0005	0.00024	0.000046	0.0011	0.0001	0.0001
4-May-10	17	--	--	--	--	0.02	--	--	2.22	--	--	--	--	--	--	0.5	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--
11-May-10	18	--	--	--	--	0.01	--	--	2.7	--	--	--	--	--	--	0.9	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--
18-May-10	19	--	--	--	--	0.01	--	--	2.04	--	--	--	--	--	--	0.5	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
25-May-10	20	0.0001	0.000738	0.00029	0.00005	0.014	0.000017	0.0005	2.14	0.0108	0.002	0.02	0.00019	0.00111	--	0.59	0.00086	0.00021	0.3	0.000005	0.24	0.00605	0.00002	0.000002	0.000005	0.00004	0.0005	0.00016	0.000029	0.0008	0.0005	0.0001
1-Jun-10	21	--	--	--	--	0.02	--	--	2.59	--	--	--	--	--	--	0.6	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
8-Jun-10	22	--	--	--	--	0.01	--	--	2.15	--	--	--	--	--	--	0.5	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
15-Jun-10	23	--	--	--	--	0.01	--	--	2.54	--	--	--	--	--	--	0.6	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
22-Jun-10	24	0.0002	0.00196	0.00069	0.00005	0.02	0.00003	0.0005	2.81	0.00995	0.002	0.02	0.00024	0.00281	--	0.66	0.001	0.00023	0.3	0.000005	0.25	0.00598	0.00002	0.000002	0.000005	0.00001	0.0005	0.00015	0.000037	0.0008	0.0001	0.0001
29-Jun-10	25	--	--	--	--	0.01	--	--	2.7	--	--	--	--	--	--	0.6	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
6-Jul-10	26	--	--	--	--	0.01	--	--	2.39	--	--	--	--	--	--	0.5	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
13-Jul-10	27	--	--	--	--	0.01	--	--	2.36	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
20-Jul-10	28	0.0001	0.00143	0.0004	0.00005	0.009	0.000025	0.0006	2.39	0.00754	0.006	0.02	0.00021	0.00176	--	0.54	0.001	0.00018	0.2	0.000005	0.19	0.00538	0.00002	0.000002	0.000005	0.00001	0.0005	0.00012	0.000023	0.0007	0.0001	0.0001
27-Jul-10	29	--	--	--	--	0.01	--	--	2.29	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
3-Aug-10	30	--	--	--	--	0.01	--	--	2.68	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
10-Aug-10	31	--	--	--	--	0.01	--	--	2.48	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
17-Aug-10	32	0.0002	0.00144	0.00074	0.00005	0.01	0.000039	0.0005	2.48	0.00894	0.002	0.02	0.00018	0.00199	--	0.46	0.00091	0.00013	0.3	0.000005	0.15	0.00505	0.00002	0.000002	0.000005	0.00001	0.0005	0.00011	0.000018	0.0006	0.0001	0.0001
24-Aug-10	33	--	--	--	--	0.01	--	--	2.58	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
31-Aug-10	34	--	--	--	--	0.01	--	--	2.44	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
7-Sep-10	35	--	--	--	--	0.01	--	--	2.25	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
14-Sep-10	36	0.0002	0.00124	0.0007	0.00005	0.015	0.000047	0.0005	2.11	0.00627	0.002	0.02	0.00019	0.00159	--	0.38	0.0008	0.00013	0.2	0.000005	0.11	0.0045	0.00002	0.000002	0.000005	0.00001	0.0005	0.00009	0.000019	0.0004	0.0001	0.0001
21-Sep-10	37	--	--	--	--	0.01	--	--	2.32	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
28-Sep-10	38	--	--	--	--	0.01	--	--	2.28	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
5-Oct-10	39	--	--	--	--	0.01	--	--	2.22	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
12-Oct-10	40	0.0002	0.000893	0.00025	0.00005	0.007	0.000092	0.0005	2.59	0.0116	0.008	0.005	0.0002	0.0012	--	0.37	0.00076	0.00012	0.2	0.000005	0.12	0.00446	0.00002	0.000002	0.000005	0.00004	0.0005	0.00008	0.000012	0.0006	0.0029	0.0001
19-Oct-10	41	--	--	--	--	0.01	--	--	2.33	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
26-Oct-10	42	--	--	--	--	0.01	--	--	2.28	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
2-Nov-10	43	--	--	--	--	0.01	--	--	2.49	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
9-Nov-10	44	--	--	--	--	0.01	--	--	2.34	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
16-Nov-10	45	--	--	--	--	0.01	--	--	2.93	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
23-Nov-10	46	--	--	--	--	0.01	--	--	2.17	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
30-Nov-10	47	--	--	--	--	0.01	--	--	2.3	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
7-Dec-10	48	0.0001	0.00139	0.00029	0.00005	0.003	0.000007	0.0005	2.34	0.00843	0.002	0.002	0.00017	0.00243	--	0.29	0.00068	0.00011	0.2	0.000005	0.17	0.00445	0.00002	0.000002	0.000005	0.00001	0.0005	0.00007	0.000016	0.0009	0.0002	0.0001
14-Dec-10	49	--	--	--	--	0.01																										

HC-33		Dissolved Metals by ICP-MS (Cantest)																											
Sample Weight = 1 kg		Volume (ml)		pH (pH Units)	EC (µS/cm)	ORP (mV)	SO4 (mg/l)	Acidity (mg CaCO3/l)		Total Alkalinity (mg CaCO3/l)	Fluoride (mg/l)	Chloride (mg/l)	Nitrate-N (mg/l)	Nitrite-N (mg/l)	Total Ammonia (mgN/l)	Diss.-P (mgP/l)	TDS (mg/l)	Hardness CaCO3 (mg/l)	Al (mg/l)	Sb (mg/l)	As (mg/l)	Ba (mg/l)	Be (mg/l)	Bi mg/l	B mg/l	Cs mg/l	Cd mg/l	Ca mg/l	Cr mg/l
Date	Accum. Weeks	Input	Output					to pH 4.5	to pH 8.3																				
5-Jan-10	0	750	595	0.01	1	50	1	1	1	0.1	0.2	0.02	0.002	0.01	0.001	10	0.02	0.001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001	0.005	0.0001	0.00001	0.01	0.0002
12-Jan-10	1	500	455	9.15	119	130	5	--	--	31	0.05	9.37	0.08	0.004	0.04	0.02	51	12.50841	0.14	0.0044	0.143	0.0004	0.0001	0.0001	0.1	0.0001	0.00001	2.85	0.0003
19-Jan-10	2	500	430	8.84	175	130	15	--	--	38	0.08	13	0.08	0.006	0.04	0.35	103	20.40559	0.07	0.013	1.14	0.0006	0.0001	0.0001	0.18	0.0002	0.00001	4.15	0.0005
26-Jan-10	3	500	445	8.93	153	140	29	--	--	28	0.05	7.93	0.05	0.004	0.07	0.21	67	21.36709	0.06	0.01	1.43	0.0005	0.0001	0.0001	0.15	0.0001	0.00001	4.09	0.0003
2-Feb-10	4	500	410	8.84	150	125	27	--	--	25	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	--	5.45	--
9-Feb-10	5	500	410	9.15	122	135	29	--	--	20	0.05	3.39	0.05	0.003	0.14	0.44	63	25.48745	0.061	0.0092	1.29	0.0006	0.0001	0.0001	0.13	0.0002	0.00001	4.85	0.0004
16-Feb-10	6	500	435	8.95	109	135	27	--	--	20	--	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--	--	--	5.28	--
23-Feb-10	7	500	405	9.25	150	125	37	--	--	24	--	--	--	--	--	--	--	--	0.11	--	--	--	--	--	--	--	--	6.27	--
2-Mar-10	8	500	415	9.06	110	140	20	--	--	31	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	--	6.16	--
9-Mar-10	9	500	425	8.9	66	125	9	--	--	21	0.05	0.2	0.05	0.004	0.19	0.35	98	20.17482	0.044	0.0078	1.01	0.0004	0.0001	0.0001	0.097	0.0001	0.00001	4.14	0.0002
16-Mar-10	10	500	435	8.83	61	145	8	--	--	19	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	4.3	--
23-Mar-10	11	500	440	8.8	61	165	9	--	--	19	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	4.63	--
30-Mar-10	12	500	425	8.78	52	170	9	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.1	--
6-Apr-10	13	500	430	8.61	68	165	9	--	--	19	0.05	0.2	0.05	0.002	0.21	0.32	52	23.50081	0.024	0.0056	0.946	0.0007	0.0001	0.0001	0.059	0.0001	0.00001	4.45	0.0003
13-Apr-10	14	500	455	8.53	62	180	9	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.65	--
20-Apr-10	15	500	425	8.76	55	150	8	--	--	17	--	--	--	--	--	--	--	--	0.09	--	--	--	--	--	--	--	--	4.7	--
27-Apr-10	16	500	415	8.19	60	140	9	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.4	--
4-May-10	17	500	425	8.65	50	135	5	--	--	18	0.03	0.5	0.02	0.005	0.17	0.226	48	19.49048	0.0314	0.00526	0.799	0.00047	0.00001	0.000005	0.05	0.00016	0.000005	3.8	0.0001
11-May-10	18	500	430	8.74	43	170	5	--	--	15	--	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--	--	--	3.63	--
18-May-10	19	500	430	8.5	51	170	5	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.96	--
25-May-10	20	500	445	8.69	45	150	5	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.71	--
1-Jun-10	21	500	420	8.8	47	150	5	--	--	17	0.01	0.5	0.02	0.005	0.16	0.256	40	20.76725	0.0296	0.00413	0.696	0.00045	0.00001	0.000005	0.05	0.00012	0.000005	4.13	0.0001
8-Jun-10	22	500	470	8.32	52	150	5	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.61	--
15-Jun-10	23	500	440	8.45	45	170	5	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.67	--
22-Jun-10	24	500	435	8.51	46	175	5	--	--	18	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	4.14	--
29-Jun-10	25	500	450	8.36	49	130	3	--	--	17	0.02	0.5	0.02	0.005	0.3	0.172	24	22.44273	0.0292	0.00345	0.572	0.00045	0.00001	0.000005	0.05	0.00014	0.000005	4.29	0.0002
6-Jul-10	26	500	410	8.95	50	150	5	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.28	--
13-Jul-10	27	500	420	8.92	44	150	4	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.73	--
20-Jul-10	28	500	420	8.81	33	140	3	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.73	--
27-Jul-10	29	500	430	8.6	38	170	4	--	--	17	0.01	0.5	0.02	0.005	0.35	0.217	20	18.44585	0.0223	0.00292	0.55	0.00035	0.00001	0.000005	0.05	0.00016	0.000005	3.53	0.0001
3-Aug-10	30	500	445	8.52	44	160	4	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.99	--
10-Aug-10	31	500	430	8.62	40	160	3	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.38	--
17-Aug-10	32	500	420	8.67	37	160	4	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.6	--
24-Aug-10	33	500	445	8.52	40	175	4	--	--	16	0.01	0.5	0.02	0.005	0.31	0.187	24	20.17675	0.0241	0.00273	0.484	0.00036	0.00001	0.000005	0.05	0.00017	0.000005	3.91	0.0002
31-Aug-10	34	500	435	8.64	43	160	4	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.23	--
7-Sep-10	35	500	425	8.58	44	160	3	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.75	--
14-Sep-10	36	500	440	8.52	41	155	3	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.	

HC-33

Sample Weight = 1 kg		Co	Cu	La	Fe	Pb	Li	Mg	Mn	P	Hg	Mo	Ni	Re	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr
Date	Accum. Weeks	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	(CVAF) µg/L	mg/l	mg/l	mg/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
5-Jan-10	0	0.0001	0.0002	0.0001	0.01	0.00005	0.0001	0.005	0.0001	0.015	0.02	0.0001	0.0002	0.0001	0.01	0.0001	0.0002	0.05	0.00004	0.005	0.0001	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0001	0.001	0.0001
12-Jan-10	1	0.0008	0.0008	0.0001	0.02	0.00005	0.0009	2.44	0.0076	0.015	0.02	0.0003	0.0013	0.0001	3.1	0.0019	0.0004	0.33	0.00004	18.3	0.0076	0.0002	0.00002	0.00005	0.0001	0.0002	0.0009	0.00005	0.0012	0.001	0.0001
19-Jan-10	2	0.0008	0.0003	0.0001	0.01	0.00005	0.0008	2.71	0.0059	0.015	0.02	0.001	0.0034	0.0001	3.86	0.0026	0.0019	0.46	0.00004	17.6	0.017	0.0002	0.00002	0.00005	0.0001	0.0002	0.0012	0.00007	0.0024	0.001	0.0001
26-Jan-10	3	--	--	--	0.02	--	--	3.74	--	--	--	--	--	--	4.5	--	--	--	--	16	--	--	--	--	--	--	--	--	--	--	--
2-Feb-10	4	0.001	0.0002	0.0001	0.02	0.00005	0.0009	3.25	0.0059	0.015	0.02	0.0007	0.0028	0.0001	3.83	0.0027	0.0013	0.43	0.00004	11.1	0.016	0.0002	0.00002	0.00005	0.0001	0.0002	0.001	0.00005	0.0023	0.001	0.0001
9-Feb-10	5	--	--	--	0.02	--	--	3.74	--	--	--	--	--	--	3.5	--	--	--	--	8.5	--	--	--	--	--	--	--	--	--	--	--
16-Feb-10	6	--	--	--	0.04	--	--	5.7	--	--	--	--	--	--	5.2	--	--	--	--	10.8	--	--	--	--	--	--	--	--	--	--	--
23-Feb-10	7	--	--	--	0.01	--	--	4.54	--	--	--	--	--	--	4.2	--	--	--	--	5	--	--	--	--	--	--	--	--	--	--	--
2-Mar-10	8	0.0012	0.0002	0.0001	0.02	0.00005	0.0005	2.39	0.0057	0.015	0.02	0.0003	0.0025	0.0001	2.3	0.0022	0.0005	0.38	0.00004	1.5	0.012	0.0002	0.00002	0.00005	0.0001	0.0002	0.0004	0.00005	0.0015	0.001	0.0001
9-Mar-10	9	--	--	--	0.02	--	--	2.88	0.007	--	--	--	--	--	1.8	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--	--	--
16-Mar-10	10	--	--	--	0.02	--	--	3.03	--	--	--	--	--	--	1.6	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--
23-Mar-10	11	--	--	--	0.03	--	--	2.55	--	--	--	--	--	--	1.2	--	--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--
30-Mar-10	12	0.0014	0.0003	0.0001	0.02	0.00005	0.0009	3.01	0.0064	0.015	0.02	0.0002	0.0023	0.0001	1.82	0.0019	0.0005	0.3	0.00004	0.77	0.011	0.0002	0.00002	0.00005	0.0001	0.0002	0.0003	0.00005	0.0014	0.001	0.0001
6-Apr-10	13	--	--	--	0.02	--	--	2.89	--	--	--	--	--	--	1.2	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--
13-Apr-10	14	--	--	--	0.32	--	--	2.97	--	--	--	--	--	--	1.3	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--
20-Apr-10	15	--	--	--	0.01	--	--	3.04	--	--	--	--	--	--	1.6	--	--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--
27-Apr-10	16	0.00138	0.00064	0.00005	0.012	0.00002	0.0005	2.43	0.00636	0.002	0.02	0.00017	0.00195	--	1.22	0.00175	0.00033	0.4	0.000005	0.44	0.00934	0.00002	0.000002	0.000005	0.00001	0.0005	0.00026	0.000018	0.0013	0.0008	0.0001
4-May-10	17	--	--	--	0.02	--	--	2.29	--	--	--	--	--	--	0.8	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--
11-May-10	18	--	--	--	0.02	--	--	2.76	--	--	--	--	--	--	1.1	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--
18-May-10	19	--	--	--	0.01	--	--	2.38	--	--	--	--	--	--	0.9	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
25-May-10	20	0.000891	0.00112	0.00005	0.012	0.000035	0.0005	2.54	0.012	0.002	0.02	0.00013	0.00124	--	0.96	0.00149	0.00031	0.3	0.000005	0.28	0.00794	0.00002	0.000002	0.000005	0.00008	0.0005	0.00016	0.000013	0.0011	0.0001	0.0001
1-Jun-10	21	--	--	--	0.02	--	--	2.84	--	--	--	--	--	--	0.8	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
8-Jun-10	22	--	--	--	0.01	--	--	2.3	--	--	--	--	--	--	0.7	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
15-Jun-10	23	--	--	--	0.02	--	--	2.56	--	--	--	--	--	--	0.8	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
22-Jun-10	24	0.00164	0.00028	0.00005	0.017	0.000009	0.0006	2.85	0.0127	0.002	0.02	0.00014	0.00225	--	0.85	0.00168	0.00032	0.3	0.000005	0.21	0.00811	0.00002	0.000002	0.000005	0.00001	0.0005	0.00014	0.000013	0.0009	0.0001	0.0001
29-Jun-10	25	--	--	--	0.01	--	--	2.97	--	--	--	--	--	--	0.9	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
6-Jul-10	26	--	--	--	0.01	--	--	2.65	--	--	--	--	--	--	0.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
13-Jul-10	27	--	--	--	0.01	--	--	2.57	--	--	--	--	--	--	0.5	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
20-Jul-10	28	0.00116	0.0005	0.00005	0.013	0.000023	0.0006	2.34	0.00705	0.008	0.02	0.00011	0.00143	--	0.65	0.00142	0.00027	0.3	0.000005	0.16	0.00703	0.00002	0.000002	0.000005	0.00001	0.0005	0.00012	0.000007	0.0008	0.0001	0.0001
27-Jul-10	29	--	--	--	0.01	--	--	2.41	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
3-Aug-10	30	--	--	--	0.01	--	--	2.75	--	--	--	--	--	--	0.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
10-Aug-10	31	--	--	--	0.01	--	--	2.24	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
17-Aug-10	32	0.00126	0.0009	0.00005	0.011	0.000039	0.0005	2.53	0.0082	0.002	0.02	0.00009	0.0015	--	0.57	0.00127	0.00022	0.3	0.000005	0.13	0.00697	0.00002	0.000002	0.000005	0.00001	0.0005	0.00012	0.000006	0.0006	0.0002	0.0001
24-Aug-10	33	--	--	--	0.01	--	--	2.59	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
31-Aug-10	34	--	--	--	0.01	--	--	2.36	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
7-Sep-10	35	--	--	--	0.01	--	--	2.4	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
14-Sep-10	36	0.00219	0.00057	0.00005	0.018	0.00012	0.0005	2.5	0.00964	0.002	0.02	0.00011	0.00258	--	0.41	0.00102	0.00024	0.3	0.000005	0.09	0.00848	0.00002	0.000002	0.000005	0.00001	0.0005	0.0001	0.000007	0.0004	0.0009	0.0001
21-Sep-10	37	--	--	--	0.01	--	--	2.28	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
28-Sep-10	38	--	--	--	0.02	--	--	2.43	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
5-Oct-10	39	--	--	--	0.01	--	--	2.24	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
12-Oct-10	40	0.000963	0.00019	0.00005	0.008	0.000092	0.0005	2.56	0.0126	0.009	0.005	0.00014	0.00134	--	0.44	0.00104	0.00024	0.3	0.000005	0.1	0.00574	0.00002	0.000015	0.000005	0.00002	0.0005	0.00008	0.000005	0.0006	0.0004	0.0001
19-Oct-10	41	--	--	--	0.01	--	--	2.43	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
26-Oct-10	42	--	--	--	0.01	--	--	2.28	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
2-Nov-10	43	--	--	--	0.01	--	--	2.44	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
9-Nov-10	44	--	--	--	0.01	--	--	2.4	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
16-Nov-10	45	--	--	--	0.01	--	--	3.22	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
23-Nov-10	46	--	--	--	0.01	--	--	2.29	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
30-Nov-10	47	--	--	--	0.01	--	--	2.44	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
7-Dec-10	48	0.00135	0.00043	0.00005	0.005	0.000026	0.0005	2.71	0.0069	0.002	0.002	0.00013	0.00223	--	0.34	0.0009	0.00023	0.3	0.000005	0.13	0.00724	0.00002	0.000002	0.000005	0.00001	0.0005	0.00011	0.000008	0.0006	0.0001	0.0001
14-Dec-10	49	--	--	--	0.01	--	--	2.61	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
21-Dec-10	50	--	--	--	0.01	--	--	2.37	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
28-Dec-10	51	--	--	--	0.01	--	--	2.49	--</																						

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Sample Weight = 1 kg		Co	Cu	La	Fe	Pb	Li	Mg	Mn	P	Hg	Mo	Ni	Re	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr	
Date	Accum. Weeks	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	(CVAF) µg/L	mg/l	mg/l	mg/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
		0.0001	0.0001	0.0001	0.01	0.00005	0.0001	0.005	0.0001	0.015	0.02	0.0001	0.0002	0.0001	0.01	0.0001	0.0002	0.05	0.00004	0.005	0.0001	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0001	0.001	0.0001	
5-Jan-10	0	0.0091	0.001	0.0001	0.01	0.00028	0.0086	12.9	0.059	0.015	0.02	0.0055	0.024	0.0001	13.8	0.0055	0.0075	0.34	0.00004	107	0.109	0.0002	0.00005	0.00005	0.0001	0.0002	0.001	0.00028	0.0001	0.001	0.0002	
12-Jan-10	1	0.018	0.0025	0.0001	0.02	0.0001	0.016	31.7	0.147	0.015	0.02	0.0081	0.04	0.0001	18.5	0.0081	0.012	0.51	0.00004	161	0.293	0.0002	0.00005	0.00005	0.0001	0.0005	0.0011	0.0014	0.0001	0.001	0.0001	
19-Jan-10	2	0.0055	0.0005	0.0001	0.01	0.00005	0.0095	16.2	0.054	0.02	0.02	0.0062	0.01	0.0001	11.1	0.005	0.0067	0.29	0.00004	83.3	0.158	0.0002	0.00003	0.00005	0.0001	0.0003	0.0006	0.00054	0.0001	0.001	0.0001	
26-Jan-10	3	--	--	--	0.01	--	--	13.2	--	--	--	--	--	--	10.8	--	--	--	--	53.5	--	--	--	--	--	--	--	--	--	--	--	--
2-Feb-10	4	0.0017	0.0003	0.0001	0.01	0.00005	0.0046	8.49	0.019	0.015	0.02	0.0051	0.0033	0.0001	8.37	0.0033	0.0028	0.24	0.00004	36.5	0.065	0.0002	0.00002	0.00005	0.0001	0.0002	0.0004	0.00022	0.0001	0.001	0.0001	
9-Feb-10	5	--	--	--	0.01	--	--	8.72	--	--	--	--	--	--	8.9	--	--	--	--	27.6	--	--	--	--	--	--	--	--	--	--	--	--
16-Feb-10	6	--	--	--	0.04	--	--	12	--	--	--	--	--	--	10.2	--	--	--	--	30.8	--	--	--	--	--	--	--	--	--	--	--	--
23-Feb-10	7	--	--	--	0.01	--	--	7.91	--	--	--	--	--	--	10.6	--	--	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--
2-Mar-10	8	0.0007	0.0002	0.0001	0.01	0.00005	0.0021	3.14	0.0069	0.015	0.02	0.0056	0.0015	0.0001	5.24	0.0026	0.001	0.23	0.00004	6.01	0.022	0.0002	0.00002	0.00005	0.0001	0.0002	0.0003	0.00013	0.0001	0.001	0.0001	
9-Mar-10	9	--	--	--	0.01	--	--	3.53	0.007	--	--	--	--	--	4.5	--	--	--	--	5.3	--	--	--	--	--	--	--	--	--	--	--	--
16-Mar-10	10	--	--	--	0.01	--	--	3.51	--	--	--	--	--	--	4.3	--	--	--	--	4.3	--	--	--	--	--	--	--	--	--	--	--	--
23-Mar-10	11	--	--	--	0.01	--	--	3.65	--	--	--	--	--	--	4.1	--	--	--	--	3.7	--	--	--	--	--	--	--	--	--	--	--	--
30-Mar-10	12	0.0005	0.0004	0.0001	0.01	0.00005	0.0019	3.77	0.004	0.015	0.02	0.0065	0.0011	0.0001	4.95	0.0024	0.001	0.17	0.00004	3.69	0.018	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.0001	0.0001	0.001	0.0001	
6-Apr-10	13	--	--	--	0.01	--	--	3.34	--	--	--	--	--	--	3.9	--	--	--	--	2.2	--	--	--	--	--	--	--	--	--	--	--	--
13-Apr-10	14	--	--	--	0.01	--	--	3.67	--	--	--	--	--	--	3.8	--	--	--	--	2.1	--	--	--	--	--	--	--	--	--	--	--	--
20-Apr-10	15	--	--	--	0.01	--	--	4.67	--	--	--	--	--	--	5.5	--	--	--	--	2.8	--	--	--	--	--	--	--	--	--	--	--	--
27-Apr-10	16	0.000387	0.00062	0.00005	0.004	0.000017	0.0014	3.25	0.0033	0.003	0.02	0.00713	0.00097	--	3.7	0.00233	0.0007	0.2	0.000005	1.67	0.0152	0.00002	0.000009	0.000005	0.00001	0.0005	0.00013	0.000093	0.0002	0.0003	0.0001	
4-May-10	17	--	--	--	0.01	--	--	3.18	--	--	--	--	--	--	3.1	--	--	--	--	1.3	--	--	--	--	--	--	--	--	--	--	--	--
11-May-10	18	--	--	--	0.01	--	--	3.35	--	--	--	--	--	--	3.3	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--	--	--	--
18-May-10	19	--	--	--	0.01	--	--	3.49	--	--	--	--	--	--	3.4	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--
25-May-10	20	0.000315	0.0004	0.00005	0.004	0.000018	0.0011	3.39	0.00382	0.002	0.02	0.00627	0.00081	--	3.06	0.00199	0.00066	0.2	0.000005	0.93	0.0155	0.00002	0.000009	0.000005	0.00013	0.0005	0.00009	0.000051	0.0002	0.0003	0.0001	
1-Jun-10	21	--	--	--	0.01	--	--	3.44	--	--	--	--	--	--	3.3	--	--	--	--	0.8	--	--	--	--	--	--	--	--	--	--	--	--
8-Jun-10	22	--	--	--	0.01	--	--	3.26	--	--	--	--	--	--	2.7	--	--	--	--	0.7	--	--	--	--	--	--	--	--	--	--	--	--
15-Jun-10	23	--	--	--	0.01	--	--	3.4	--	--	--	--	--	--	3	--	--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--	--
22-Jun-10	24	0.000334	0.00076	0.00005	0.004	0.000044	0.001	3.75	0.0036	0.002	0.02	0.00514	0.00079	--	2.91	0.00211	0.00063	0.2	0.000005	0.6	0.0145	0.00002	0.000008	0.000005	0.00002	0.0005	0.00006	0.000082	0.0002	0.0002	0.0001	
29-Jun-10	25	--	--	--	0.01	--	--	4.02	--	--	--	--	--	--	3.1	--	--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--	--
6-Jul-10	26	--	--	--	0.01	--	--	3.58	--	--	--	--	--	--	2.5	--	--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--	--
13-Jul-10	27	--	--	--	0.01	--	--	3.4	--	--	--	--	--	--	2.7	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
20-Jul-10	28	0.000294	0.00045	0.00005	0.004	0.000047	0.001	3.17	0.00304	0.007	0.02	0.00578	0.00058	--	2.51	0.002	0.00053	0.2	0.000005	0.42	0.0126	0.00002	0.000008	0.000005	0.00001	0.0005	0.00006	0.000072	0.0002	0.0004	0.0001	
27-Jul-10	29	--	--	--	0.01	--	--	3.11	--	--	--	--	--	--	2.1	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
3-Aug-10	30	--	--	--	0.01	--	--	3.84	--	--	--	--	--	--	2.8	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
10-Aug-10	31	--	--	--	0.01	--	--	3.31	--	--	--	--	--	--	2.1	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
17-Aug-10	32	0.000243	0.00072	0.00005	0.002	0.000045	0.0007	3.7	0.00289	0.002	0.02	0.00622	0.00055	--	2.44	0.00157	0.00051	0.2	0.000005	0.36	0.0125	0.00002	0.000008	0.000005	0.00001	0.0005	0.00007	0.000072	0.0002	0.0003	0.0001	
24-Aug-10	33	--	--	--	0.01	--	--	3.57	--	--	--	--	--	--	2.3	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
31-Aug-10	34	--	--	--	0.01	--	--	3.35	--	--	--	--	--	--	2.1	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
7-Sep-10	35	--	--	--	0.01	--	--	3.38	--	--	--	--	--	--	2	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
14-Sep-10	36	0.000277	0.0003	0.00005	0.007	0.000055	0.0007	2.98	0.00281	0.002	0.02	0.00475	0.0006	--	2.06	0.00161	0.00046	0.2	0.000005	0.24	0.0122	0.00002	0.00001	0.000005	0.00001	0.0005	0.00005	0.000071	0.0002	0.0003	0.0001	
21-Sep-10	37	--	--	--	0.01	--	--	3.38	--	--	--	--	--	--	1.8	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
28-Sep-10	38	--	--	--	0.01	--	--	3.23	--	--	--	--	--	--	1.7	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
5-Oct-10	39	--	--	--	0.01	--	--	3.17	--	--	--	--	--	--	1.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
12-Oct-10	40	0.000334	0.00036	0.00005	0.003	0.000155	0.0006	3.43	0.00359	0.008	0.006	0.00474	0.00068	--	2.02	0.00159	0.00045	0.2	0.000005	0.23	0.0118	0.00002	0.000019	0.000005	0.00004	0.0005	0.00004	0.00006	0.0002	0.0009	0.0001	
19-Oct-10	41	--	--	--	0.01	--	--	3.33	--	--	--	--	--	--	2	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
26-Oct-10	42	--	--	--	0.01	--	--	3.36	--	--	--	--	--	--	1.8	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
2-Nov-10	43	--	--	--	0.01	--	--	3.41	--	--	--	--	--	--	1.7	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
9-Nov-10	44	--	--	--	0.01	--	--	3.59	--	--	--	--	--	--	1.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
16-Nov-10	45	--	--	--	0.01	--	--	5.38	--	--	--	--	--	--	2.5	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
23-Nov-10	46	--	--	--	0.01	--	--	3	--	--	--	--	--	--	1.2	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
30-Nov-10	47	--	--	--	0.01	--	--	3.05	--	--	--	--	--	--	1.5	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
7-Dec-10	48	0.000249	0.00053	0.00005	0.003	0.000016	0.0007	3.4	0.0031	0.003	0.002	0.00369	0.00068	--	1.73	0.0015	0.00034	0.2	0.000005	0.18	0.0137	0.00002	0.000007	0.000005	0.00001	0.0006	0.00003	0.				

HC-35		Dissolved Metals by ICP-MS (Cantest)																											
Sample Weight = 1 kg		Volume (ml)		pH (pH Units)	EC (µS/cm)	ORP (mV)	SO4 (mg/l)	Acidity (mg CaCO3/l)		Total Alkalinity (mg CaCO3/l) to pH 4.5	Fluoride (mg/l)	Chloride (mg/l)	Nitrate-N (mg/l)	Nitrite-N (mg/l)	Total Ammonia (mgN/l)	Diss.-P (mgP/l)	TDS (mg/l)	Hardness CaCO3 (mg/l)	Al (mg/l)	Sb (mg/l)	As (mg/l)	Ba (mg/l)	Be (mg/l)	Bi mg/l	B mg/l	Cs mg/l	Cd mg/l	Ca mg/l	Cr mg/l
Date	Accum. Weeks	Input	Output					to pH 4.5	to pH 8.3																				
5-Jan-10	0	750	580	9.1	109	125	1	1	1	29	0.05	12	0.05	0.002	0.03	0.02	49	11.14876	0.22	0.0097	0.032	0.001	0.0001	0.0001	0.058	0.0004	0.00001	2.8	0.0002
12-Jan-10	1	500	445	8.78	171	125	9	--	--	40	0.14	16.7	0.05	0.003	0.04	0.15	10	16.91633	0.14	0.031	0.483	0.0022	0.0001	0.0001	0.11	0.0007	0.00001	3.89	0.0002
19-Jan-10	2	500	435	8.79	145	115	17	--	--	36	0.05	8.92	0.05	0.007	0.09	0.15	98	17.92036	0.15	0.022	0.589	0.002	0.0001	0.0001	0.084	0.0007	0.00001	3.88	0.0002
26-Jan-10	3	500	440	8.93	116	120	14	--	--	30	--	--	--	--	--	--	--	--	0.17	--	--	--	--	--	--	--	--	4.55	--
2-Feb-10	4	500	435	8.94	75	135	12	--	--	23	0.05	1.28	0.05	0.002	0.14	0.06	21	17.76917	0.14	0.011	0.318	0.0017	0.0001	0.0001	0.057	0.0007	0.00001	3.77	0.0002
9-Feb-10	5	500	445	9.01	76	145	10	--	--	24	--	--	--	--	--	--	--	--	0.18	--	--	--	--	--	--	--	--	4.95	--
16-Feb-10	6	500	410	9.3	83	125	11	--	--	26	--	--	--	--	--	--	--	--	0.15	--	--	--	--	--	--	--	--	3.9	--
23-Feb-10	7	500	415	9.11	75	150	7	--	--	30	--	--	--	--	--	--	--	--	0.2	--	--	--	--	--	--	--	--	5.09	--
2-Mar-10	8	500	435	8.82	56	130	5	--	--	22	0.05	0.2	0.05	0.004	0.22	0.02	10	18.13631	0.1	0.0078	0.246	0.0014	0.0001	0.0001	0.038	0.0006	0.00001	3.95	0.0002
9-Mar-10	9	500	440	8.89	57	145	4	--	--	23	--	--	--	--	--	--	--	--	0.13	--	--	--	--	--	--	--	--	4.33	--
16-Mar-10	10	500	435	8.81	54	160	5	--	--	22	--	--	--	--	--	--	--	--	0.12	--	--	--	--	--	--	--	--	4.26	--
23-Mar-10	11	500	445	8.81	56	175	4	--	--	24	--	--	--	--	--	--	--	--	0.13	--	--	--	--	--	--	--	--	4.78	--
30-Mar-10	12	500	430	8.75	55	160	3	--	--	23	0.05	0.2	0.05	0.002	0.27	0.1	50	19.97039	0.09	0.0047	0.18	0.0014	0.0001	0.0001	0.031	0.0007	0.00001	4.19	0.0002
6-Apr-10	13	500	450	8.64	53	185	3	--	--	24	--	--	--	--	--	--	--	--	0.1	--	--	--	--	--	--	--	--	4.54	--
13-Apr-10	14	500	435	8.77	48	140	3	--	--	22	--	--	--	--	--	--	--	--	0.11	--	--	--	--	--	--	--	--	4.32	--
20-Apr-10	15	500	425	8.89	58	135	4	--	--	25	--	--	--	--	--	--	--	--	0.13	--	--	--	--	--	--	--	--	3.73	--
27-Apr-10	16	500	435	8.68	41	150	2	--	--	19	0.03	0.5	0.02	0.005	0.19	0.022	40	16.28193	0.103	0.00357	0.116	0.00127	0.00001	0.000005	0.05	0.00062	0.000005	3.57	0.0001
4-May-10	17	500	425	8.67	40	155	2	--	--	19	--	--	--	--	--	--	--	--	0.1	--	--	--	--	--	--	--	--	3.51	--
11-May-10	18	500	430	8.65	55	130	2	--	--	24	--	--	--	--	--	--	--	--	0.12	--	--	--	--	--	--	--	--	4.82	--
18-May-10	19	500	435	8.57	43	160	2	--	--	20	--	--	--	--	--	--	--	--	0.09	--	--	--	--	--	--	--	--	3.88	--
25-May-10	20	500	430	8.58	51	160	2	--	--	22	0.02	0.5	0.02	0.005	0.33	0.031	36	19.68227	0.105	0.00283	0.11	0.00135	0.00001	0.000005	0.05	0.0007	0.000005	4.19	0.0001
1-Jun-10	21	500	465	8.45	52	155	2	--	--	25	--	--	--	--	--	--	--	--	0.09	--	--	--	--	--	--	--	--	5.57	--
8-Jun-10	22	500	435	8.6	40	170	2	--	--	19	--	--	--	--	--	--	--	--	0.08	--	--	--	--	--	--	--	--	3.78	--
15-Jun-10	23	500	440	8.72	41	155	3	--	--	19	--	--	--	--	--	--	--	--	0.12	--	--	--	--	--	--	--	--	4.15	--
22-Jun-10	24	500	430	8.68	40	130	2	--	--	19	0.01	0.5	0.02	0.005	0.28	0.014	20	17.71786	0.086	0.0022	0.075	0.00113	0.00001	0.000005	0.05	0.00065	0.000005	3.7	0.0001
29-Jun-10	25	500	425	8.85	47	150	4	--	--	21	--	--	--	--	--	--	--	--	0.09	--	--	--	--	--	--	--	--	4.68	--
6-Jul-10	26	500	430	8.83	40	150	2	--	--	19	--	--	--	--	--	--	--	--	0.08	--	--	--	--	--	--	--	--	3.93	--
13-Jul-10	27	500	420	8.89	33	145	2	--	--	19	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	--	4.16	--
20-Jul-10	28	500	450	8.4	49	165	3	--	--	20	0.01	0.5	0.02	0.189	0.32	0.028	28	23.06916	0.064	0.00214	0.0641	0.00111	0.00001	0.000005	0.05	0.00073	0.000005	4.92	0.0001
27-Jul-10	29	500	440	8.6	51	145	3	--	--	20	--	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--	--	--	4.99	--
3-Aug-10	30	500	440	8.71	50	150	4	--	--	18	--	--	--	--	--	--	--	--	0.08	--	--	--	--	--	--	--	--	5.98	--
10-Aug-10	31	500	425	8.65	65	165	6	--	--	22	--	--	--	--	--	--	--	--	0.08	--	--	--	--	--	--	--	--	6.81	--
17-Aug-10	32	500	440	8.36	53	165	4	--	--	18	0.01	0.5	0.05	1.09	0.12	0.021	28	25.99233	0.0661	0.00166	0.0454	0.00095	0.00001	0.000005	0.05	0.00031			

HC-35

Sample Weight = 1 kg		Co	Cu	La	Fe	Pb	Li	Mg	Mn	P	Hg	Mo	Ni	Re	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr	
Date	Accum. Weeks	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	(CVAF) µg/L	mg/l	mg/l	mg/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
		0.0001	0.0001	0.0001	0.01	0.00005	0.0001	0.005	0.0001	0.015	0.02	0.0001	0.0002	0.0001	0.01	0.0001	0.0002	0.05	0.00004	0.005	0.0001	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0001	0.001	0.0001	
5-Jan-10	0	0.0001	0.0005	0.0001	0.03	0.00005	0.0019	1.01	0.0035	0.015	0.02	0.0044	0.0005	0.0001	3.49	0.003	0.0003	0.57	0.00004	17	0.021	0.0002	0.00002	0.00005	0.0001	0.0002	0.0009	0.00013	0.0004	0.001	0.0001	
12-Jan-10	1	0.0006	0.0006	0.0001	0.02	0.00007	0.003	1.75	0.0053	0.015	0.02	0.017	0.0026	0.0001	5.62	0.0049	0.0011	0.73	0.00004	24.1	0.046	0.0002	0.00002	0.00005	0.0001	0.0003	0.0023	0.004	0.001	0.001	0.0001	
19-Jan-10	2	0.0006	0.0003	0.0001	0.03	0.00006	0.0025	2	0.0045	0.015	0.02	0.013	0.0018	0.0001	5.15	0.0046	0.001	0.7	0.00004	16.8	0.045	0.0002	0.00002	0.00005	0.0001	0.0002	0.0021	0.0039	0.001	0.001	0.0001	
26-Jan-10	3	--	--	--	0.06	--	--	2.63	--	--	--	--	--	--	5.6	--	--	--	--	12	--	--	--	--	--	--	--	--	--	--	--	--
2-Feb-10	4	0.0005	0.0002	0.0001	0.02	0.00006	0.0015	2.03	0.0058	0.015	0.02	0.0056	0.001	0.0001	3.99	0.0035	0.0005	0.61	0.00004	6.1	0.032	0.0002	0.00002	0.00005	0.0001	0.0002	0.0011	0.002	0.0006	0.001	0.0001	
9-Feb-10	5	--	--	--	0.25	--	--	2.53	--	--	--	--	--	--	3.4	--	--	--	--	3.8	--	--	--	--	--	--	--	--	--	--	--	--
16-Feb-10	6	--	--	--	0.01	--	--	3.12	--	--	--	--	--	--	4.7	--	--	--	--	4.7	--	--	--	--	--	--	--	--	--	--	--	--
23-Feb-10	7	--	--	--	0.01	--	--	2.81	--	--	--	--	--	--	3.7	--	--	--	--	2.4	--	--	--	--	--	--	--	--	--	--	--	--
2-Mar-10	8	0.0006	0.0002	0.0001	0.02	0.00006	0.001	2.01	0.0045	0.015	0.02	0.0031	0.0009	0.0001	2.6	0.0032	0.0002	0.57	0.00004	1.1	0.034	0.0002	0.00002	0.00005	0.0001	0.0002	0.0005	0.0013	0.0004	0.001	0.0001	
9-Mar-10	9	--	--	--	0.01	--	--	2.46	0.006	--	--	--	--	--	2.2	--	--	--	--	1.1	--	--	--	--	--	--	--	--	--	--	--	--
16-Mar-10	10	--	--	--	0.01	--	--	2.56	--	--	--	--	--	--	1.9	--	--	--	--	0.9	--	--	--	--	--	--	--	--	--	--	--	--
23-Mar-10	11	--	--	--	0.01	--	--	2.61	--	--	--	--	--	--	2	--	--	--	--	0.8	--	--	--	--	--	--	--	--	--	--	--	--
30-Mar-10	12	0.0005	0.0004	0.0001	0.01	0.00005	0.0011	2.31	0.0047	0.015	0.02	0.0031	0.0007	0.0001	2.02	0.0028	0.0002	0.48	0.00004	0.72	0.027	0.0002	0.00002	0.00005	0.0001	0.0002	0.0003	0.0012	0.0004	0.001	0.0001	
6-Apr-10	13	--	--	--	0.01	--	--	2.32	--	--	--	--	--	--	1.3	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
13-Apr-10	14	--	--	--	0.02	--	--	2.28	--	--	--	--	--	--	1.5	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
20-Apr-10	15	--	--	--	0.01	--	--	3.21	--	--	--	--	--	--	2	--	--	--	--	0.7	--	--	--	--	--	--	--	--	--	--	--	--
27-Apr-10	16	0.000498	0.00048	0.00005	0.013	0.000049	0.0008	1.79	0.0051	0.002	0.02	0.00239	0.00065	--	1.27	0.00233	0.0001	0.5	0.000005	0.39	0.0217	0.00002	0.000003	0.000005	0.00001	0.0005	0.00016	0.000892	0.0003	0.0002	0.0001	
4-May-10	17	--	--	--	0.01	--	--	1.9	--	--	--	--	--	--	1	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
11-May-10	18	--	--	--	0.01	--	--	2.73	--	--	--	--	--	--	1.6	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
18-May-10	19	--	--	--	0.01	--	--	2	--	--	--	--	--	--	1.1	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
25-May-10	20	0.000398	0.00024	0.00005	0.007	0.000058	0.0007	2.24	0.00682	0.002	0.02	0.00249	0.00047	--	1.2	0.00248	0.00012	0.6	0.000005	0.33	0.0237	0.00002	0.000003	0.000005	0.00001	0.0005	0.0001	0.00083	0.0002	0.0001	0.0001	
1-Jun-10	21	--	--	--	0.01	--	--	2.61	--	--	--	--	--	--	1.2	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
8-Jun-10	22	--	--	--	0.01	--	--	1.8	--	--	--	--	--	--	0.7	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
15-Jun-10	23	--	--	--	0.01	--	--	1.99	--	--	--	--	--	--	0.9	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
22-Jun-10	24	0.00049	0.0004	0.00005	0.01	0.000053	0.0006	2.06	0.00634	0.002	0.02	0.00315	0.00061	--	0.9	0.00189	0.0001	0.5	0.000005	0.27	0.0212	0.00002	0.000002	0.000005	0.00002	0.0005	0.00009	0.00064	0.0002	0.0003	0.0001	
29-Jun-10	25	--	--	--	0.01	--	--	2.44	--	--	--	--	--	--	1	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
6-Jul-10	26	--	--	--	0.01	--	--	2.05	--	--	--	--	--	--	0.6	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
13-Jul-10	27	--	--	--	0.01	--	--	2.29	--	--	--	--	--	--	0.8	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
20-Jul-10	28	0.000528	0.00051	0.00005	0.005	0.000052	0.0008	2.62	0.00771	0.008	0.02	0.00458	0.00051	--	0.9	0.00216	0.00011	0.5	0.000005	0.27	0.0257	0.00002	0.000002	0.000005	0.00001	0.0005	0.00007	0.000666	0.0002	0.0002	0.0001	
27-Jul-10	29	--	--	--	0.01	--	--	2.47	--	--	--	--	--	--	0.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
3-Aug-10	30	--	--	--	0.01	--	--	3.03	--	--	--	--	--	--	0.6	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
10-Aug-10	31	--	--	--	0.01	--	--	3.58	--	--	--	--	--	--	0.5	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
17-Aug-10	32	0.000543	0.00059	0.00005	0.006	0.00006	0.0005	3.13	0.00697	0.002	0.02	0.00456	0.00046	--	0.58	0.001	0.00007	0.5	0.000005	0.21	0.0231	0.00002	0.000002	0.000005	0.00001	0.0005	0.00005	0.000426	0.0002	0.0002	0.0001	
24-Aug-10	33	--	--	--	0.01	--	--	3.35	--	--	--	--	--	--	0.5	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
31-Aug-10	34	--	--	--	0.01	--	--	2.92	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
7-Sep-10	35	--	--	--	0.01	--	--	4.24	--	--	--	--	--	--	0.5	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
14-Sep-10	36	0.00056	0.00114	0.00005	0.014	0.000158	0.0006	3.07	0.00619	0.002	0.02	0.0076	0.0005	--	0.47	0.00079	0.00007	0.5	0.000005	0.17	0.0252	0.00002	0.000002	0.000005	0.00001	0.0005	0.00004	0.000592	0.0002	0.0002	0.0001	
21-Sep-10	37	--	--	--	0.01	--	--	3.44	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
28-Sep-10	38	--	--	--	0.01	--	--	3.56	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
5-Oct-10	39	--	--	--	0.01	--	--	3.56	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
12-Oct-10	40	0.00059	0.00026	0.00005	0.002	0.000092	0.0005	3.71	0.00725	0.008	0.005	0.0111	0.00057	--	0.47	0.00077	0.00007	0.5	0.000005	0.18	0.0291	0.00002	0.000004	0.000005	0.00004	0.0005	0.00002	0.000547	0.0002	0.0008	0.0001	
19-Oct-10	41	--	--	--	0.01	--	--	3.38	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
26-Oct-10	42	--	--	--	0.01	--	--	3.6	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
2-Nov-10	43	--	--	--	0.01	--	--	3.56	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
9-Nov-10	44	--	--	--	0.01	--	--	3.37	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
16-Nov-10	45	--	--	--	0.01	--	--	4.59	--	--	--	--	--	--	0.6	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
23-Nov-10	46	--	--	--	0.01	--	--	3.01	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
30-Nov-10	47	--	--	--	0.01	--	--	2.64	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
7-Dec-10	48	0.000398	0.00024	0.00005	0.002	0.000025	0.0005	2.88	0.00358	0.004	0.002	0.00524	0.00049	--	0.36	0.00049	0.00006	0.4	0.000005	0.15	0.0233	0.00002	0.000002	0.000005	0.00001	0.0005	0.00003	0.000253				

