

DRAFT ENVIRONMENTAL BASELINE STUDIES PROPOSED 2007 STUDY PLANS

CHAPTER 7. TRACE ELEMENTS

DRAFT

SEPTEMBER 2007

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ACRONYMS AND ABBREVIATIONS

BEESC Bristol Environmental and Engineering Services Corporation

NOC naturally occurring constituents

SLR SLR Alaska

7. TRACE ELEMENTS

7.1 Introduction

This document summarizes the proposed scope of work for the 2007 trace elements program for the Pebble Project. SLR Alaska (SLR) is the lead consultant for the trace elements program in 2007. Bristol Environmental and Engineering Services Corporation (BEESC) is performing sampling for the study in the transportation corridor.

The term "trace elements" refers to naturally occurring elements (mostly metals) that are analyzed for in various matrices. In Pebble Project documents, the term "trace elements" also is used to refer to the trace elements program. The trace elements program examines not only elements, but other naturally occurring compounds such as anions, cations, and biogenic hydrocarbons; the term "naturally occurring constituents" (NOC) is commonly used in this document to refer collectively to the analytical parameters included in the trace elements program.

The NOC studies in 2005 and 2006 are described in Chapter 7 of the study plans for those years (NDM, 2005 and 2006). The discussions in Sections 7.3 and 7.4 below indicate how the 2007 program differs from the studies in previous years.

7.2 Objectives

The objectives of the baseline study of NOC at the mine study area and along the transportation corridor are as follows:

- Continue collecting baseline data to characterize the natural levels of NOC existing in
 environmental media (i.e., terrestrial and aquatic vegetation, lake and pond sediment, surface
 soil), including their spatial and temporal variability, prior to mining operations.
- Provide environmental input to engineering design.
- Determine organic content in surface soils to support long-term site-monitoring objectives.
- Support the permitting process.
- Continue and update field procedures established in the 2004 study of NOC in surface soil and vegetation.

7.3 Mine Study Area

The study activities for 2004 through 2007 in the mine study area are summarized in Table 7.1-1. The sampling locations for the mine study area are presented on Figure 7.1-1. A record of sampling conducted at all locations in the mine study area in 2004 through 2006, and to be conducted in 2007, is presented in Tables 7.1-2a and b.

The 2007 study will characterize NOC in the following media:

- Terrestrial vegetation (includes lichens and mosses).
- Aquatic vegetation associated with lakes and ponds.
- Freshwater sediments associated with lakes and ponds.
- Surface soil (including soil bacteria).

The number of samples to be collected in 2007 is summarized by area and sample media in the 2007 field sampling plan for naturally occurring constituents in surface soil, sediment, and vegetation (NDM, In press2). The short-term goal of the sampling program is to collect data over two years at each location. Therefore, soil and terrestrial plant sampling in the area near the west deposit (Pebble West) will not be repeated except at sites where two years of data have not been collected. Sampling at Pebble West will occur in July and August and will target soil and terrestrial vegetation at the three sites (335011, 335081, and 335101) where only one year of sampling has been done, and sediment and aquatic vegetation from tundra ponds and lakes (Table 7.1-2a).

A new soil study to be conducted in Pebble West in 2007 will test the hypotheses of cyanogenic bacteria as a cyanide source in soil. Soil samples will be collected at 11 locations for bacteriological analysis focusing on the presence or absence of cyanide (HCN)-producing bacteria in native soils. In addition to vascular plants, mosses and lichens will be collected concurrently with and at the same location as each bacteriological soil sample. The 11 sample locations identified in Table 7-1.2a were selected based on previous analytical data that showed high levels of cyanide in soil and plants.

Sampling for the eastern deposit (Pebble East) is summarized in Table 7.1-2b. A total of 17 locations were sampled in 2006 as part of the Pebble East program. Surface soil, terrestrial and aquatic vegetation, and pond and lake sediments will be collected in 2007 from the same sites that were sampled in 2006 (Table 7.1-2 and Figure 7.1-1).