HC-35

Dissolved Metals by ICP-MS (Cantest)

Sample Weight = 1 kg

Date		Volume (ml)		pH (pH Units)	EC (µS/cm)	ORP (mV)	SO4 (mg/l)	Acidity (mg CaCO3/l)		Total Alkalinity (mg CaCO3/l) to pH 4.5	Fluoride (mg/l)	Chloride (mg/l)	Nitrate-N (mg/l)	Nitrite-N (mg/l)	Total Ammonia (mgN/l)	Diss.-P (mgP/l)	TDS (mg/l)	Hardness CaCO3 (mg/l)	Al (mg/l)	Sb (mg/l)	As (mg/l)	Ba (mg/l)	Be (mg/l)	Bi mg/l	B mg/l	Cs mg/l	Cd mg/l	Ca mg/l	Cr mg/l
		Input	Output					to pH 4.5	to pH 8.3																				
		5	5					1	1																				
10-May-11	70	500	455	8	70	130	2.6	--	1	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.26	--
17-May-11	71	500	435	8.14	81	180	6.1	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.23	--
24-May-11	72	500	470	8.16	75	140	2.6	--	1	20	0.01	7.6	0.039	0.251	0.14	0.01	38	32.8	0.0317	0.00061	0.00896	0.00083	0.00001	0.000005	0.05	0.00019	0.000005	7.41	0.0001
31-May-11	73	500	440	8.05	68	175	2.6	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.59	--
7-Jun-11	74	500	445	7.87	65	170	2.8	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.56	--
14-Jun-11	75	500	450	7.83	70	170	2.4	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.08	--
21-Jun-11	76	500	445	7.89	81	150	2.3	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.13	--
28-Jun-11	77	500	445	7.65	91	155	3.6	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.44	--
5-Jul-11	78	500	480	7.72	71	160	2	--	1	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.61	--
12-Jul-11	79	500	435	7.79	86	200	1.8	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.71	--
19-Jul-11	80	500	450	7.68	99	185	2.5	--	1	18	0.01	16	0.046	0.244	0.081	0.006	50	41.7	0.0249	0.00047	0.00657	0.00097	0.00001	0.000005	0.05	0.00024	0.000005	10	0.0001
26-Jul-11	81	500	445	7.68	109	185	2.5	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11	--
2-Aug-11	82	500	440	7.71	124	170	3.3	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12.8	--
9-Aug-11	83	500	425	8.06	109	175	2.4	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.6	--
16-Aug-11	84	500	475	7.72	89	170	2.6	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.45	--
23-Aug-11	85	500	465	8.09	89	165	2.7	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.32	--
30-Aug-11	86	500	465	7.83	90	180	1.7	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.86	--
6-Sep-11	87	500	445	7.78	82	160	2.8	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.37	--
13-Sep-11	88	500	435	7.49	109	170	2.5	--	1	17	0.01	20	0.075	0.255	0.16	0.005	64	43.8	0.0265	0.00045	0.00657	0.00139	0.00001	0.000005	0.05	0.00027	0.000008	10.3	0.0001
20-Sep-11	89	500	450	7.73	83	170	2.2	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.69	--
27-Sep-11	90	500	420	7.99	89	140	2	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.37	--
4-Oct-11	91	500	435	8.05	99	125	2.2	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.7	--
11-Oct-11	92	500	440	8	106	190	0.8	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.64	--
18-Oct-11	93	500	440	7.7	101	170	1.4	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.13	--
25-Oct-11	94	500	440	7.91	123	180	1.2	--	1	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.96	--
1-Nov-11	95	500	445	7.9	86	200	2.7	--	1	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.22	--
8-Nov-11	96	500	485	7.84	72	190	1.8	--	1	25	0.01	3.2	0.108	0.27	0.17	0.005	44	30.9	0.0199	0.0005	0.00803	0.00067	0.00001	0.000005	0.05	0.0002	0.000006	7.75	0.0001
15-Nov-11	97	500	490	7.83	82	230	2.42	--	1	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.9	--
22-Nov-11	98	500	450	8.19	96	270	2.24	--	1	31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11	--
29-Nov-11	99	500	450	7.83	34	235	2	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.02	--
6-Dec-11	100	500	465	7.7	71	230	1.88	--	1	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.55	--
13-Dec-11	101	500	445	7.59	82	225	2.34	--	1	26	--	--	--	--	--	--	--	--	0.12	--	--	--	--	--	--	--	--	8.72	--
20-Dec-11	102	500	465	7.68	73	245	1.65	--	1	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.52	--
27-Dec-11	103	500	460	7.53	73	240	5.68	--	1	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.82	--
3-Jan-12	104	500	455	7.39	60	135	0.58	--	1	21	0.01	3.2	0.062	0.116	0.13	0.0104	38	26.3	0.0256	0.00044	0.00787	0.00056	0.00001	0.000005	0.05	0.00023	0.000005	6.08	0.0001
10-Jan-12	105	500	430	7.72	60	120	1.94	--	1	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.88	--
17-Jan-12	106	500	450	7.8	58	110	1.96	--	1	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.61	--
24-Jan-12	107	500	440	7.82	53	120	1.99	--	1	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.34	--
31-Jan-12	108	500	450	7.93	64	115	2.45	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.92	--
Terminated																													

HC-35

Sample Weight = 1 kg

Sample Weight = 1 kg		Co	Cu	La	Fe	Pb	Li	Mg	Mn	P	Hg (CVAF)	Mo	Ni	Re	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr	
Date	Accum. Weeks	mg/l 0.0001	mg/l 0.0001	mg/l 0.0001	mg/l 0.01	mg/l 0.00005	mg/l 0.0001	mg/l 0.005	mg/l 0.0001	mg/L 0.015	µg/L 0.02	mg/l 0.0001	mg/l 0.0002	mg/L 0.0001	mg/l 0.01	mg/l 0.0001	mg/l 0.0002	mg/l 0.05	mg/l 0.00004	mg/l 0.005	mg/l 0.0001	mg/l 0.0002	mg/l 0.00002	mg/l 0.00005	mg/l 0.0001	mg/l 0.0002	mg/l 0.0001	mg/l 0.00005	mg/l 0.0001	mg/l 0.001	mg/l 0.0001	
10-May-11	70	--	--	--	0.01	--	--	3.02	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
17-May-11	71	--	--	--	0.01	--	--	3.87	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
24-May-11	72	0.000383	0.00147	0.00005	0.008	0.000194	0.0005	3.46	0.00445	0.01	0.002	0.00273	0.00064	--	0.27	0.00055	0.00005	0.3	0.000005	0.12	0.0256	0.00002	0.000003	0.000005	0.00004	0.0005	0.00001	0.000109	0.0002	0.0004	0.0001	
31-May-11	73	--	--	--	0.01	--	--	3.25	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
7-Jun-11	74	--	--	--	0.01	--	--	3.16	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
14-Jun-11	75	--	--	--	0.01	--	--	3.56	--	--	--	--	--	--	1.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
21-Jun-11	76	--	--	--	0.01	--	--	3.84	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
28-Jun-11	77	--	--	--	0.01	--	--	4.19	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
5-Jul-11	78	--	--	--	0.01	--	--	3.26	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
12-Jul-11	79	--	--	--	0.01	--	--	3.72	--	--	--	--	--	--	0.4	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
19-Jul-11	80	0.000456	0.00034	0.00005	0.001	0.00002	0.0005	4.05	0.00416	0.005	0.002	0.00267	0.00072	--	0.26	0.00055	0.00006	0.3	0.000005	0.13	0.0319	0.00002	0.000002	0.000005	0.00002	0.0005	0.00001	0.000088	0.0002	0.0008	0.0001	
26-Jul-11	81	--	--	--	0.01	--	--	4.92	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
2-Aug-11	82	--	--	--	0.01	--	--	5.29	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
9-Aug-11	83	--	--	--	0.01	--	--	4.69	--	--	--	--	--	--	0.4	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
16-Aug-11	84	--	--	--	0.01	--	--	3.7	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
23-Aug-11	85	--	--	--	0.01	--	--	4.18	--	--	--	--	--	--	0.3	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
30-Aug-11	86	--	--	--	0.01	--	--	4.06	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
6-Sep-11	87	--	--	--	0.01	--	--	4.01	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
13-Sep-11	88	0.000398	0.00018	0.00005	0.006	0.000098	0.0005	4.39	0.00327	0.006	0.002	0.00242	0.00101	--	0.26	0.00074	0.00004	0.3	0.000005	0.12	0.0331	0.00002	0.000002	0.000005	0.00003	0.0005	0.00001	0.000096	0.0003	0.0029	0.0001	
20-Sep-11	89	--	--	--	0.01	--	--	3.59	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
27-Sep-11	90	--	--	--	0.01	--	--	4.39	--	--	--	--	--	--	0.3	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
4-Oct-11	91	--	--	--	0.01	--	--	4.43	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
11-Oct-11	92	--	--	--	0.01	--	--	4.52	--	--	--	--	--	--	0.6	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
18-Oct-11	93	--	--	--	0.01	--	--	4.39	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
25-Oct-11	94	--	--	--	0.01	--	--	4.7	--	--	--	--	--	--	0.5	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
1-Nov-11	95	--	--	--	0.01	--	--	3.59	--	--	--	--	--	--	0.6	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
8-Nov-11	96	0.000297	0.00034	0.00005	0.003	0.000056	0.0005	2.79	0.00256	0.003	0.003	0.00206	0.00053	--	0.16	0.00048	0.00004	0.3	0.000005	0.11	0.0266	0.00002	0.000002	0.000005	0.00002	0.0005	0.00001	0.00014	0.0002	0.0006	0.0001	
15-Nov-11	97	--	--	--	0.01	--	--	3.71	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
22-Nov-11	98	--	--	--	0.01	--	--	4.6	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
29-Nov-11	99	--	--	--	0.01	--	--	1.35	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
6-Dec-11	100	--	--	--	0.01	--	--	3.27	--	--	--	--	--	--	0.3	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
13-Dec-11	101	--	--	--	0.01	--	--	3.95	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
20-Dec-11	102	--	--	--	0.01	--	--	3.53	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
27-Dec-11	103	--	--	--	0.01	--	--	3.64	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
3-Jan-12	104	0.000216	0.00029	0.00005	0.001	0.000831	0.0005	2.7	0.00213	0.009	0.002	0.00194	0.00051	--	0.16	0.00046	0.00004	0.3	0.000005	0.13	0.0215	0.00002	0.000002	0.000005	0.00004	0.0005	0.00001	0.000121	0.0002	0.0005	0.0001	
10-Jan-12	105	--	--	--	0.01	--	--	3.22	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
17-Jan-12	106	--	--	--	0.01	--	--	3.17	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
24-Jan-12	107	--	--	--	0.01	--	--	2.74	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
31-Jan-12	108	--	--	--	0.01	--	--	3.19	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
Terminated																																

HC-37		Dissolved Metals by ICP-MS (Cantest)																												
Sample Weight = 1 kg		Volume (ml)		pH	EC	ORP	SO4	Acidity (mg CaCO3/l)		Total Alkalinity (mg CaCO3/l)	Fluoride	Chloride	Nitrate-N	Nitrite-N	Total Ammonia	Diss.-P	TDS	Hardness CaCO3	Al	Sb	As	Ba	Be	Bi	B	Cs	Cd	Ca	Cr	
Date	Accum. Weeks	Input	Output	(pH Units)	(µS/cm)	(mV)	(mg/l)	to pH 4.5	to pH 8.3	to pH 4.5	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mgN/l)	(mgP/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
5-Jan-10	0	750	575	7.88	84	145	10	--	1	21	0.05	2.99	0.05	0.005	0.11	0.08	47	19.49895	0.044	0.0079	0.239	0.0011	0.0001	0.0001	0.03	0.0011	0.00001	4.71	0.0002	
12-Jan-10	1	500	450	8.12	154	135	23	--	1	33	0.05	3.53	0.05	0.006	0.13	0.45	136	40.71591	0.041	0.02	1.37	0.0031	0.0001	0.0001	0.069	0.0015	0.00001	9.63	0.0003	
19-Jan-10	2	500	410	8.79	116	135	26	--	--	20	0.05	1.96	0.05	0.004	0.08	0.42	73	27.02295	0.053	0.015	1.23	0.002	0.0001	0.0001	0.046	0.0009	0.00001	5.91	0.0003	
26-Jan-10	3	500	410	8.48	87	135	17	--	--	19	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	--	5.67	--
2-Feb-10	4	500	415	8.44	79	130	17	--	--	17	0.05	0.27	0.05	0.003	0.2	0.27	42	24.68262	0.055	0.012	0.815	0.0018	0.0001	0.0001	0.046	0.0012	0.00001	5.22	0.0004	
9-Feb-10	5	500	435	8.5	70	135	17	--	--	17	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	--	5.38	--
16-Feb-10	6	500	405	8.72	92	145	17	--	--	23	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	--	--	5.79	--
23-Feb-10	7	500	415	8.65	72	145	11	--	--	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.27	--
2-Mar-10	8	500	420	8.58	60	140	7	--	--	18	0.05	0.2	0.05	0.004	0.25	0.32	88	19.01767	0.034	0.015	0.839	0.0013	0.0001	0.0001	0.055	0.001	0.00001	4.27	0.0002	
9-Mar-10	9	500	435	8.4	56	155	6	--	--	19	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	--	4.6	--
16-Mar-10	10	500	420	8.44	55	160	12	--	--	17	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	--	4.7	--
23-Mar-10	11	500	425	8.38	57	170	10	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.41	--
30-Mar-10	12	500	430	8.32	58	165	7	--	--	19	0.05	0.2	0.05	0.004	0.27	0.18	44	21.15002	0.019	0.0092	0.553	0.0014	0.0001	0.0001	0.051	0.0011	0.00001	4.58	0.0002	
6-Apr-10	13	500	440	8.36	55	185	7	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.69	--
13-Apr-10	14	500	430	8.34	52	150	8	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.69	--
20-Apr-10	15	500	410	8.55	62	160	13	--	--	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.78	--
27-Apr-10	16	500	435	8.26	58	170	10	--	1	16	0.03	0.5	0.02	0.005	0.26	0.072	54	22.52667	0.0261	0.00951	0.436	0.00249	0.00001	0.000005	0.05	0.00118	0.000005	4.95	0.0001	
4-May-10	17	500	410	8.35	60	165	13	--	--	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.31	--
11-May-10	18	500	430	8.03	63	165	12	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.31	--
18-May-10	19	500	445	8.32	67	155	14	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.96	--
25-May-10	20	500	420	7.65	67	160	16	--	1	15	0.01	0.5	0.02	0.005	0.31	0.085	48	26.74772	0.0199	0.00894	0.321	0.00166	0.00001	0.000005	0.05	0.00101	0.000005	6.08	0.0001	
1-Jun-10	21	500	460	7.96	77	160	16	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.12	--
8-Jun-10	22	500	435	7.91	68	175	18	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.42	--
15-Jun-10	23	500	420	8.05	71	160	18	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.91	--
22-Jun-10	24	500	415	7.76	66	145	16	--	1	14	0.01	0.5	0.02	0.005	0.3	0.062	34	28.16061	0.0209	0.00895	0.351	0.00156	0.00001	0.000005	0.05	0.00116	0.000005	5.97	0.0001	
29-Jun-10	25	500	435	8.14	69	175	17	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.87	--
6-Jul-10	26	500	440	7.97	63	170	14	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.37	--
13-Jul-10	27	500	440	8.16	55	185	14	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.84	--
20-Jul-10	28	500	440	7.78	55	175	12	--	1	15	0.01	0.5	0.02	0.019	0.28	0.139	32	26.40418	0.0114	0.00881	0.357	0.00134	0.00001	0.000005	0.05	0.00095	0.000005	5.86	0.0001	
27-Jul-10	29	500	430	7.88	64	180	13	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.27	--
3-Aug-10	30	500	450	7.9	61	175	13	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.51	--
10-Aug-10	31	500	435	8.06	55	175	12	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.09	--
17-Aug-10	32	500	430	7.71	56	180	11	--	1	16	0.01	0.5	0.02	0.005	0.38	0.125	30	24.59563	0.0146	0.00792	0.33	0.00115	0.00001	0.000005	0.05	0.00108	0.000005	5.35	0.0001	
24-Aug-10	33	500	425	8	58	185	11	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.23	--
31-Aug-10	34	500	430	7.99	55	165	10	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.65	--
7-Sep-10	35	500	445	7.83	60	180	13	--	1	16	--	--	--	--	--															

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Sample Weight = 1 kg		Co	Cu	La	Fe	Pb	Li	Mg	Mn	P	Hg	Mo	Ni	Re	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr	
Date	Accum. Weeks	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	(CVAF) µg/L	mg/l	mg/l	mg/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
		0.0001	0.0001	0.0001	0.01	0.00005	0.0001	0.005	0.0001	0.015	0.02	0.0001	0.0002	0.0001	0.01	0.0001	0.0002	0.05	0.00004	0.005	0.0001	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0001	0.0001	0.0001	
5-Jan-10	0	0.0015	0.0021	0.0001	0.02	0.00005	0.0008	1.88	0.013	0.015	0.02	0.0007	0.015	0.0001	3.74	0.0034	0.0008	0.32	0.00004	6.09	0.015	0.0002	0.00002	0.00005	0.0001	0.0002	0.0005	0.00007	0.0009	0.001	0.0001	
12-Jan-10	1	0.0042	0.0027	0.0001	0.02	0.00005	0.0013	4.05	0.018	0.015	0.02	0.0025	0.026	0.0001	5.42	0.0053	0.0016	0.79	0.00004	9.85	0.037	0.0002	0.00002	0.00005	0.0001	0.0002	0.0011	0.00025	0.0019	0.001	0.0001	
19-Jan-10	2	0.0019	0.0015	0.0001	0.04	0.00005	0.0007	2.98	0.0078	0.03	0.02	0.0024	0.01	0.0001	4.06	0.0037	0.0012	0.47	0.00004	6.89	0.024	0.0002	0.00002	0.00005	0.0001	0.0003	0.0008	0.00014	0.0019	0.001	0.0001	
26-Jan-10	3	--	--	--	0.04	--	--	3.03	--	--	--	--	--	--	3.8	--	--	--	--	4	--	--	--	--	--	--	--	--	--	--	--	--
2-Feb-10	4	0.002	0.0008	0.0001	0.02	0.00005	0.0005	2.83	0.01	0.015	0.02	0.0012	0.0068	0.0001	3.37	0.0034	0.0005	0.49	0.00004	2.79	0.018	0.0002	0.00002	0.00005	0.0001	0.0003	0.0005	0.00008	0.0014	0.001	0.0001	
9-Feb-10	5	--	--	--	0.05	--	--	2.92	--	--	--	--	--	--	2.9	--	--	--	--	2	--	--	--	--	--	--	--	--	--	--	--	--
16-Feb-10	6	--	--	--	0.01	--	--	4.09	--	--	--	--	--	--	4.3	--	--	--	--	2.4	--	--	--	--	--	--	--	--	--	--	--	--
23-Feb-10	7	--	--	--	0.01	--	--	3.07	--	--	--	--	--	--	3.2	--	--	--	--	1.6	--	--	--	--	--	--	--	--	--	--	--	--
2-Mar-10	8	0.0015	0.0006	0.0001	0.02	0.00005	0.0003	2.03	0.0061	0.015	0.02	0.0006	0.005	0.0001	2.3	0.0031	0.0003	0.47	0.00004	0.69	0.016	0.0002	0.00002	0.00005	0.0001	0.0002	0.0004	0.00007	0.0012	0.001	0.0001	
9-Mar-10	9	--	--	--	0.02	--	--	2.44	0.008	--	--	--	--	--	1.7	--	--	--	--	0.6	--	--	--	--	--	--	--	--	--	--	--	--
16-Mar-10	10	--	--	--	0.01	--	--	2.49	--	--	--	--	--	--	1.6	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--	--
23-Mar-10	11	--	--	--	0.01	--	--	2.41	--	--	--	--	--	--	1.4	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
30-Mar-10	12	0.0013	0.0005	0.0001	0.01	0.00005	0.0003	2.36	0.0059	0.015	0.02	0.0005	0.0034	0.0001	1.7	0.0026	0.0003	0.33	0.00004	0.41	0.014	0.0002	0.00002	0.00005	0.0001	0.0002	0.0002	0.00005	0.0009	0.001	0.0001	
6-Apr-10	13	--	--	--	0.02	--	--	2.26	--	--	--	--	--	--	1	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
13-Apr-10	14	--	--	--	0.04	--	--	2.36	--	--	--	--	--	--	1.2	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
20-Apr-10	15	--	--	--	0.02	--	--	2.92	--	--	--	--	--	--	1.5	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
27-Apr-10	16	0.00155	0.00066	0.00005	0.008	0.000022	0.0005	2.47	0.00656	0.002	0.02	0.00054	0.0036	--	1.33	0.00246	0.00018	0.4	0.000005	0.28	0.0151	0.00002	0.000008	0.000005	0.00004	0.0005	0.00015	0.000044	0.0008	0.0006	0.0001	
4-May-10	17	--	--	--	0.02	--	--	2.84	--	--	--	--	--	--	1.1	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
11-May-10	18	--	--	--	0.02	--	--	3.02	--	--	--	--	--	--	1.1	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
18-May-10	19	--	--	--	0.01	--	--	2.93	--	--	--	--	--	--	1	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
25-May-10	20	0.00146	0.00039	0.00005	0.009	0.000023	0.0005	2.81	0.0126	0.002	0.02	0.00065	0.0036	--	0.98	0.00193	0.00014	0.4	0.000005	0.18	0.0155	0.00002	0.000008	0.000005	0.00011	0.0005	0.0001	0.000022	0.0005	0.0003	0.0001	
1-Jun-10	21	--	--	--	0.01	--	--	3.59	--	--	--	--	--	--	1	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
8-Jun-10	22	--	--	--	0.01	--	--	2.9	--	--	--	--	--	--	0.7	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
15-Jun-10	23	--	--	--	0.01	--	--	3.32	--	--	--	--	--	--	1	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
22-Jun-10	24	0.00198	0.00059	0.00005	0.015	0.000016	0.0005	3.22	0.0081	0.002	0.02	0.0007	0.00478	--	0.96	0.00208	0.00013	0.4	0.000005	0.17	0.0143	0.00002	0.000006	0.000005	0.00001	0.0005	0.00008	0.000025	0.0005	0.0001	0.0001	
29-Jun-10	25	--	--	--	0.01	--	--	3.43	--	--	--	--	--	--	0.8	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
6-Jul-10	26	--	--	--	0.01	--	--	2.99	--	--	--	--	--	--	0.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
13-Jul-10	27	--	--	--	0.01	--	--	3.13	--	--	--	--	--	--	0.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
20-Jul-10	28	0.0018	0.00034	0.00005	0.01	0.000013	0.0005	2.86	0.00794	0.008	0.02	0.00068	0.00431	--	0.69	0.00195	0.00013	0.3	0.000005	0.14	0.0132	0.00002	0.000006	0.000005	0.00003	0.0005	0.00008	0.000025	0.0005	0.0003	0.0001	
27-Jul-10	29	--	--	--	0.01	--	--	2.89	--	--	--	--	--	--	0.5	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
3-Aug-10	30	--	--	--	0.01	--	--	3.36	--	--	--	--	--	--	0.7	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
10-Aug-10	31	--	--	--	0.01	--	--	2.75	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
17-Aug-10	32	0.00181	0.00102	0.00005	0.009	0.000041	0.0005	2.73	0.00777	0.002	0.02	0.00058	0.00423	--	0.59	0.0017	0.00013	0.3	0.000005	0.11	0.0109	0.00002	0.000009	0.000005	0.00001	0.0005	0.00007	0.000018	0.0003	0.0002	0.0001	
24-Aug-10	33	--	--	--	0.01	--	--	2.94	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
31-Aug-10	34	--	--	--	0.01	--	--	2.68	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
7-Sep-10	35	--	--	--	0.01	--	--	3.16	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
14-Sep-10	36	0.00171	0.00094	0.00005	0.013	0.000109	0.0005	2.43	0.00671	0.003	0.02	0.00053	0.00429	--	0.51	0.00149	0.0001	0.3	0.000005	0.09	0.0102	0.00002	0.000007	0.000005	0.00001	0.0005	0.00006	0.00002	0.0003	0.0001	0.0001	
21-Sep-10	37	--	--	--	0.01	--	--	3	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
28-Sep-10	38	--	--	--	0.01	--	--	2.66	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
5-Oct-10	39	--	--	--	0.01	--	--	2.45	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
12-Oct-10	40	0.00145	0.00035	0.00005	0.004	0.000054	0.0005	2.61	0.0129	0.005	0.01	0.00047	0.00377	--	0.42	0.00131	0.00011	0.2	0.000005	0.08	0.00855	--	0.000007	0.000005	0.00007	0.0005	0.00004	0.000011	0.0003	0.0006	0.0001	
19-Oct-10	41	--	--	--	0.01	--	--	2.8	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
26-Oct-10	42	--	--	--	0.01	--	--	2.71	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
2-Nov-10	43	--	--	--	0.01	--	--	2.92	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
9-Nov-10	44	--	--	--	0.01	--	--	2.92	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
16-Nov-10	45	--	--	--	0.01	--	--	4.27	--	--	--	--	--	--	0.5	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
23-Nov-10	46	--	--	--	0.01	--	--	2.48	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
30-Nov-10	47	--	--	--	0.01	--	--	2.41	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
7-Dec-10	48	0.00187	0.00043	0.00005	0.003	0.000022	0.0005	2.82	0.00858	0.009	0.002	0.00044	0.00573	--	0.39	0.00139	0.00009	0.3	0.000005	0.13	0.00898	--	0.000007	0.000005	0.00002	0.0005	0.00007	0.000018				

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Sample Weight = 1 kg		Dissolved Metals by ICP-MS (Cantest)																														
		Volume (ml)		pH	EC	ORP	SO4	Acidity (mg CaCO3/l)		Total Alkalinity	Fluoride	Chloride	Nitrate-N	Nitrite-N	Total Ammonia	Diss.-P	TDS	Hardness	Al	Sb	As	Ba	Be	Bi	B	Cs	Cd	Ca	Cr	Co	Cu	
		Input	Output	(pH Units)	(µS/cm)	(mV)	(mg/l)	to pH 4.5	to pH 8.3	(mg CaCO3/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
Date	Accum. Weeks	5	5	0.01	1	50	1	1	1	0.1	0.2	0.02	0.002	0.01	0.001	10	0.02	0.001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
5-Jan-10	0	750	585	8.27	127	145	18	--	1	29	0.05	5.3	0.05	0.002	0.04	0.03	83	37.6347	0.084	0.0007	0.013	0.0011	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
12-Jan-10	1	500	460	8.05	145	130	20	--	1	39	0.05	2.73	0.05	0.002	0.03	0.02	130	47.72868	0.062	0.0013	0.028	0.0016	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
19-Jan-10	2	500	435	8.4	102	145	15	--	--	28	0.05	1.22	0.05	0.002	0.04	0.02	69	34.50548	0.059	0.001	0.03	0.001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
26-Jan-10	3	500	435	8.31	85	145	14	--	--	23	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Feb-10	4	500	445	8.22	75	135	19	--	1	26	0.05	0.49	0.05	0.002	0.08	0.02	49	38.46313	0.047	0.001	0.03	0.0014	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
9-Feb-10	5	500	430	8.43	80	145	16	--	--	24	--	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--	--	--	--	--	--	--	--
16-Feb-10	6	500	410	8.58	94	150	20	--	--	23	--	--	--	--	--	--	--	--	0.09	--	--	--	--	--	--	--	--	--	--	--	--	--
23-Feb-10	7	500	425	8.42	76	170	13	--	--	23	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Mar-10	8	500	455	8.46	75	155	10	--	--	24	0.05	0.2	0.05	0.002	0.18	0.02	45	30.59229	0.042	0.001	0.025	0.0011	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
9-Mar-10	9	500	465	8.35	68	170	9	--	--	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
16-Mar-10	10	500	445	8.36	62	160	11	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23-Mar-10	11	500	435	8.37	70	185	15	--	--	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
30-Mar-10	12	500	450	8.21	93	170	20	--	1	22	0.05	0.2	0.05	0.004	0.21	0.02	113	37.37678	0.021	0.0018	0.026	0.001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
6-Apr-10	13	500	450	8.17	96	190	23	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13-Apr-10	14	500	445	8.33	95	150	26	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20-Apr-10	15	500	440	8.1	86	150	26	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27-Apr-10	16	500	445	8.17	93	155	25	--	1	17	0.02	0.5	0.02	0.005	0.14	0.007	82	38.60635	0.0246	0.00201	0.0241	0.00096	0.00001	0.000005	0.05	0.0013	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
4-May-10	17	500	460	8.23	95	160	28	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11-May-10	18	500	440	8.17	94	170	23	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18-May-10	19	500	445	8.41	90	165	23	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25-May-10	20	500	435	7.74	91	170	22	--	1	18	0.01	0.5	0.02	0.005	0.28	0.005	60	36.80851	0.0145	0.00182	0.0154	0.00104	0.00001	0.000005	0.05	0.00136	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
1-Jun-10	21	500	470	7.76	88	155	22	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8-Jun-10	22	500	455	7.9	82	185	21	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15-Jun-10	23	500	435	8.17	84	185	21	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22-Jun-10	24	500	435	8.14	85	135	22	--	1	19	0.01	0.5	0.02	0.005	0.24	0.005	42	37.33755	0.0162	0.00172	0.0174	0.00078	0.00001	0.000005	0.05	0.00151	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
29-Jun-10	25	500	430	8.25	80	160	21	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6-Jul-10	26	500	435	8.17	85	160	22	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13-Jul-10	27	500	435	8.26	79	170	22	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20-Jul-10	28	500	430	7.83	80	180	17	--	1	18	0.01	0.5	0.02	0.005	0.37	0.009	46	32.14292	0.012	0.0012	0.0122	0.00062	0.00001	0.000005	0.05	0.00139	0.000005	0.000005	0.000005	0.000005	0.000005	0.000

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Sample Weight = 1 kg		La	Fe	Pb	Li	Mg	Mn	P	Hg	Mo	Ni	Re	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr
Date	Accum. Weeks	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/L	(CVAF) µg/L	mg/l	mg/l	mg/L	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
5-Jan-10	0	0.0001	0.01	0.00005	0.0001	0.005	0.0001	0.015	0.02	0.0001	0.0002	0.0001	0.01	0.0001	0.0002	0.05	0.00004	0.005	0.0001	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0001	0.001	0.0001
12-Jan-10	1	0.0001	0.12	0.00005	0.0015	4.68	0.032	0.015	0.02	0.0016	0.0018	0.0001	3.04	0.0036	0.0004	0.69	0.00004	7.25	0.032	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00013	0.0005	0.001	0.0001
19-Jan-10	2	0.0001	0.03	0.00005	0.0009	3.53	0.016	0.015	0.02	0.0017	0.0011	0.0001	1.99	0.0026	0.0003	0.48	0.00004	4.1	0.021	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00007	0.0004	0.001	0.0002
26-Jan-10	3	--	0.02	--	--	3.46	--	--	--	--	--	--	1.7	--	--	--	--	3	--	--	--	--	--	--	--	--	--	--	--
2-Feb-10	4	0.0001	--	0.00005	0.0008	4.17	0.013	0.015	0.02	0.002	0.0009	0.0001	1.97	0.0024	0.0002	0.44	0.00004	2.58	0.02	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0003	0.001	0.0001
9-Feb-10	5	--	0.01	--	--	3.6	--	--	--	--	--	--	1.3	--	--	--	--	1.5	--	--	--	--	--	--	--	--	--	--	--
16-Feb-10	6	--	0.02	--	--	4.86	--	--	--	--	--	--	2.1	--	--	--	--	2.2	--	--	--	--	--	--	--	--	--	--	--
23-Feb-10	7	--	0.02	--	--	3.71	--	--	--	--	--	--	1.2	--	--	--	--	1.1	--	--	--	--	--	--	--	--	--	--	--
2-Mar-10	8	0.0001	0.31	0.00005	0.0003	3.01	0.016	0.015	0.02	0.0009	0.0007	0.0001	1.2	0.0021	0.0002	0.34	0.00004	0.56	0.016	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0004	0.001	0.0001
9-Mar-10	9	--	0.01	--	--	3.13	0.007	--	--	--	--	--	0.8	--	--	--	--	0.5	--	--	--	--	--	--	--	--	--	--	--
16-Mar-10	10	--	--	--	--	2.83	--	--	--	--	--	--	0.7	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
23-Mar-10	11	--	0.03	--	--	3.37	--	--	--	--	--	--	0.7	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
30-Mar-10	12	0.0001	0.01	0.00005	0.0006	3.9	0.0079	0.015	0.02	0.0006	0.0009	0.0001	1	0.002	0.0002	0.22	0.00004	0.41	0.015	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0002	0.001	0.0001
6-Apr-10	13	--	0.92	--	--	4.26	--	--	--	--	--	--	0.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
13-Apr-10	14	--	0.01	--	--	4.12	--	--	--	--	--	--	0.7	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
20-Apr-10	15	--	0.01	--	--	3.66	--	--	--	--	--	--	0.4	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
27-Apr-10	16	0.00005	0.006	0.000007	0.0005	3.95	0.00681	0.002	0.02	0.0008	0.00062	--	0.77	0.00184	0.00013	0.2	0.000005	0.25	0.0154	0.00002	0.000003	0.000005	0.00012	0.0005	0.00001	0.000015	0.0002	0.0002	0.0001
4-May-10	17	--	0.01	--	--	4.55	--	--	--	--	--	--	0.6	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--
11-May-10	18	--	--	--	--	4.4	--	--	--	--	--	--	0.7	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
18-May-10	19	--	--	--	--	4.27	--	--	--	--	--	--	0.6	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
25-May-10	20	0.00005	0.004	0.000011	0.0005	3.95	0.00937	0.002	0.02	0.00091	0.00058	--	0.63	0.00181	0.00013	0.2	0.000005	0.18	0.0131	0.00002	0.000002	0.000005	0.00004	0.0005	0.00001	0.000013	0.0002	0.0007	0.0001
1-Jun-10	21	--	--	--	--	4.17	--	--	--	--	--	--	0.5	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
8-Jun-10	22	--	0.02	--	--	3.65	--	--	--	--	--	--	0.5	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
15-Jun-10	23	--	--	--	--	3.93	--	--	--	--	--	--	0.5	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
22-Jun-10	24	0.00005	0.006	0.000028	0.0005	4.03	0.00331	0.002	0.02	0.00099	0.00043	--	0.58	0.00173	0.00014	0.2	0.000005	0.16	0.0126	0.00002	0.000003	0.000005	0.00003	0.0005	0.00001	0.000014	0.0002	0.0001	0.0001
29-Jun-10	25	--	--	--	--	4.06	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
6-Jul-10	26	--	--	--	--	4.28	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
13-Jul-10	27	--	--	--	--	4.28	--	--	--	--	--	--	0.4	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
20-Jul-10	28	0.00005	0.005	0.000052	0.0005	3.32	0.0027	0.006	0.02	0.00081	0.00046	--	0.4	0.00147	0.00012	0.2	0.000005	0.12	0.0106	0.00002	0.000002	0.000005	0.00003	0.0005	0.00001	0.000009	0.0002	0.0003	0.0001
27-Jul-10	29	--	--	--	--	4.57	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
3-Aug-10	30	--	--	--	--	5.38	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
10-Aug-10	31	--	--	--	--	5.85	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
17-Aug-10	32	0.00005	0.003	0.000061	0.0005	6.59	0.00287	0.002	0.02	0.00082	0.00081	--	0.48	0.00157	0.00015	0.2	0.000005	0.13	0.0191	0.00002	0.000004	0.000005	0.00001	0.0005	0.00001	0.000009	0.0002	0.0004	0.0001
24-Aug-10	33	--	--	--	--	8.4	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
31-Aug-10	34	--	--	--	--	8.16	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
7-Sep-10	35	--	--	--	--	7.12	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
14-Sep-10	36	0.00005	0.007	0.000088	0.0005	7.95	0.00212	0.003	0.02	0.00072	0.00079	--	0.43	0.00147	0.00018	0.2	0.000005	0.13	0.0219	0.00002	0.000004	0.000005	0.00002	0.0005	0.00001	0.000013	0.0002	0.0008	0.0001
21-Sep-10	37	--	--	--	--	11.2	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
28-Sep-10	38	--	--	--	--	10.3	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
5-Oct-10	39	--	--	--	--	8.57	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
12-Oct-10	40	0.00005	0.001	0.000183	0.0005	8.94	0.00104	0.007	0.009	0.00057	0.00074	--	0.34	0.00086	0.0002	0.2	0.000005	0.15	0.0467	0.00002	0.000003	0.000005	0.00013	0.0005	0.00001	0.000012	0.0002	0.001	0.0001
19-Oct-10	41	--	--	--	--	9.93	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
26-Oct-10	42	--	--	--	--	8.54	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
2-Nov-10	43	--	--	--	--	9.68	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
9-Nov-10	44	--	--	--	--	9.05	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
16-Nov-10	45	--	--	--	--	22.1	--	--	--	--	--	--	0.5	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--
23-Nov-10	46	--	--	--	--	4.57	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
30-Nov-10	47	--	--	--	--	4.92	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
7-Dec-10	48	0.00005	0.002	0.000005	0.0005	5.76	0.00208	0.008	0.002	0.00035	0.00056	--	0.2	0.00039	0.00013	0.1	0.000005	0.15	0.012	0.00002	0.000002	0.000005	0.00001	0.0005	0.00001	0.000006	0.0002	0.0005	0.0001
14-Dec-10	49	--	--	--	--	6.29	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--
21-Dec-10	50	--	--	--	--	7.61	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
28-Dec-10	51	--	--	--	--	10.1	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
4-Jan-11	52	--	--	--	--	8.51	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
11-Jan-11	53	--	--	--	--	7.11	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
18-Jan-11	54	--	--	--	--	6.17	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
25-Jan-11	55	--	--	--	--	6.84	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
1-Feb-11	56	0.00005	0.001	0.000																									

HC-38		Dissolved Metals by ICP-MS (Cantest)																													
Sample Weight = 1 kg		Volume (ml)		pH	EC	ORP	SO4	Acidity (mg CaCO3/l)		Total Alkalinity	Fluoride	Chloride	Nitrate-N	Nitrite-N	Total Ammonia	Diss.-P	TDS	Hardness	Al	Sb	As	Ba	Be	Bi	B	Cs	Cd	Ca	Cr	Co	Cu
Date	Accum. Weeks	Input	Output	(pH Units)	(µS/cm)	(mV)	(mg/l)	to pH 4.5	to pH 8.3	to pH 4.5	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mgN/l)	(mgP/l)	(mg/l)	CaCO3 (mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
26-Jul-11	81	500	450	7.63	160	190	31	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.2	--	--	--
2-Aug-11	82	500	430	7.55	150	185	28	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.5	--	--	--
9-Aug-11	83	500	430	7.56	157	160	25	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.6	--	--	--
16-Aug-11	84	500	440	7.54	172	185	28	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.5	--	--	--
23-Aug-11	85	500	445	7.58	165	160	29	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.4	--	--	--
30-Aug-11	86	500	430	8.05	176	170	25	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.9	--	--	--
6-Sep-11	87	500	435	7.75	166	155	29	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.1	--	--	--
13-Sep-11	88	500	440	7.7	190	170	27	--	1	16	0.01	25	0.52	0.005	0.1	0.005	110	79.8	0.003	0.00011	0.00105	0.00045	0.00001	0.000005	0.05	0.00033	0.000008	18.4	0.0001	0.000137	0.00031
20-Sep-11	89	500	440	7.45	178	160	29	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.1	--	--	--
27-Sep-11	90	500	435	7.54	163	160	27	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.6	--	--	--
4-Oct-11	91	500	440	7.63	199	130	28.2	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19	--	--	--
11-Oct-11	92	500	435	7.68	218	190	23.8	--	1	19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19.7	--	--	--
18-Oct-11	93	500	420	7.62	217	190	25	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19.5	--	--	--
25-Oct-11	94	500	445	7.63	224	180	26.4	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18.7	--	--	--
1-Nov-11	95	500	435	7.63	244	215	28.1	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22.6	--	--	--
8-Nov-11	96	500	440	7.61	203	185	24.3	--	1	20	0.01	27	0.72	0.005	0.23	0.005	130	84.7	0.0024	0.00009	0.0012	0.00046	0.00001	0.000005	0.05	0.00047	0.000006	19.4	0.0001	0.000171	0.00055
15-Nov-11	97	500	485	7.67	200	210	33.4	--	1	27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	21.6	--	--	--
22-Nov-11	98	500	445	7.7	195	230	29.9	--	1	23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	20	--	--	--
29-Nov-11	99	500	450	7.51	154	230	27.2	--	1	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.2	--	--	--
6-Dec-11	100	500	440	7.71	196	230	24.1	--	1	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.4	--	--	--
13-Dec-11	101	500	440	7.43	174	230	23.9	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.6	--	--	--
20-Dec-11	102	500	435	7.49	178	250	21.6	--	1	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.8	--	--	--
27-Dec-11	103	500	445	7.46	178	240	27.2	--	1	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.1	--	--	--
3-Jan-12	104	500	455	7.47	159	135	25.5	--	1	24	0.01	12	0.254	0.005	0.075	0.0062	92	64	0.0015	0.00009	0.00109	0.00037	0.00001	0.000005	0.05	0.00017	0.000005	13.9	0.0001	0.000074	0.00037
10-Jan-12	105	500	425	7.52	145	120	22.1	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14.5	--	--	--
17-Jan-12	106	500	440	7.65	150	110	28.2	--	1	22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15	--	--	--
24-Jan-12	107	500	450	7.57	153	120	23.5	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13.9	--	--	--
31-Jan-12	108	500	450	7.67	188	115	26.4	--	1	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16.7	--	--	--
Terminated																															

HC-38

Sample Weight = 1 kg

Date	Accum. Weeks	La mg/l 0.0001	Fe mg/l 0.01	Pb mg/l 0.00005	Li mg/l 0.0001	Mg mg/l 0.005	Mn mg/l 0.0001	P mg/L 0.015	(CVAF) µg/L 0.02	Mo mg/l 0.0001	Ni mg/l 0.0002	Re mg/L 0.0001	K mg/l 0.01	Rb mg/l 0.0001	Se mg/l 0.0002	Si mg/l 0.05	Ag mg/l 0.00004	Na mg/l 0.005	Sr mg/l 0.0001	Te mg/l 0.0002	Tl mg/l 0.00002	Th mg/l 0.00005	Sn mg/l 0.0001	Ti mg/l 0.0002	W mg/l 0.0001	U mg/l 0.00005	V mg/l 0.0001	Zn mg/l 0.001	Zr mg/l 0.0001	
26-Jul-11	81	--	--	--	--	8.11	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
2-Aug-11	82	--	--	--	--	7.35	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
9-Aug-11	83	--	--	--	--	7.49	--	--	--	--	--	--	0.3	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
16-Aug-11	84	--	--	--	--	8.09	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
23-Aug-11	85	--	--	--	--	8.37	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
30-Aug-11	86	--	--	--	--	8.39	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
6-Sep-11	87	--	--	--	--	8.25	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
13-Sep-11	88	0.00005	0.002	0.000024	0.0005	8.26	0.00116	0.006	0.002	0.00017	0.00033	--	0.13	0.00033	0.00017	0.1	0.000005	0.08	0.0129	0.00002	0.000002	0.000005	0.00002	0.0005	0.00001	0.000007	0.0002	0.0006	0.0001	
20-Sep-11	89	--	--	--	--	8.53	--	--	--	--	--	--	0.5	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
27-Sep-11	90	--	--	--	--	8.19	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
4-Oct-11	91	--	--	--	--	9.51	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
11-Oct-11	92	--	--	--	--	9.58	--	--	--	--	--	--	0.6	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
18-Oct-11	93	--	--	--	--	9.7	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
25-Oct-11	94	--	--	--	--	9.32	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
1-Nov-11	95	--	--	--	--	11	--	--	--	--	--	--	0.5	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
8-Nov-11	96	0.00005	0.003	0.000104	0.0005	8.81	0.00191	0.005	0.002	0.00015	0.0005	--	0.13	0.0004	0.00013	0.1	0.000005	0.09	0.0142	0.00002	0.000002	0.000005	0.00021	0.0005	0.00001	0.000007	0.0002	0.0008	0.0001	
15-Nov-11	97	--	--	--	--	9.91	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
22-Nov-11	98	--	--	--	--	9.58	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
29-Nov-11	99	--	--	--	--	7.93	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
6-Dec-11	100	--	--	--	--	8.46	--	--	--	--	--	--	0.3	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
13-Dec-11	101	--	--	--	--	8.49	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
20-Dec-11	102	--	--	--	--	8.45	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
27-Dec-11	103	--	--	--	--	8.78	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
3-Jan-12	104	0.00005	0.001	0.000243	0.0005	7.1	0.00067	0.01	0.002	0.00011	0.00037	--	0.11	0.00013	0.00016	0.1	0.000005	0.07	0.0113	0.00002	0.000002	0.000005	0.00016	0.0005	0.00001	0.000004	0.0002	0.0005	0.0001	
10-Jan-12	105	--	--	--	--	7.69	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
17-Jan-12	106	--	--	--	--	8.13	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
24-Jan-12	107	--	--	--	--	7.42	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
31-Jan-12	108	--	--	--	--	9.04	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
Terminated																														

HC-55		Dissolved Metals by ICP-MS (Cantest)																													
Sample Weight = 1 kg		Volume (ml)		pH	EC	ORP	SO4	Acidity (mg CaCO3/l)		Total Alkalinity	Fluoride	Chloride	Nitrate-N	Nitrite-N	Total Ammonia	Diss.-P	TDS	Hardness	Al	Sb	As	Ba	Be	Bi	B	Cs	Cd	Ca	Cr	Co	
Date	Accum. Weeks	Input	Output	(pH Units)	(µS/cm)	(mV)	(mg/l)	to pH 4.5	to pH 8.3	(mg CaCO3/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mgN/l)	(mgP/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
		5	5	0.01	1	50	1	1	1	1	0.1	0.2	0.02	0.002	0.01	0.001	10	0.02	0.001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0005	0.0001	0.00001	0.01	0.0002	0.0001	
13-Apr-10	0	750	605	8.85	148	140	11	--	--	45	0.06	7.1	0.02	0.014	0.078	0.008	85	32.5189	0.141	0.0054	0.0216	0.00125	0.00001	0.000005	0.05	0.00012	0.000005	6.1	0.0001	0.000215	
20-Apr-10	1	500	420	9.15	126	145	11	--	--	34	0.06	3.9	0.03	0.006	0.12	0.009	52	30.19588	0.107	0.0116	0.107	0.0022	0.00001	0.000005	0.08	0.00006	0.000005	4.84	0.0001	0.000575	
27-Apr-10	2	500	460	8.64	110	140	14	--	--	34	0.06	1.2	0.02	0.005	0.05	0.027	52	35.65696	0.0508	0.0101	0.133	0.002	0.00001	0.000005	0.06	0.00006	0.000006	5.56	0.0001	0.00206	
4-May-10	3	500	455	9.35	125	135	20	--	--	35	--	--	--	--	--	--	--	--	0.1	--	--	--	--	--	--	--	--	6.14	--	--	
11-May-10	4	500	430	9.42	107	180	20	--	--	25	0.01	0.9	0.02	0.005	0.06	0.005	50	33.13966	0.0705	0.00901	0.205	0.00178	0.00001	0.000005	0.07	0.00005	0.000005	4.42	0.0001	0.000509	
18-May-10	5	500	445	9.12	70	155	12	--	--	21	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	4.01	--	--	
25-May-10	6	500	440	8.98	63	155	8	--	--	22	--	--	--	--	--	--	--	--	0.07	--	--	--	--	--	--	--	--	4.12	--	--	
1-Jun-10	7	500	485	8.78	58	155	7	--	--	20	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	3.97	--	--	
8-Jun-10	8	500	460	8.65	52	170	7	--	--	18	0.02	0.5	0.02	0.005	0.21	0.034	32	23.43966	0.0656	0.00517	0.152	0.0011	0.00001	0.000005	0.05	0.00005	0.000005	3.42	0.0003	0.000496	
15-Jun-10	9	500	490	8.53	56	170	6	--	--	21	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	4.22	--	--	
22-Jun-10	10	500	495	8.35	58	130	5	--	--	21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.52	--	--	
29-Jun-10	11	500	440	8.86	49	155	5	--	--	18	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	3.63	--	--	
6-Jul-10	12	500	455	8.48	49	155	4	--	--	18	0.02	0.5	0.02	0.005	0.05	0.058	38	21.00848	0.0455	0.0042	0.155	0.00075	0.00001	0.000005	0.05	0.00005	0.000005	3.32	0.0002	0.000418	
13-Jul-10	13	500	440	8.94	35	140	5	--	--	16	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	3.48	--	--	
20-Jul-10	14	500	440	8.65	39	160	5	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.39	--	--	
27-Jul-10	15	500	445	8.73	47	160	6	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.29	--	--	
3-Aug-10	16	500	440	8.34	41	160	6	--	--	18	0.05	0.5	0.5	0.005	0.44	0.005	34	20.3993	0.0538	0.00384	0.15	0.00071	0.00001	0.000005	0.05	0.00005	0.000005	3.62	0.0002	0.000236	
10-Aug-10	17	500	440	8.76	39	165	5	--	--	16	--	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--	--	--	3.23	--	--	
17-Aug-10	18	500	430	8.75	43	160	5	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.42	--	--	
24-Aug-10	19	500	425	8.72	44	155	5	--	--	17	--	--	--	--	--	--	--	--	0.05	--	--	--	--	--	--	--	--	3.59	--	--	
31-Aug-10	20	500	430	8.4	40	160	5	--	--	17	0.02	0.5	0.02	0.007	0.17	0.051	24	18.8978	0.0453	0.00348	0.145	0.00055	0.00001	0.000005	0.05	0.00005	0.000005	3.2	0.0001	0.000286	
7-Sep-10	21	500	420	8.87	52	150	6	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.46	--	--	
14-Sep-10	22	500	445	8.91	45	160	5	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.68	--	--	
21-Sep-10	23	500	500	8.4	54	160	7	--	--	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.25	--	--	
28-Sep-10	24	500	445	8.3	36	185	6	--	--	16	0.01	0.5	0.02	0.026	0.19	0.052	22	18.44778	0.0449	0.00357	0.144	0.00153	0.00001	0.000005	0.05	0.00005	0.000005	3.3	0.0001	0.000271	
5-Oct-10	25	500	420	8.6	39	170	6	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.96	--	--	
12-Oct-10	26	500	430	8.56	50	180	7	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.81	--	--	
19-Oct-10	27	500	430	8.47	52	165	10	--	--	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.57	--	--	
26-Oct-10	28	500	445	8.35	52	180	6	--	--	16	0.01	0.5	0.043	0.057	0.31	0.037	26	26.92388	0.0089	0.00323	0.12	0.00064	0.00001	0.000005	0.05	0.00005	0.000005	6.2	0.0001	0.000345	
2-Nov-10	29	500	440	8.59	53	165	9	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.5	--	--	
9-Nov-10	30	500	430	8.32	50	180	6	--	--	16	--	--	--	--	--	--	--	--	--	--	--	--									

HC-55		Dissolved Metals by ICP-MS (Cantest)																													
Sample Weight = 1 kg		Volume (ml)		pH (pH Units)	EC (µS/cm)	ORP (mV)	SO4 (mg/l)	Acidity (mg CaCO3/l)		Total Alkalinity (mg CaCO3/l) to pH 4.5	Fluoride (mg/l)	Chloride (mg/l)	Nitrate-N (mg/l)	Nitrite-N (mg/l)	Total Ammonia (mgN/l)	Diss.-P (mgP/l)	TDS (mg/l)	Hardness CaCO3 (mg/l)	Al (mg/l)	Sb (mg/l)	As (mg/l)	Ba (mg/l)	Be (mg/l)	Bi mg/l	B mg/l	Cs mg/l	Cd mg/l	Ca mg/l	Cr mg/l	Co mg/l	
Date	Accum. Weeks	Input	Output					to pH 4.5	to pH 8.3																						
		5	5					0.01	1																						50
4-Oct-11	77	500	440	7.4	101	125	2.3	--	1	12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.83	--	--
11-Oct-11	78	500	430	7.66	127	175	1.2	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	--	--
18-Oct-11	79	500	430	7.47	129	170	1.5	--	1	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.5	--	--
25-Oct-11	80	500	440	7.5	130	180	1.2	--	1	13	0.01	21	0.46	0.005	0.12	0.005	70	44.1	0.0153	0.00095	0.0407	0.00085	0.00001	0.000005	0.05	0.00005	0.000005	9.47	0.0001	0.000835	
1-Nov-11	81	500	435	7.61	132	200	2.3	--	1	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11.6	--	--
8-Nov-11	82	500	440	7.53	130	190	1.5	--	1	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.9	--	--
15-Nov-11	83	500	495	7.65	112	210	2.43	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11.3	--	--
22-Nov-11	84	500	475	7.54	89	270	2.6	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.03	--	--
29-Nov-11	85	500	470	7.69	77	245	3.55	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.54	--	--
6-Dec-11	86	500	455	7.65	94	230	1.86	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.47	--	--
13-Dec-11	87	500	460	7.55	84	235	2.65	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.01	--	--
20-Dec-11	88	500	460	7.5	70	250	2.12	--	1	16	0.01	9.2	0.294	0.005	0.12	0.005	40	29.2	0.0174	0.00126	0.0515	0.00061	0.00001	0.000005	0.05	0.00005	0.000005	6.36	0.0001	0.000642	
27-Dec-11	89	500	460	7.42	62	245	2.35	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.12	--	--
3-Jan-12	90	500	460	7.43	58	130	1.68	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.91	--	--
10-Jan-12	91	500	465	7.39	52	125	1.7	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.43	--	--
17-Jan-12	92	500	460	7.46	53	115	1.76	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.21	--	--
24-Jan-12	93	500	455	7.59	52	120	2.09	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.38	--	--
31-Jan-12	94	500	450	7.57	69	115	2.33	--	1	12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.43	--	--
7-Feb-12	95	500	445	7.55	65	120	1.61	--	1	12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.92	--	--
14-Feb-12	96	500	430	7.55	72	125	3	--	1	15	0.01	13	0.164	0.005	0.058	0.0057	10	30.1	0.0157	0.00083	0.0346	0.00078	0.00001	0.000005	0.05	0.00005	0.000005	6.29	0.0001	0.000539	
21-Feb-12	97	500	445	7.57	87	130	2.1	--	1	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.76	--	--
28-Feb-12	98	500	445	7.49	101	130	2.85	--	1	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6-Mar-12	99	500	420	7.43	89	130	1.18	--	1	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13-Mar-12	100	500	435	7.53	85	130	1.09	--	1	11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20-Mar-12	101	500	425	7.66	99	125	1.46	--	1	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27-Mar-12	102	500	420	7.58	88	125	1.65	--	1	11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Apr-12	103	500	440	7.9	79	130	1.88	--	1	11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10-Apr-12	104	500	450	7.71	110	130	1.86	--	1	16	0.01	7.8	0.237	0.005	0.098	0.005	34	27.7	0.0135	0.00091	0.0361	0.00054	0.00001	0.000005	0.05	0.00005	0.000005	5.75	0.0001	0.000526	
17-Apr-12	105	500	455	7.79	54	140	1.45	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24-Apr-12	106	500	430	7.8	66	140	2.6	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1-May-12	107	500	425	7.81	54	130	1.96	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8-May-12	108	500	450	7.7	56	125	2.08	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15-May-12	109	500	435	7.71	58	135	2.08	--	1	16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22-May-12	110	500	435	7.72	61	135	1.16	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
29-May-12	111	500	425	7.73	66	130	1.81	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5-Jun-12	112	500	450	7.6	65	130	2.22	--	2	23	0.01	6.7	0.357	0.005	0.075	0.0076	32	25.3	0.0135	0.000793	0.0322	0.000366	0.00001	0.0000059	0.05	0.000086	0.000005	5.04	0.0003	0.000471	
12-Jun-12	113	500	440	7.61	56	130	1.47	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
19-Jun-12	114	500	435	7.59	55	130	1.64	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
26-Jun-12	115	500	430	7.64	59	130	1.17	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Jul-12	116	500	450	7.65	69	135	2.73	--	1	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10-Jul-12	117	500	455	7.7	65	135	1.9	--	1	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
17-Jul-12	118	500	495	7.74	62	135	2.37	--	1	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24-Jul-12	119	500	460	7.64	53	135	1.26	--	1	13.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31-Jul-12	120	500	450	7.66	58	135	1.52	--	--	11.8	0.01	6.5	0.371	0.005	0.13	0.005	68	25.9	0.0174	0.000767	0.0327	0.000416	0.00001	0.000005	0.05	0.00005	0.000005	5.35	0.0001	0.000438	
7-Aug-12	121	500	440	7.69	69	145	1.47	--	1	13.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					

HC-55

Sample Weight = 1 kg		Cu	La	Fe	Pb	Li	Mg	Mn	P	Hg (CVAF)	Mo	Ni	Re	K	Rb	Se	Si	Ag	Na	Sr	Te	Tl	Th	Sn	Ti	W	U	V	Zn	Zr	
Date	Accum. Weeks	0.0001	0.0001	0.01	0.00005	0.0001	0.005	0.0001	0.015	0.02	0.0001	0.0002	0.0001	0.01	0.0001	0.0002	0.05	0.00004	0.005	0.0001	0.0002	0.00002	0.00005	0.0001	0.0002	0.0001	0.00005	0.0001	0.001	0.0001	
4-Oct-11	77	--	--	--	--	--	4.95	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
11-Oct-11	78	--	--	--	--	--	5.76	--	--	--	--	--	--	0.4	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
18-Oct-11	79	--	--	--	--	--	6.1	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
25-Oct-11	80	0.00028	0.00005	0.006	0.000056	0.0005	4.98	0.0117	0.002	0.003	0.00013	0.00122	--	0.13	0.00031	0.00013	0.2	0.000005	0.08	0.00906	0.00002	0.000002	0.000005	0.0002	0.0005	0.00012	0.000002	0.0002	0.0003	0.0001	
1-Nov-11	81	--	--	--	--	--	6.27	--	--	--	--	--	--	0.4	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
8-Nov-11	82	--	--	--	--	--	5.81	--	--	--	--	--	--	0.3	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
15-Nov-11	83	--	--	--	--	--	5.35	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
22-Nov-11	84	--	--	--	--	--	4.35	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
29-Nov-11	85	--	--	--	--	--	3.78	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
6-Dec-11	86	--	--	--	--	--	4.19	--	--	--	--	--	--	0.3	--	--	--	--	0.4	--	--	--	--	--	--	--	--	--	--	--	--
13-Dec-11	87	--	--	--	--	--	4.09	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
20-Dec-11	88	0.00052	0.00005	0.007	0.000068	0.0005	3.22	0.00827	0.002	0.002	0.00012	0.00095	--	0.1	0.0002	0.00015	0.2	0.000005	0.08	0.00605	0.00002	0.000002	0.000005	0.00026	0.0005	0.00018	0.000002	0.0002	0.0005	0.0001	
27-Dec-11	89	--	--	--	--	--	3.22	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
3-Jan-12	90	--	--	--	--	--	2.92	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
10-Jan-12	91	--	--	--	--	--	2.88	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
17-Jan-12	92	--	--	--	--	--	2.83	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
24-Jan-12	93	--	--	--	--	--	2.79	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
31-Jan-12	94	--	--	--	--	--	3.6	--	--	--	--	--	--	0.3	--	--	--	--	0.2	--	--	--	--	--	--	--	--	--	--	--	--
7-Feb-12	95	--	--	0.01	--	--	3.28	--	--	--	--	--	--	0.3	--	--	--	--	0.3	--	--	--	--	--	--	--	--	--	--	--	--
14-Feb-12	96	0.00021	0.00005	0.007	0.000058	0.0005	3.5	0.00824	0.005	0.002	0.00008	0.00085	--	0.08	0.00015	0.00011	0.2	0.000005	0.09	0.00596	0.00002	0.000002	0.000005	0.0002	0.0005	0.00014	0.000002	0.0002	0.0004	0.0001	
21-Feb-12	97	--	--	--	--	--	4.55	--	--	--	--	--	--	0.3	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
28-Feb-12	98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6-Mar-12	99	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
13-Mar-12	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
20-Mar-12	101	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27-Mar-12	102	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Apr-12	103	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10-Apr-12	104	0.00036	0.00005	0.012	0.000049	0.0005	3.25	0.00864	0.004	0.002	0.00009	0.00088	--	0.07	0.00014	0.00013	0.2	0.000005	0.05	0.00503	0.00002	0.000002	0.000005	0.0003	0.0005	0.00016	0.000002	0.0002	0.001	0.0001	
17-Apr-12	105	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24-Apr-12	106	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1-May-12	107	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8-May-12	108	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
15-May-12	109	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22-May-12	110	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
29-May-12	111	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5-Jun-12	112	0.00116	0.00005	0.0086	0.0000063	0.0005	3.09	0.00801	0.0065	0.002	0.000204	0.000811	--	0.065	0.000205	0.000133	0.3	0.000005	0.05	0.00429	0.00002	0.000002	0.000005	0.00054	0.0005	0.000268	0.0000046	0.0002	0.00091	0.0001	
12-Jun-12	113	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
19-Jun-12	114	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
26-Jun-12	115	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3-Jul-12	116	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10-Jul-12	117	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
17-Jul-12	118	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24-Jul-12	119	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31-Jul-12	120	0.000418	0.00005	0.01	0.000024	0.0005	3.05	0.00785	0.002	0.002	0.000077	0.000811	--	0.061	0.000143	0.000123	0.19	0.000005	0.05	0.00436	0.00002	0.000002	0.000005	0.0002	0.0005	0.000171	0.000002	0.0002	0.00059	0.0001	
7-Aug-12	121	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
14-Aug-12	122	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
21-Aug-12	123	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
28-Aug-12	124	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Sep-12	125	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11-Sep-12	126	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Terminated																															

Appendix L – Barrel Test Results, Boston

Appendix L1 – Field Barrel Sample Mineralogy Data, Boston

Appendix L-1: Mineralogy (XRD) Data, Barrel Test Samples

Barrel ID	Lithology	Description	Preliminary Economic Classification	Sample Type	Ankerite/Dolomite	Calcite	Chamosite Chlorite	Chlorite	Chloritoid	Muscovite	Muscovite/Sericite	Paragonite	Plagioclase	Pyrite	Pyrophyllite	Quartz	Rutile	Siderite	Siderite/Magnesite	Tourmaline	Sum
					Ca(Fe,Mg)(CO ₃) ₂	CaCO ₃	(Fe,Mg) ₂ Al(AlSi ₃ O ₁₀)(OH) ₈	(Mg,Fe,Al) ₂ (Al,Si) ₄ O ₁₀ (OH) ₈	(Fe,Mg,Mn) ₂ Al ₄ Si ₂ O ₁₀ (OH) ₄	KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂		NaAl ₃ Si ₃ O ₁₀ (OH) ₂	(Ca,Na)(Al,Si)AlSi ₂ O ₈	FeS ₂	AlSi ₂ O ₅ (OH)	SiO ₂	TiO ₂	FeCO ₃		Na(Fe,Mg) ₃ Al ₆ Si ₆ O ₁₈ (BO ₃) ₃ (OH) ₄	
B3	1	Ultramafic to Mafic Metavolcanic Rocks	Ore/Waste	barrel	38	bd	bd	14	bd	bd	3	10	bd	bd	bd	30	1	4	bd	bd	100
				pulp	39	bd	bd	10	bd	bd	1.2	11	bd	0.054	bd	32	1.4	bd	4.4	bd	100
B1	1 mixed	xed Ultramafic to Mafic Metavolcanic Roc	Waste	barrel	22	8	bd	33	bd	bd	bd	9	bd	bd	bd	26	tr	2	bd	bd	100
				pulp	23	6.4	bd	26	bd	bd	1.7	6.3	4.8	0.28	bd	28	0.58	bd	1.7	0.058	100
B4	1oj	Mafic Metavolcanic Rocks with Sediments	Waste	barrel	31	bd	5.9	bd	1.5	bd	bd	22	bd	1.2	bd	35	1.3	2.8	bd	bd	100
B2	5	Early Sedimentary Units (Argillite-Wacke)	Waste	barrel	21	bd	bd	14	7	bd	15	6	bd	bd	bd	36	1	bd	bd	bd	100
				pulp	23	bd	bd	15	0.16	bd	12	8.5	bd	0.4	bd	40	1	bd	bd	bd	100
B5	5	Early Sedimentary Units (Argillite-Wacke)	Ore/Waste	barrel	34	2.3	2	bd	3.1	10	bd	4	bd	bd	9	34	1.8	bd	bd	bd	100

¹Early and late used in a relative sense only
"-" denotes sample not available for characterization

Appendix L2 – Field Barrel Sample Solid-Phase Elemental Data, Boston

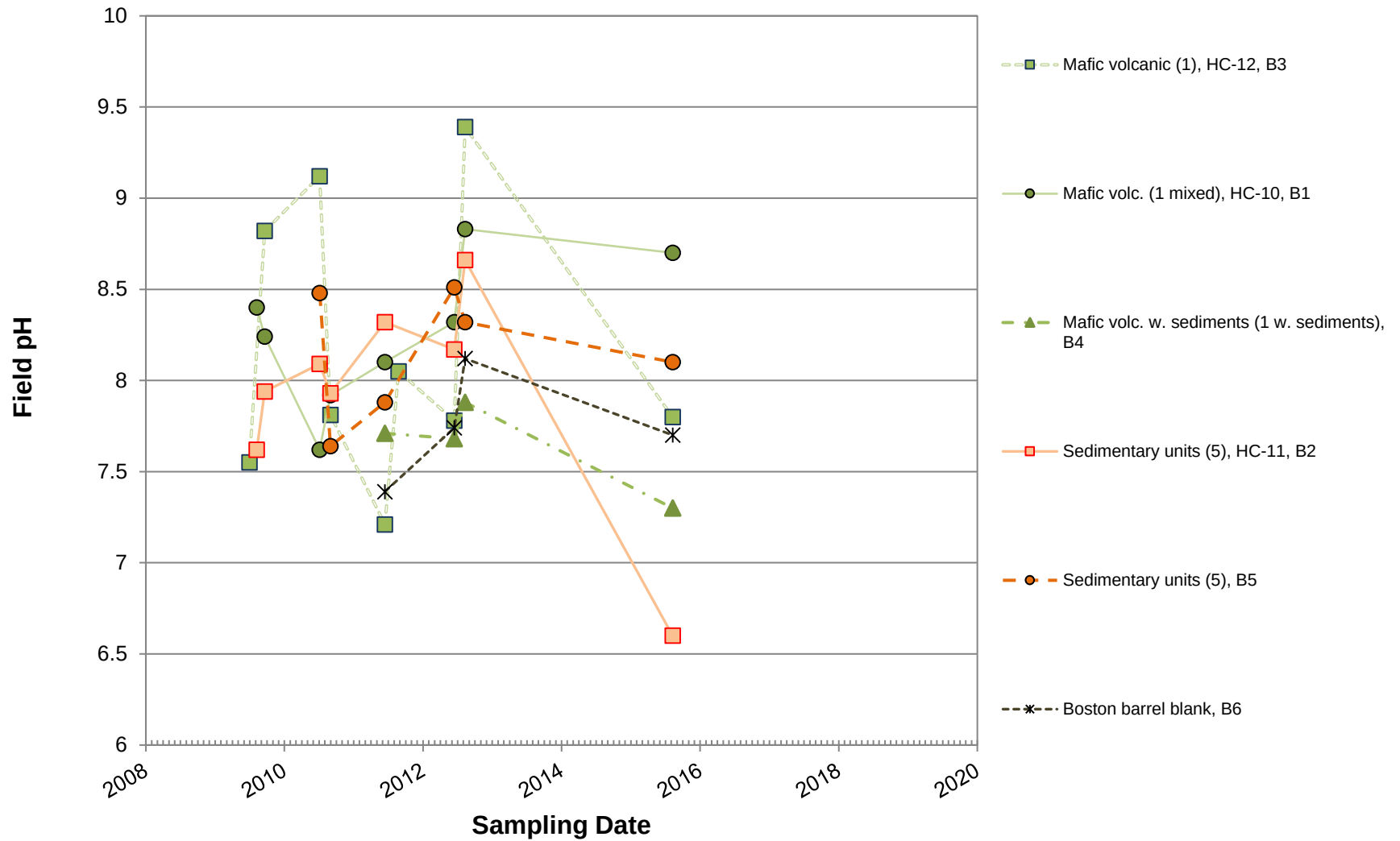
Appendix L-2: Solid-Phase Trace Metal Data - ICP Metals by Aqua Regia Digestion for Barrel Test Samples

Barrel ID	Lithology	Description	Preliminary Economic Classification	Sample Type	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se
					ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppb	ppm	ppm	%	ppm	ppm
B3	1	Ultramafic to Mafic Metavolcanic Rocks	Ore/Waste	barrel	0.8	98	2.2	77	<0.1	93	45	1800	7.5	160	<0.1	150	<0.1	47	0.1	0.5	<0.1	57	6.9	0.021	<1	120	3.1	11	0.001	<20	1.1	0.081	0.04	<0.1	<10	14	<0.1	0.15	3	<0.5
				pulp	0.22	100	3	72	0.13	86	40	1500	6.8	190	0.1	340	0.1	49	0.1	0.21	0.1	47	6.5	0.019	1	130	3	8.9	0.001	20	1	0.073	0.029	0.22	0.00001	13	0.1	0.23	2.7	0.6
B1	1 mixed	Mixed Ultramafic to Mafic Metavolcanic Rocks	Waste	barrel	0.5	110	1.3	71	<0.1	160	56	1600	7.2	110	<0.1	7.9	<0.1	47	0.1	0.4	<0.1	130	6.7	0.022	<1	270	3.5	12	0.002	<20	2.9	0.048	0.02	<0.1	<10	18	<0.1	0.18	7	<0.5
				pulp	0.12	92	0.76	66	0.1	160	49	1500	6.4	81	0.1	26	0.1	48	0.1	0.28	0.1	130	6.4	0.022	1	290	3.4	17	0.0021	20	2.9	0.073	0.024	3.3	0.00001	18	0.1	0.17	7	0.51
B4	1oj	Mafic Metavolcanic Rocks with Sediments	Waste	barrel	0.7	210	4	110	0.3	58	44	1500	6.8	140	<0.1	<0.5	0.3	33	0.1	0.8	<0.1	72	6.6	0.037	1	46	3	9	<0.001	<20	1.4	0.086	0.04	0.2	30	15	0.1	0.65	5	0.9
B2	5	Early Sedimentary Units (Argillite-Wacke) ¹	Waste	barrel	2.4	60	3.7	86	0.1	19	25	1200	4.7	28	0.5	<0.5	2.8	77	0.2	0.8	0.2	35	4	0.091	14	23	1.4	28	0.001	<20	1.3	0.065	0.09	<0.1	<10	5	<0.1	0.34	4	<0.5
				pulp	0.72	47	2.2	93	0.14	15	24	1300	5.2	30	0.2	4.2	1.1	72	0.16	0.64	0.14	38	4.2	0.076	7.6	1.8	1.4	26	0.001	20	1.6	0.093	0.08	0.1	0.00001	6.1	0.1	0.25	4.7	0.54
B5	5	Early Sedimentary Units (Argillite-Wacke) ¹	Ore/Waste	barrel	0.4	110	1.9	99	<0.1	78	41	1700	5.1	120	<0.1	170	0.4	47	0.1	0.4	<0.1	37	6.6	0.063	3	40	1.6	10	<0.001	<20	0.64	0.041	0.05	<0.1	<10	8.1	<0.1	0.25	2	<0.5

¹Early and late used in a relative sense only
*- denotes sample not available for characterization

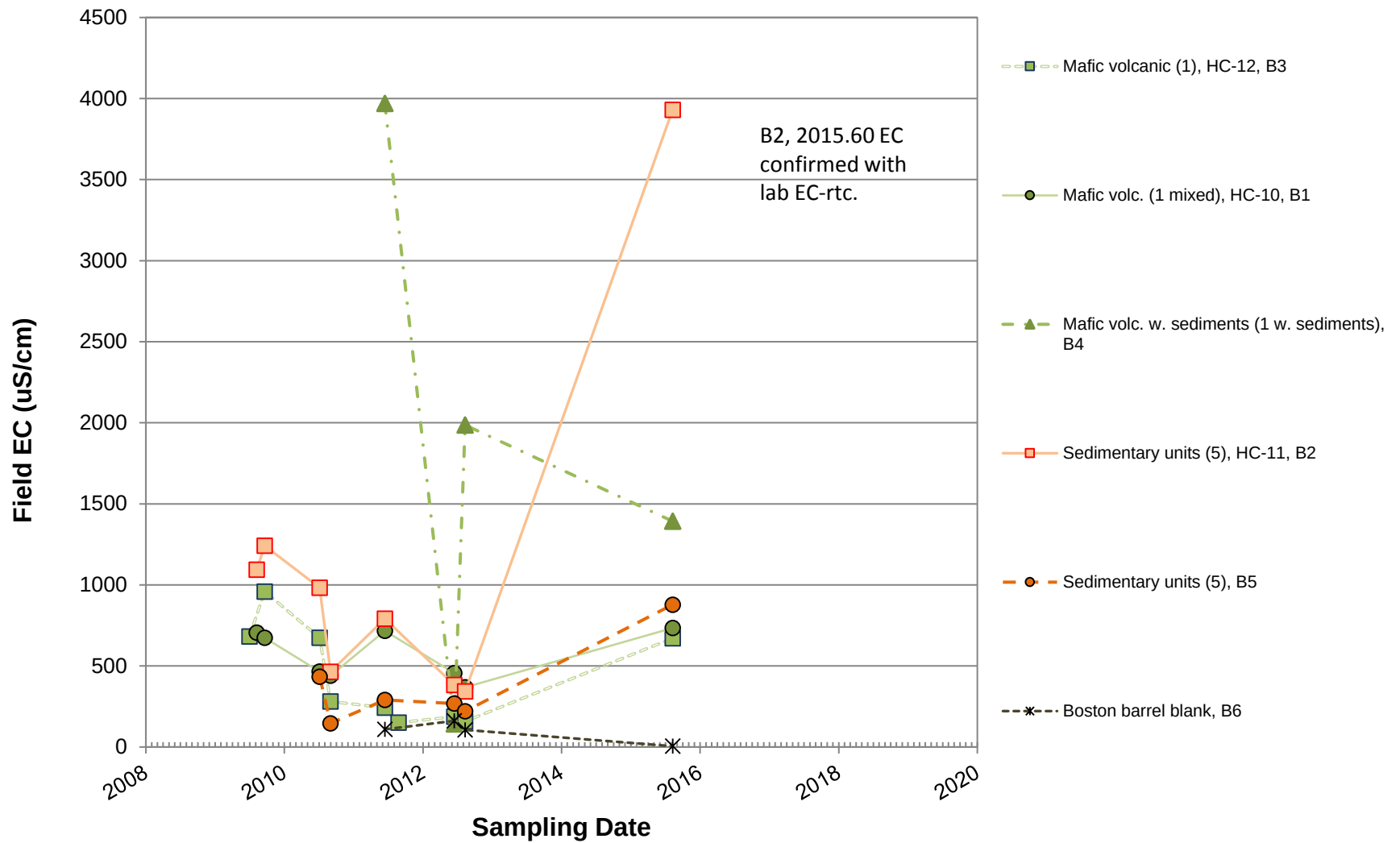
Appendix L3 – Field Barrel Concentration Graphs, Boston

Hope Bay Barrel Tests



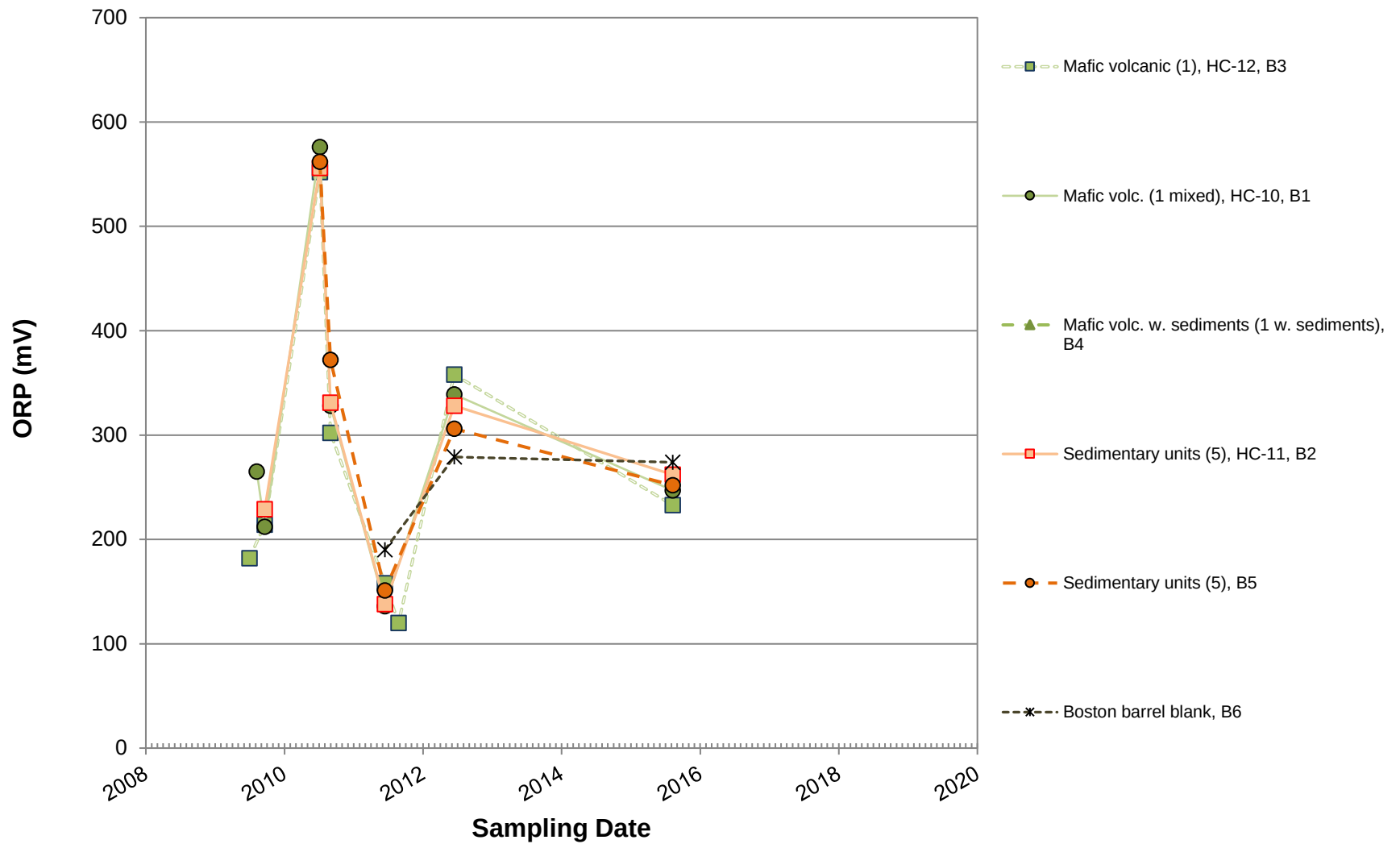
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Hope Bay Barrel Tests



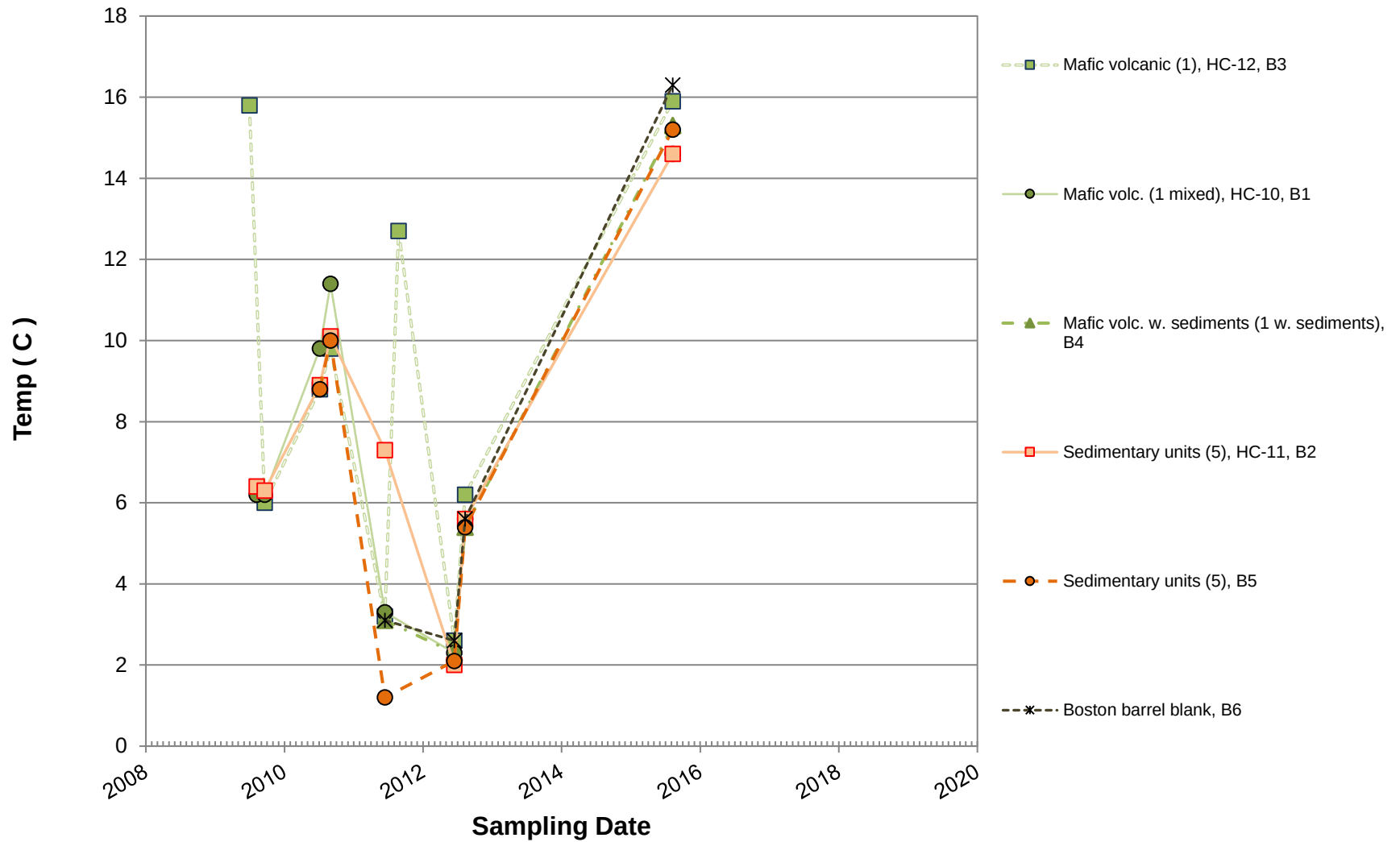
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Hope Bay Barrel Tests



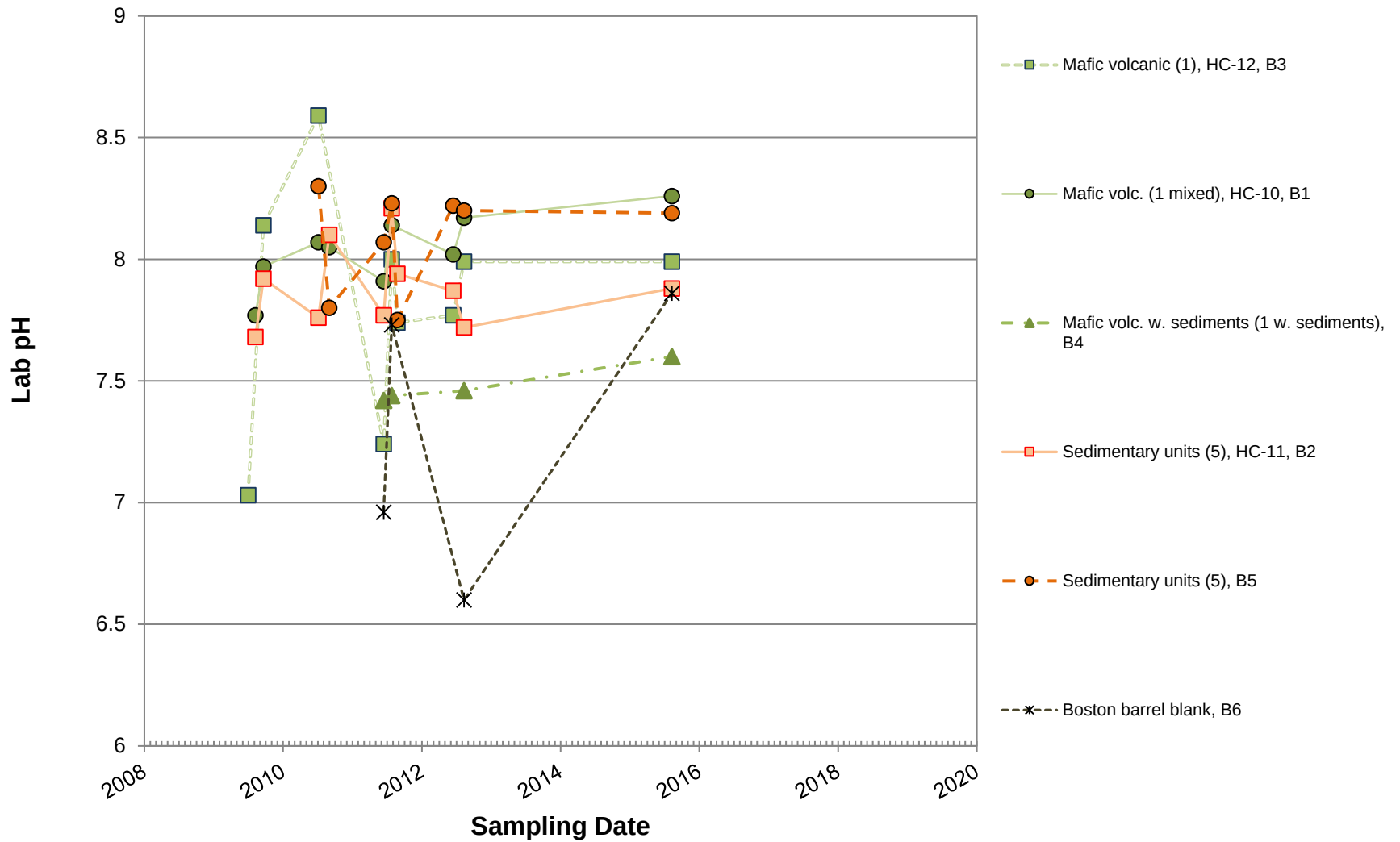
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Hope Bay Barrel Tests