Additional aquatic vegetation samples will be collected in 12 small ponds in 2007 to complete two years of data collection which started in 2006. These samples will be collected from the same locations as in 2006. All aquatic vegetation sampling from these ponds will be coordinated with the water-quality team, which is collecting surface water and sediment samples, so that water, sediment, and aquatic vegetation samples are temporally and spatially collocated. The surface water and sediment sampling is described in Chapter 6 and in the 2007 field sampling plan for surface water quality, hydrology, and sediment (NDM, In press1).

Terrestrial vegetation sampling will include specific mosses and lichens that were relevant to other mine projects in Alaska. These vegetative types were first collected for the Pebble studies in 2006. Additional moss and lichen samples will be collected in 2007 in both Pebble East and Pebble West.

7.4 Transportation Corridor

The study activities for 2004 through 2007 for the trace elements study in the transportation corridor are summarized in Tables 7.2-1a and b. The sampling locations for the transportation corridor are presented on Figure 7.2-1. Table 7.2-2 presents a summary of sampling at each sample location throughout the

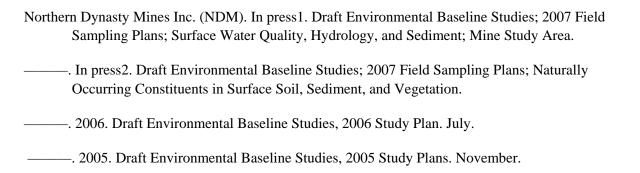
project. The number of samples of each sample medium proposed for 2007 in the transportation corridor is summarized in the 2007 field sampling plan for naturally occurring constituents (NDM, In press2). In 2007, sampling will be conducted only in the portion of the transportation corridor located in the Cook Inlet drainages.

The 2007 study will characterize NOC in the following media:

- Surface soil.
- Terrestrial vegetation.
- Aquatic vegetation associated with lakes and ponds.
- Pond and stream sediments.
- Stream surface water.

The study program for the transportation corridor will be conducted as outlined in Section 7.2 of the 2005 and 2006 study plans (NDM, 2005 and 2006). The 2007 season will focus on achieving a second year of sampling in the portion of the transportation corridor east of Summit Lake and will include a minimum of 12 locations (Figure 7.2-1).

7.5 References



TABLES

TABLE 7.1-1

Pebble Project Environmental Studies Study Summary for Trace Elements, Mine Study Area, 2004-2007 Consultant: SLR Alaska

Discipline	2004	2005	2006	2007
Discipline	(completed by CH2M Hill)	Data Collected or Tasks	Data Collected or Tasks	Tasks To Be Completed
Trace Elements		Mine St	udy Area	
	Information gathering	Information gathering	Information gathering	Information gathering
	Scope, schedule, field sampling			
	plan	plan	plan	plan
	2004 study plan	2005 study plan	2007 study plan summary	2007 study plan summary
	Soil sampling (Aug/Sep)	Soil sampling (July and August)	Soil sampling (July)	Bacteriological soil, lichens and
				moss sampling (July)
				Surface soil sampling (July)
	Vegetation sampling	Vegetation sampling (July	Terrestrial vegetation sampling	Terrestrial vegetation sampling
	(Aug/Sepleaves and berries)	leaves; Augleaves and berries)	`	(Julyleaves only; Augleaves
			and berries)	and berries)
		Aquatic plant sampling (August)	Aquatic plant sampling	Aquatic plant sampling
				(coordinated with HDR; August)
		Mercury/methylmercury fish-	Fish-tissue data analysis	Fish-tissue data analysis
		tissue data analysis		
			Pond sediment sampling	Pond/lakes sediment sampling
				(August)
			Stream-sediment and surface-	Stream-sediment and surface-
			water data analysis	water data analysis
			Coordination with HDR and	Coordination with HDR and
			BEESC	BEESC
			Draft environmental baseline	Draft environmental baseline
		0 " " " NDM 0	document	document
		Coordination with NDM &	Coordination with NDM, agency	Coordination with NDM, agency
		agencies, monthly reporting	meetings, monthly reporting	meetings, monthly reporting
		Communication and data	Communication and data	Communication and data
		management	management	management
	OARD review	Data entry and analysis	Data analysis	Data analysis
	QAPP review	QAPP update	QAPP update: aquatic species	
		2004 progress report		