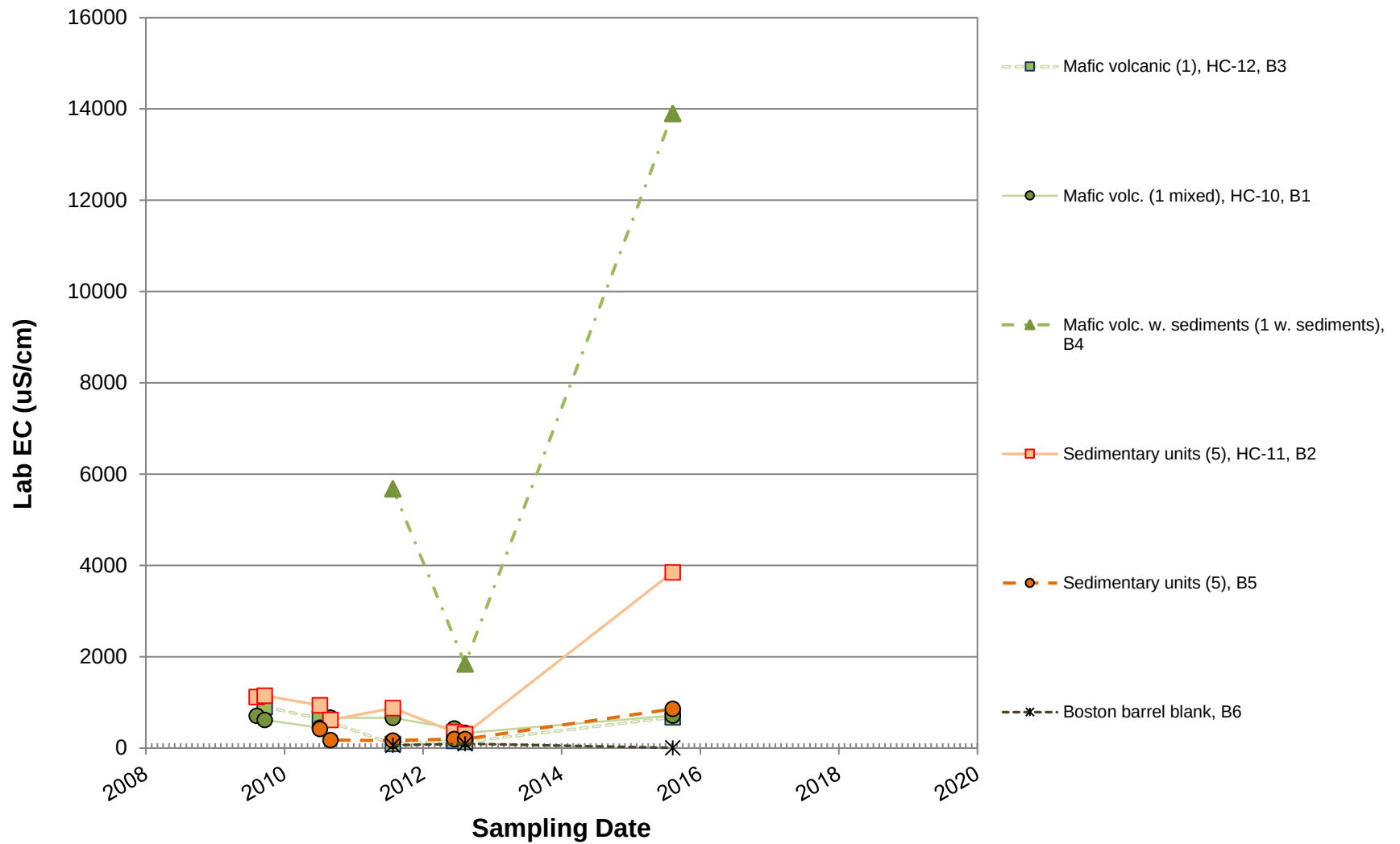
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Hope Bay Barrel Tests



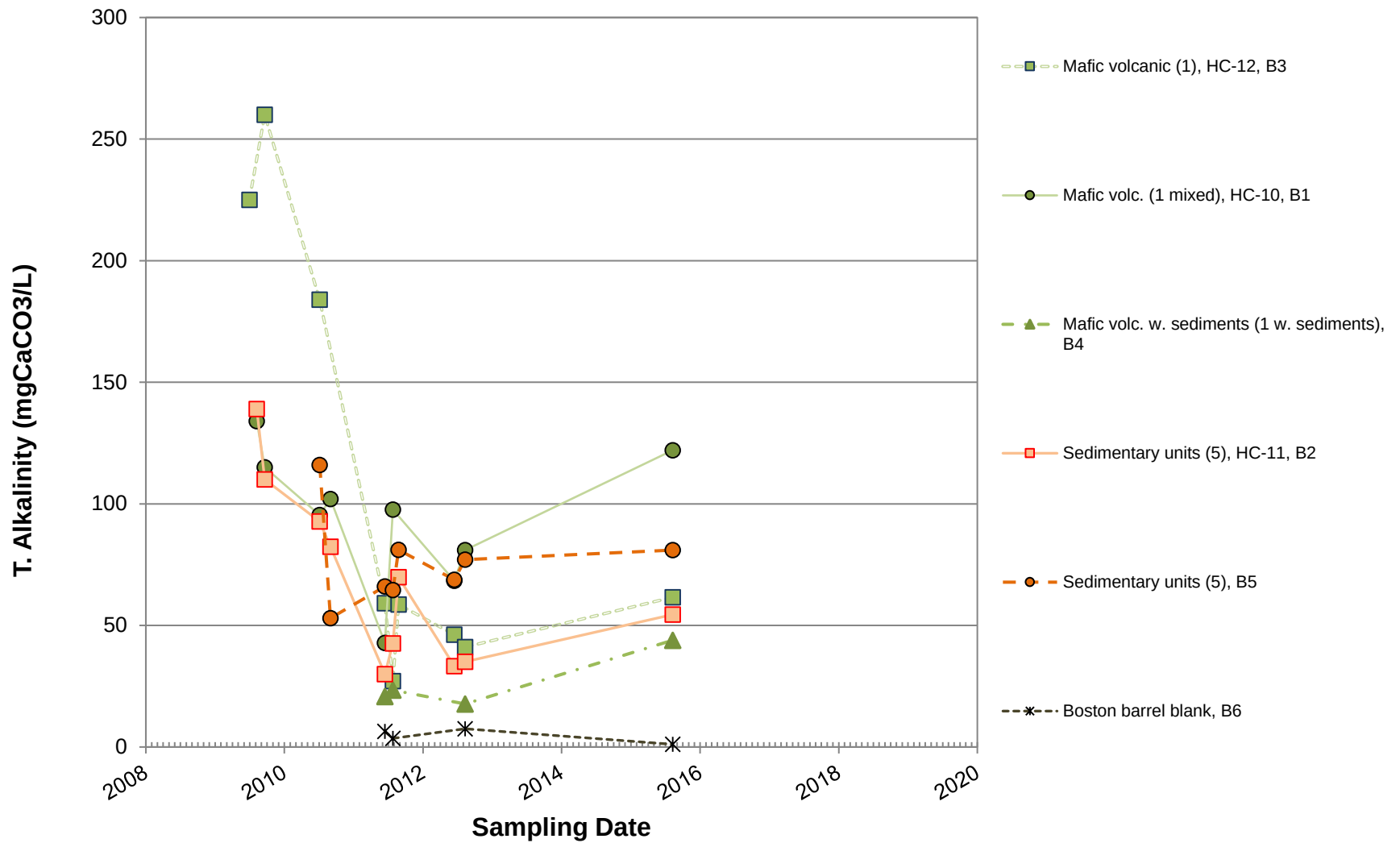
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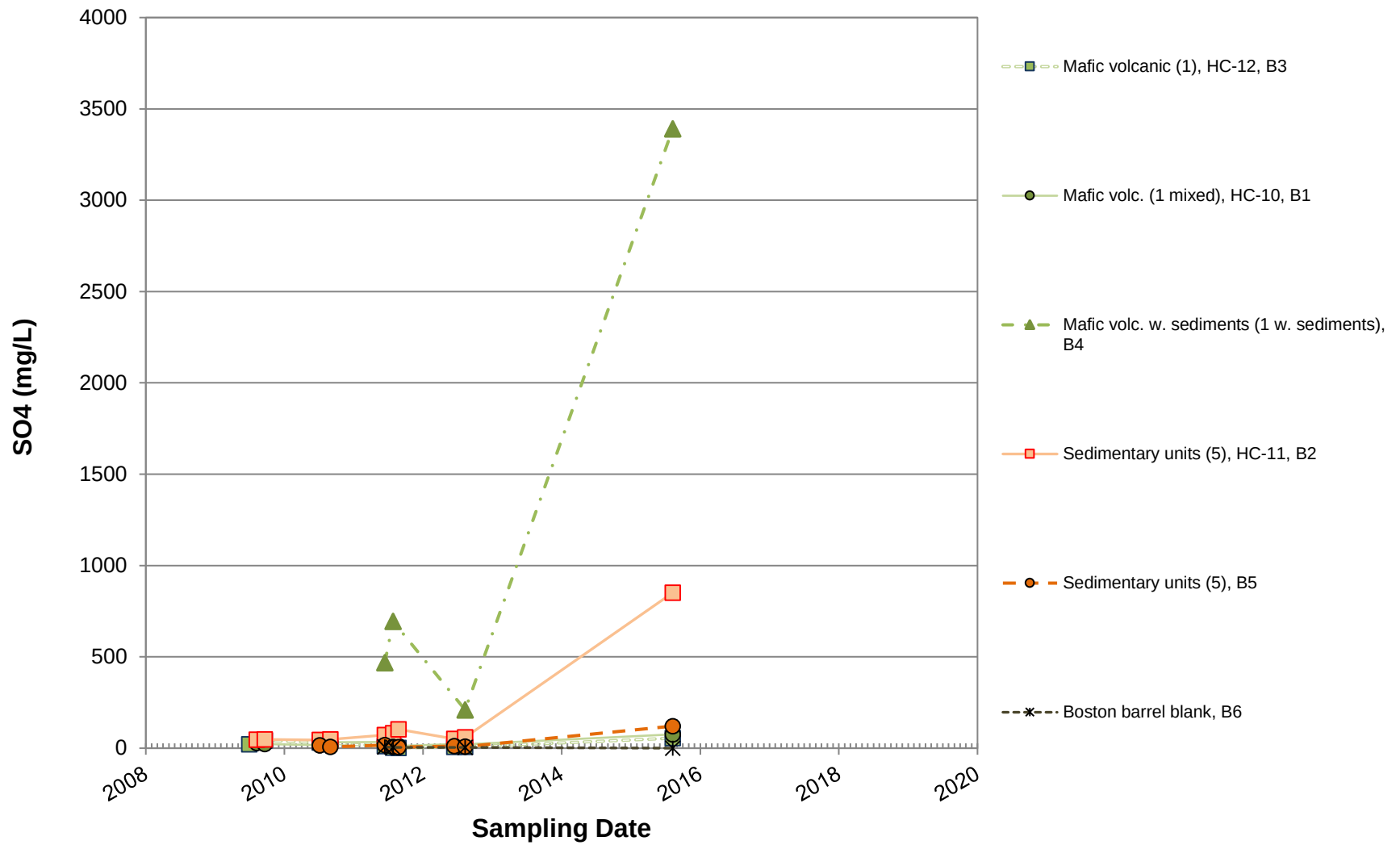
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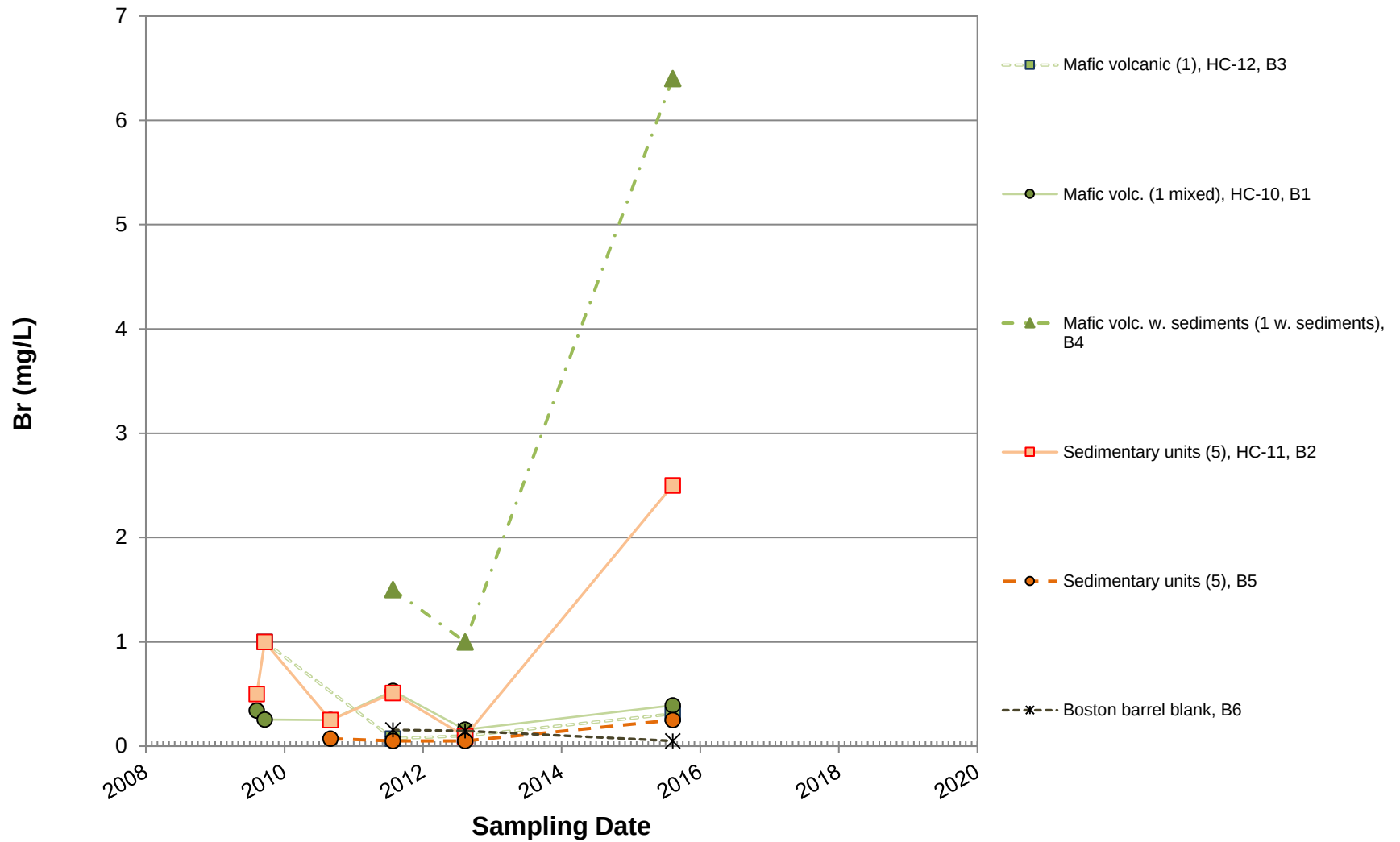
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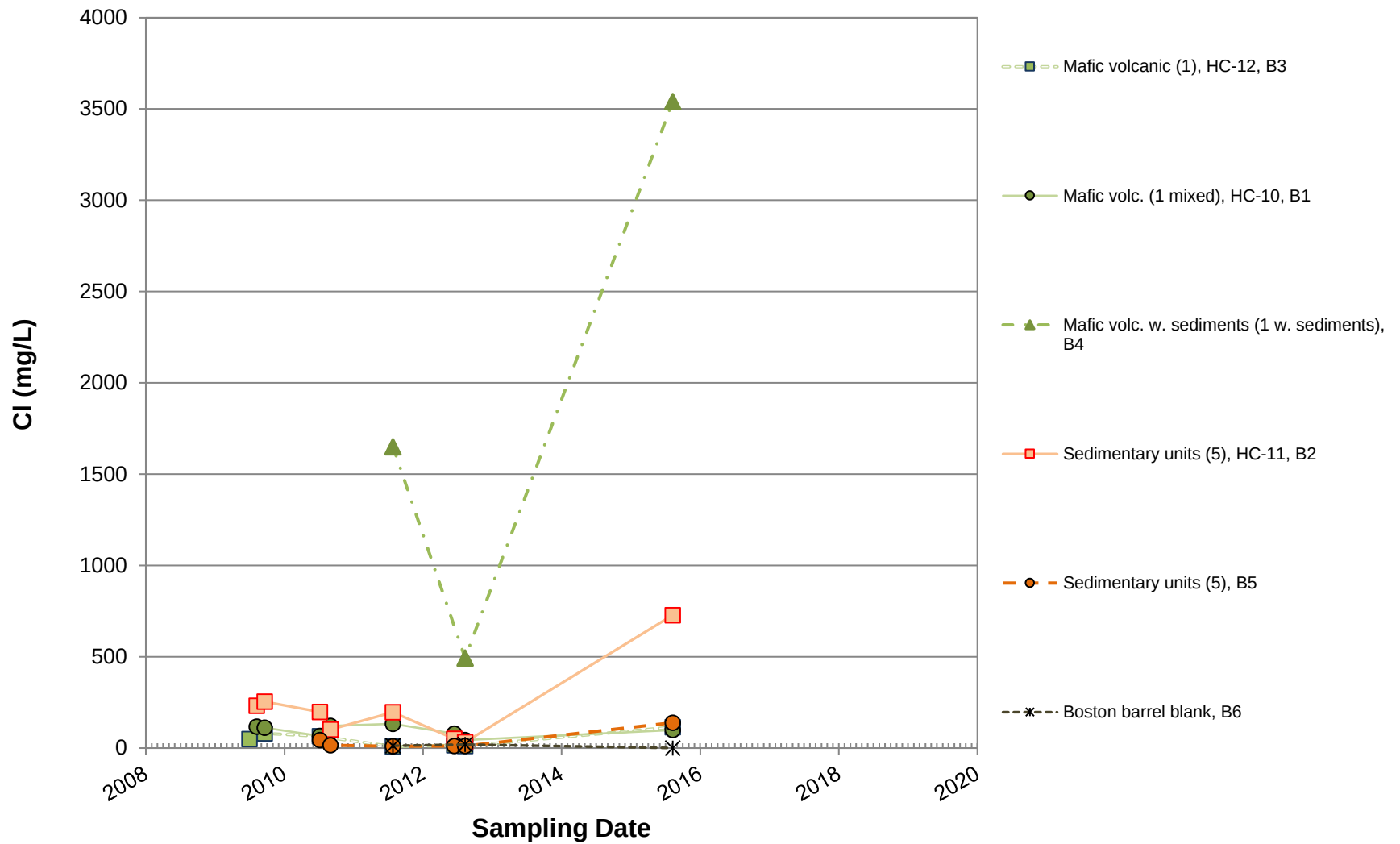
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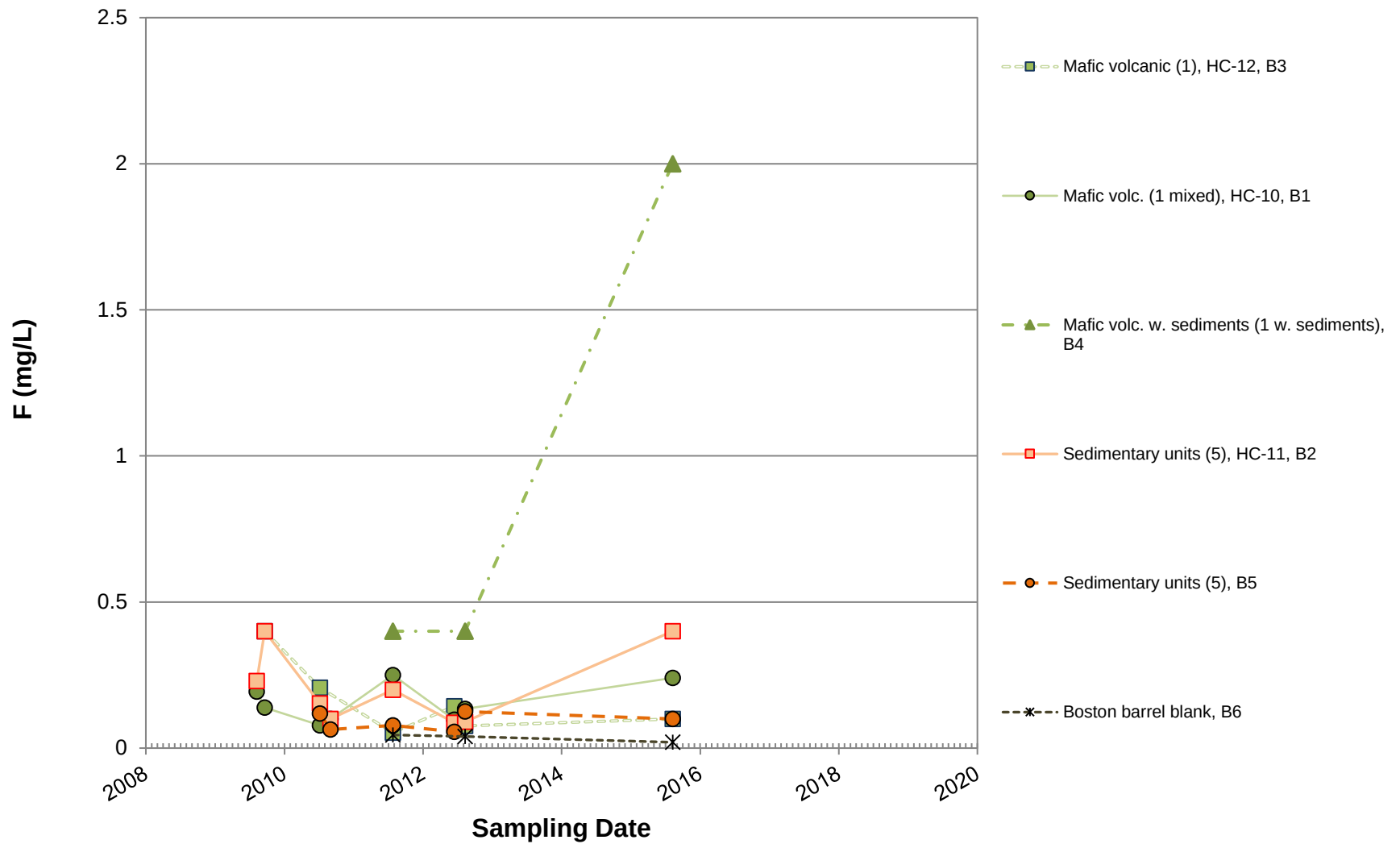
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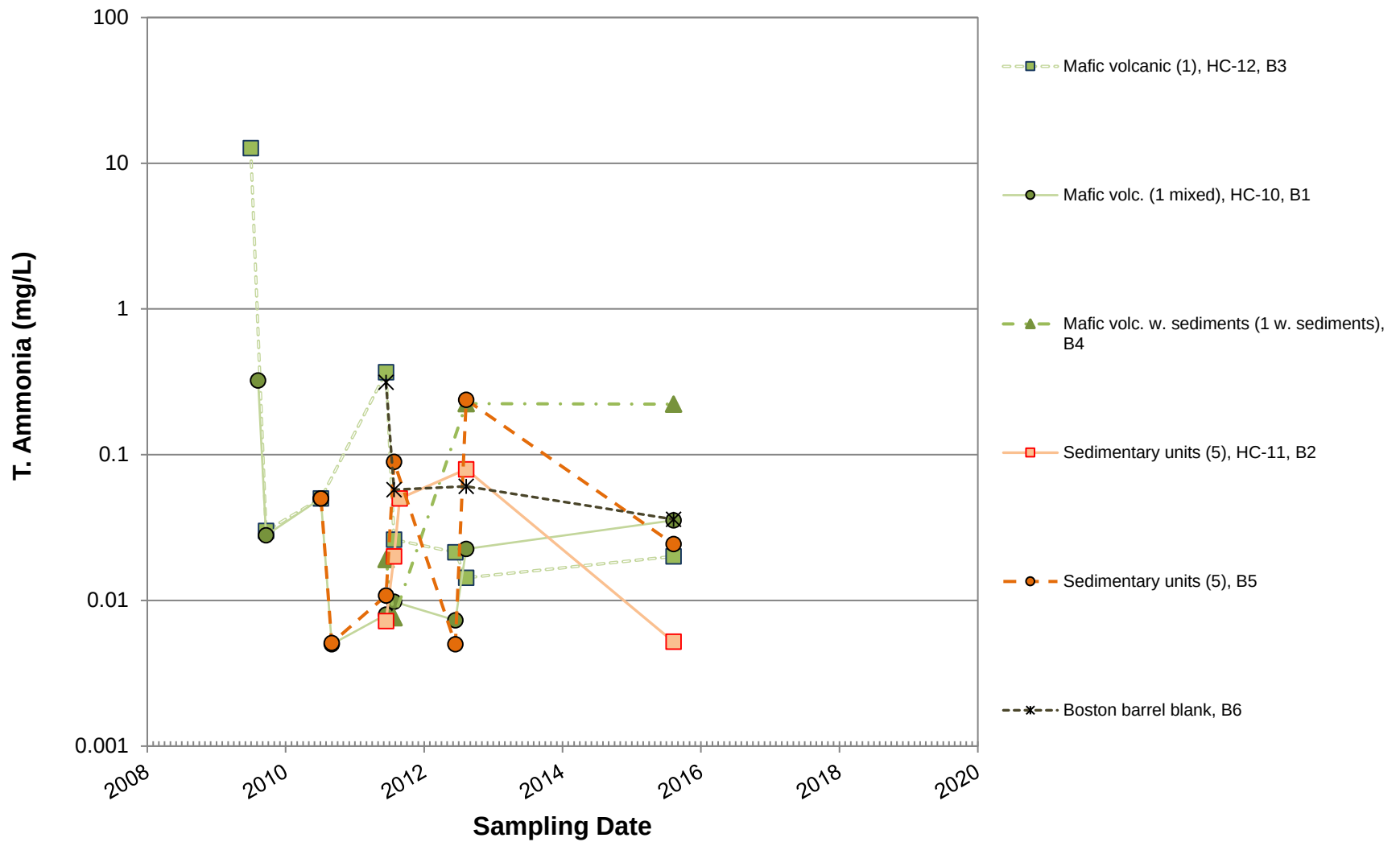
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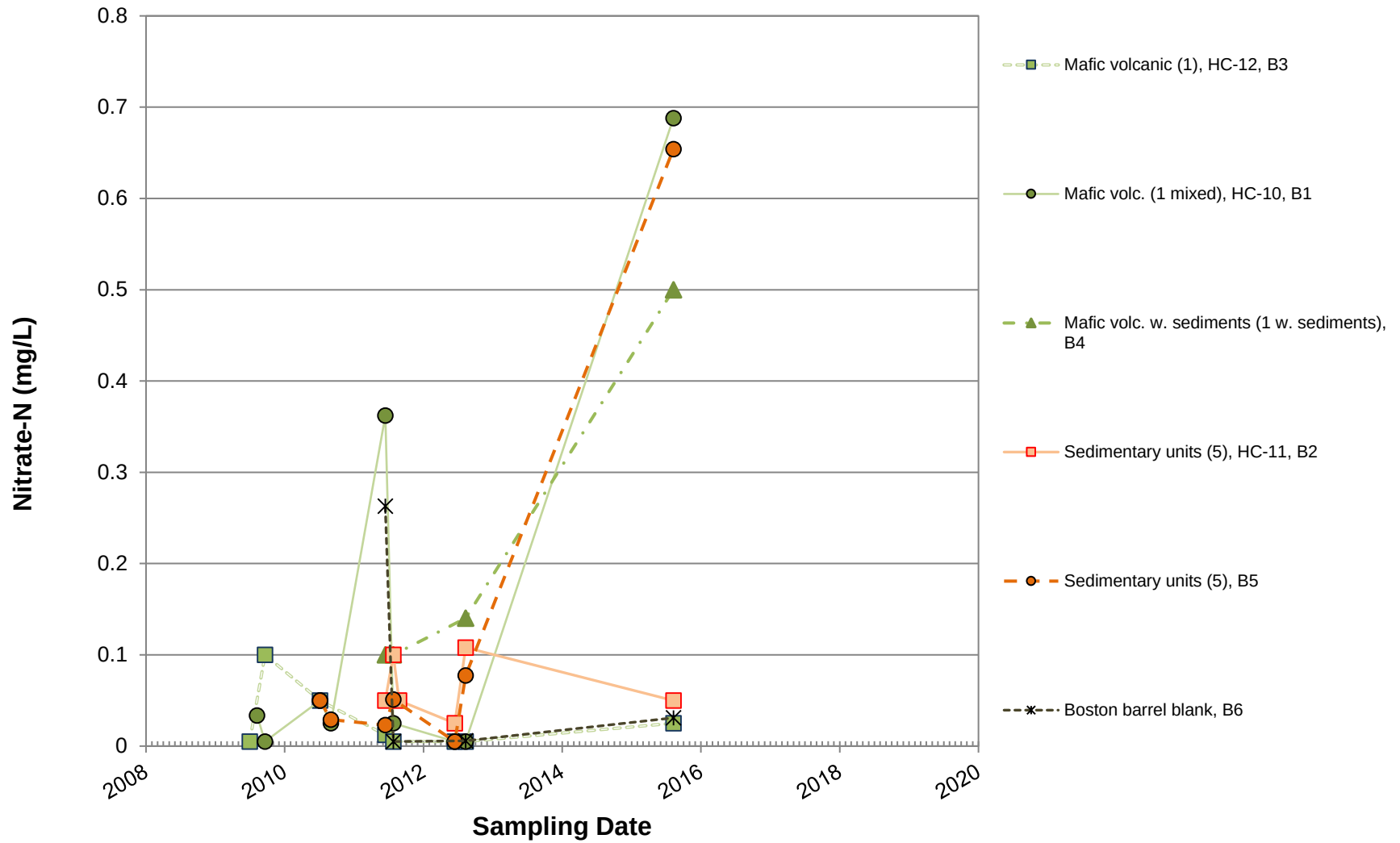
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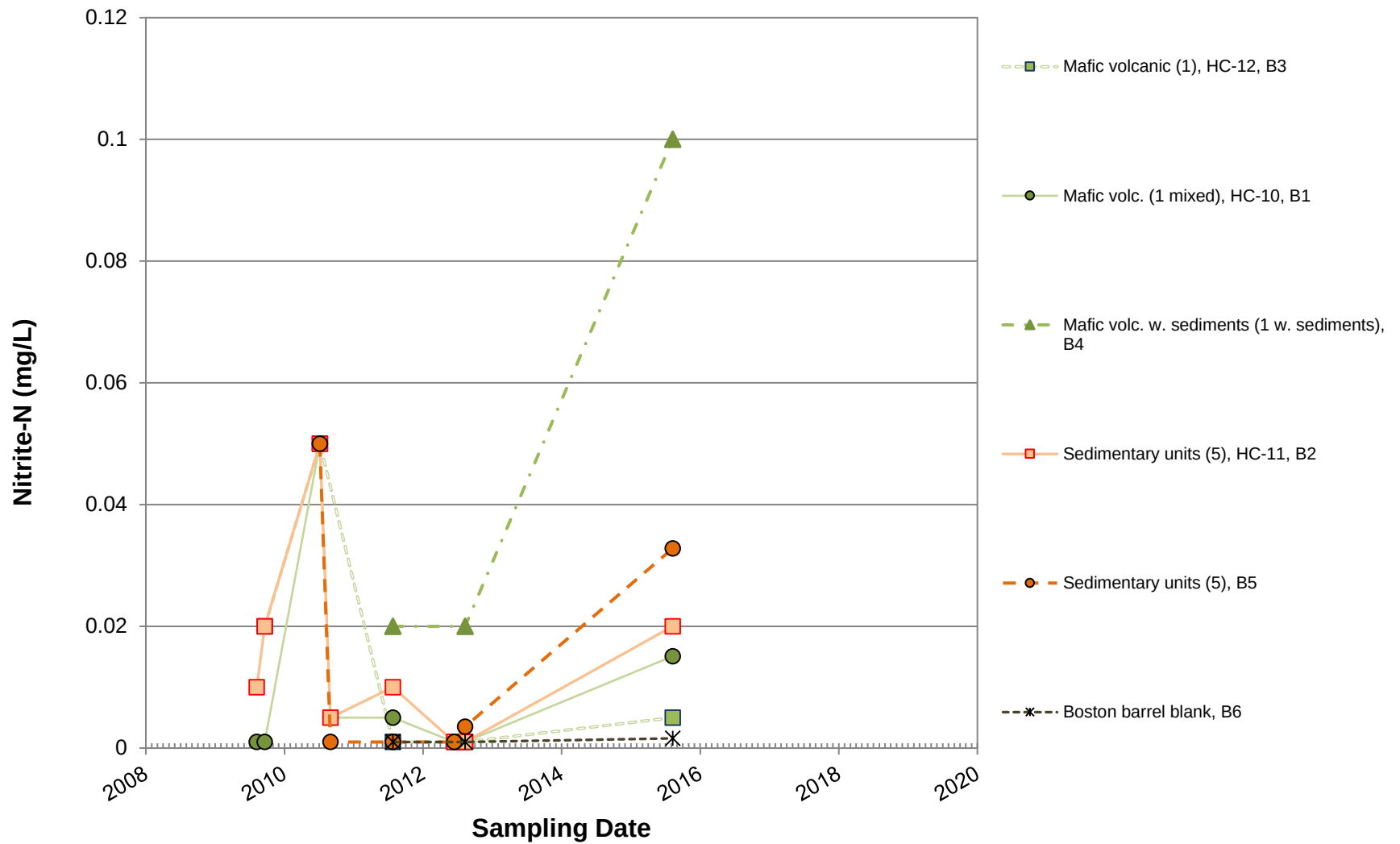
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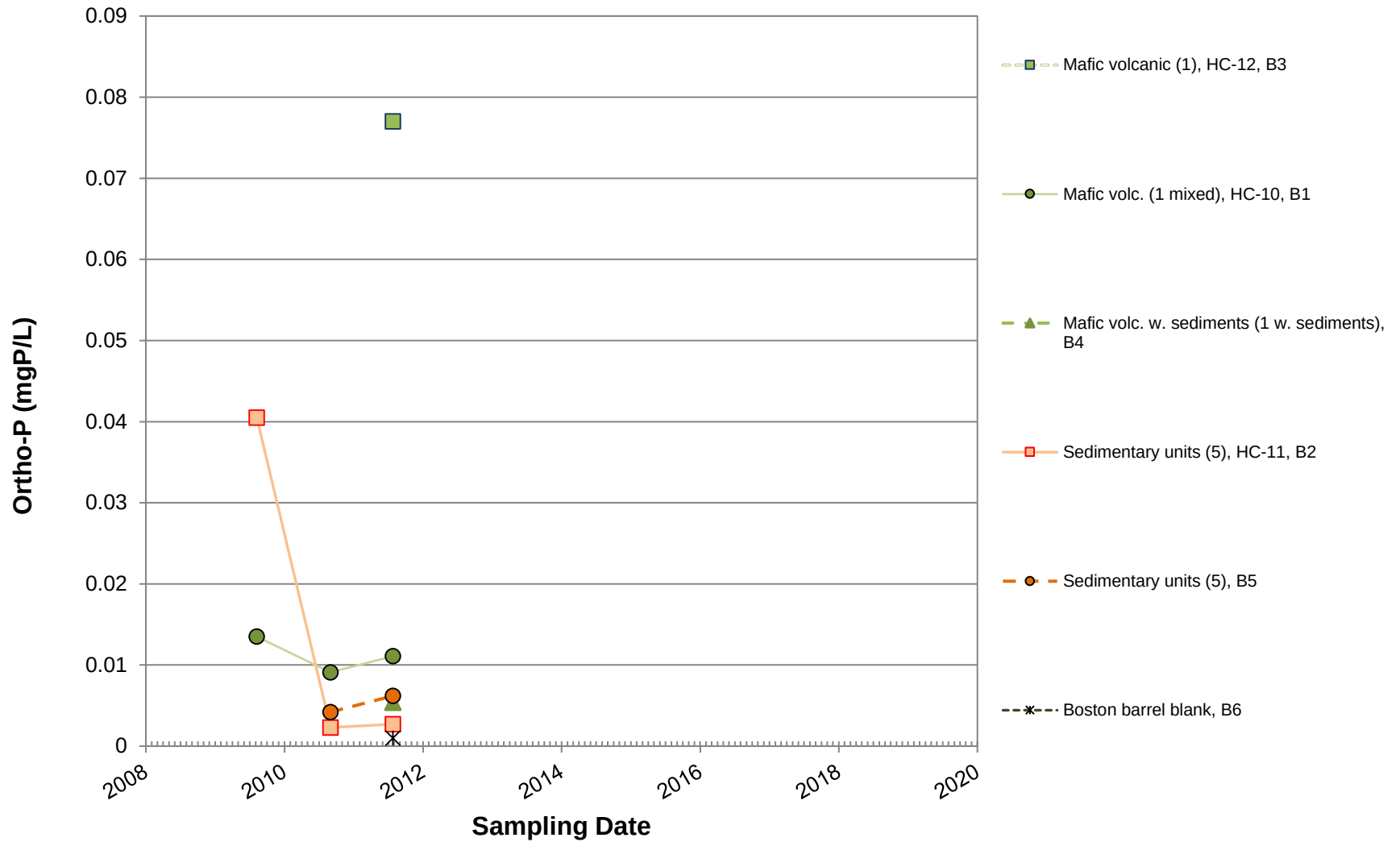
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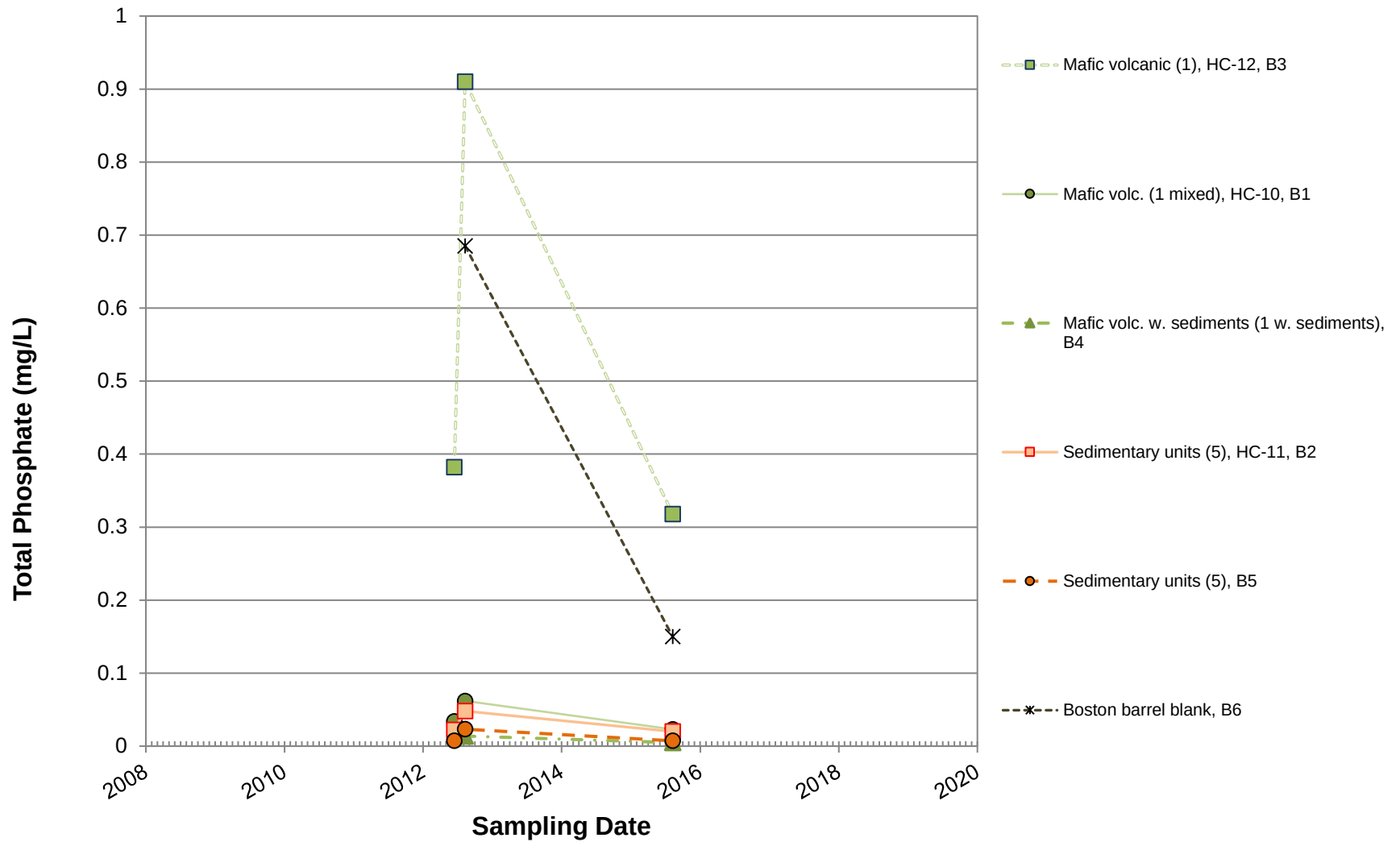
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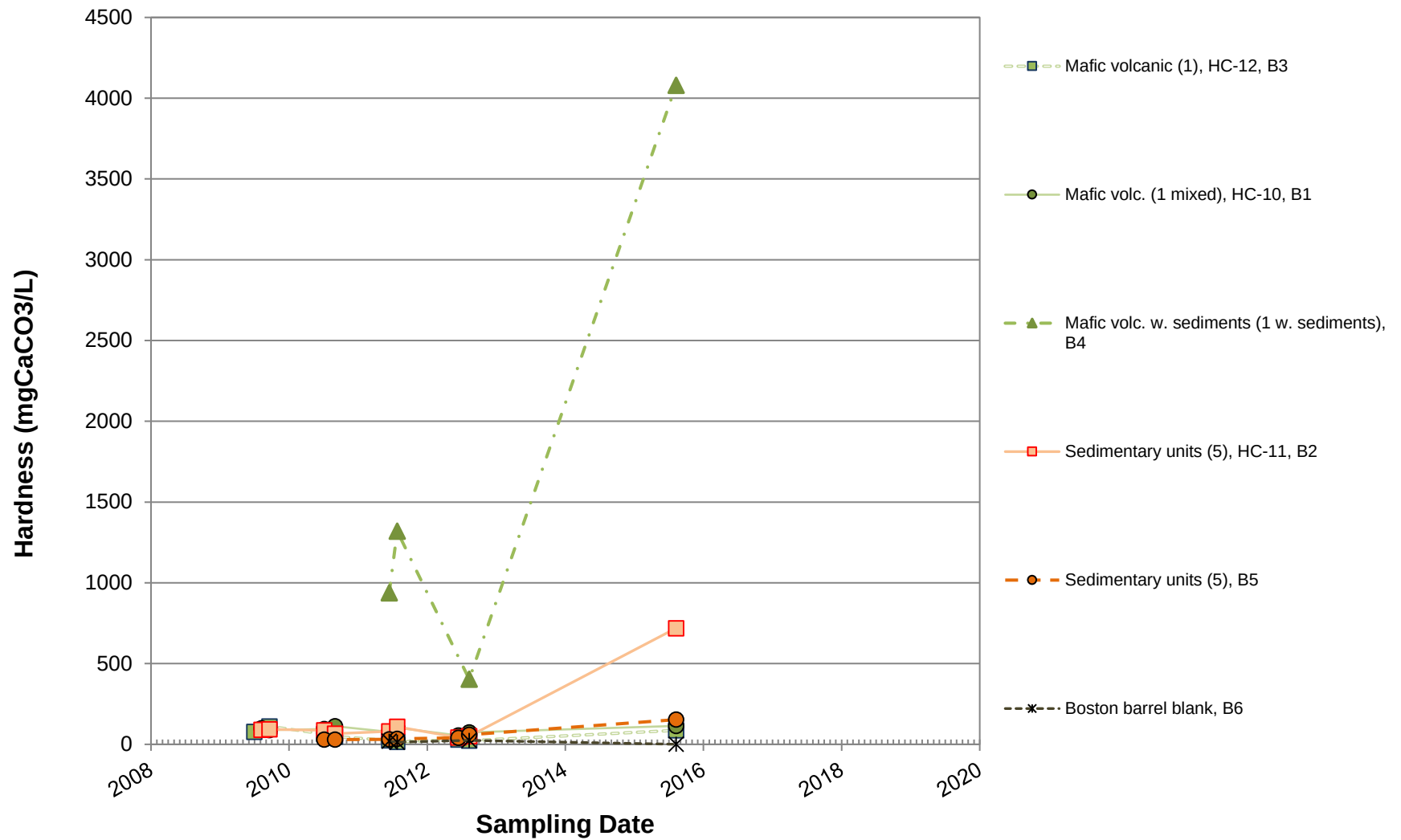
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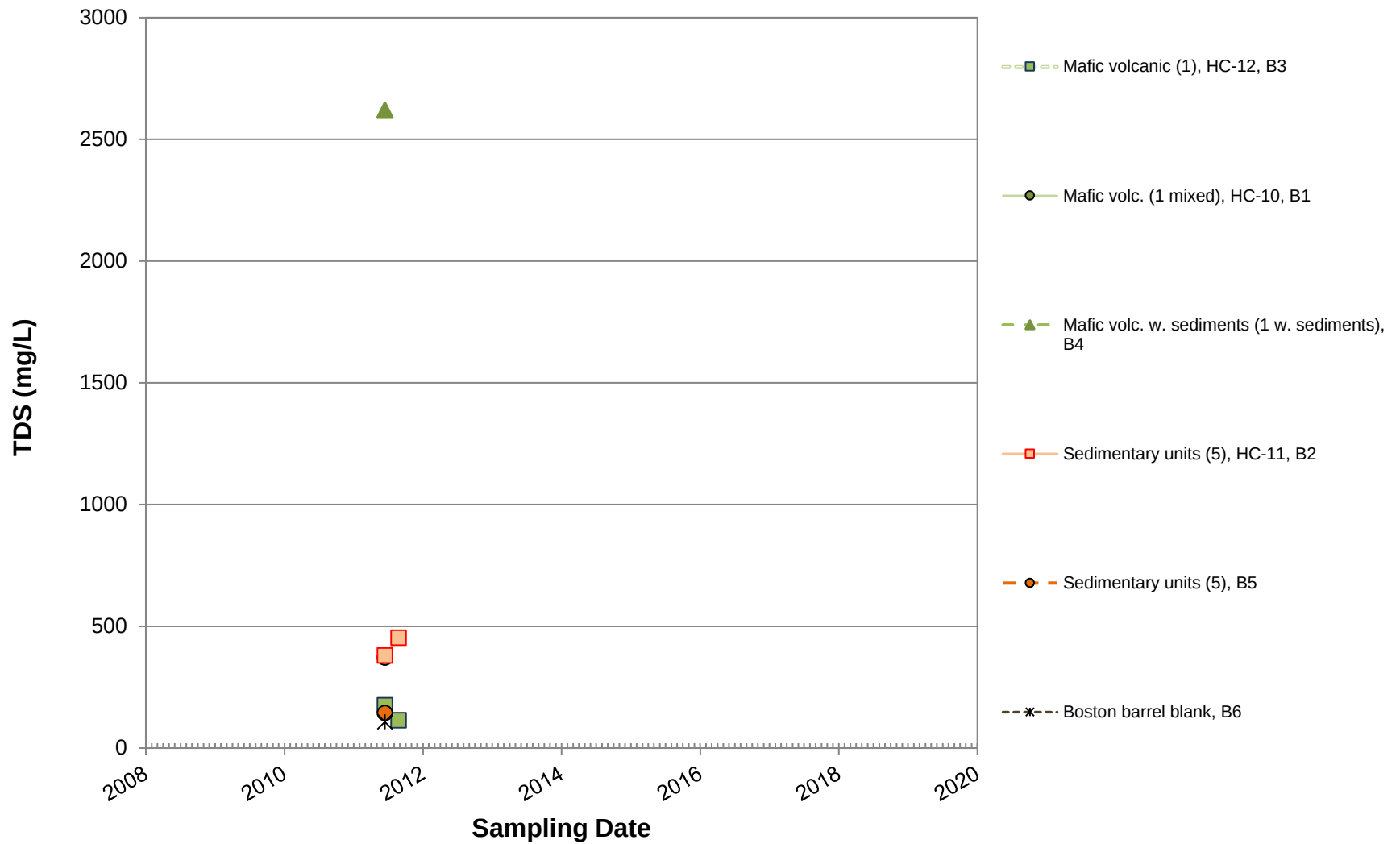
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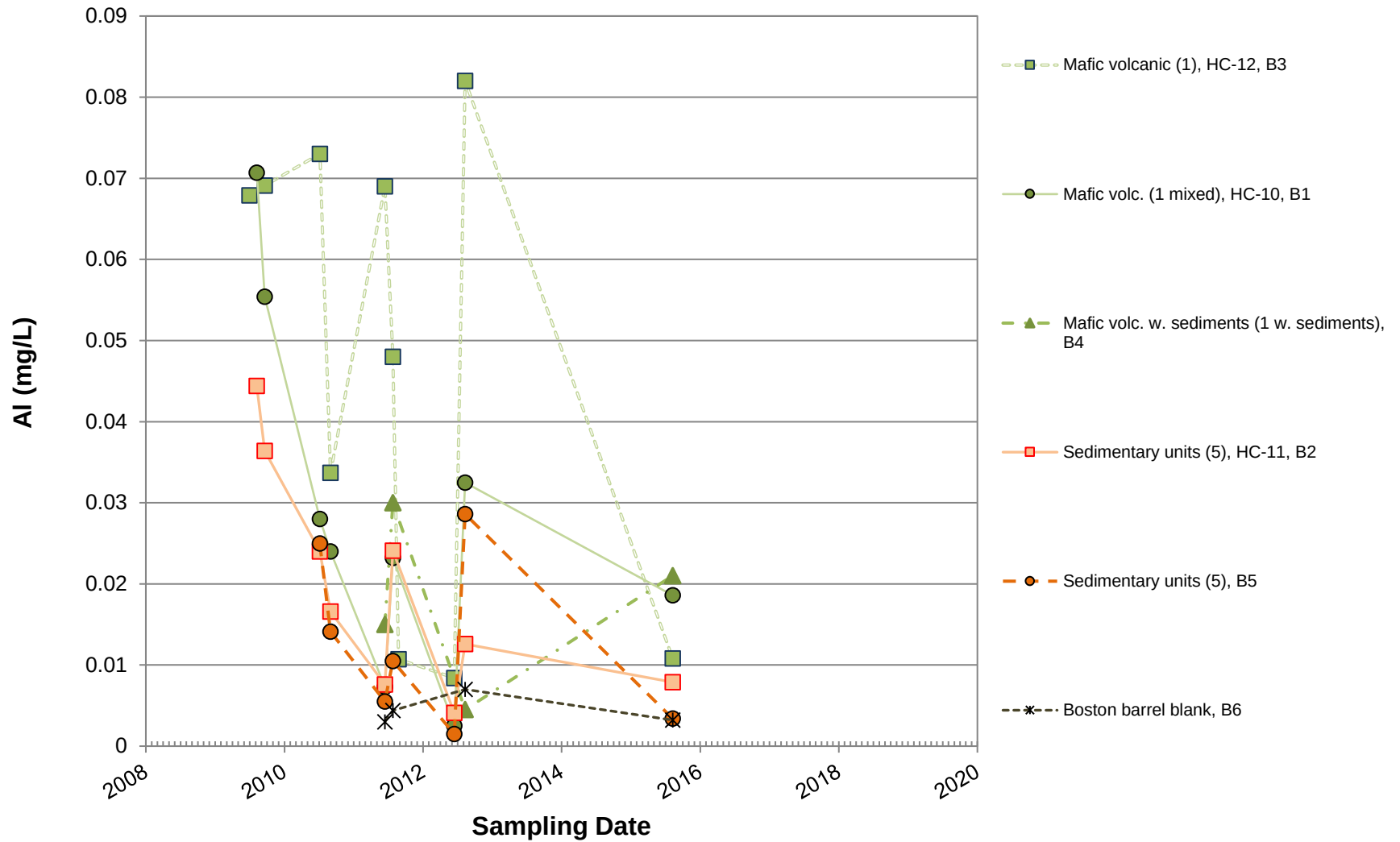
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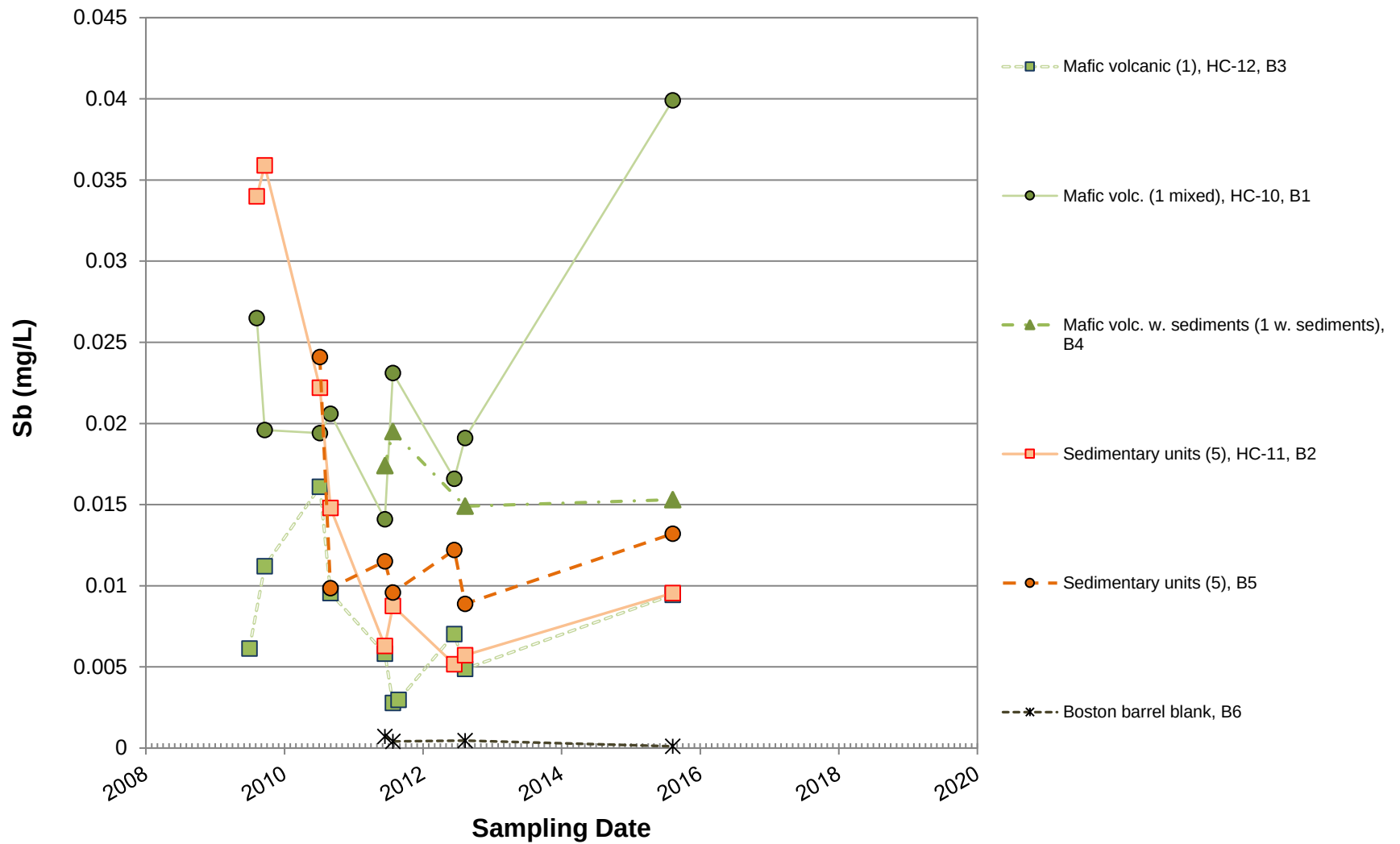
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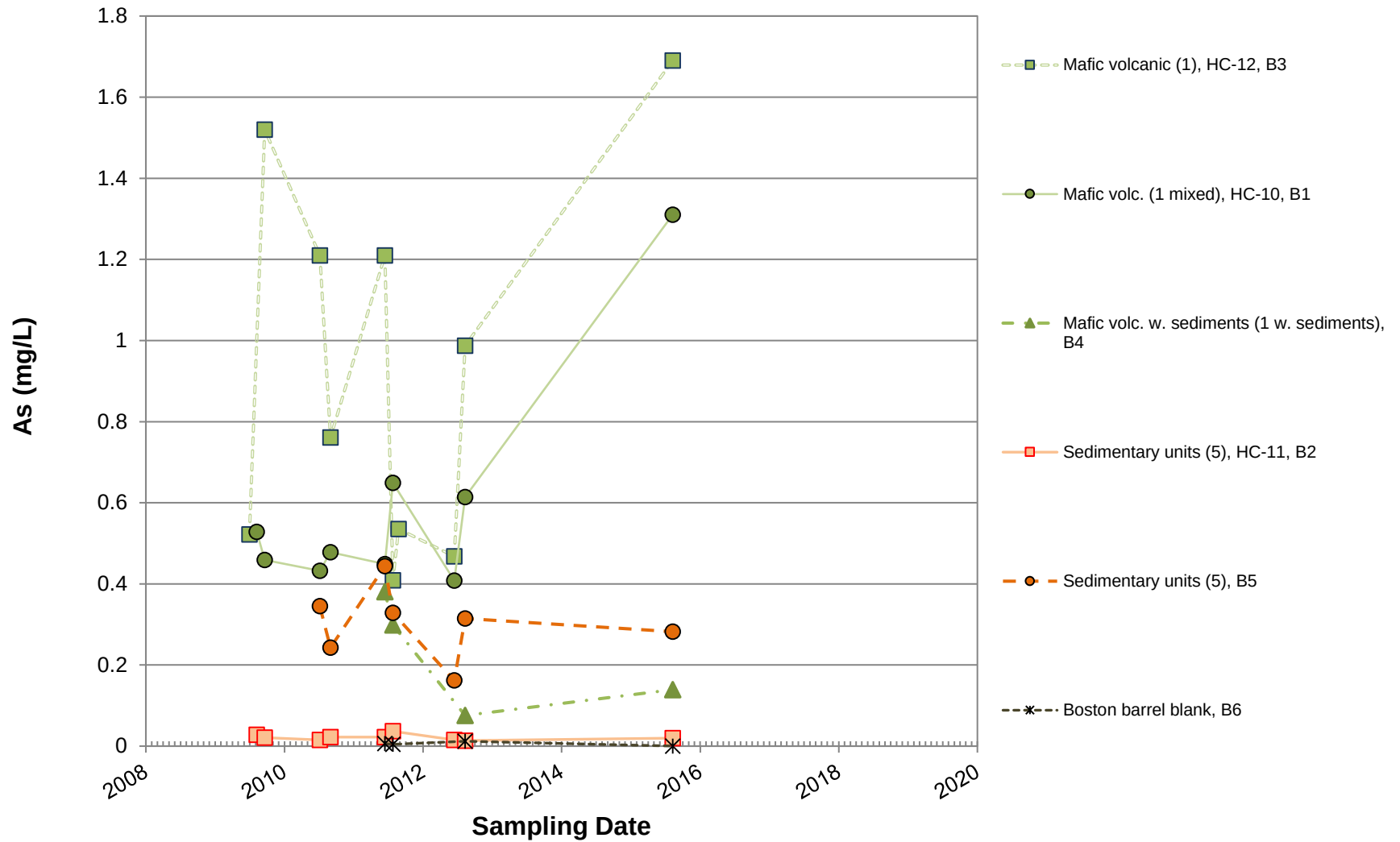
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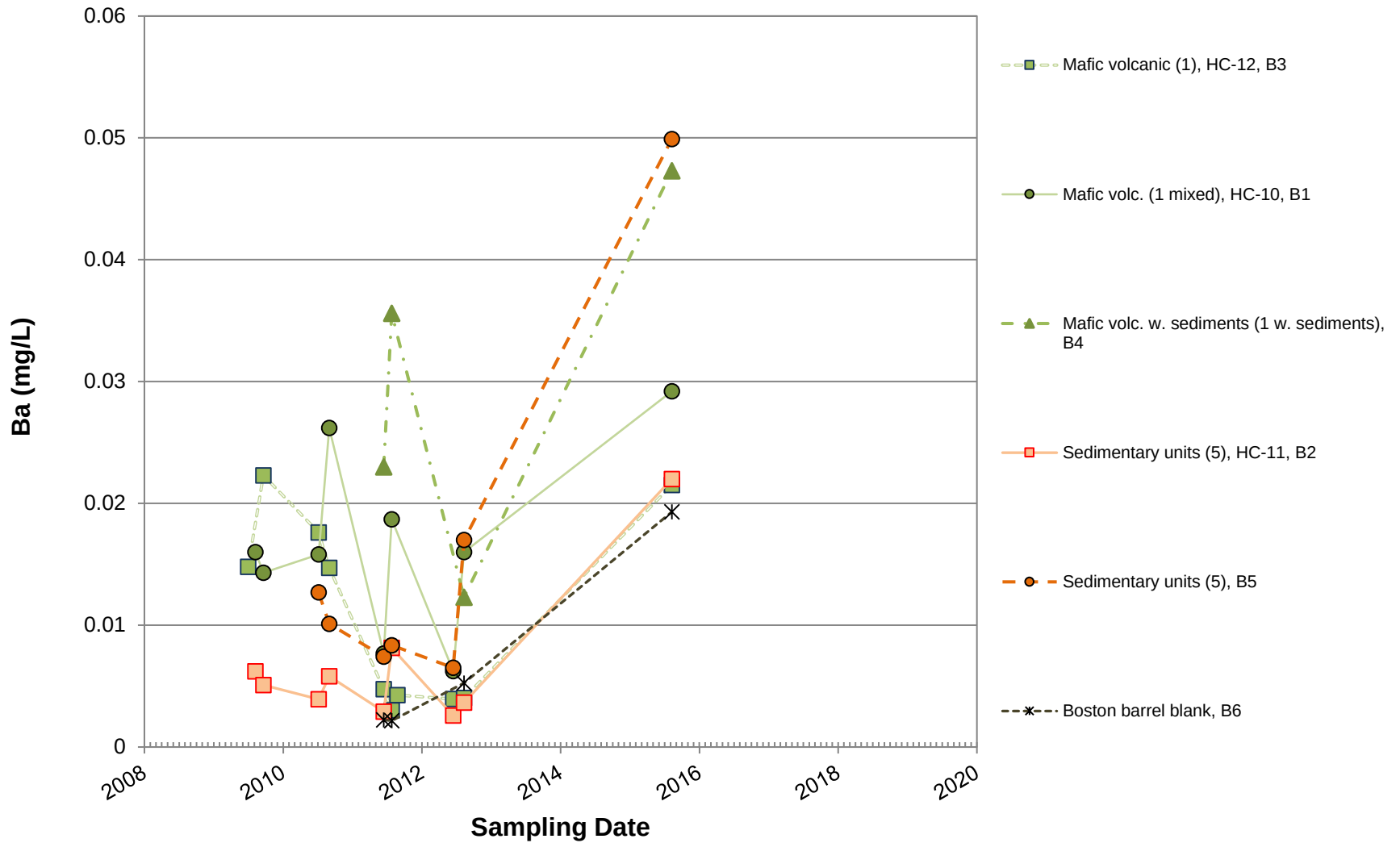
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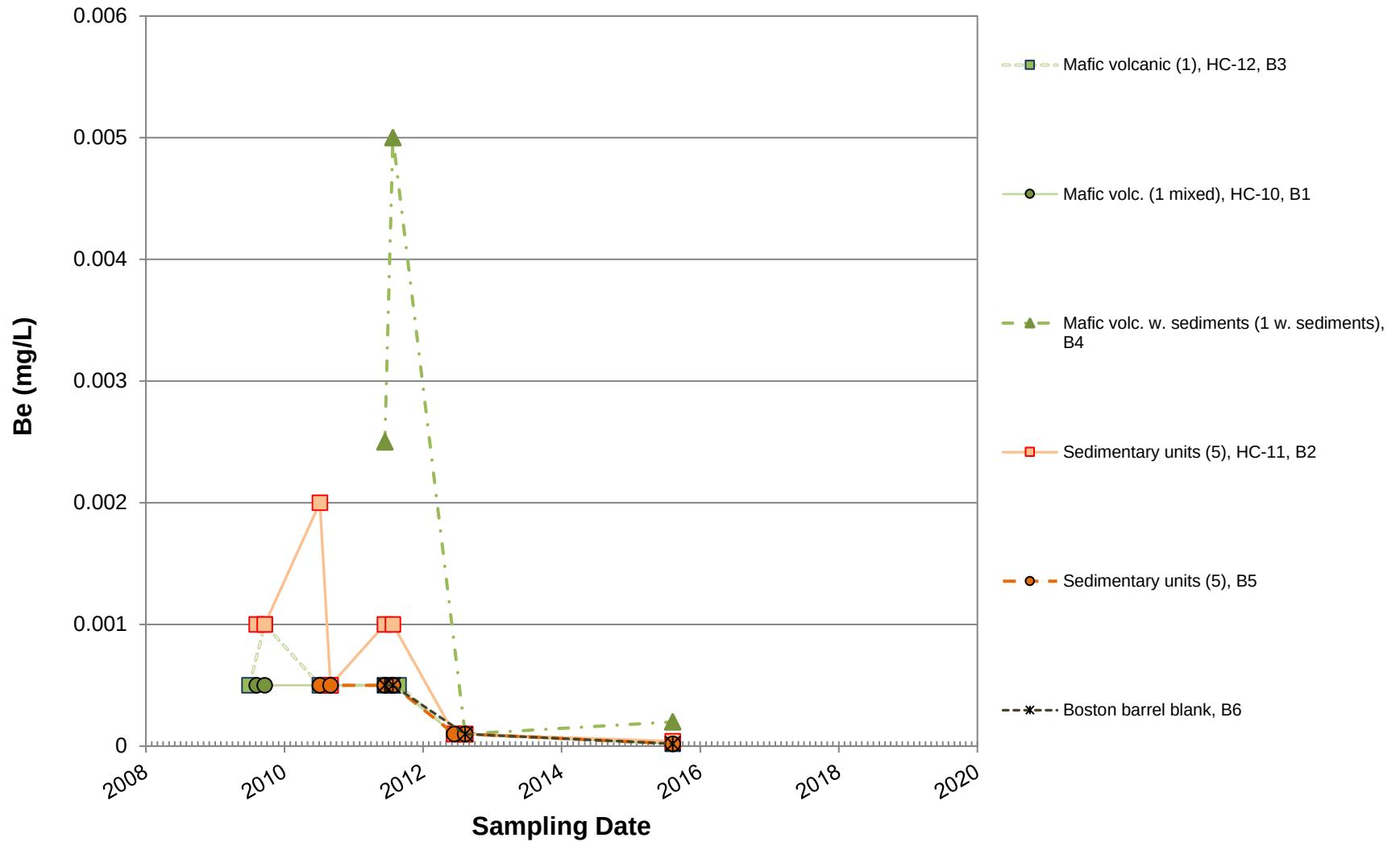
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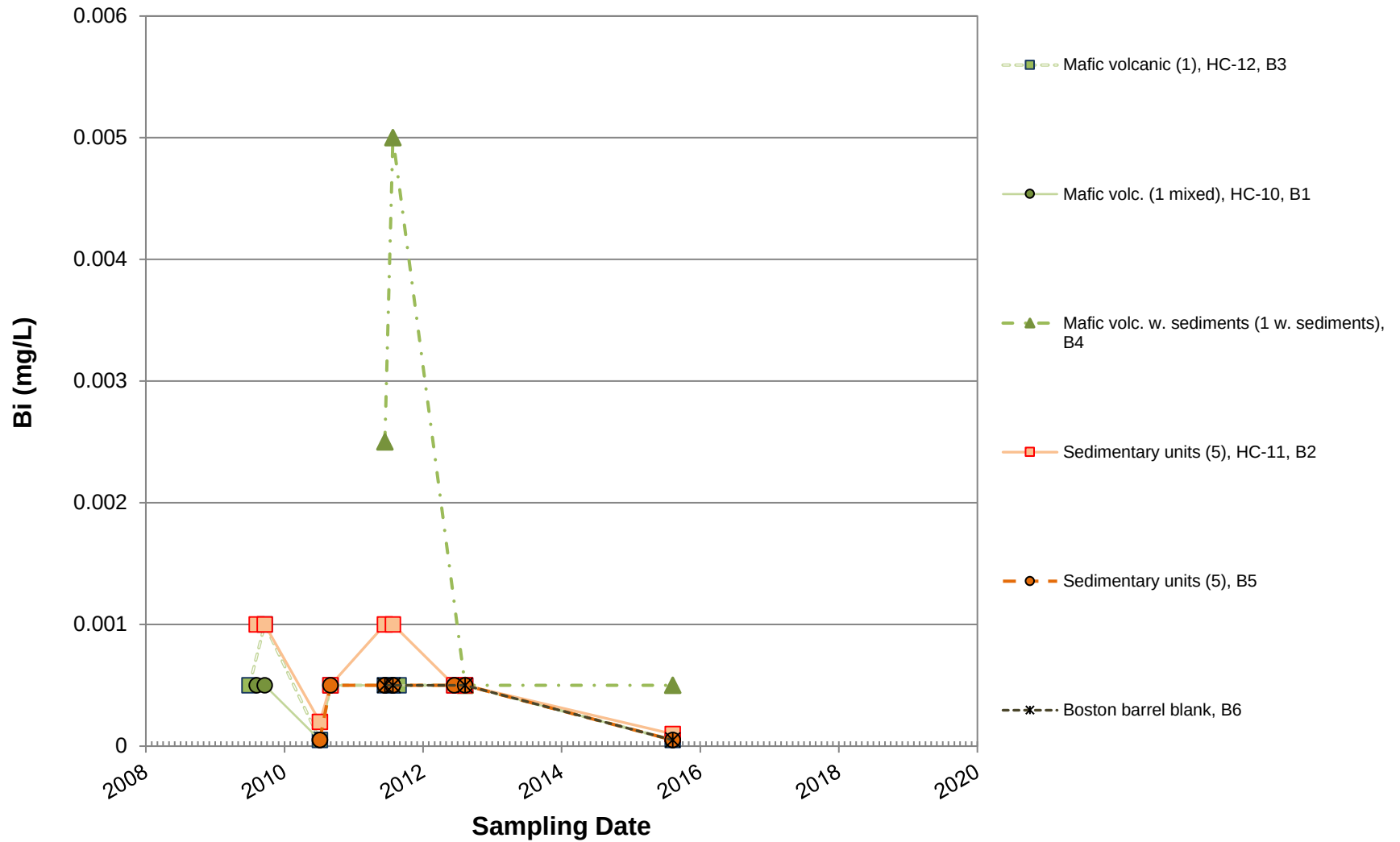
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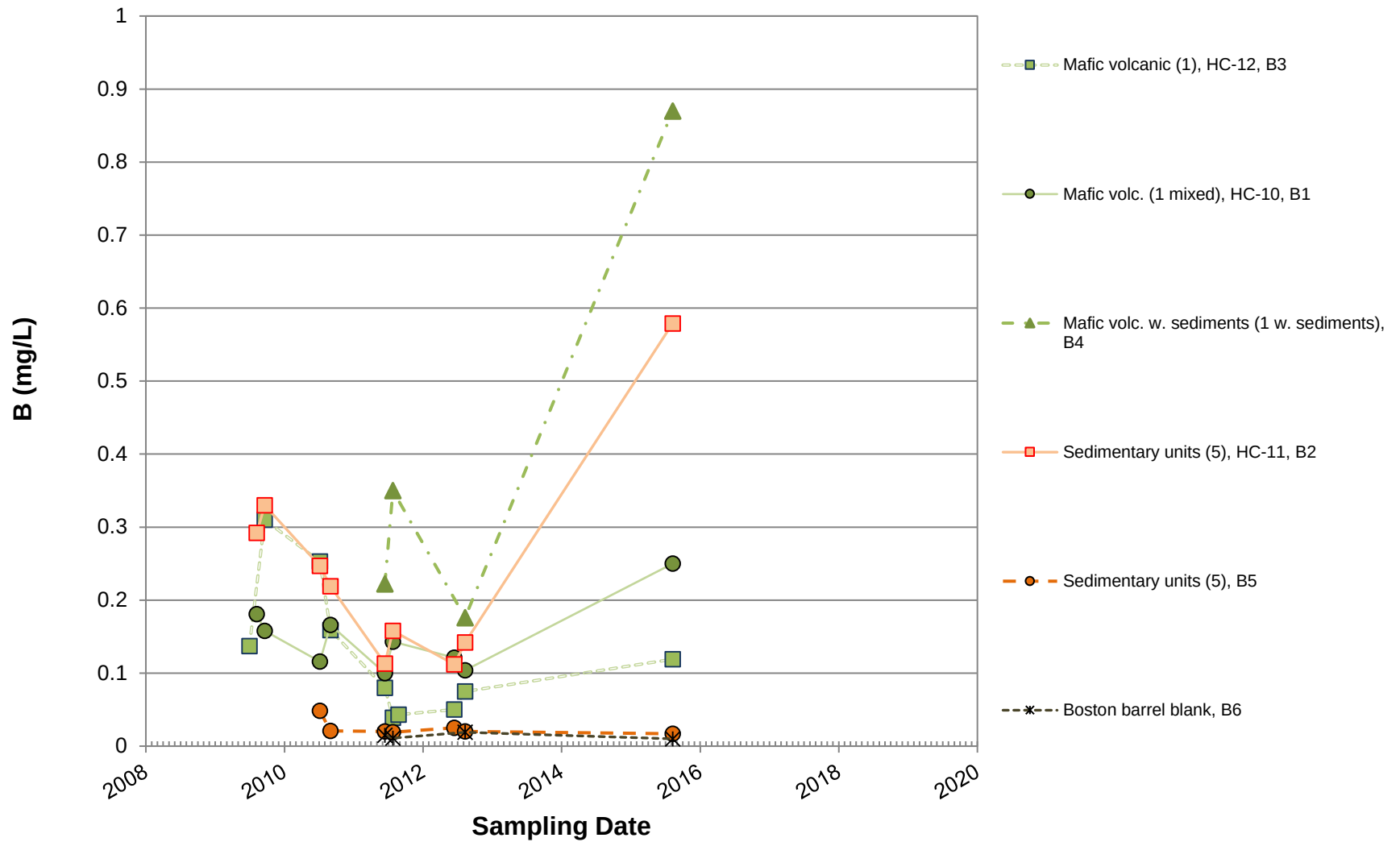
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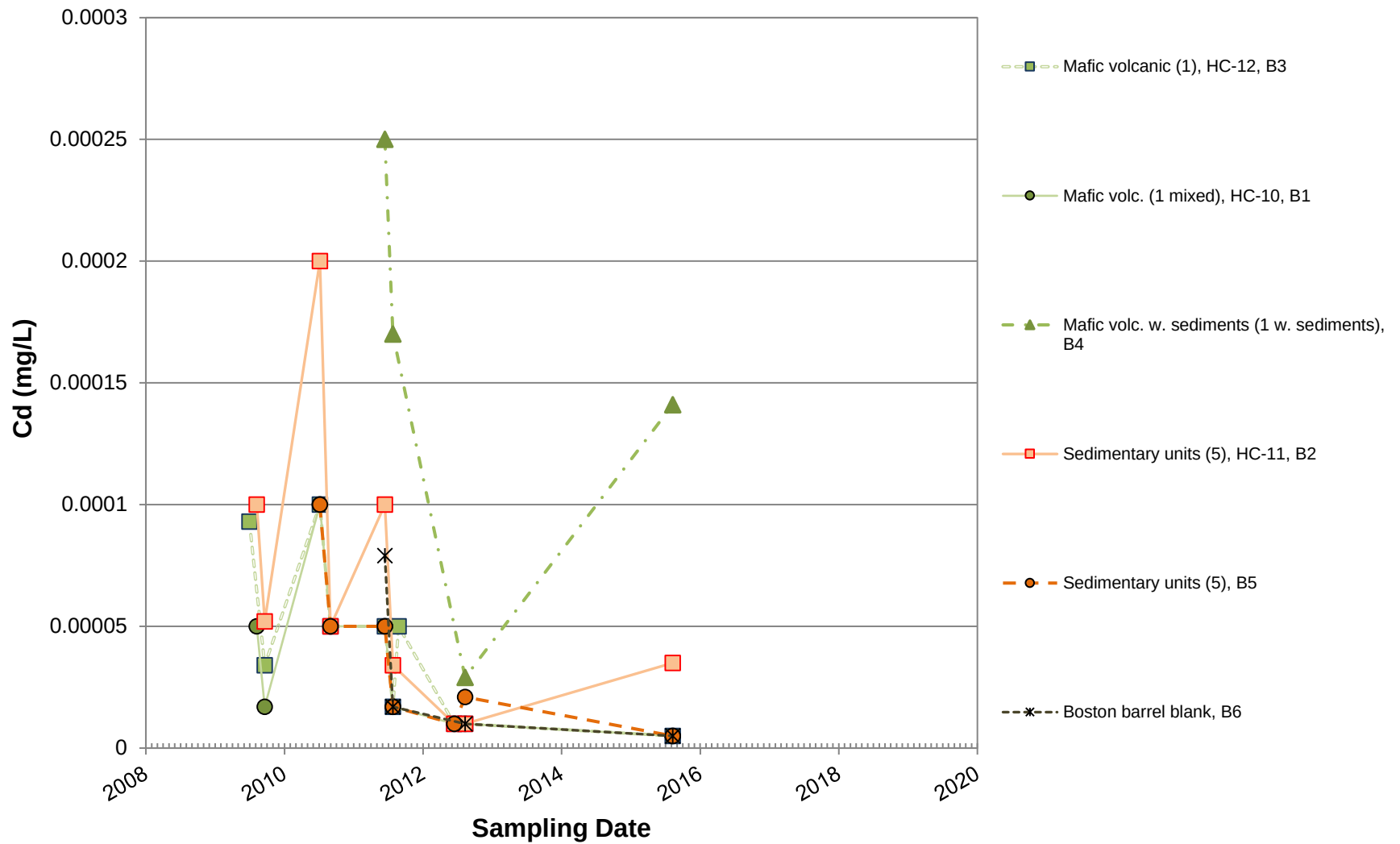
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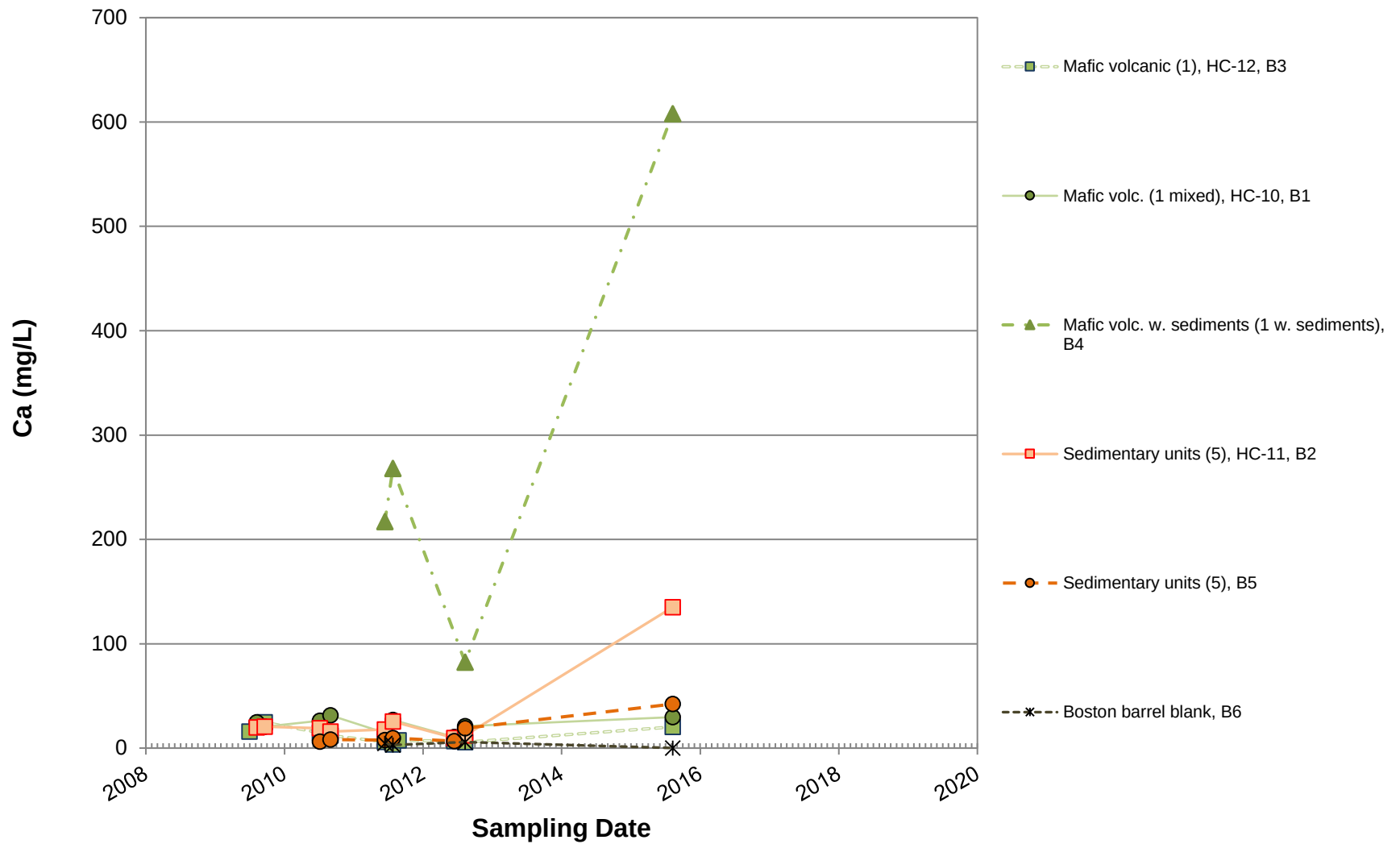
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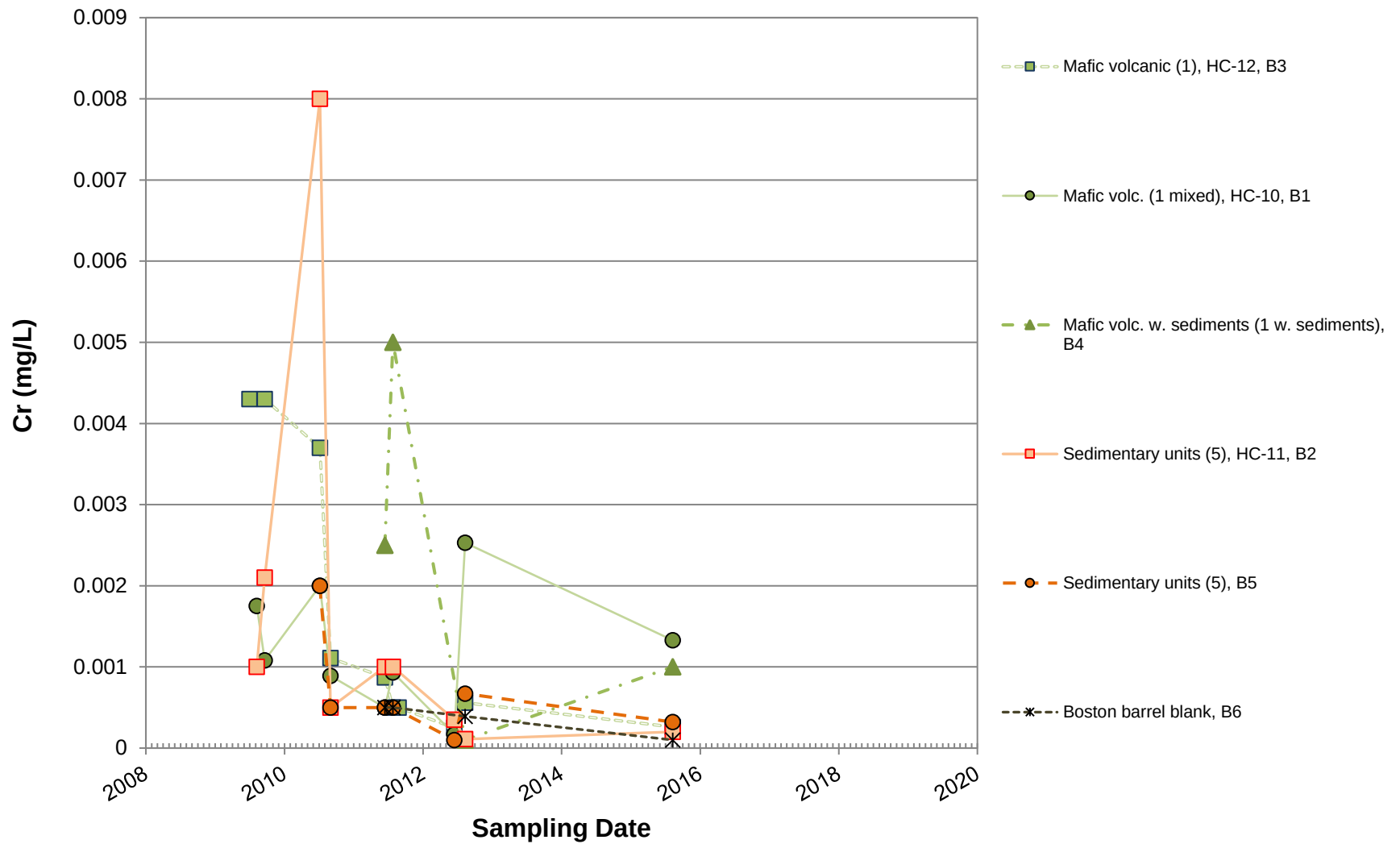
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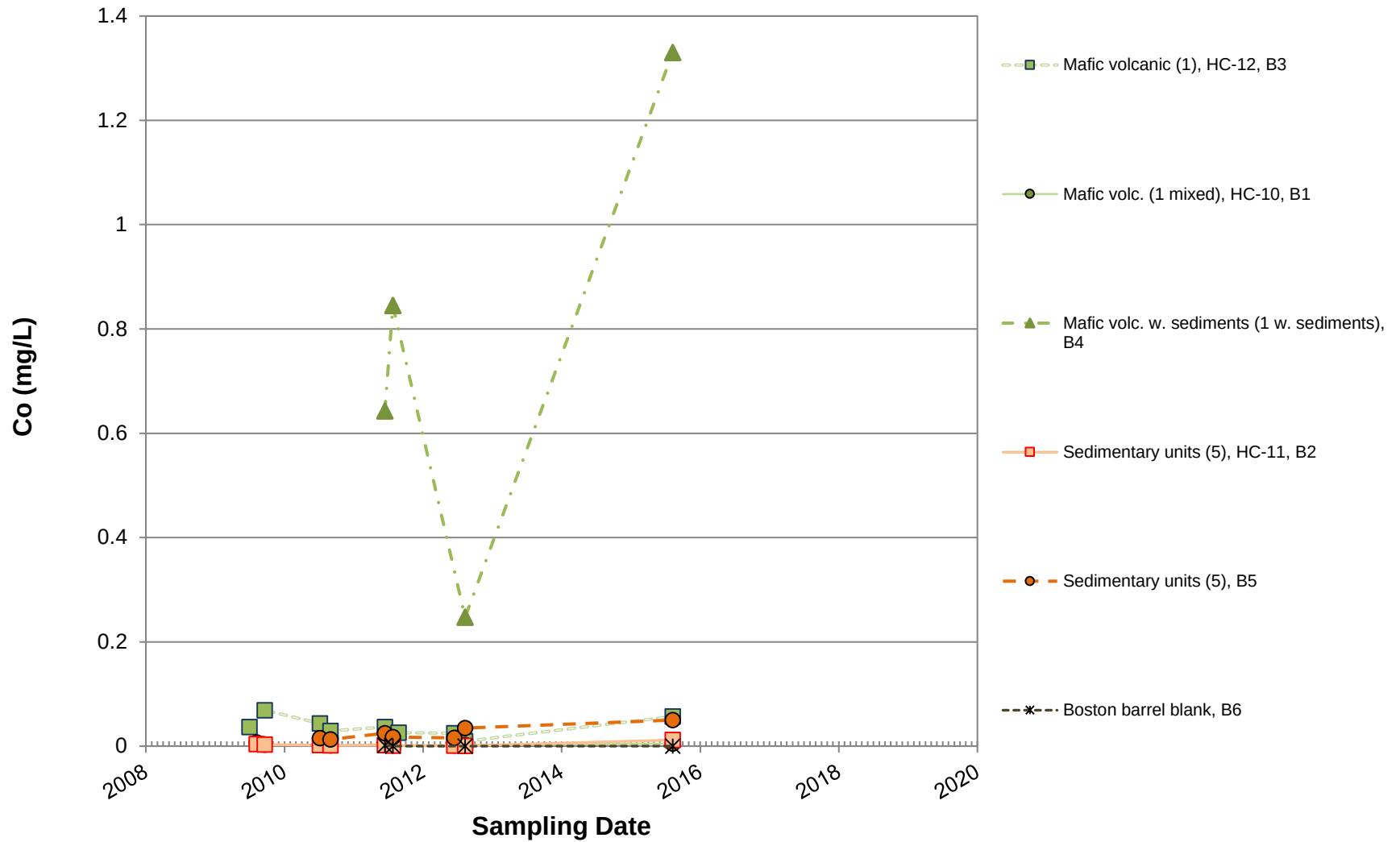
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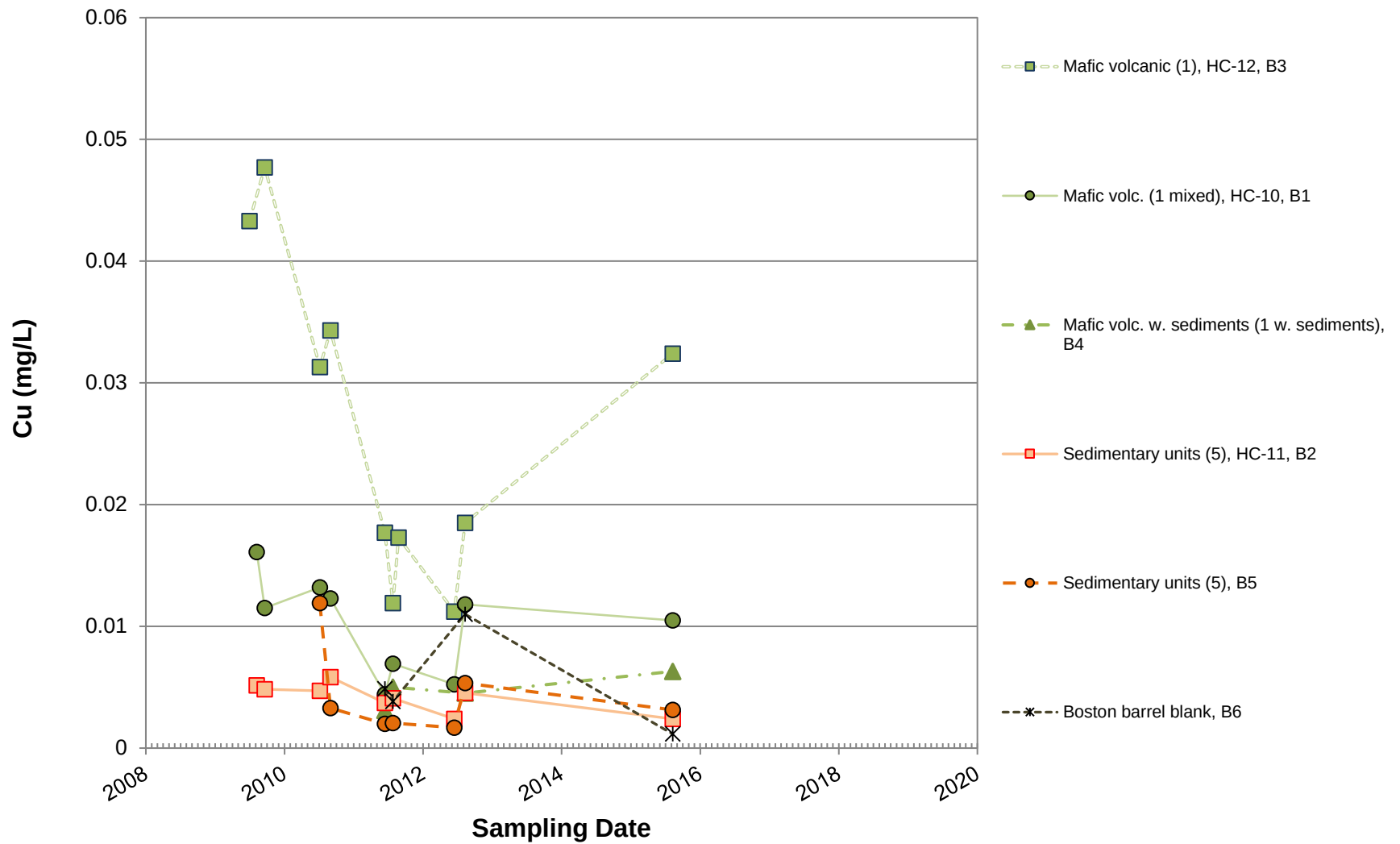
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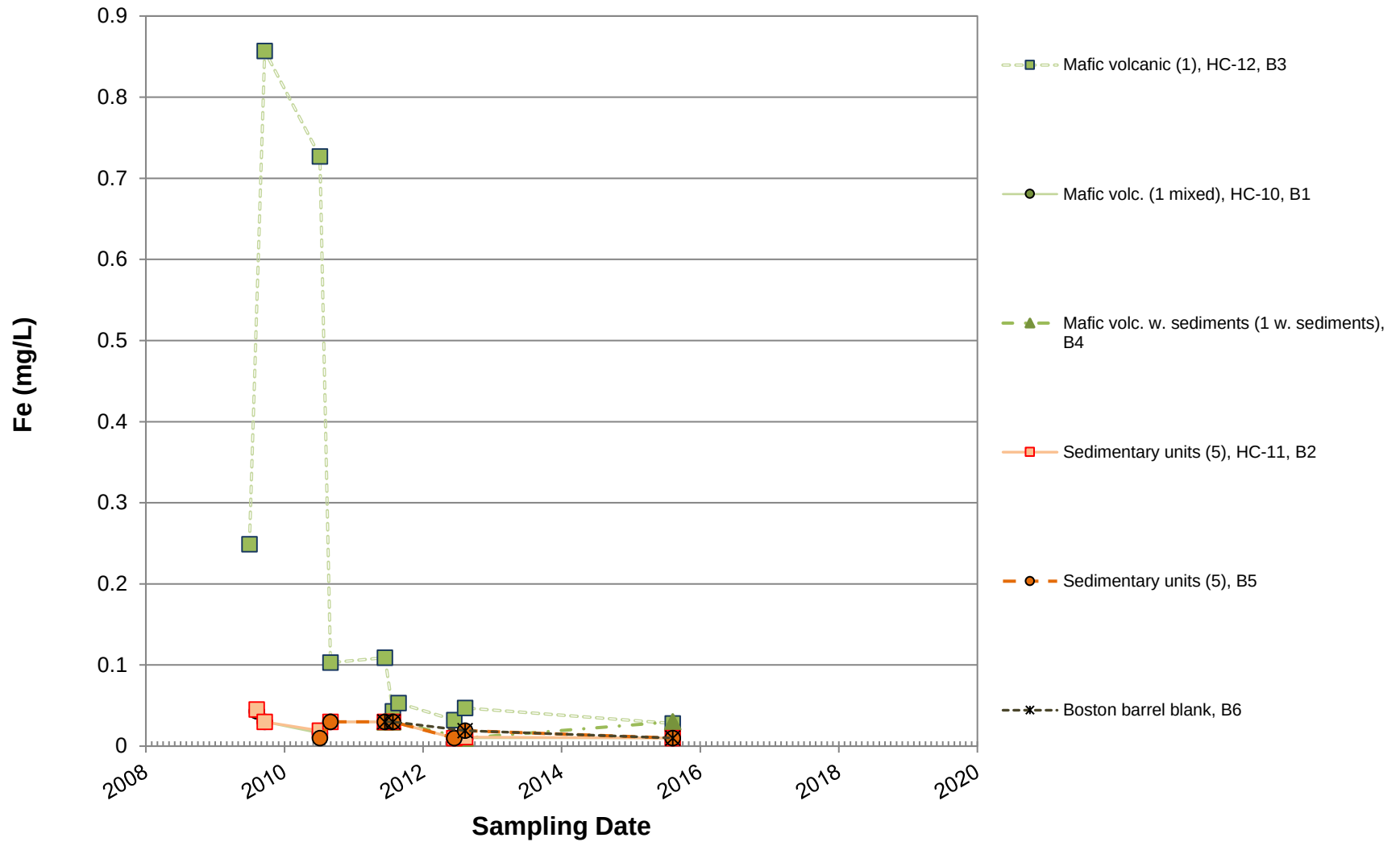
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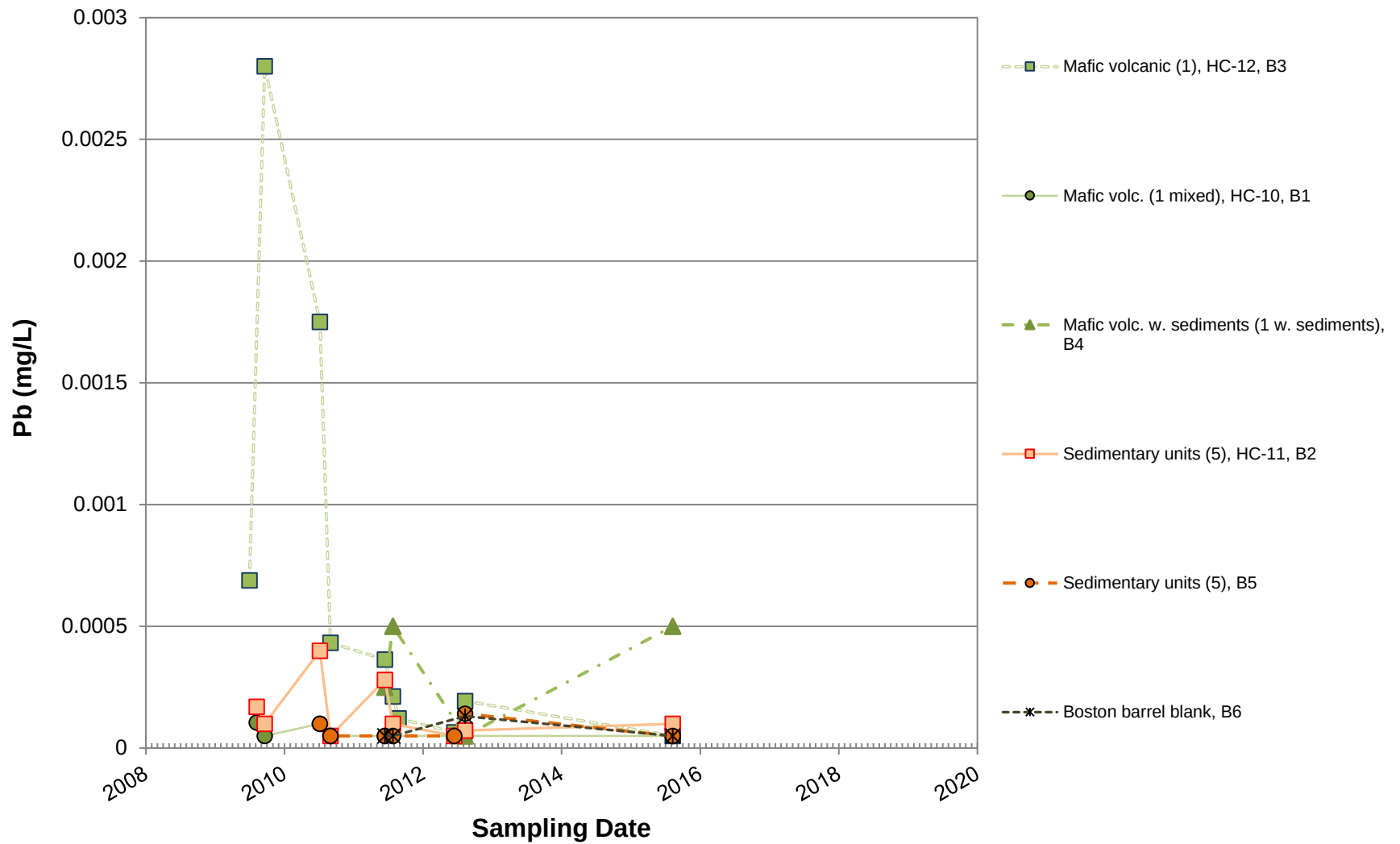
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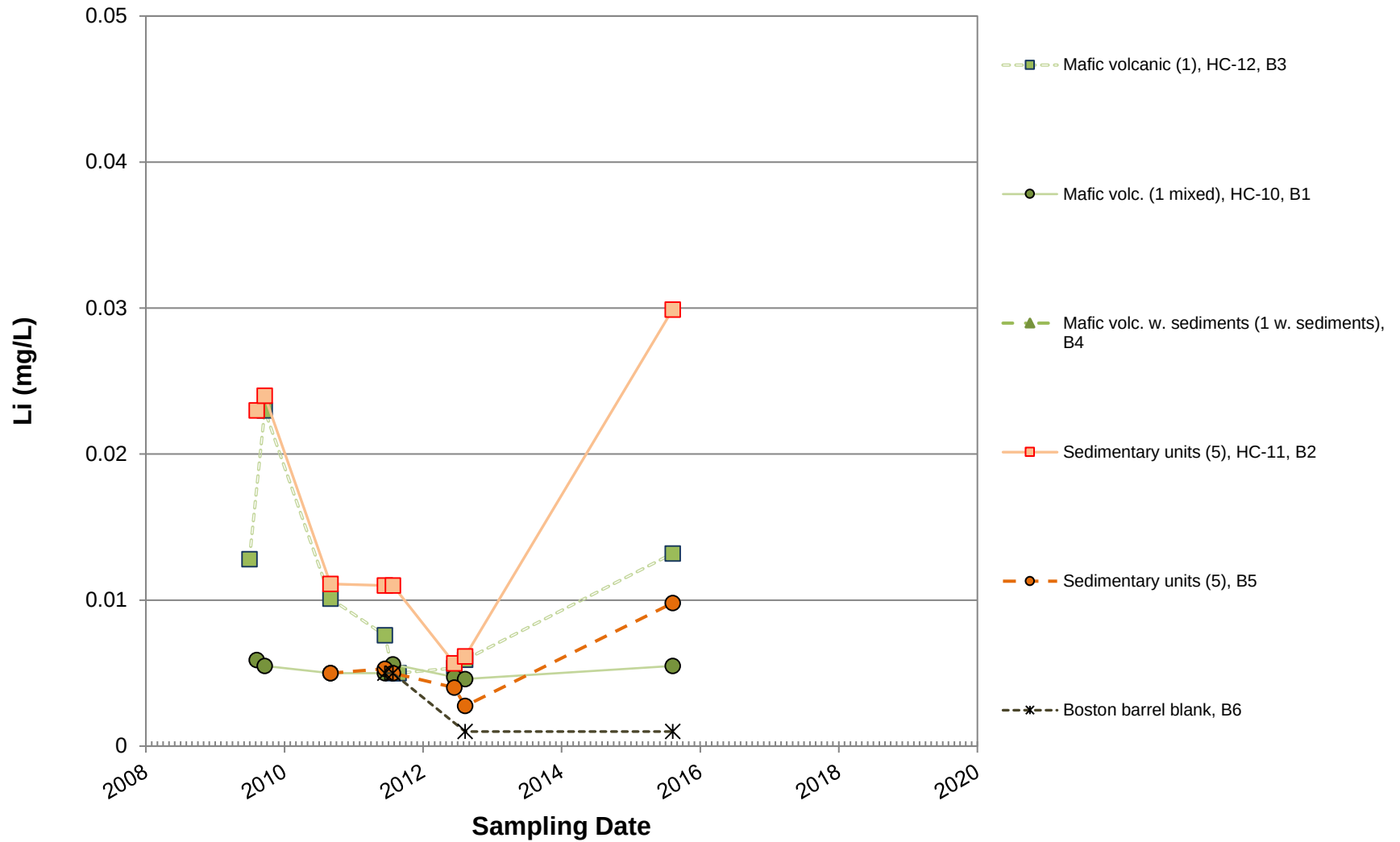
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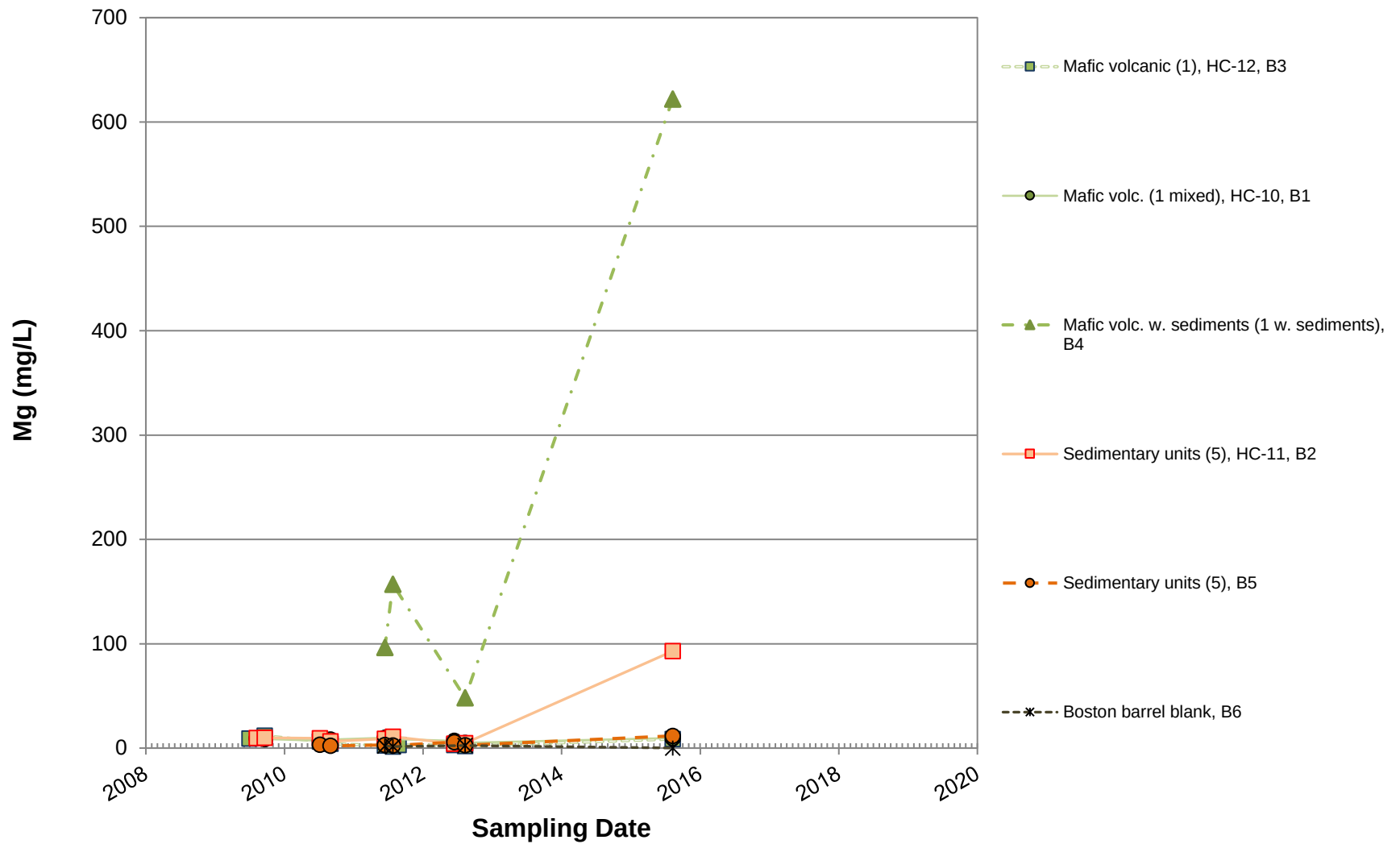
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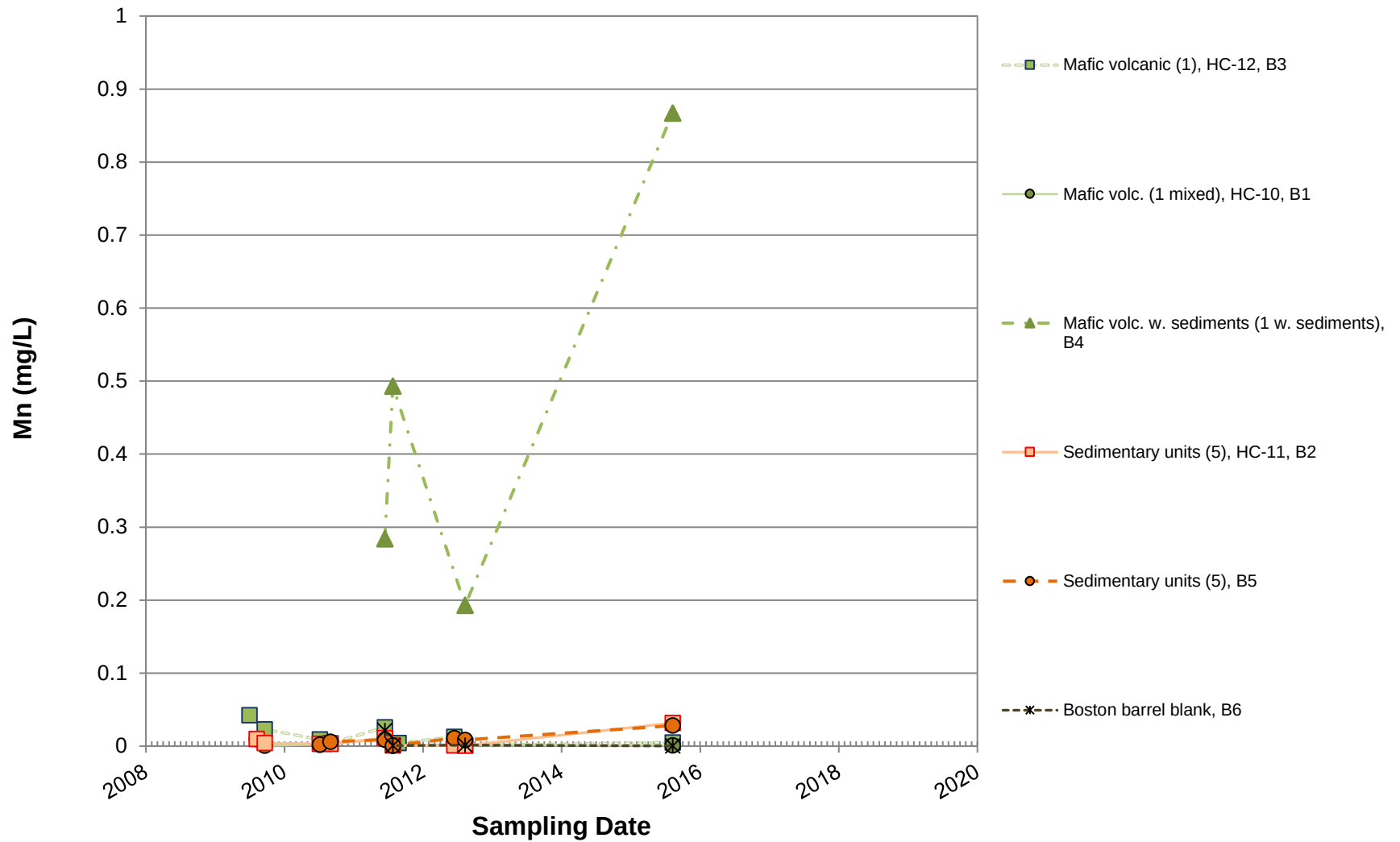
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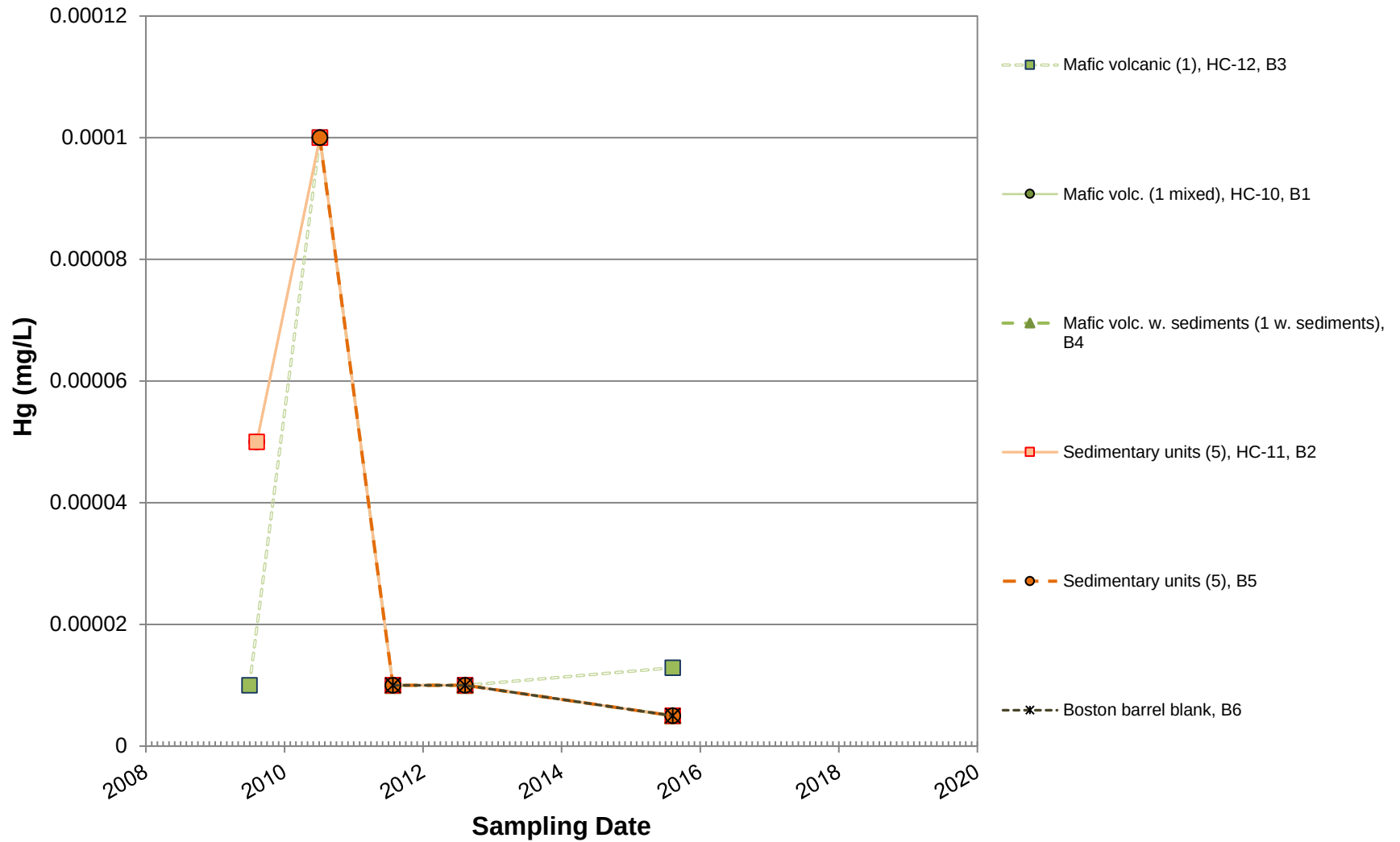
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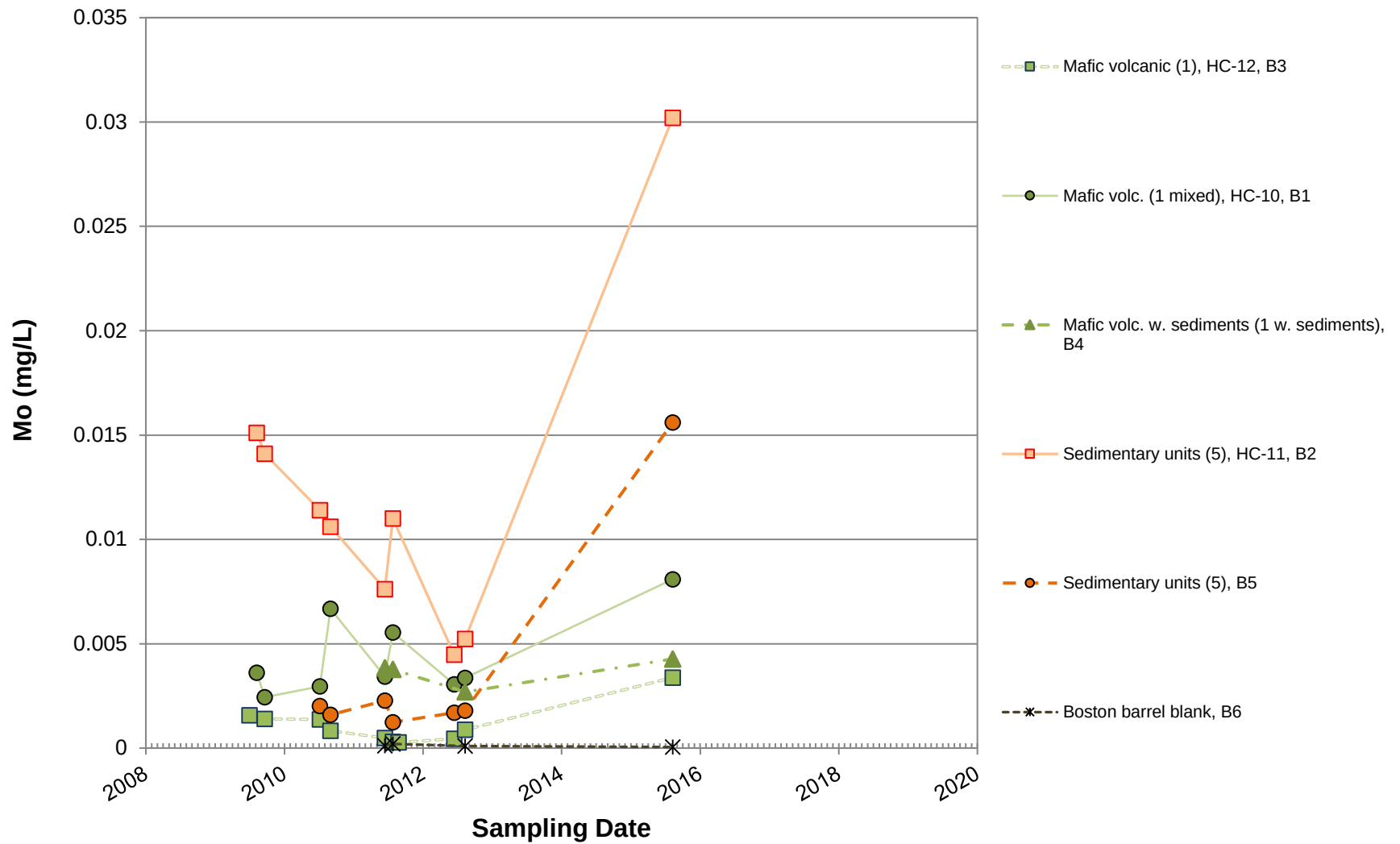
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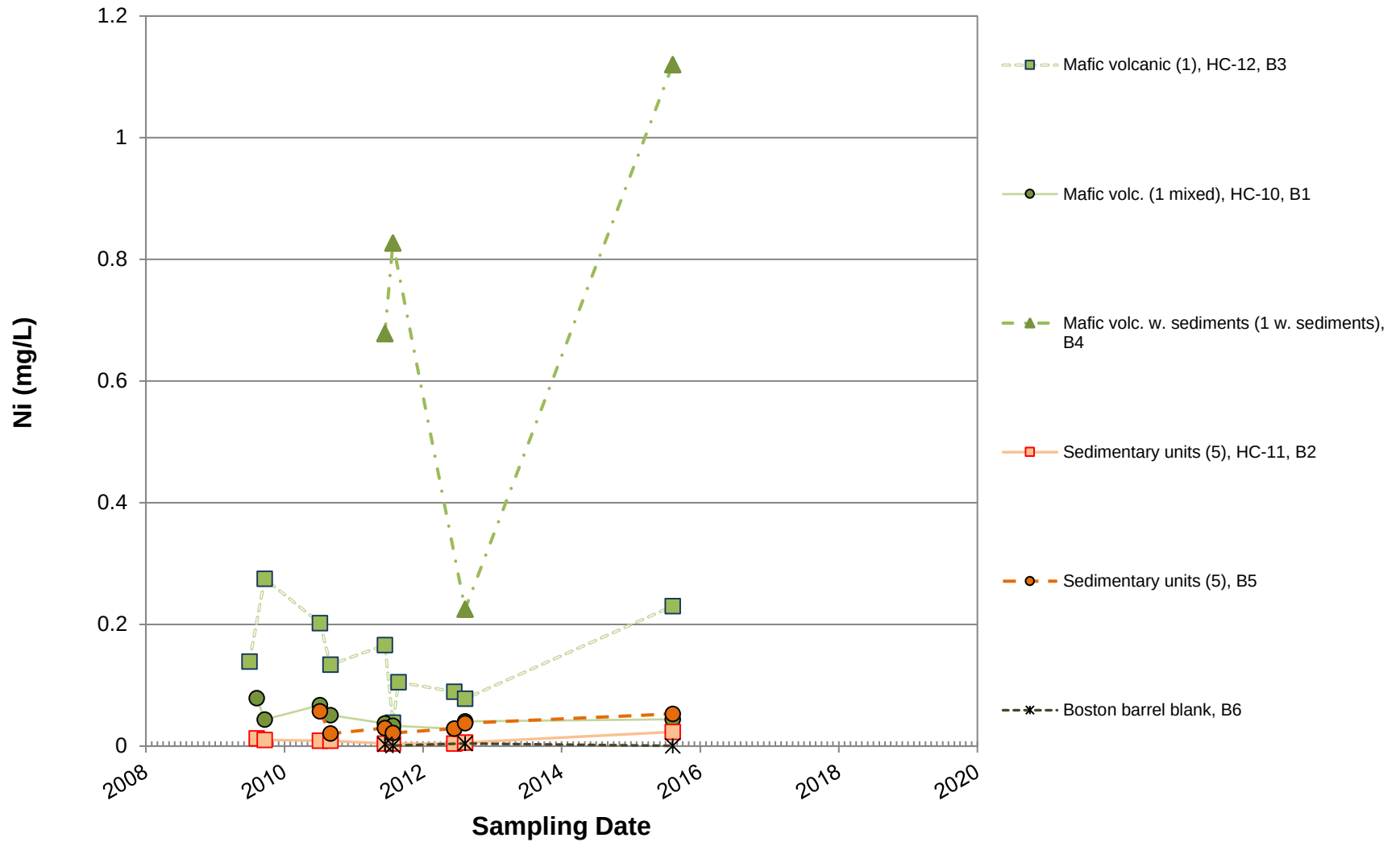
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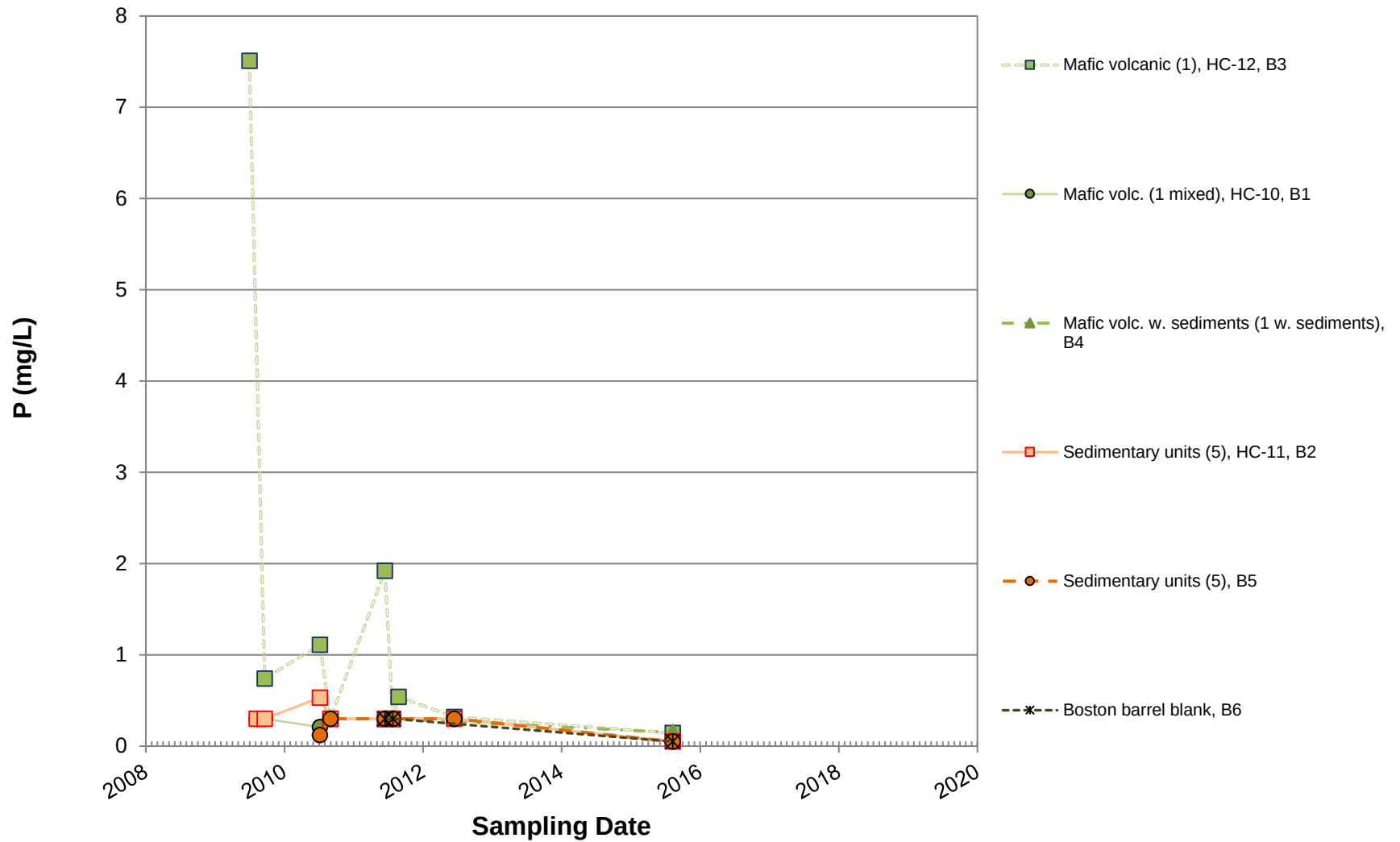
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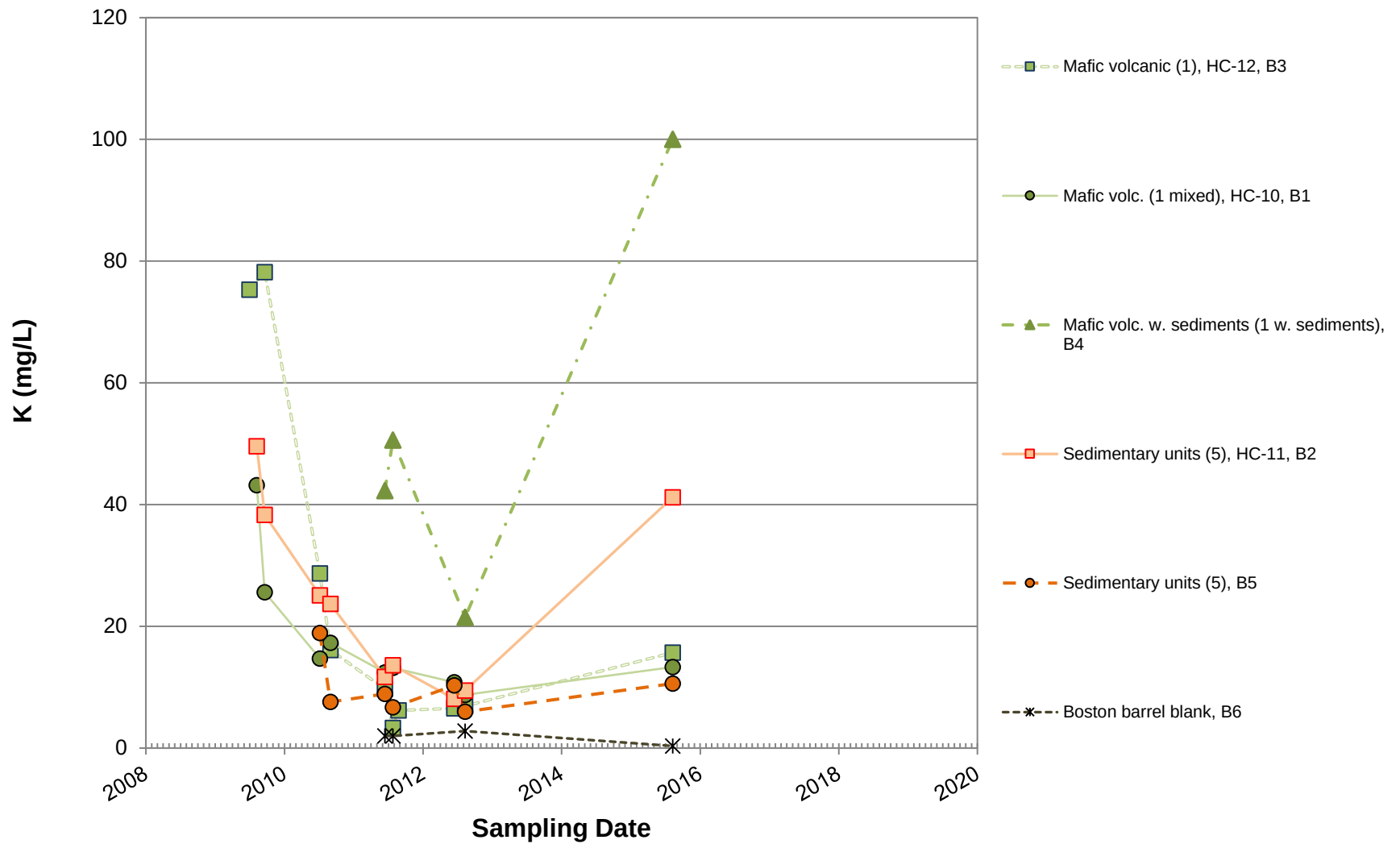
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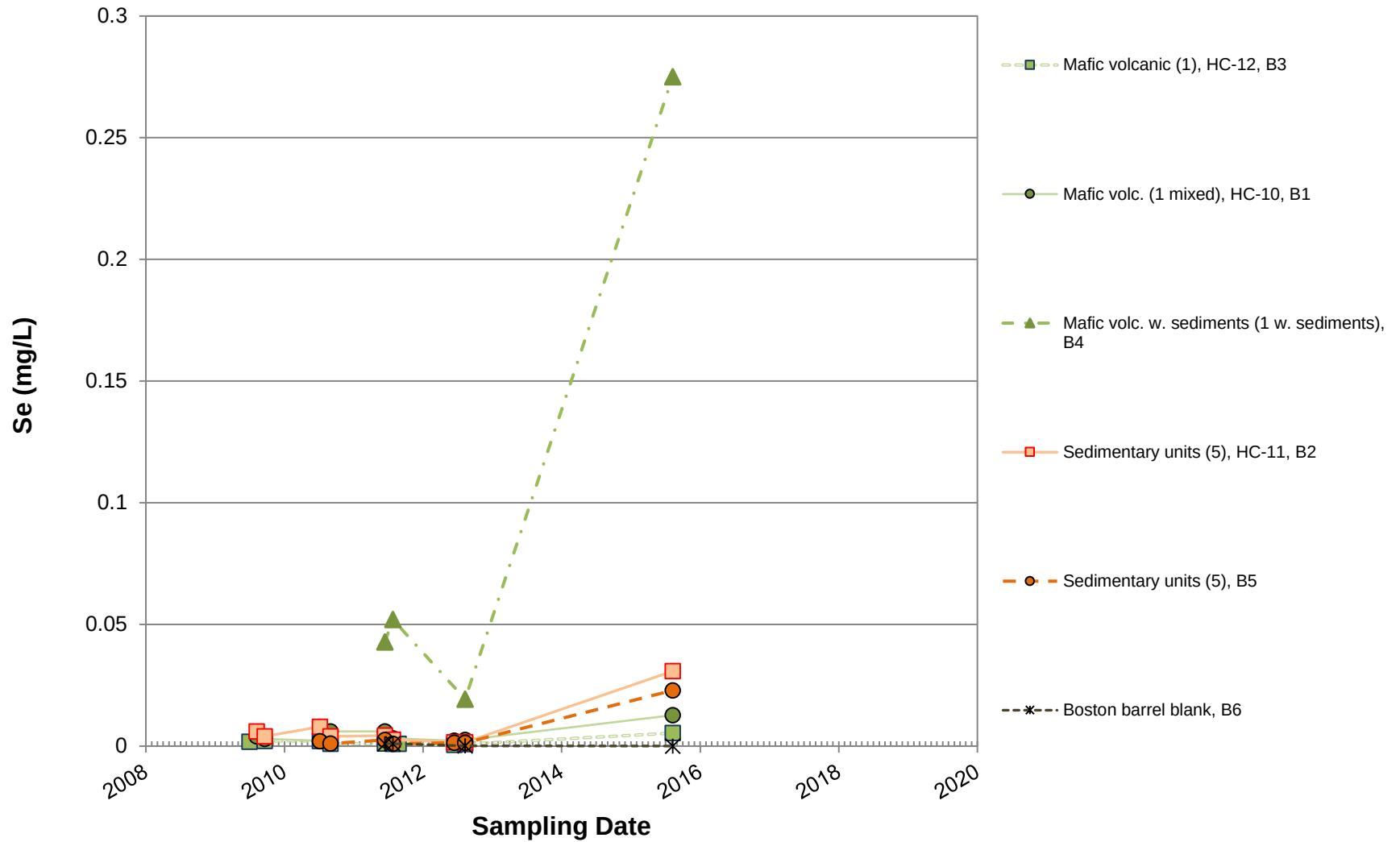
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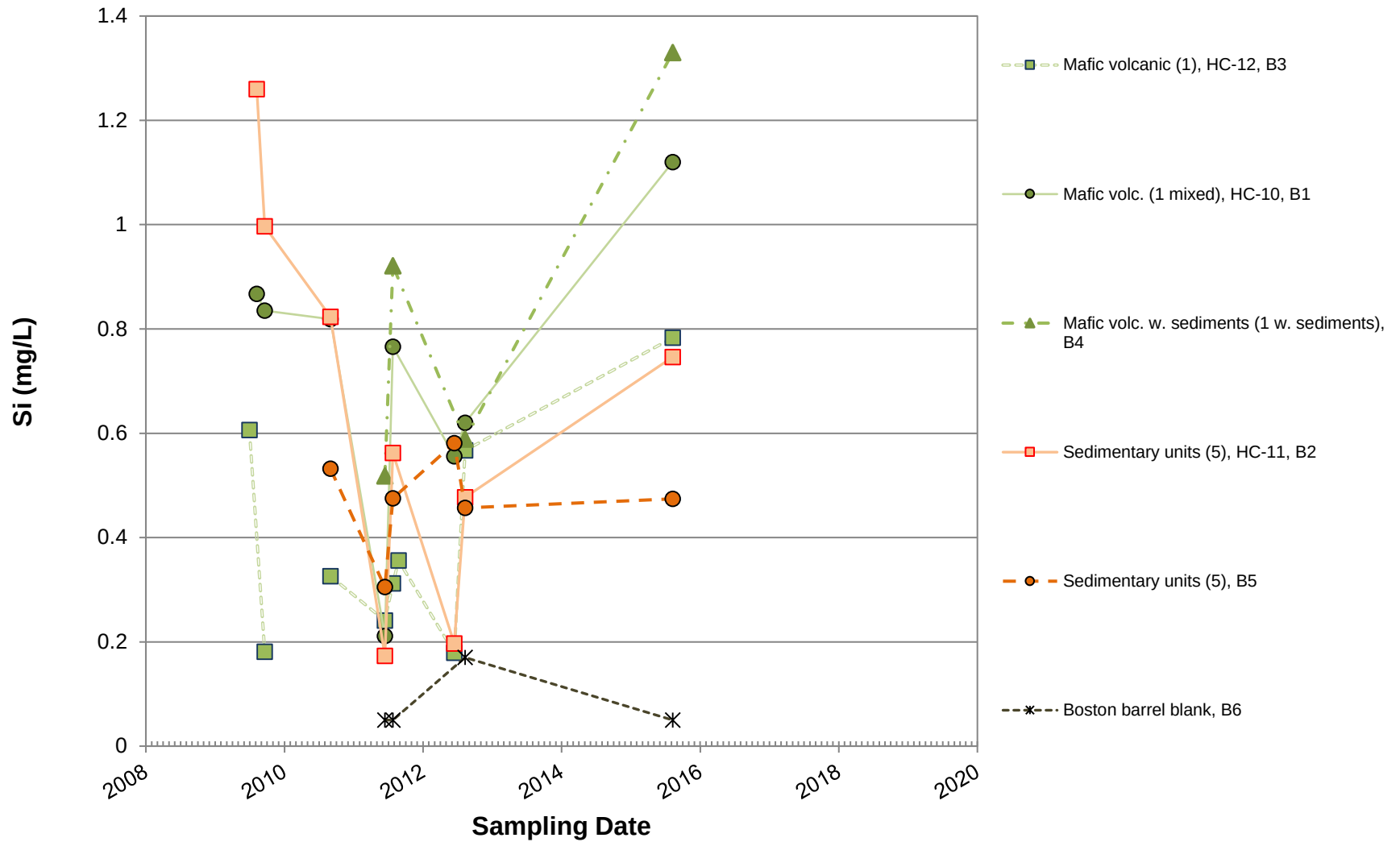
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Hope Bay Barrel Tests