TABLE 7.1-2a

Pebble Project Sample Site Period-of-Record Index

Trace Elements, Pebble West Area Mine Studies

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200271 2004	Sample Site	Year ^a								So	il													1	Notes
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330131	2006												
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336231	2005			 		X							
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336241	2005 2006	+++				X	+++		+ + +	+		-	
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336242	2005					X				44			
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336361	2006					X							
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435162	2005					Х							
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Sample Site	Year ^a					Perio	d-of-Rec		by D	isciplin	е								Nata
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435223	2005								Х										
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435301	2005			X X				Х	_		$\perp \perp$	Ш					ļ		
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425202	2005			X X				Х	_										
435302	2006																		
	2007									V									
	2004 2005			+	+++			Х	_	X									
435341	2006							 ^											
	2007																		
	2004							\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		Х	\bot		\perp				_		
435342	2005 2006			+	+++			Х					+						
	2007																		
	2004			Х					Х										
436041	2005			XX	+++			Х											
	2006 2007			X				X											Bacteriological Soil Study
	2004			XX					Х			$\overline{}$							<u> </u>
436221	2005			хх				Х	Х										
400221	2006			v	$\sqcup \sqcup$			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				\perp							D
	2007 2004			X				Х											Bacteriological Soil Study
426000	2005	1		++	 	1	 	Х	++		++	+	+	\dashv	++		+	\vdash	
436222	2006							Х											
	2007										+								
	2004 2005	1		+	++	1	+++	Х	++	+	++	++	+	+	++		+	+	
436223	2006							X			士十	力					1		
	2007																		
	2004			+	++		++	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		Х	+ +	+	\dashv	-	+	\Box	+	+	
436361	2005 2006			+	+++			Х					+						
	2007																		
	2004									Х									
535051	2005							X											
	2006								Н										
	2007 2004									х									
535052	2005							Х											
535052	2006																		
	2007 2004																		
	2005			Х							+	+	+						Tundra Pond
536051	2006			Х															Tundra Pond
	2007			Х															Tundra Pond
	2004 2005			+	+++								+						
335011	2006			хх				Х											
	2007			ХХ				X											
	2004 2005			+	+++			-	\vdash		+				_		-	\vdash	
335081	2006			ХХ				Х	\vdash									\vdash	
	2007			ХХ				Х											
	2004				+++						\bot		\perp				_		
335101	2005 2006			хх	+++			Х					+						
	2007			X X				X											
	2004																		
WL-P01	2005 2006			X	+++				\vdash		+	+	+						Pond Study
	2007			X															Pond Study
	2004								П			П						П	
WL-S04D	2005 2006	++-		X	++	+++	++	+	$\vdash \vdash$	+	++	+	\dashv	+	++	\vdash	+	\vdash	Pond Study
	2006			X															Pond Study Pond Study
	2004								П			П							
28B1	2005				++		++	+	H	+	+ +	+	\dashv	-	+	\Box	+	+	Pand Study
	2006 2007			X															Pond Study Pond Study
	2004																Ī		
28B2	2005				\Box		\Box		П		\Box	П	口	\blacksquare		\Box		П	David Otal
	2006 2007			X															Pond Study Pond Study
	2007			^							++								i ona otaay
TPS1	2005								П		ፗ								
]	2006			X															Pond Study
	2007 2004			Х							++								Pond Study
TPS2	2005							士	╁┼		<u></u>				<u> </u>			Ħ	
11-32	2006			X													I		Pond Study
	2007 2004			Х							+								Pond Study
	2004			++	+++		+++	+	\vdash	+	++	+	+	+	++	++	+	+	
TPS3	2006			Х				上	口		丗	力				口	上	Ħ	Pond Study
	2007			Х															Pond Study
_	2004 2005			++	++	++	+++	+	\vdash	+	++	++	+	+	++	\vdash	+	+	
TPS4	2006	1		Х	+++	1	 	+	+		++	+	+	+	++		+	+	Pond Study
	2007			X															Pond Study
	2004			+	++		$++$ $\overline{+}$	+-	μĪ		+T	$+$ \Box	$+\Box$	-	\prod	HĒ	\bot	$oldsymbol{\square}$	
TPS5	2005 2006	1		X	++	1	+ + +	+	++	+	++	++	+	+	++		+	+	Pond Study
	2007			X															Pond Study
	2004								П		\prod	丌						П	
TPS6	2005 2006				++	++-	++	+	$\vdash \vdash$	+	++	+	\dashv	-	++	\vdash	-	+	Pand Study
	2006			X															Pond Study Pond Study