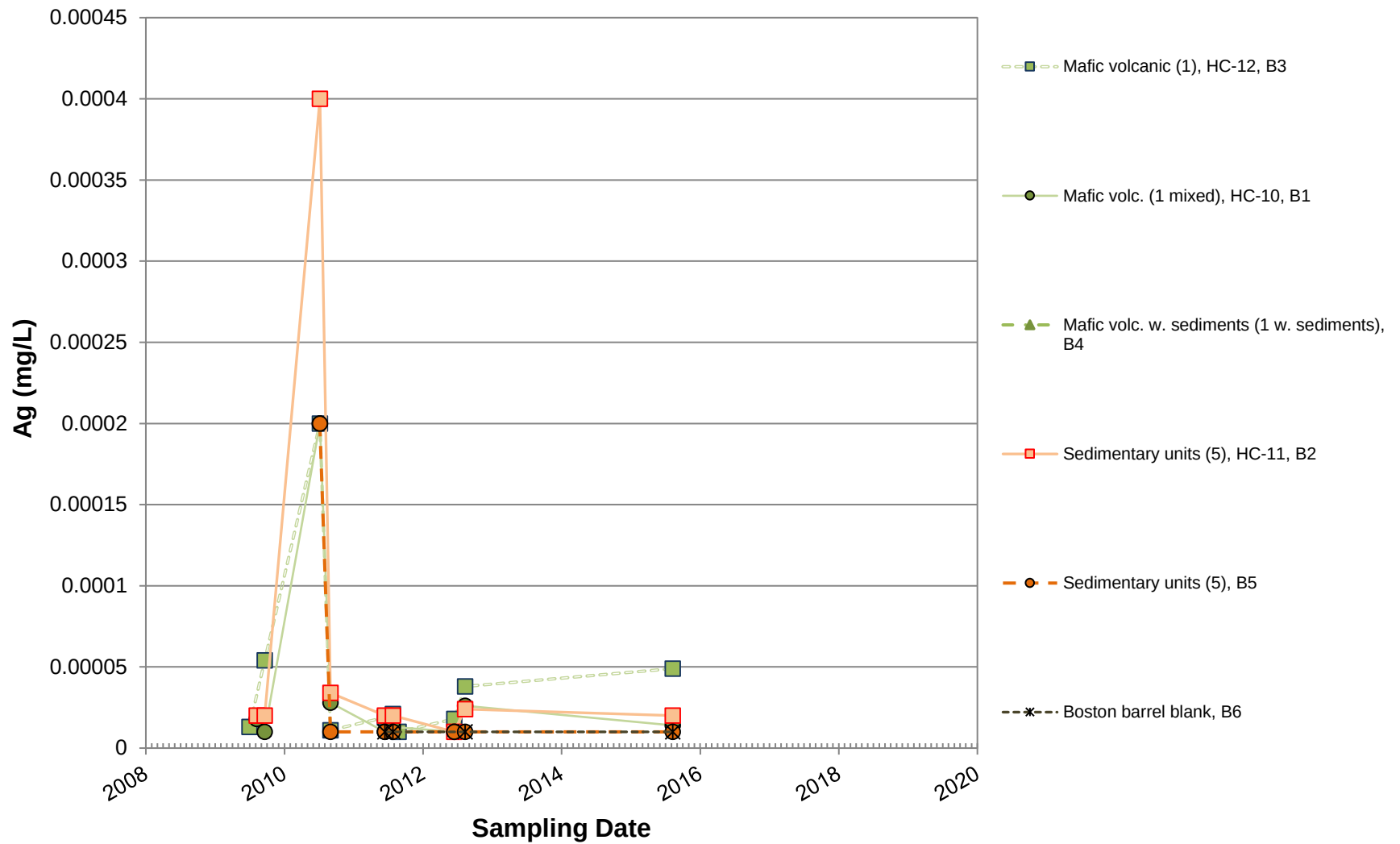
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Hope Bay Barrel Tests