Cample Cite	Voor ^a										Perio	d-of	-Rec	ord l	by D	iscij	oline											
Sample Site	Year ^a				Veg	etati	on						5	Soil					Ţ				nent				⇉	Notes
	Month 2004	J	F M	A	M J	J	Α	S O	N) I	F M	A	M J	J	Α	S	D N D	J	F M	I A	M	J	JA	S	0	N	D	
	2005			+	-					+						-			+	+						-	\dashv	
TPS7	2006						Χ																					Pond Study
	2007						X																					Pond Study
	2004 2005	-		1					1 1	+			-				+										4	
TPS8	2006	+		+			Х	+		+			-				++	+								_	٠,	Pond Study
	2007						X																					Pond Study
	2004															Х								Х				
Section 3,	2005	\bot								+	_								_									
Grid 10 ^b	2006 2007	-		+					+	+			-				+	+										
	2004			+	+	+	H			+		\dashv	-	+-	\vdash	Х	++-	H		╁	\vdash	-	+	+-		+	+	
Section 2,	2005																										1	
Grid 5 ^b	2006																											
	2007																											
Section 3,	2004					-				+						Х	+							-		_	_	
Grid 4 ^b	2005 2006																+	+									-	
Ond 4	2007																										1	
	2004									11						Х											T	
Section 36,	2005																											
Grid 20 ^b	2006	\bot			_	-				\perp							+							-		_	_	
	2007								+	+						v	++					_	-	V		_	+	
Section 32,	2004 2005				-					++						Х	+	+						Х				
Grid 16 ^b	2005	+	-	++	\dashv	+	\vdash	+	++	+	+	+	\dashv	+	${}^{\dag}$	+	++	H	+	+	+	\dashv	+	+	H	\dashv	\dashv	
	2007									_					Ħ			\Box			Ħ				H			
0. 1. 5	2004									П						Х		П									1	
Section 27,	2005	+		+	_	_	\sqcup	\perp	++	+	\perp	$\sqcup \downarrow$	_	_	\sqcup	\perp	++	\vdash	\perp	_	\sqcup		\perp	\perp	\sqcup	_	_	
Grid 28 ^b	2006 2007	+		++	+	+	\vdash	+	++	+	+	-	+	-	$\vdash \vdash$	+	++	\vdash	+	-	\vdash		+	-	$\vdash \vdash$		+	
	2007	+	-	++	\dashv	+	\vdash	+	++	+	+	\dashv	+	+	\forall	\dashv	++	${f H}$	+	+	H	\dashv	+	Х	\forall	-	+	
Section 17,	2005	+	_	$\dagger \dagger$	\dashv	+	\vdash	+	++	+	+	\vdash	+	+	\forall	\dashv	++	H	+	+	\dagger	$-\dagger$	+	+^	H	\dashv	十	-
Grid 106 ^b	2006				I			丄	口		工		工	L	口	土	Ш		工	I			I				ᅼ	
	2007									\prod					Ш			П							Щ			
Section 34,	2004	\bot			_	-				\perp							+							X		_	_	
Grid 72 ^b	2005 2006	-		+					 	+			-				+	+									_	
Grid 72	2007	+		+	-	+		+	+	\pm	+			-			+		-					-				
	2004									\top														Х			1	
Section 32,	2005																											
Grid 76 ^b	2006																											
	2007									\perp					Щ					_	Ш	_		ļ.,		_	4	
Section 28,	2004 2005									+							+	+						Х		-		
Grid 81 ^b	2006	+		+	-	+		+	+	+	-						+	+				_				-		
ona on	2007			1 1														t									T	
	2004																							Х				
Section 21,	2005																										_	
Grid 91 ^b	2006	+		++		+		_	+	+	_		_				+	+									_	
	2007 2004									+							++-							Х			+	
Section 3,	2005	+ 1		1 1	-												+ +		-					 ^			1	
Grid 128 ^b	2006																											
	2007																											
Section 42	2004					-				\perp			_				\bot							X			_	
Section 12, Grid 120 ^b	2005 2006	+	_	++	_	+		+	++	+	-						+	+	-									
Grid 120	2007																++-	\mathbf{H}			\vdash						-	