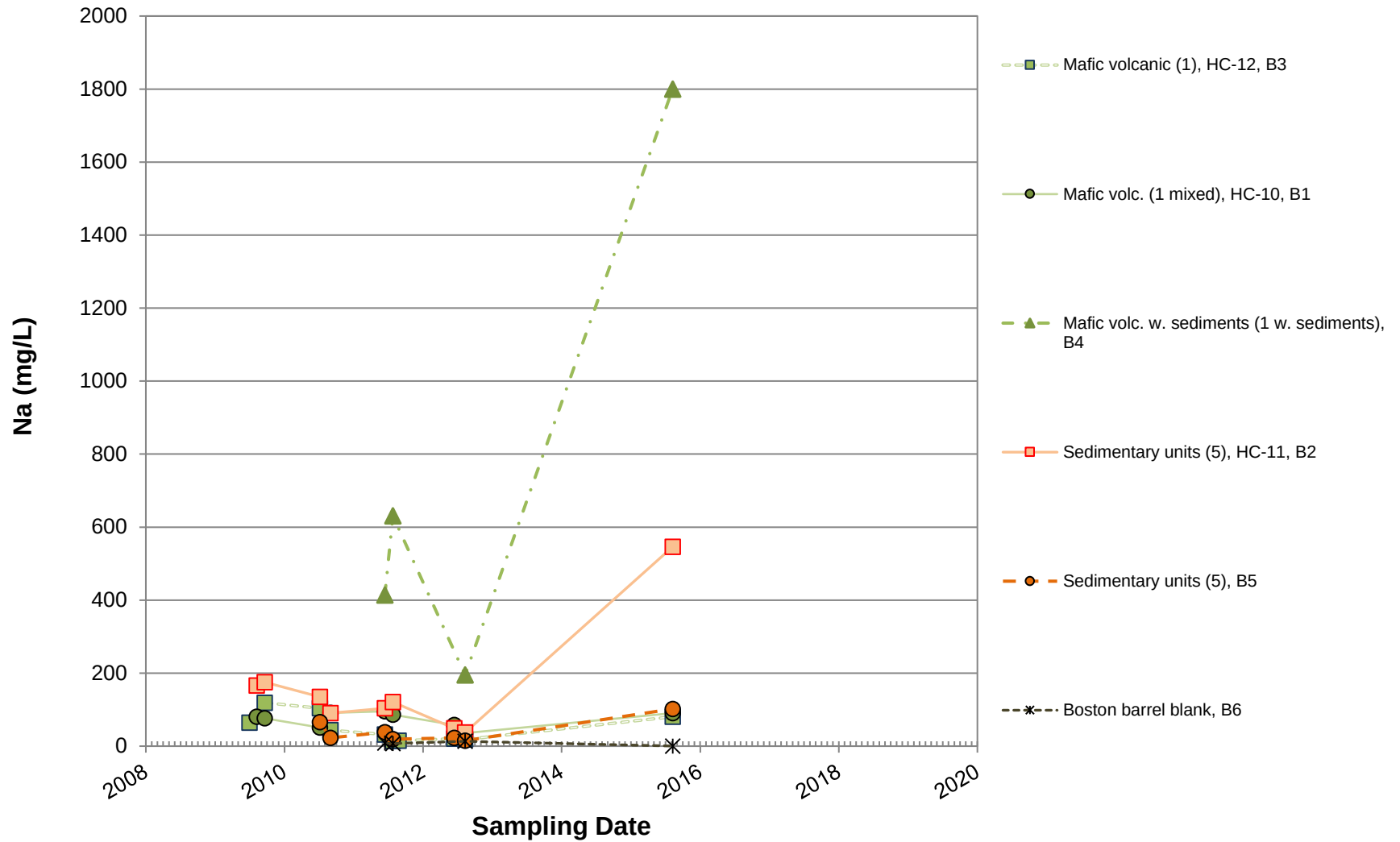
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Hope Bay Barrel Tests



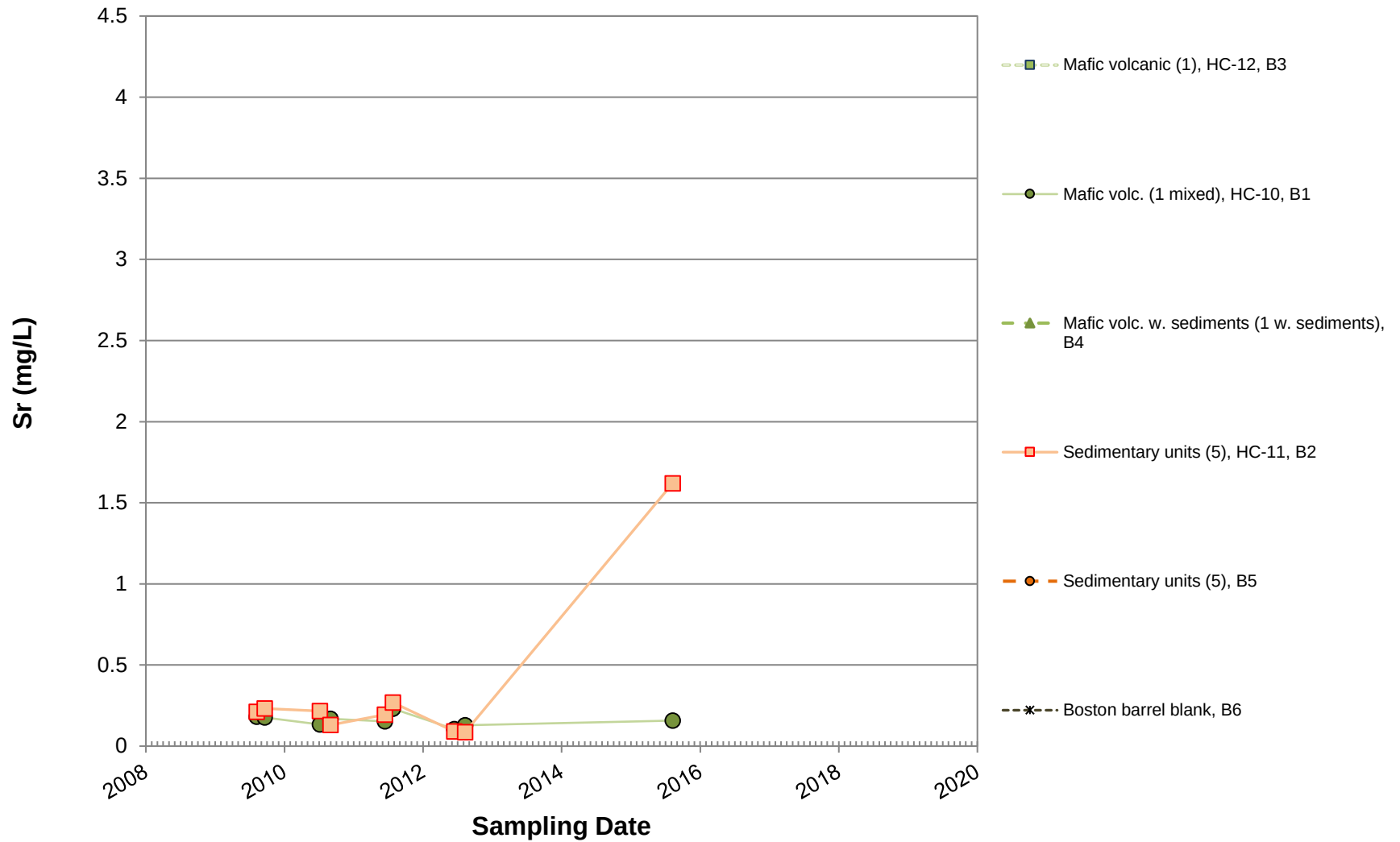
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Hope Bay Barrel Tests



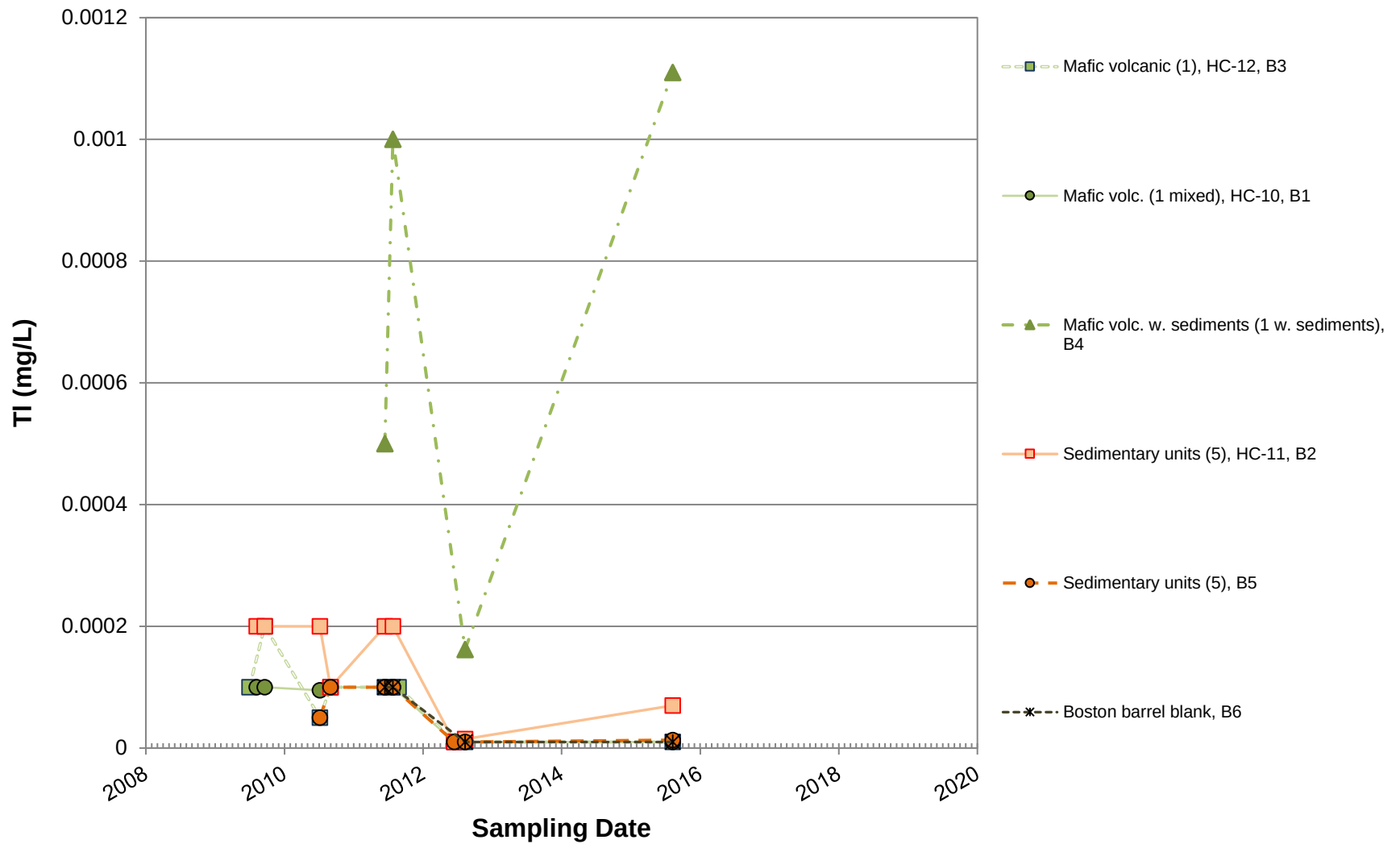
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Hope Bay Barrel Tests



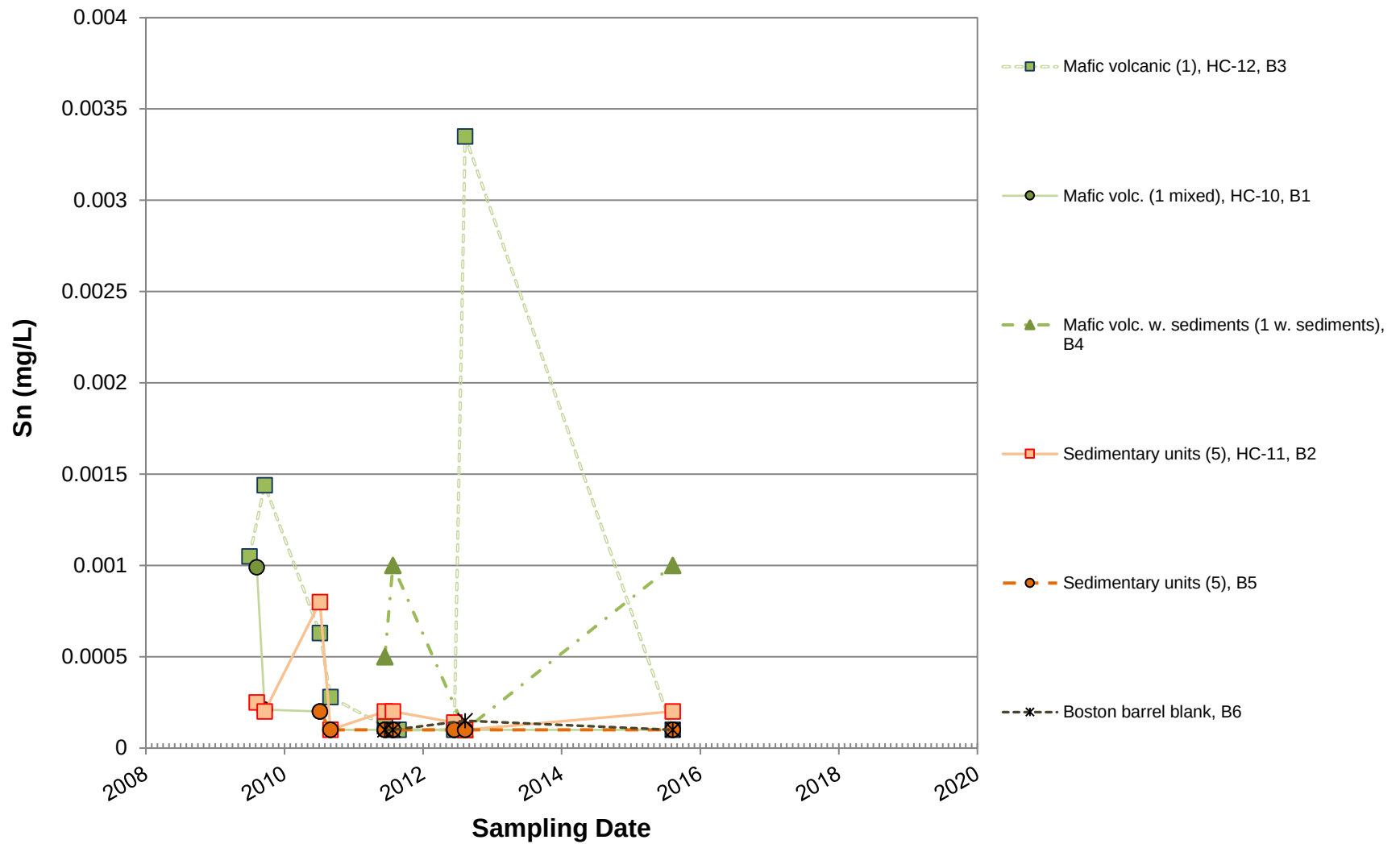
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Hope Bay Barrel Tests



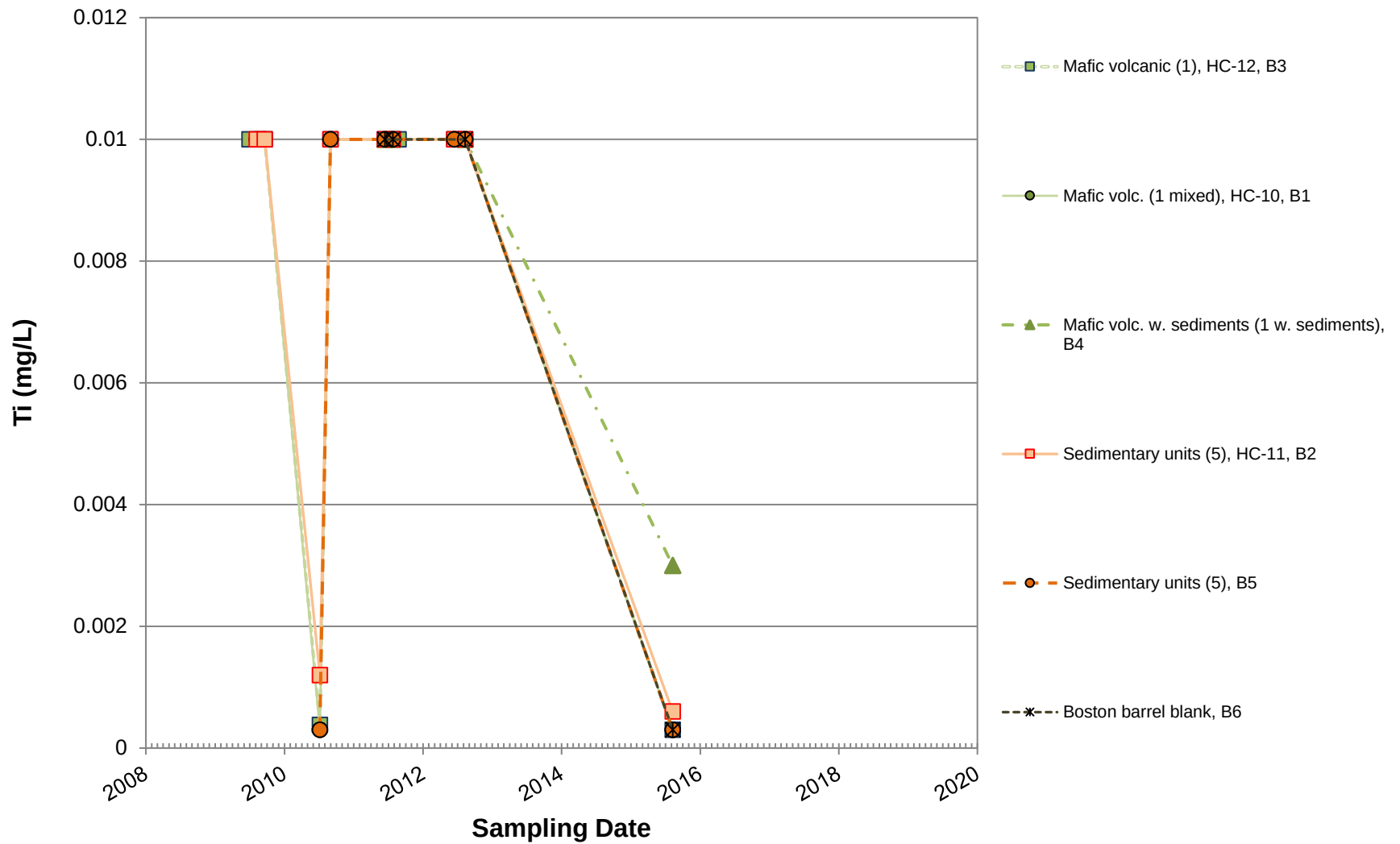
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Hope Bay Barrel Tests



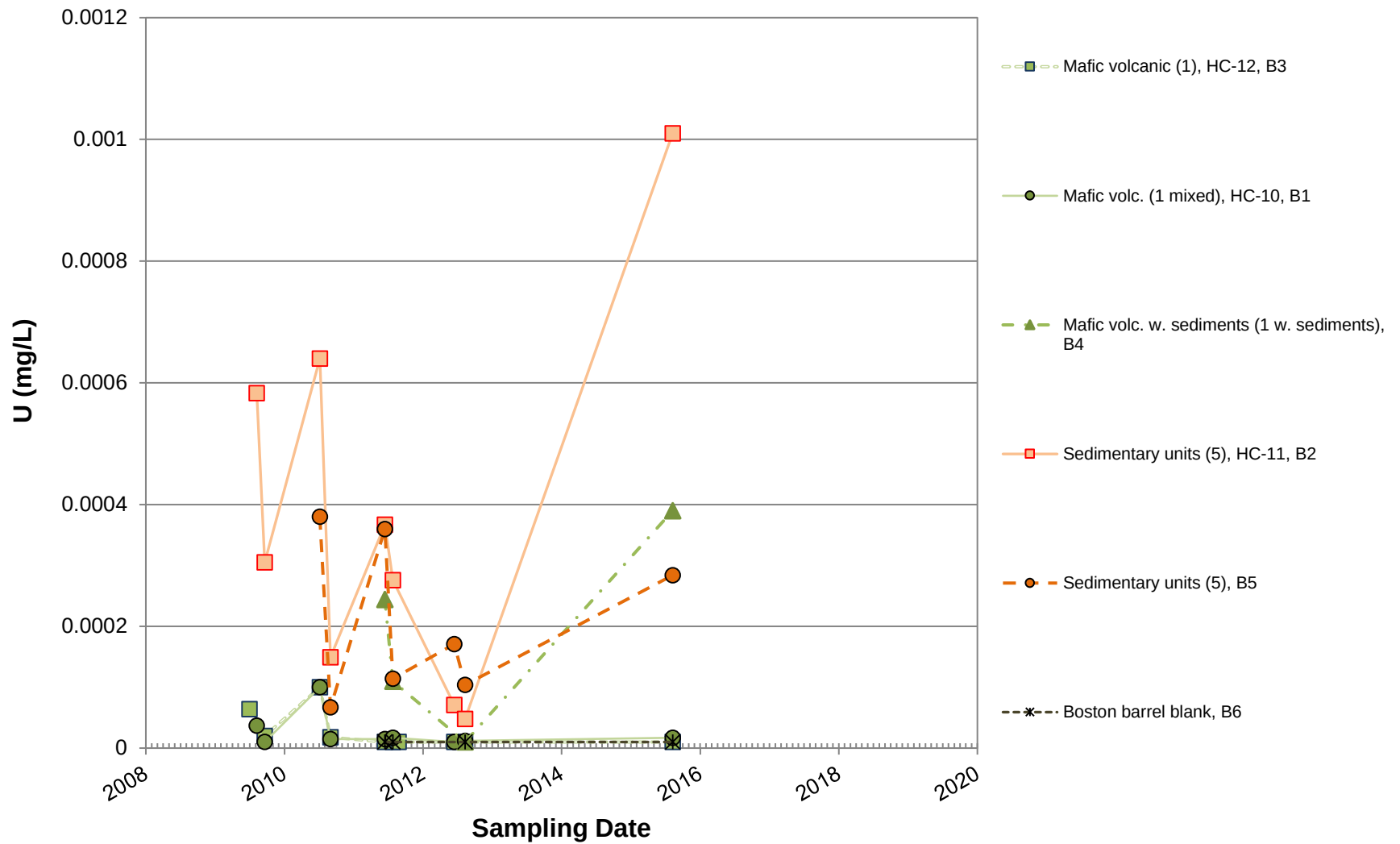
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Hope Bay Barrel Tests



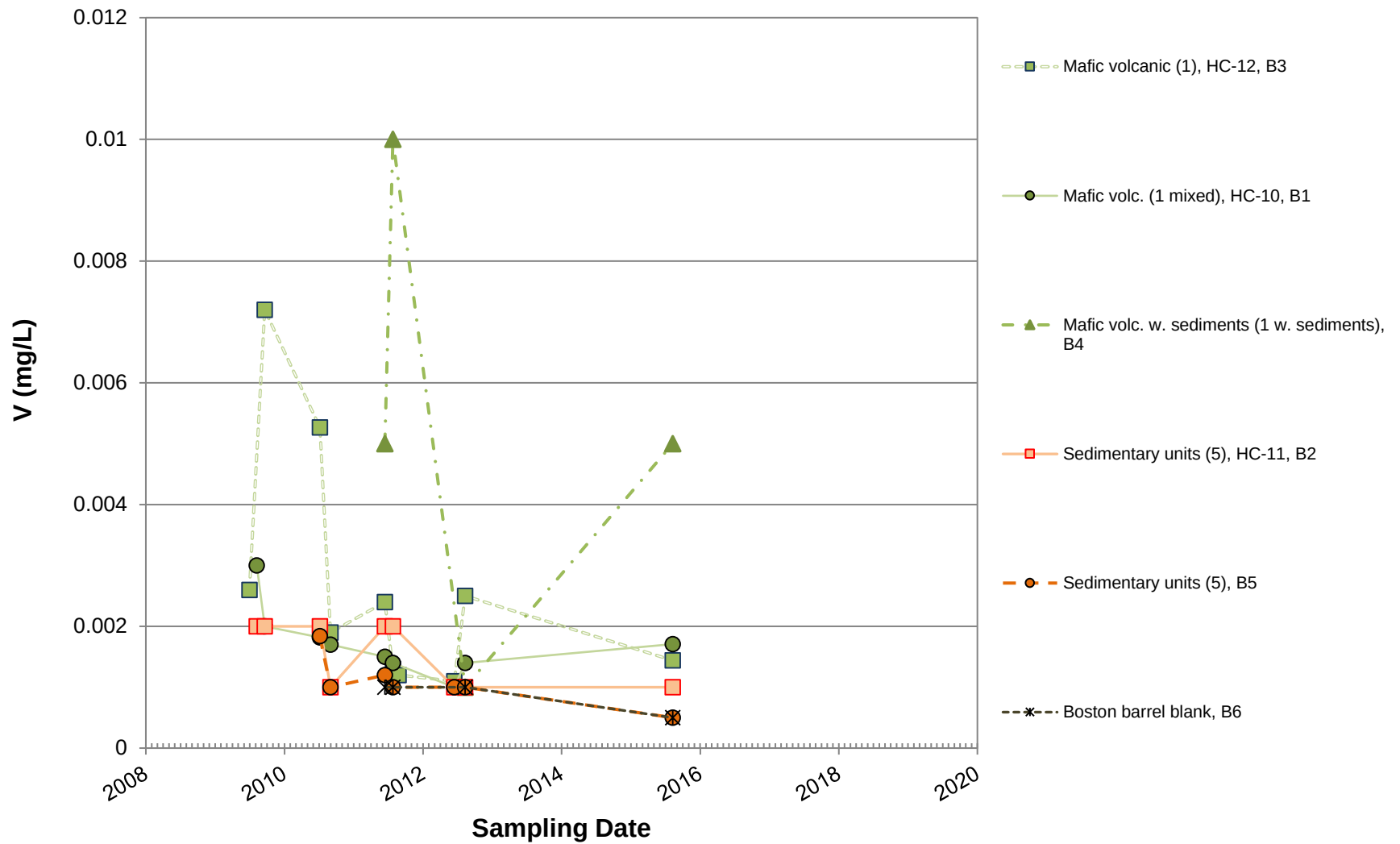
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Hope Bay Barrel Tests



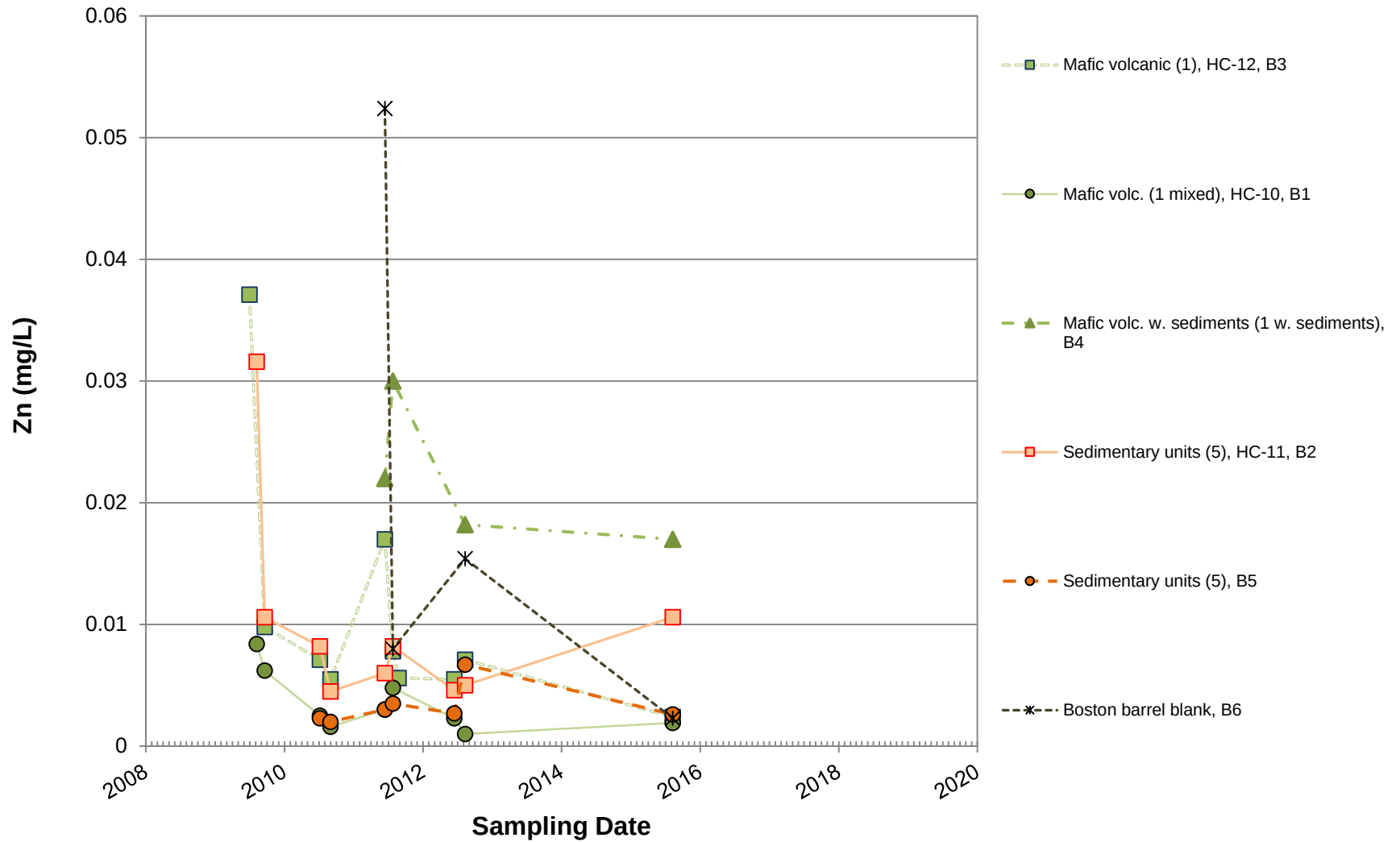
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Hope Bay Barrel Tests



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Hope Bay Barrel Tests



Y:\01_SITES\Hope.Bay\1CH008.005_Geochemistry (Doris, Madrid, Boston)\3.ABA data\201606_Boston_DEIS\Working Files\BarrelData.1CHO008-

Appendix L4 – Monitoring Data for Boston Barrel Tests

Appendix L-4: Barrel Test Leachate Raw Data

Barrel ID	Date	Volume	ALS Sample ID	Field pH	EC uS/cm	ORP mV	Temp C	Lab pH	EC uS/cm	Acidity mgCaCO3/L	Alkalinity mgCaCO3/L	SO4 mg/L	Br mg/L	Cl mg/L	F mg/L	Ammonia mg N/L	NO3 mg N/L	NO2 mg N/L	Ortho Phosphate mg P/L	Total Phosphate mg/L	Hardness mgCaCO3/L
B1	8-Aug-09	2.7	L804656-1	8.4	710	270	6.2	7.8	710	--	130	28	0.34	120	0.19	0.32	0.034	0.001	0.014	--	100
B1	19-Sep-09	3.1	L820839-1	8.2	670	210	6.2	8	620	--	120	22	0.26	110	0.14	0.028	0.005	0.001	--	--	88
B1	6-Jul-10	2.8	L905797-1	7.6	470	580	9.8	8.1	450	--	95	17	--	66	0.078	0.05	0.05	0.05	--	--	95
B1	31-Aug-10	1.2	L928581-1	7.9	440	330	11	8.1	670	--	100	32	0.25	120	0.1	0.005	0.025	0.005	0.0091	--	110
B1	3-Oct-10	2.5	L939391-20	7.9	3400	380	5.2	8.3	3400	--	280	180	--	770	0.5	0.094	0.5	0.5	--	--	320
B1	14-Jun-11	2.8	L1020367-1	8.1	720	140	3.3	7.9	--	2.2	43	34	--	--	--	0.008	0.36	--	--	--	77
B1	27-Jul-11	--	L1038624-1	--	--	--	--	8.1	660	2.1	98	32	0.53	130	0.25	0.0098	0.025	0.005	0.011	--	100
B1	25-Aug-11	0.035	L1052916-11	--	--	--	--	--	--	--	--	12	--	--	--	--	--	--	--	--	--
B1	14-Jun-12	3.7	L1163243-2	8.3	460	340	2.3	8	430	2.7	68	22	--	80	0.097	0.0073	0.005	0.001	--	0.034	55
B1	10-Aug-12	3.1	L1195392-1	8.8	370	--	5.6	8.2	330	1.3	81	21	0.16	44	0.13	0.023	0.005	0.001	--	0.062	73
B1	9-Aug-15	0.49	L1656366-1	8.7	730	250	15	8.3	710	1	120	76	0.39	99	0.24	0.035	0.69	0.015	--	0.023	110
B2	8-Aug-09	0.9	L804656-2	7.6	1100	--	6.4	7.7	1100	--	140	46	0.5	230	0.23	0.0072	0.05	0.01	0.041	--	90
B2	19-Sep-09	1.2	L820839-2	7.9	1200	230	6.3	7.9	1200	--	110	48	1	250	0.4	0.02	0.1	0.02	--	--	93
B2	6-Jul-10	3.4	L905797-2	8.1	980	560	8.9	7.8	940	--	93	45	--	200	0.15	0.05	0.05	0.05	--	--	87
B2	31-Aug-10	0.31	L928581-2	7.9	460	330	10	8.1	610	--	82	48	0.25	100	0.1	--	0.025	0.005	0.0023	--	66
B2	3-Oct-10	2.5	L939391-22	7.9	2900	650	6.1	8.3	3000	--	160	380	--	630	0.5	0.05	0.5	0.5	--	--	310
B2	14-Jun-11	2.6	L1020367-2	8.3	790	140	7.3	7.8	--	1	30	72	--	--	--	0.079	0.11	--	--	--	81
B2	27-Jul-11	--	L1038624-2	--	--	--	--	8.2	880	1.4	43	82	0.51	200	0.2	0.0052	0.05	0.01	0.0027	--	110
B2	25-Aug-11	0.41	L1052916-13	--	--	--	--	7.9	--	3.9	70	100	--	--	--	--	--	--	--	--	--
B2	14-Jun-12	2.5	L1163243-3	8.2	380	330	2	7.9	350	3.2	33	51	--	51	0.087	0.005	0.005	0.001	--	0.022	42
B2	10-Aug-12	3.7	L1195392-2	8.7	340	--	5.6	7.7	310	1.8	35	60	0.093	33	0.09	0.0055	0.005	0.001	--	0.048	50
B2	9-Aug-15	0.49	L1656366-2	6.6	3900	260	15	7.9	3900	3.3	55	850	2.5	730	0.4	0.027	0.48	0.02	--	0.02	720
B3	30-Jun-09	0.5	L786052-27	7.6	680	180	16	7	--	--	230	22	--	50	--	13	0.005	--	--	--	77
B3	19-Sep-09	9.4	L820839-3	8.8	960	210	6	8.1	900	--	260	43	1	80	0.4	0.03	0.1	0.02	--	--	110
B3	06-Jul-10	7.8	L905797-3	9.1	670	550	8.8	8.6	650	--	180	31	--	65	0.21	0.05	0.05	0.05	--	--	64
B3	31-Aug-10	0.31	L928581-3	7.8	280	300	9.8	--	--	--	--	--	--	--	--	--	--	--	--	--	48
B3	03-Oct-10	6	L939391-24	7.8	2000	670	4.2	8.4	2000	--	630	74	--	220	0.74	0.21	0.05	0.05	--	--	260
B3	14-Jun-11	4.6	L1020367-3	7.2	240	160	3.2	7.2	--	6.7	59	12	--	--	--	0.37	0.012	--	--	--	25
B3	27-Jul-11	--	L1038624-3	--	--	--	--	8	90	2.3	27	2.7	0.073	8.1	0.053	0.026	0.005	0.001	0.077	--	15
B3	25-Aug-11	2.4	L1052916-12	8.1	150	120	13	7.7	--	4.5	59	1.4	--	--	--	--	--	--	--	--	--
B3	14-Jun-12	5.8	L1163243-1	7.8	190	360	2.6	7.8	160	3.7	46	7.7	--	16	0.14	0.021	0.005	0.001	--	0.38	29
B3	10-Aug-12	4.9	L1195392-3	9.4	160	--	6.2	8	140	1.6	41	7.7	0.1	11	0.076	0.014	0.005	0.001	--	0.91	22
B3	09-Aug-15	0.46	L1656366-3	7.8	670	230	16	8	670	1.8	62	55	0.31	120	0.1	0.02	0.025	0.005	--	0.32	86
B4	06-Jul-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	31-Aug-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	14-Jun-11	1.9	L1020367-4	7.7	4000	180	3.1	7.4	--	2.9	21	470	--	--	--	0.019	0.1	--	--	--	940
B4	27-Jul-11	--	L1038624-4	--	--	--	--	7.4	5700	4.8	23	700	1.5	1700	0.4	0.0076	0.1	0.02	0.0054	--	1300
B4	25-Aug-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	14-Jun-12	0.62	--	7.7	140	350	2.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	10-Aug-12	1.9	L1195392-4	7.9	2000	--	5.4	7.5	1800	2.4	18	210	1	490	0.4	0.22	0.14	0.02	--	0.014	400
B4	09-Aug-15	0.4	L1656366-4	7.3	1400	280	15	7.6	14000	6.3	44	3400	6.4	3500	2	0.22	0.5	0.1	--	0.0049	4100
B5	06-Jul-10	9.4	L905797-4	8.5	430	560	8.8	8.3	420	--	120	16	--	44	0.12	0.05	0.05	0.05	--	--	29
B5	31-Aug-10	3.4	L928581-4	7.6	150	370	10	7.8	180	--	53	7.6	0.072	16	0.064	0.0051	0.029	0.001	0.0042	--	30
B5	03-Oct-10	4.4	L939391-26	8	680	360	5.6	8.3	560	--	140	35	--	65	0.13	0.05	0.05	0.05	--	--	65
B5	14-Jun-11	5.4	L1020367-5	7.9	290	150	1.2	8.1	--	1	66	17	--	--	--	0.011	0.023	--	--	--	31
B5	27-Jul-11	--	L1038624-5	--	--	--	--	8.2	170	1.2	65	6.6	0.05	9.9	0.078	0.089	0.051	0.001	0.0062	--	34
B5	25-Aug-11	0.19	L1052916-10	--	--	--	--	7.8	--	4.2	81	6.3	--	--	--	--	--	--	--	--	--
B5	14-Jun-12	5.5	L1163243-4	8.5	270	310	2.1	8.2	200	1	69	11	--	11	0.056	0.005	0.005	0.001	--	0.0074	40
B5	10-Aug-12	1.8	L1195392-5	8.3	220	--	5.4	8.20	200.00	1.20	77.00	9.20	0.05	11.00	0.13	0.24	0.08	0.00	--	0.02	60.00
B5	09-Aug-15	0.46	L1656366-5	8.1	880	250	15	8.20	860.00	1.10	81.00	120.00	0.25	140.00	0.10	0.02	0.65	0.03	--	0.01	150.00
B6	06-Jul-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B6	31-Aug-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B6	14-Jun-11	4.1	L1020367-6	7.4	110	190	3.1	7	--	1.5	6.4	6.7	--	--	--	0.31	0.26	--	--	--	20
B6	27-Jul-11	--	L1038624-6	--	--	--	--	7.7	62	2.3	3.5	3.8	0.16	13	0.045	0.058	0.005	0.001	0.001	--	13
B6	25-Aug-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B6	14-Jun-12	0.31	--	7.7	160	280	2.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B6	10-Aug-12	1.1	L11953928	8.1	110	--	5.6	6.6	97	4.2	7.5	3.9	0.15	20	0.04	0.061	0.0058	0.001	--	0.69	25
B6	09-Aug-15	0.55	L1656366-6	7.7	5	270	16	7.9	5.4	1.3	1.1	0.44	0.05	0.5	0.02	0.036	0.031	0.0016	--	0.15	0.5

Notes:
Sampling events highlighted in grey have been omitted from the interpretation due to contamination. See section 2.3.1 in report for more details.
Values in red indicate value is under detection limit. Values under detection limit available only as of August 2015.