	2004														H		1 1							Х			7	
Section 27,	2005																											
Grid 142 ^b	2006			$oxed{\Box}$	\bot		П		\prod	$\perp \Box$		Щ		Ļ	Щ	\Box	\prod	Ц	\Box	Ļ	П	\bot	Ţ	\perp	ЦŢ	_Ţ	_[
	2007	+	_	++	\dashv	+			++	+	-	4	\perp	-	igoplus		++	\vdash	+	+	\vdash		+	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Щ	4	+	
Section 22,	2004 2005	+	-	++	+	+	\vdash	+	++	+	+	\dashv	+	+	$\vdash \vdash$	+	++	\vdash	+	+	\vdash	\dashv	+	Х	\forall	\dashv	+	
Grid 158 ^b	2006	+	\dashv	++	\dashv	+	\vdash	+	++	+	+	\exists	\dashv	+	†	\dashv	++	H	+	+	+	\dashv	+	+	H	\dashv	\dashv	
	2007	†	l								╧			Ţ						ፗ			╛	I			丁	<u> </u>
0	2004									П						Х		П						Х			1	
Section 11,	2005	+		+	-	-	\sqcup	_	++	+	_	-	\perp	-	\sqcup	_	+	\vdash	+	+	\vdash		+	+	\sqcup	_	_	
Grid 53 ^b	2006 2007	+	-	++	+	-	\vdash	+	++	++	+	\dashv	+	+	$\vdash \vdash$	+	++	\vdash	+	+			+	+	$\vdash \vdash$	-	\dashv	
	2007	+	\dashv	++	\dashv	+	\vdash	\dashv	++	+	+	\exists	\dashv	+	\forall	Х	++	${\sf H}$	+	+	\vdash	\dashv	+	Х	H	+	\dashv	
Section 4,	2005	1								1	╧				╚					1			╧	Ï			ⅎ	
Grid 67 ^b	2006			П					П							I		П	I		П		Ţ			I	I	
	2007	 			_	_			\coprod	4		Щ	_	_	Щ		++	$oxed{oxed}$	\perp	_	Щ		1	1	Щ	_	4	
Section 26,	2004 2005	+		++	+	-	\vdash	+	++	+	-	\vdash	+	-	$\vdash \vdash$	Х	++	\dashv	+	+	+		+	Х	$\vdash \vdash$		+	
Grid 23 ^b	2005	+	-	++	\dashv	+	\vdash	+	++	+	+	\dashv	+	+	$\vdash \vdash$	+	++	\vdash	+	+	+	\dashv	+	+	H	\dashv	+	
5 20	2007				\dashv	\top	$ \cdot $	\dashv	$\dagger \dagger$	1 +	\top		\dashv	+	${\dagger}$	\dashv		H	\top		\dagger	$-\dagger$	\top	1	H	_	+	
	2004									$oldsymbol{oldsymbol{ o}}$						Х			╧	I			╧	Х			J	
Section 23,	2005							\perp	П	\Box					П	1		П	I				T		Щ		1	
Grid 39 ^b	2006	+		++	\perp	-		_	++	+	+	_	_	-	$\vdash \downarrow$	_	++	\vdash	\perp		1	-	\perp	-	Н	_	4	
	2007 2004	+		++	+	+	\vdash	+	++	+	+	+	\dashv	+	$\vdash \vdash$	+	++	\vdash	+	+	\vdash	 -	+	Х	${\mathbb H}$	+	+	
	2004	+	-	++	+	+	\vdash	+	++	+	+	\dashv	\dashv	+	$\vdash \vdash$	+	++	\vdash	+	+	\vdash	\dashv	+	+^	$\vdash \vdash$	\dashv	\dashv	
Section 16 ^b	2006	_		$\dagger \dagger$					T^{\dagger}	_				╁	\Box			\mathbf{I}^{\dagger}		_	1		_	丁	H			
	2007															Ⅱ				L							⅃	
Seattle 12	2004	耳			I		口		ΙĪ				Ţ		口	Х		П	I		口	I	Ţ		口	I	T	
Section 12,	2005	+		+	-	-	\sqcup	_	++	+	_	-	\perp	-	\sqcup	_	+	\vdash	+	+	\vdash		+	+	\sqcup	_	_	
Grid 54 ^b	2006 2007	+		++	+	-	\vdash	+	++	+	+	\dashv	+	+	$\vdash \vdash$	+	++	\vdash	+	+	\vdash		+	+	$\vdash \vdash$	\dashv	+	
	2007	+	-	++	\dashv	+	\vdash	+	++	+	+	\dashv	\dashv	+	\vdash	Х	++	${oldsymbol{arphi}}$	+	+	\vdash	\dashv	+	Х	H	\dashv	+	
Section 19,	2004	+	-	++	\dashv	+	\vdash	+	++	+	+	$\exists \dagger$	\dashv	+	$\vdash \vdash$	^	++	H	+	+	$\dagger \dagger$	\dashv	+	+^	H	\dashv	\dashv	
	2006	┱╛												丁	┢	_†				╧	ፗᅦ			丁			寸	
Grid 35 ^b						T				П								Ш								T	T	
Grid 35 ^b	2007				_	_																		_		_	_	
Grid 35 ^b	2004	\blacksquare		Ħ					$\downarrow \downarrow$	1					Щ	_	+		_					Х			1	
Grid 35 ^b Section 28 ^b									\Box															Х]	