Appendix L-4: Barrel Test Leachate Raw Data

Barrel ID	Date	Volume	ALS Sample ID	Ni mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	Tl mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L
B1	8-Aug-09	2.7	L804656-1	0.079	0.3	43	0.004	0.87	0.000018	80	0.18	0.0001	0.00099	0.01	0.000037	0.003	0.0084
B1	19-Sep-09	3.1	L820839-1	0.044	0.3	26	0.003	0.84	0.00001	77	0.18	0.0001	0.00021	0.01	0.00001	0.002	0.0062
B1	6-Jul-10	2.8	L905797-1	0.067	0.21	15	0.0022	--	0.0002	51	0.13	0.000095	0.0002	0.0003	0.0001	0.0018	0.0025
B1	31-Aug-10	1.2	L928581-1	0.051	0.3	17	0.006	0.82	0.000028	92	0.17	0.0001	0.0001	0.01	0.000015	0.0017	0.0016
B1	3-Oct-10	2.5	L939391-20	--	1	85	--	--	--	560	--	--	--	--	--	--	--
B1	14-Jun-11	2.8	L1020367-1	0.037	0.3	12	0.006	0.21	0.00001	95	0.15	0.0001	0.0001	0.01	0.000015	0.0015	0.003
B1	27-Jul-11	--	L1038624-1	0.034	0.3	13	0.0032	0.77	0.000013	86	0.23	0.0001	0.0001	0.01	0.000017	0.0014	0.0048
B1	25-Aug-11	0.035	L1052916-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B1	14-Jun-12	3.7	L1163243-2	0.029	0.3	11	0.0022	0.56	0.00001	58	0.11	0.00001	0.0001	0.01	0.00001	0.001	0.0023
B1	10-Aug-12	3.1	L1195392-1	0.041	--	8.8	0.0026	0.62	0.000026	36	0.13	0.00001	0.0001	0.01	0.000012	0.0014	0.001
B1	9-Aug-15	0.49	L1656366-1	0.044	0.05	13	0.013	1.1	0.000014	90	0.16	0.00001	0.0001	0.0003	0.000017	0.0017	0.0019
B2	8-Aug-09	0.9	L804656-2	0.013	0.3	50	0.006	1.3	0.00002	170	0.21	0.0002	0.00025	0.01	0.00058	0.002	0.032
B2	19-Sep-09	1.2	L820839-2	0.01	0.3	38	0.004	1	0.00002	180	0.23	0.0002	0.0002	0.01	0.00031	0.002	0.011
B2	6-Jul-10	3.4	L905797-2	0.0091	0.53	25	0.008	--	0.0004	140	0.22	0.0002	0.0008	0.0012	0.00064	0.002	0.0082
B2	31-Aug-10	0.31	L928581-2	0.0089	0.3	24	0.004	0.82	0.000034	91	0.13	0.0001	0.0001	0.01	0.00015	0.001	0.0045
B2	3-Oct-10	2.5	L939391-22	--	0.2	74	--	--	--	490	--	--	--	--	--	--	--
B2	14-Jun-11	2.6	L1020367-2	0.0041	0.3	12	0.0043	0.17	0.00002	100	0.19	0.0002	0.0002	0.01	0.00037	0.002	0.006
B2	27-Jul-11	--	L1038624-2	0.0041	0.3	14	0.0027	0.56	0.00002	120	0.27	0.0002	0.0002	0.01	0.00028	0.002	0.0082
B2	25-Aug-11	0.41	L1052916-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B2	14-Jun-12	2.5	L1163243-3	0.0044	0.3	8.1	0.0016	0.2	0.00001	49	0.09	0.00001	0.00014	0.01	0.000071	0.001	0.0046
B2	10-Aug-12	3.7	L1195392-2	0.0058	--	9.5	0.0016	0.48	0.000024	37	0.086	0.000015	0.0001	0.01	0.000048	0.001	0.005
B2	9-Aug-15	0.49	L1656366-2	0.023	0.05	41	0.031	0.75	0.00002	550	1.6	0.00007	0.0002	0.0006	0.001	0.001	0.011
B3	30-Jun-09	0.5	L786052-27	0.14	7.5	75	0.0018	0.61	0.000013	64	0.23	0.0001	0.0011	0.01	0.000064	0.0026	0.037
B3	19-Sep-09	9.4	L820839-3	0.28	0.74	78	0.0021	0.18	0.000054	120	0.43	0.0002	0.0014	0.01	0.00002	0.0072	0.0098
B3	06-Jul-10	7.8	L905797-3	0.2	1.1	29	0.0021	0	0.0002	100	0.22	0.00005	0.00063	0.00038	0.0001	0.0053	0.0071
B3	31-Aug-10	0.31	L928581-3	0.13	0.3	16	0.001	0.33	0.000011	44	0.1	0.0001	0.00028	0.01	0.000018	0.0019	0.0055
B3	03-Oct-10	6	L939391-24	1.4	4.2	90	0.0043	--	0.0002	300	1	0.00005	0.00041	0.00065	0.0001	0.0096	0.016
B3	14-Jun-11	4.6	L1020367-3	0.17	1.9	9.7	0.0011	0.24	0.000019	32	0.065	0.0001	0.00012	0.01	0.00001	0.0024	0.017
B3	27-Jul-11	--	L1038624-3	0.039	0.3	3.3	0.001	0.31	0.000021	14	0.024	0.0001	0.0001	0.01	0.00001	0.0013	0.0078
B3	25-Aug-11	2.4	L1052916-12	0.11	0.54	6.2	0.001	0.36	0.00001	15	0.069	0.0001	0.0001	0.01	0.00001	0.0012	0.0056
B3	14-Jun-12	5.8	L1163243-1	0.09	0.32	6.5	0.00049	0.18	0.000018	21	0.065	0.00001	0.0001	0.01	0.00001	0.0011	0.0055
B3	10-Aug-12	4.9	L1195392-3	0.078	--	6.9	0.00084	0.57	0.000038	18	0.046	0.00001	0.0034	0.01	0.00001	0.0025	0.0071
B3	09-Aug-15	0.46	L1656366-3	0.23	0.14	16	0.0054	0.78	0.000049	81	0.18	0.00001	0.0001	0.0003	0.00001	0.0014	0.0024
B4	06-Jul-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	31-Aug-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	14-Jun-11	1.9	L1020367-4	0.68	0.3	42	0.043	0.52	0.00005	410	1.6	0.0005	0.0005	0.01	0.00024	0.005	0.022
B4	27-Jul-11	--	L1038624-4	0.83	0.3	51	0.052	0.92	0.0001	630	2.3	0.001	0.001	0.01	0.00011	0.01	0.03
B4	25-Aug-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	14-Jun-12	0.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	10-Aug-12	1.9	L1195392-4	0.23	--	22	0.019	0.59	0.00001	200	0.64	0.00016	0.0001	0.01	0.00001	0.001	0.018
B4	09-Aug-15	0.4	L1656366-4	1.1	0.15	100	0.28	1.3	0.0001	1800	4.2	0.0011	0.001	0.003	0.00039	0.005	0.017
B5	06-Jul-10	9.4	L905797-4	0.057	0.12	19	0.002	--	0.0002	65	0.058	0.00005	0.0002	0.0003	0.00038	0.0018	0.0023
B5	31-Aug-10	3.4	L928581-4	0.021	0.3	7.6	0.0011	0.53	0.00001	23	0.045	0.0001	0.0001	0.01	0.000067	0.001	0.002
B5	03-Oct-10	4.4	L939391-26	0.082	0.053	19	0.0044	--	0.0002	72	0.1	0.00005	0.0002	0.0003	0.00027	0.0011	0.0049
B5	14-Jun-11	5.4	L1020367-5	0.03	0.3	8.9	0.0025	0.31	0.00001	38	0.046	0.0001	0.0001	0.01	0.00036	0.0012	0.003
B5	27-Jul-11	--	L1038624-5	0.022	0.3	6.7	0.001	0.48	0.00001	19	0.051	0.0001	0.0001	0.01	0.00011	0.001	0.0035
B5	25-Aug-11	0.19	L1052916-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B5	14-Jun-12	5.5	L1163243-4	0.029	0.3	10	0.0014	0.58	0.00001	22	0.05	0.00001	0.0001	0.01	0.00017	0.001	0.0027
B5	10-Aug-12	1.8	L1195392-5	0.04	--	6.00	0.00	0.46	0.00	15.00	0.09	0.00001	0.0001	0.01	0.000100	0.001	0.01
B5	09-Aug-15	0.46	L1656366-5	0.05	0.05	11.00	0.02	0.47	0.00	100.00	0.17	0.000013	0.000100	0.000300	0.000280	0.000500	0.00
B6	06-Jul-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B6	31-Aug-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B6	14-Jun-11	4.1	L1020367-6	0.003	0.3	2	0.001	0.05	0.00001	8.8	0.014	0.0001	0.0001	0.01	0.00001	0.001	0.052
B6	27-Jul-11	--	L1038624-6	0.00098	0.3	2	0.001	0.05	0.00001	7.2	0.011	0.0001	0.0001	0.01	0.00001	0.001	0.008
B6	25-Aug-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B6	14-Jun-12	0.31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B6	10-Aug-12	1.1	L11953928	0.0044	--	2.8	0.00013	0.17	0.00001	13	0.023	0.00001	0.00015	0.01	0.00001	0.001	0.015
B6	09-Aug-15	0.55	L1656366-6	0.0005	0.05	0.35	0.00005	0.05	0.00001	0.35	0.00062	0.00001	0.0001	0.0003	0.00001	0.0005	0.0023

Notes:
Sampling events highlighted in grey have been omitted from the interpretation due to contamination. See section 2.3.1 in report for more details.
Values in red indicate value is under detection limit. Values under detection limit available only as of August 2015.

Appendix L5 – Release Rates for Boston Barrel Tests

Appendix L-5: Barrel Test Leaching Rates

Barrel ID	Date	Volume	ALS Sample ID	Acidity mgCaCO3/kg/wk	Alkalinity mgCaCO3/kg/wk	SO4 mg/kg/week	Br mg/kg/week	Cl mg/kg/week	F mg/kg/week	Ammonia mg N/kg/wk	NO3 mg N/kg/wk	NO2 mg N/kg/wk	Ortho Phosphate mg P/kg/wk	Total Phosphate mg/kg/wk	Hardness mgCaCO3/kg/wk	Al mg/kg/wk	Sb mg/kg/wk	As mg/kg/wk	Ba mg/kg/wk
B1	8-Aug-09	2.7	L804656-1	--	0.00072	0.00015	0.0000018	0.00063	0.000001	0.0000017	0.0000018	5.4E-09	0.000000073	--	0.00054	0.00000038	0.00000014	0.0000028	0.00000086
B1	19-Sep-09	3.1	L820839-1	--	0.26	0.051	0.00058	0.25	0.00031	0.000063	0.000011	0.0000023	--	--	0.2	0.00013	0.000044	0.001	0.000032
B1	6-Jul-10	2.8	L905797-1	--	0.028	0.0051	--	0.02	0.000023	0.000015	0.000015	0.000015	--	--	0.028	0.0000083	0.0000057	0.00013	0.0000047
B1	31-Aug-10	1.2	L928581-1	--	0.069	0.022	0.00017	0.083	0.000068	0.0000034	0.000017	0.0000034	0.0000062	--	0.076	0.000016	0.000014	0.00032	0.000018
B1	3-Oct-10	2.5	L939391-20	--	0.63	0.42	--	1.8	0.0012	0.00022	0.0012	0.0012	--	--	0.73	--	--	--	--
B1	14-Jun-11	2.8	L1020367-1	0.00074	0.014	0.011	--	--	--	0.0000027	0.00012	--	--	--	0.026	0.0000025	0.0000048	0.00015	0.0000026
B1	27-Jul-11	--	L1038624-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B1	25-Aug-11	0.035	L1052916-11	--	--	0.00044	--	--	--	--	--	--	--	--	--	--	--	--	--
B1	14-Jun-12	3.7	L1163243-2	0.001	0.026	0.0086	--	0.03	0.000037	0.0000028	0.0000019	0.0000038	--	0.000013	0.021	0.0000096	0.0000064	0.00016	0.0000024
B1	10-Aug-12	3.1	L1195392-1	0.0022	0.13	0.035	0.00026	0.073	0.00022	0.000037	0.0000083	0.0000017	--	0.0001	0.12	0.000054	0.000032	0.001	0.000027
B1	9-Aug-15	0.49	L1656366-1	0.000014	0.0017	0.001	0.0000053	0.0014	0.0000033	0.00000049	0.0000094	0.00000021	--	0.00000032	0.0016	0.00000026	0.00000055	0.000018	0.0000004
B2	8-Aug-09	0.9	L804656-2	--	0.012	0.0039	0.000042	0.02	0.000019	0.00000061	0.0000042	0.00000085	0.0000034	--	0.0076	0.0000038	0.0000029	0.0000024	0.00000053
B2	19-Sep-09	1.2	L820839-2	--	0.096	0.042	0.00087	0.22	0.00035	0.000017	0.000087	0.000017	--	--	0.081	0.000032	0.000031	0.000018	0.0000044
B2	6-Jul-10	3.4	L905797-2	--	0.032	0.016	--	0.069	0.000053	0.000017	0.000017	0.000017	--	--	0.03	0.0000083	0.0000077	0.0000052	0.0000014
B2	31-Aug-10	0.31	L928581-2	--	0.013	0.0079	0.000041	0.017	0.000016	--	0.0000041	0.00000082	0.00000038	--	0.011	0.0000027	0.0000024	0.0000036	0.00000095
B2	3-Oct-10	2.5	L939391-22	--	0.35	0.84	--	1.4	0.0011	0.00011	0.0011	0.0011	--	--	0.68	--	--	--	--
B2	14-Jun-11	2.6	L1020367-2	0.0003	0.0089	0.021	--	--	--	0.000023	0.000032	--	--	--	0.024	0.0000022	0.0000019	0.0000065	0.0000086
B2	27-Jul-11	--	L1038624-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B2	25-Aug-11	0.41	L1052916-13	0.0016	0.029	0.043	--	--	--	--	--	--	--	--	--	--	--	--	--
B2	14-Jun-12	2.5	L1163243-3	0.00079	0.0082	0.013	--	0.013	0.000021	0.0000012	0.0000012	0.00000025	--	0.0000055	0.01	0.000001	0.0000013	0.0000038	0.00000064
B2	10-Aug-12	3.7	L1195392-2	0.0034	0.067	0.11	0.00018	0.062	0.00017	0.000011	0.0000096	0.0000019	--	0.000092	0.096	0.000024	0.000011	0.000026	0.000007
B2	9-Aug-15	0.49	L1656366-2	0.000044	0.00072	0.011	0.000033	0.0096	0.0000053	0.00000036	0.0000063	0.00000026	--	0.00000026	0.0095	0.0000001	0.00000013	0.00000026	0.00000029
B3	30-Jun-09	0.5	L786052-27	--	0.014	0.0013	--	0.003	--	0.00076	0.0000003	--	--	--	0.0046	0.0000041	0.00000037	0.000031	0.00000089
B3	19-Sep-09	9.4	L820839-3	--	0.98	0.16	0.0038	0.3	0.0015	0.00011	0.00038	0.000076	--	--	0.42	0.00026	0.000042	0.0058	0.000084
B3	6-Jul-10	7.8	L905797-3	--	0.16	0.027	--	0.057	0.00018	0.000044	0.000044	0.000044	--	--	0.056	0.000064	0.000014	0.0011	0.000015
B3	31-Aug-10	0.31	L928581-3	--	--	--	--	--	--	--	--	--	--	--	0.0088	0.0000061	0.0000017	0.00014	0.0000027
B3	03-Oct-10	6	L939391-24	--	3.8	0.44	--	1.3	0.0044	0.0012	0.0003	0.0003	--	--	1.5	0.00078	0.00033	0.044	0.00056
B3	14-Jun-11	4.6	L1020367-3	0.0039	0.035	0.007	--	--	--	0.00022	0.0000073	--	--	--	0.015	0.000041	0.0000034	0.00071	0.0000028
B3	27-Jul-11	--	L1038624-3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B3	25-Aug-11	2.4	L1052916-12	0.012	0.16	0.0039	--	--	--	--	--	--	--	--	--	0.000029	0.000008	0.0014	0.000012
B3	14-Jun-12	5.8	L1163243-1	0.0024	0.03	0.005	--	0.01	0.000093	0.000014	0.0000033	0.00000065	--	0.00025	0.019	0.0000055	0.0000046	0.0003	0.0000026
B3	10-Aug-12	4.9	L1195392-3	0.0045	0.12	0.022	0.00028	0.032	0.00021	0.00004	0.000014	0.0000028	--	0.00026	0.063	0.00023	0.000014	0.00028	0.000011
B3	09-Aug-15	0.46	L1656366-3	0.000025	0.00085	0.00076	0.0000043	0.0016	0.0000014	0.00000028	0.00000035	0.000000069	--	0.00000044	0.0012	0.00000015	0.00000013	0.000023	0.0000003
B4	06-Jul-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	31-Aug-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	14-Jun-11	1.9	L1020367-4	0.00054	0.0039	0.087	--	--	--	0.0000036	0.000019	--	--	--	0.17	0.0000028	0.0000032	0.000071	0.0000043
B4	27-Jul-11	--	L1038624-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	25-Aug-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	14-Jun-12	0.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	10-Aug-12	1.9	L1195392-4	0.0022	0.017	0.2	0.00094	0.46	0.00037	0.00021	0.00013	0.000019	--	0.000013	0.38	0.0000042	0.000014	0.000071	0.000012
B4	09-Aug-15	0.4	L1656366-4	0.000064	0.00044	0.034	0.000065	0.036	0.00002	0.0000022	0.0000051	0.0000001	--	0.00000005	0.041	0.00000021	0.00000015	0.0000014	0.00000048
B5	06-Jul-10	9.4	L905797-4	--	0.13	0.019	--	0.051	0.00014	0.000058	0.000058	0.000058	--	--	0.034	0.000029	0.000028	0.0004	0.000015
B5	31-Aug-10	3.4	L928581-4	--	0.13	0.019	0.00018	0.039	0.00016	0.000012	0.000071	0.0000024	0.000001	--	0.072	0.000035	0.000024	0.00059	0.000025
B5	03-Oct-10	4.4	L939391-26	--	0.75	0.18	--	0.34	0.00068	0.00026	0.00026	0.00026	--	--	0.35	0.000053	0.00014	0.0032	0.000087
B5	14-Jun-11	5.4	L1020367-5	0.00085	0.056	0.015	--	--	--	0.0000092	0.00002	--	--	--	0.027	0.0000047	0.0000098	0.00038	0.0000063
B5	27-Jul-11	--	L1038624-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B5	25-Aug-11	0.19	L1052916-10	0.0011	0.021	0.0016	--	--	--	--	--	--	--	--	--	--	--	--	--
B5	14-Jun-12	5.5	L1163243-4	0.00075	0.052	0.0084	--	0.0086	0.000042	0.0000038	0.0000038	0.00000075	--	0.0000056	0.03	0.0000011	0.0000092	0.00012	0.0000049
B5	10-Aug-12	1.8	L1195392-5	0.0015	0.099	0.012	0.000064	0.015	0.00016	0.00031	0.0001	0.0000045	--	0.00003	0.077	0.000037	0.000011	0.00041	0.000022
B5	09-Aug-15	0.46	L1656366-5	0.000019	0.0014	0.002	0.0000042	0.0023	0.0000017	0.00000041	0.000011	0.00000055	--	0.00000012	0.0026	0.000000057	0.00000022	0.00000048	0.00000084

Notes:
Rates are not available for sampling events without volume data.

Appendix L-5: Barrel Test Leaching Rates

Barrel ID	Date	Volume	ALS Sample ID	Be mg/kg/wk	Bi mg/kg/wk	B mg/kg/wk	Cd mg/kg/wk	Ca mg/kg/wk	Cr mg/kg/wk	Co mg/kg/wk	Cu mg/kg/wk	Fe mg/kg/wk	Pb mg/kg/wk	Li mg/kg/wk	Mg mg/kg/wk	Mn mg/kg/wk	Hg mg/kg/wk	Mo mg/kg/wk	Ni mg/kg/wk
B1	8-Aug-09	2.7	L804656-1	2.7E-09	2.7E-09	0.00000097	2.7E-10	0.00013	9.4E-09	0.00000037	0.00000087	0.00000023	5.6E-10	0.00000032	0.00005	0.000000052	2.7E-10	0.000000019	0.00000042
B1	19-Sep-09	3.1	L820839-1	0.0000011	0.0000011	0.00036	0.000000039	0.047	0.0000024	0.0000068	0.000026	0.000068	0.00000011	0.000012	0.02	0.0000015	--	0.0000055	0.000099
B1	6-Jul-10	2.8	L905797-1	0.00000015	0.000000015	0.000034	0.00000003	0.0077	0.00000059	0.00000066	0.0000039	0.0000047	0.00000003	--	0.0021	0.00000059	0.00000003	0.00000087	0.00002
B1	31-Aug-10	1.2	L928581-1	0.00000034	0.000000034	0.00011	0.000000034	0.021	0.0000006	0.0000012	0.0000084	0.00002	0.000000034	0.0000034	0.0056	0.0000021	--	0.0000045	0.000035
B1	3-Oct-10	2.5	L939391-20	--	--	--	--	0.13	--	--	--	--	--	--	0.099	--	--	--	--
B1	14-Jun-11	2.8	L1020367-1	0.00000017	0.000000017	0.000034	0.000000017	0.0049	0.00000017	0.0000011	0.0000015	0.00001	0.000000017	0.0000017	0.0033	0.0000034	--	0.0000012	0.000013
B1	27-Jul-11	--	L1038624-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B1	25-Aug-11	0.035	L1052916-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B1	14-Jun-12	3.7	L1163243-2	0.000000038	0.000000019	0.000046	3.8E-09	0.0041	0.000000065	0.0000006	0.000002	0.0000038	0.000000019	0.0000018	0.0027	0.0000009	--	0.0000012	0.000011
B1	10-Aug-12	3.1	L1195392-1	0.000000017	0.000000083	0.00017	0.000000017	0.035	0.0000042	0.0000036	0.00002	0.000017	0.000000083	0.0000076	0.0084	0.0000026	0.000000017	0.0000056	0.000068
B1	9-Aug-15	0.49	L1656366-1	2.7E-10	6.9E-10	0.0000034	6.9E-11	0.00041	0.000000018	0.000000065	0.00000014	0.00000014	6.9E-10	0.000000075	0.00013	0.000000014	6.9E-11	0.00000011	0.00000061
B2	8-Aug-09	0.9	L804656-2	0.000000085	0.000000085	0.000025	8.5E-09	0.0017	0.000000085	0.00000033	0.00000044	0.0000038	0.000000014	0.0000019	0.00082	0.00000085	4.2E-09	0.0000013	0.0000011
B2	19-Sep-09	1.2	L820839-2	0.00000087	0.00000087	0.00029	0.000000045	0.018	0.0000018	0.0000025	0.0000042	0.000026	0.000000087	0.000021	0.0087	0.0000039	--	0.000012	0.000087
B2	6-Jul-10	3.4	L905797-2	0.00000069	0.000000069	0.00086	0.000000069	0.066	0.0000028	0.00000062	0.0000016	0.0000066	0.00000014	--	0.0033	0.0000011	0.000000035	0.000004	0.000032
B2	31-Aug-10	0.31	L928581-2	0.000000082	0.000000082	0.000036	8.2E-09	0.0026	0.000000082	0.00000023	0.00000095	0.0000049	8.2E-09	0.0000018	0.001	0.00000054	--	0.0000017	0.0000015
B2	3-Oct-10	2.5	L939391-22	--	--	--	--	0.13	--	--	--	--	--	--	0.084	--	--	--	--
B2	14-Jun-11	2.6	L1020367-2	0.0000003	0.0000003	0.000033	0.00000003	0.0053	0.0000003	0.00000056	0.0000011	0.0000089	0.000000083	0.0000033	0.0026	0.0000033	--	0.0000022	0.0000012
B2	27-Jul-11	--	L1038624-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B2	25-Aug-11	0.41	L1052916-13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B2	14-Jun-12	2.5	L1163243-3	0.000000025	0.000000012	0.000028	2.5E-09	0.0024	0.000000086	0.00000021	0.00000059	0.0000025	0.000000012	0.0000014	0.0011	0.00000031	--	0.0000011	0.0000011
B2	10-Aug-12	3.7	L1195392-2	0.000000019	0.000000096	0.00027	0.000000019	0.023	0.00000021	0.0000015	0.0000087	0.000021	0.00000014	0.000012	0.0092	0.0000013	0.000000019	0.00001	0.000011
B2	9-Aug-15	0.49	L1656366-2	5.3E-10	1.3E-09	0.0000076	4.6E-10	0.0018	2.6E-09	0.00000016	0.000000032	0.00000013	1.3E-09	0.00000039	0.0012	0.00000042	6.6E-11	0.0000004	0.00000031
B3	30-Jun-09	0.5	L786052-27	0.00000003	0.00000003	0.000082	5.6E-09	0.00095	0.00000026	0.0000022	0.0000026	0.000015	0.000000041	0.00000077	0.00055	0.0000026	6E-10	0.000000094	0.0000084
B3	19-Sep-09	9.4	L820839-3	0.0000038	0.0000038	0.0012	0.00000013	0.093	0.0000016	0.00026	0.00018	0.0032	0.000011	0.000087	0.045	0.000087	--	0.0000053	0.001
B3	06-Jul-10	7.8	L905797-3	0.00000044	0.000000044	0.00022	0.000000088	0.013	0.0000033	0.000038	0.000028	0.00064	0.0000015	--	0.0058	0.000008	0.000000088	0.0000012	0.00018
B3	31-Aug-10	0.31	L928581-3	0.000000091	0.000000091	0.000029	9.1E-09	0.0022	0.0000002	0.0000053	0.0000063	0.000019	0.000000079	0.0000018	0.00078	0.00000073	--	0.00000015	0.000024
B3	03-Oct-10	6	L939391-24	0.000003	0.0000003	0.0073	0.00000059	0.36	0.0000015	0.0022	0.00064	0.0047	0.0000093	--	0.16	0.00092	0.00000059	0.000023	0.0083
B3	14-Jun-11	4.6	L1020367-3	0.00000029	0.000000029	0.000047	0.000000029	0.0035	0.00000051	0.000021	0.00001	0.000064	0.000000021	0.0000045	0.0015	0.000015	--	0.00000029	0.000097
B3	27-Jul-11	--	L1038624-3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B3	25-Aug-11	2.4	L1052916-12	0.00000014	0.00000014	0.00012	0.000000014	0.02	0.00000014	0.00007	0.000047	0.00014	0.000000033	0.000014	0.0081	0.000012	--	0.00000074	0.00028
B3	14-Jun-12	5.8	L1163243-1	0.000000065	0.000000033	0.000033	6.5E-09	0.0044	0.00000016	0.000016	0.000073	0.000021	0.000000042	0.0000035	0.0019	0.0000084	--	0.00000029	0.000058
B3	10-Aug-12	4.9	L1195392-3	0.000000028	0.00000014	0.00021	0.000000028	0.016	0.00000016	0.000026	0.000052	0.00013	0.000000054	0.000017	0.0056	0.0000032	0.000000028	0.0000025	0.00022
B3	09-Aug-15	0.46	L1656366-3	2.8E-10	6.9E-10	0.0000016	6.9E-11	0.00028	3.6E-09	0.00000079	0.00000045	0.00000039	6.9E-10	0.00000018	0.00012	0.000000067	1.8E-10	0.000000047	0.0000032
B4	06-Jul-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	31-Aug-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	14-Jun-11	1.9	L1020367-4	0.00000047	0.00000047	0.000041	0.000000047	0.04	0.00000047	0.00012	0.00000058	0.0000056	0.000000047	0.0000076	0.018	0.000053	--	0.00000072	0.00013
B4	27-Jul-11	--	L1038624-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	25-Aug-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	14-Jun-12	0.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	10-Aug-12	1.9	L1195392-4	0.000000094	0.000000047	0.00016	0.000000027	0.077	0.000000094	0.00023	0.0000042	0.0000094	0.000000047	0.000019	0.045	0.00018	9.4E-09	0.0000025	0.00021
B4	09-Aug-15	0.4	L1656366-4	0.000000002	5.1E-09	0.0000088	1.4E-09	0.0061	0.00000001	0.000013	0.000000064	0.0000003	5.1E-09	0.0000015	0.0063	0.0000088	5.1E-11	0.000000043	0.000011
B5	06-Jul-10	9.4	L905797-4	0.00000058	0.000000058	0.000056	0.000000012	0.0072	0.00000023	0.000018	0.000014	0.000012	0.000000012	--	0.0038	0.0000023	0.000000012	0.0000023	0.000066
B5	31-Aug-10	3.4	L928581-4	0.0000012	0.00000012	0.000051	0.000000012	0.02	0.00000012	0.000032	0.0000081	0.000073	0.000000012	0.000012	0.0053	0.000014	--	0.0000039	0.00005
B5	03-Oct-10	4.4	L939391-26	0.0000026	0.000000026	0.00041	0.000000053	0.07	0.00000021	0.00025	0.000025	0.000053	0.000000053	--	0.042	0.00012	0.000000053	0.000032	0.00043
B5	14-Jun-11	5.4	L1020367-5	0.00000043	0.000000043	0.000017	0.000000043	0.0066	0.00000043	0.000021	0.0000017	0.000026	0.000000043	0.0000045	0.0025	0.0000077	--	0.00000019	0.000025
B5	27-Jul-11	--	L1038624-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B5	25-Aug-11	0.19	L1052916-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B5	14-Jun-12	5.5	L1163243-4	0.000000075	0.000000038	0.000019	7.5E-09	0.005	0.000000075	0.000012	0.0000013	0.0000075	0.000000038	0.000003	0.0043	0.0000082	--	0.00000013	0.000022
B5	10-Aug-12	1.8	L1195392-5	0.000000013	0.000000064	0.000026	0.000000027	0.025	0.00000086	0.000045	0.0000069	0.000024	0.000000018	0.0000035	0.0037	0.000011	0.000000013	0.0000023	0.000049
B5	09-Aug-15	0.46	L1656366-5	3.4E-10	8.4E-10	0.00000029	8.4E-11	0.00071	5.4E-09	0.00000084	0.000000053	0.000000017	8.4E-10	0.000000017	0.0002	0.00000047	8.4E-11	0.00000026	0.00000089

Notes:
Rates are not available for sampling events without volume data.

Appendix L-5: Barrel Test Leaching Rates

Barrel ID	Date	Volume	ALS Sample ID	P mg/kg/wk	K mg/kg/wk	Se mg/kg/wk	Si mg/kg/wk	Ag mg/kg/wk	Na mg/kg/wk	Sr mg/kg/wk	Ti mg/kg/wk	Sn mg/kg/wk	Ti mg/kg/wk	U mg/kg/wk	V mg/kg/wk	Zn mg/kg/wk
B1	8-Aug-09	2.7	L804656-1	0.000016	0.00023	0.00000022	0.0000047	9.7E-11	0.00043	0.00000097	5.4E-10	5.3E-09	0.000000054	2E-10	0.000000016	0.000000045
B1	19-Sep-09	3.1	L820839-1	0.00068	0.058	0.0000068	0.0019	0.000000023	0.17	0.0004	0.00000023	0.00000048	0.000023	0.000000023	0.0000045	0.000014
B1	6-Jul-10	2.8	L905797-1	0.000062	0.0043	0.00000065	--	0.000000059	0.015	0.00004	0.000000028	0.000000059	0.000000089	0.00000003	0.00000054	0.00000074
B1	31-Aug-10	1.2	L928581-1	0.0002	0.012	0.0000041	0.00056	0.000000019	0.062	0.00011	0.000000068	0.000000068	0.00000001	0.00000001	0.0000012	0.0000011
B1	3-Oct-10	2.5	L939391-20	0.0024	0.2	--	--	--	1.3	--	--	--	--	--	--	--
B1	14-Jun-11	2.8	L1020367-1	0.0001	0.0042	0.000002	0.000071	3.4E-09	0.032	0.000052	0.000000034	0.000000034	0.0000034	5.1E-09	0.00000051	0.000001
B1	27-Jul-11	--	L1038624-1	--	--	--	--	--	--	--	--	--	--	--	--	--
B1	25-Aug-11	0.035	L1052916-11	--	--	--	--	--	--	--	--	--	--	--	--	--
B1	14-Jun-12	3.7	L1163243-2	0.00011	0.0041	0.00000086	0.00021	3.8E-09	0.022	0.00004	3.8E-09	0.000000038	0.0000038	3.8E-09	0.00000038	0.00000088
B1	10-Aug-12	3.1	L1195392-1	--	0.015	0.0000043	0.001	0.000000043	0.059	0.00021	0.000000017	0.00000017	0.000017	0.00000002	0.0000023	0.0000017
B1	9-Aug-15	0.49	L1656366-1	0.00000069	0.00018	0.00000017	0.000015	1.9E-10	0.0012	0.0000022	1.4E-10	1.4E-09	4.1E-09	2.3E-10	0.000000023	0.000000026
B2	8-Aug-09	0.9	L804656-2	0.000025	0.0042	0.00000051	0.00011	1.7E-09	0.014	0.000018	0.000000017	0.000000021	0.00000085	0.000000049	0.00000017	0.0000027
B2	19-Sep-09	1.2	L820839-2	0.00026	0.033	0.0000035	0.00087	0.000000017	0.15	0.0002	0.00000017	0.00000017	0.0000087	0.00000027	0.0000017	0.0000092
B2	6-Jul-10	3.4	L905797-2	0.00018	0.0087	0.00000028	--	0.000000014	0.047	0.000075	0.000000069	0.000000028	0.00000042	0.00000022	0.00000069	0.0000028
B2	31-Aug-10	0.31	L928581-2	0.000049	0.0039	0.00000065	0.00013	5.6E-09	0.015	0.000021	0.000000016	0.000000016	0.00000016	0.000000024	0.00000016	0.00000074
B2	3-Oct-10	2.5	L939391-22	0.00044	0.16	--	--	--	1.1	--	--	--	--	--	--	--
B2	14-Jun-11	2.6	L1020367-2	0.000089	0.0035	0.0000013	0.000051	5.9E-09	0.031	0.000057	0.000000059	0.000000059	0.000003	0.00000011	0.00000059	0.0000018
B2	27-Jul-11	--	L1038624-2	--	--	--	--	--	--	--	--	--	--	--	--	--
B2	25-Aug-11	0.41	L1052916-13	--	--	--	--	--	--	--	--	--	--	--	--	--
B2	14-Jun-12	2.5	L1163243-3	0.000074	0.002	0.00000039	0.000048	2.5E-09	0.012	0.000022	2.5E-09	0.000000034	0.0000025	0.000000017	0.00000025	0.0000011
B2	10-Aug-12	3.7	L1195392-2	--	0.018	0.000003	0.00091	0.000000046	0.071	0.00016	0.000000029	0.00000019	0.000019	0.000000092	0.0000019	0.0000096
B2	9-Aug-15	0.49	L1656366-2	0.00000066	0.00054	0.00000041	0.0000099	2.6E-10	0.0072	0.000021	9.2E-10	2.6E-09	7.9E-09	0.000000013	0.000000013	0.00000014
B3	30-Jun-09	0.5	L786052-27	0.00045	0.0045	0.00000011	0.000036	7.8E-10	0.0039	0.000014	0.000000006	0.000000063	0.0000006	3.8E-09	0.00000016	0.0000022
B3	19-Sep-09	9.4	L820839-3	0.0028	0.3	0.0000079	0.00068	0.0000002	0.45	0.00016	0.00000076	0.0000054	0.000038	0.000000076	0.000027	0.000037
B3	6-Jul-10	7.8	L905797-3	0.00098	0.025	0.0000018	0	0.000000018	0.092	0.00019	0.000000044	0.00000055	0.00000033	0.000000088	0.0000046	0.0000063
B3	31-Aug-10	0.31	L928581-3	0.000055	0.0029	0.00000018	0.000059	0.000000002	0.008	0.000018	0.000000018	0.000000051	0.0000018	3.3E-09	0.00000035	0.000001
B3	03-Oct-10	6	L939391-24	0.025	0.53	0.0000026	--	0.0000012	1.8	0.00061	0.0000003	0.0000024	0.0000039	0.00000059	0.000057	0.000097
B3	14-Jun-11	4.6	L1020367-3	0.0011	0.0057	0.00000065	0.00014	0.000000011	0.019	0.000038	0.000000059	0.00000007	0.0000059	5.9E-09	0.0000014	0.00001
B3	27-Jul-11	--	L1038624-3	--	--	--	--	--	--	--	--	--	--	--	--	--
B3	25-Aug-11	2.4	L1052916-12	0.0015	0.017	0.0000027	0.00096	0.000000027	0.041	0.00019	0.00000027	0.00000027	0.000027	0.000000027	0.0000032	0.000015
B3	14-Jun-12	5.8	L1163243-1	0.00021	0.0042	0.00000032	0.00012	0.000000012	0.013	0.000042	6.5E-09	0.000000065	0.0000065	6.5E-09	0.00000072	0.0000036
B3	10-Aug-12	4.9	L1195392-3	--	0.019	0.0000024	0.0016	0.00000011	0.052	0.00013	0.000000028	0.0000094	0.000028	0.000000028	0.000007	0.00002
B3	09-Aug-15	0.46	L1656366-3	0.000002	0.00022	0.000000074	0.000011	6.8E-10	0.0011	0.0000024	1.4E-10	1.4E-09	4.1E-09	1.4E-10	0.00000002	0.000000033
B4	06-Jul-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	31-Aug-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	14-Jun-11	1.9	L1020367-4	0.000056	0.0079	0.000008	0.000096	9.3E-09	0.077	0.0003	0.000000093	0.000000093	0.0000019	0.000000045	0.00000093	0.0000041
B4	27-Jul-11	--	L1038624-4	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	25-Aug-11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	14-Jun-12	0.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B4	10-Aug-12	1.9	L1195392-4	--	0.02	0.000018	0.00055	9.4E-09	0.18	0.0006	0.000000015	0.000000094	0.0000094	9.4E-09	0.00000094	0.000017
B4	09-Aug-15	0.4	L1656366-4	0.0000015	0.001	0.0000028	0.000013	0.000000001	0.018	0.000043	0.000000011	0.00000001	0.00000003	3.9E-09	0.000000051	0.00000017
B5	06-Jul-10	9.4	L905797-4	0.00014	0.022	0.0000023	--	0.00000023	0.075	0.000066	0.000000058	0.00000023	0.00000035	0.00000044	0.0000021	0.0000026
B5	31-Aug-10	3.4	L928581-4	0.00073	0.019	0.0000027	0.0013	0.000000024	0.055	0.00011	0.000000024	0.00000024	0.000024	0.00000016	0.0000024	0.0000049
B5	03-Oct-10	4.4	L939391-26	0.00028	0.1	0.000023	--	0.0000011	0.38	0.00054	0.00000026	0.0000011	0.000016	0.0000014	0.0000059	0.000026
B5	14-Jun-11	5.4	L1020367-5	0.00026	0.0076	0.0000021	0.00026	8.5E-09	0.033	0.000039	0.000000085	0.000000085	0.0000085	0.00000031	0.000001	0.0000026
B5	27-Jul-11	--	L1038624-5	--	--	--	--	--	--	--	--	--	--	--	--	--
B5	25-Aug-11	0.19	L1052916-10	--	--	--	--	--	--	--	--	--	--	--	--	--
B5	14-Jun-12	5.5	L1163243-4	0.00023	0.0077	0.0000011	0.00044	7.5E-09	0.017	0.000038	7.5E-09	0.000000075	0.0000075	0.00000013	0.00000075	0.000002
B5	10-Aug-12	1.8	L1195392-5	--	0.0077	0.0000018	0.00059	0.000000013	0.019	0.00011	0.000000013	0.00000013	0.000013	0.00000013	0.0000013	0.0000086
B5	09-Aug-15	0.46	L1656366-5	0.00000084	0.00018	0.00000039	0.000008	1.7E-10	0.0017	0.0000028	2.2E-10	1.7E-09	5.1E-09	4.8E-09	8.4E-09	0.000000044

Notes:
Rates are not available for sampling events without volume data.