- NOTES:

 a. Work for 2007 is shown as planned, but not yet completed.
 b. Site removed from program after 2004.

TABLE 7.1-2b Pebble Project

Sample Site Period-of-Record Index

Trace Elements, Mine Study Area, Pebble East

Monitoring	Year ^a													Pe	eric	d-c	of-F	ec	ord	l by	/ D	isc	ipli	ine														
Site	rear							tati											Soi													me						Notes
Site	Month	J	F	M	Α	М	J	J	Α	S	0] N) ,	J	FI	VI /	A N	ΛJ	J	J A	1 5	SC)	1 [) .	J	F	М	Α	М	J	J	Α	S	0	Z	D	
	2004																																					
335245	2005																																					
333243	2006							Х)	(Lowland wet graminoid moss
	2007							X	X										\	(meadow habitat
	2004																																					
335244	2005																																					
333244	2006							Χ											>	(Riverine willow scrub habitat
	2007							X	X										>	(Riverine willow scrub habitat
	2004																																					
335246	2005																																					
333240	2006)																			Riverine willow scrub habitat
	2007)	(Kiverine willow scrub habitat
	2004																																					
335141	2005																																					
000141	2006							X					┸)	_	┸		\perp		L													Upland dwarf, low & tall scrub
	2007							X	X)	(habitat
	2004												4																									
335142	2005	-											4						4_						-													
	2006							Χ	X				_)						_													Upland dwarf, low & tall scrub
	2007	_						X	X				#)	(4													habitat
	2004	-		-								-	+				_		_		-	_	_	_	_	_		_										
335143	2005	1		-									4	_			_		+	,	-	-	-	_	+													Haland durant law 9 tall cample
	2006							X					_						>					_	_													Upland dwarf, low & tall scrub
	2007							Х	X				+)	(habitat
	2004											-	+				_				-			_	-	_												
335144	2005	╄		+	-		\vdash	v	v	\vdash		-	+	+						,	-	+		+	\perp		_	_										
	2006	\perp		_	-			X	X		4	+	+			-	\perp	-	>			+		\perp	+		4											Upland dwarf shrub habitat
	2007							X	Χ				+	4)	•			+		+			-										
_	2004	╄		+	-		\vdash	\vdash		\vdash		-	+	+							-	+		+	\perp		_	-										
335132	2005	1	_	-	-								+	-			_		+	_	-	-	-	-	+	-		-		_	_			_				
	2006)				_		\perp													Upland dwarf shrub habitat
	2007)	(<u> </u>

Monitoring	Year ^a													Р	eri	od-	of-	Re	co	rd I	by	Dis	scip	olin	ne													
Site	rear						get													oil											ed							Notes
Site	Month	J	F	М	Α	M	J	J	Α	S	0	NI	D .	J	F	M	Α	M	J	J	Α	S	0	N	D	J	F	N	I A	N	I J	J	Α	S	0	N	D	
	2004																																					
225445	2005																																					
335145	2006							Х	Х											Х																		
	2007							X	X											X																		Upland dwarf shrub habitat
	2004												T																									
335233	2005																																					
335233	2006							Х	Х											Х																		Subalpine dwarf & low scrub
	2007							Х	X											Х																		habitat
	2004																																					
335234	2005																																					
333234	2006							Х	Х											Х																		Subalpine dwarf & low scrub
	2007							Х	X											X																		habitat
	2004																																					
335235	2005																																					
335235	2006																			Χ																		Subalpine dwarf & low scrub
	2007																			X																		habitat
	2004																																					
335243	2005																																					
333243	2006							X												X																		Alpine rock & dwarf shrub
	2007							X	X											X																		habitat
	2004																																					
335242	2005																																					
333242	2006							X												X																		Alpine rock & dwarf shrub
	2007							X	X											X																		habitat
	2004																																					
335131	2005																																					
333131	2006							X												X																		Alpine rock & dwarf shrub
	2007							X	X											X																		habitat
	2004																																					
335241	2006																																					
333241	2007							X												Χ																		Alpine rock & dwarf shrub
	2006							X	X											X																		habitat
	2004																																					
335133	2005																																					
333133	2006								X																								X					Tundra Pond
	2007								X																								X					Tundra Pond

NOTES:

a. Work for 2007 is shown as <u>planned</u>, but not yet completed. No sampling was done in this area in 2004 or 2005.

TABLE 7.2-1a

Pebble Project Environmental Studies Study Summary for Trace Elements, Transportation Corridor, 2004-2007 Consultant: SLR Alaska

Discipline	2004	2005	2006	2007
Discipline	Data Collected or Tasks	Data Collected or Tasks	Data Collected or Tasks	Tasks to be Completed
Trace Elements		Transportat	ion Corridor	
	None	Information Gathering	Information Gathering	Information Gathering
			Scope, Schedule, Field	Scope, Schedule, Field
			Sampling Plan	Sampling Plan
		BEESC Study Plan Review	2006 Study Plan Summary	2007 Study Plan Summary
			Coordination with HDR and	Coordination with HDR and
			BEESC	BEESC
		Coordination with NDM &	Coordination with NDM and	Coordination with NDM and
		Agencies	Resource Agencies, Monthly	Resource Agencies, Monthly
			Reporting	Reporting
		Data Analysis	Data Entry and Analysis	Data Entry and Analysis
		2004 Progress Report	Prepare Preliminary	Prepare Preliminary
			Environmental Baseline	Environmental Baseline
			Document	Document

TABLE 7.2-1b Pebble Project Environmental Studies Study Summary for Trace Elements in Vegetation and Sediment, Transportation Corridor, 2004-2007 Consultant: BEESC

Disciplina	2004	2005	2006	2007
Discipline	Data Collected or Tasks	Data Collected or Tasks	Data Collected or Tasks	Tasks to be Completed
Trace Elements, Vegetation		Transportat	tion Corridor	
	Information Gathering	None	Information Gathering	Information Gathering
	Scope, Schedule, Field		Scope, Schedule, Field	Scope, Schedule, Field
	Sampling Plan		Sampling Plan	Sampling Plan
	Field SamplingAugust		Field SamplingAugust	Field SamplingAugust
	Communication and Data		Communication and Data	Communication and Data
	Management		Management	Management
	Coordination with local		Coordination with local	Coordination with local
	communities for observers		communities for observers	communities for observers
	Prepared presentation		Data Compilation	Data Compilation
	Report Writing		Report Writing	Report Writing
Trace Elements, Sediment		Transportat	tion Corridor	
	Information Gathering	Information Gathering	Information Gathering	Information Gathering
	Scope, Schedule, Field	Scope, Schedule, Field	Scope, Schedule, Field	Scope, Schedule, Field
	Sampling Plan	Sampling Plan	Sampling Plan	Sampling Plan
	Field SamplingJuly, Sept.	Field SamplingMay, July, Sept.	Field SamplingAugust	Field SamplingAugust
	Communication and Data	Communication and Data	Communication and Data	Communication and Data
	Management	Management	Management	Management
	Coordination with NDM	Coordination with NDM	Coordination with NDM	Coordination with NDM
	Coordination with local	Coordination with local	Coordination with local	Coordination with local
	communities for observers	communities for observers	communities for observers	communities for observers
	Prepared presentation	Data Compilation and Analysis	Data Compilation and Analysis	Data Compilation and Analysis
	Report Writing	Report Writing	Report Writing	Report Writing

TABLE 7.2-2 Pebble Project Sample Site Period-of-Record Index Trace Elements, Transportation Corridor

	3													P	erio	od-c	f-l	Rec	ord	by	Dis	cip	line													
Sample	Year ^a					S	Sedi	ime	nt								,	Veg	etat	tion										Soi	il					Comment
Location	Month	J	F	М	Α	М	J	J	Α	S	0	N D	J	ΤF	N	ЛΑ	I	иI.	IJ	ΙA	S	О	N	D	J	F	М	Α	М	J.	J	Α	s c	N	I D	
	2004							F		F			Г				Т																			
NUBIV	2005					F		F		F															l											
NHRIV	2006																																			
	2007												ı																							
	2004							F		F			Т		_		T																			
	2005							F		F			t																							
GS20	2006												Ī																							
	2007												ı																							
	2004							F		F			Т		_		T																			
00004	2005												t																							
GS20A	2006												t																							
	2007												t																							
	2004							F		F			Т				Т																			
00404	2005																																			
GS18A	2006																																			
	2007																																			
	2004							F		F			Т				Т																			
00474	2005					F		F		F																										
GS17A	2006																																			
	2007																																			
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GS14A	2005																																			
G314A	2006																																			
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GS14B	2005					F		F		F																										
G314B	2006																																			
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GS12A	2005																																			
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GS11A	2005					F		F		F																										
33114	2006														L		L																			
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GS8A	2005					F		F		F																										
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GS7A	2006												T																						
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GS6A	2006												1																						
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GS4A	2006					i.		i.		•			╁											+											
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GS23	2005								_				╂	-										4						_			-		
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GS22	2005							F		F			-					-						4						_			-		
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POND2	2005					F		F		F														I											
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POND3	2006																																				
	2007																																				
	2004							F		F			T												T												
POND4	2005					F		F		F																											
FOND4	2006																																				
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POND5	2005					F		F		F																											
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TE00	2005												T																								
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TE13	2005																								1													
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Sample	Year ^a						Sedi	ime	ent				T						'ege						T						Sc	oil						Comment
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1619	2006																				٧												S					
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TE20	2005																																					
120	2006																				٧												S					New Loc: North Head - East
	2007																				٧												S					
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TE21	2005																																					
1621	2006																				٧	_											S					New Loc: Knoll Head
	2007																				٧	_											S					
	2004																				٧												S					
TE22	2005																																					
	2006																				٧												S					New Loc: Just west of Port Site 1
	2007																				۷												S					
 -	2004																																					
TE23	2005																																					
1223	2006																				٧												S					
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_	2004																																					
TE24	2005																																					
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_	2004																																					
SWQ1 ^b	2005																																					
3W41	2006								F																													
	2007								F																													
=	2004																																					
SWQ2 ^b	2005																																					
SWQZ	2006								F																													
	2007								F																													
_	2004																																					
SWQ3 ^b	2005																																					
3449	2006								F																													
	2007								F																													
	2004																																					
SWQ4 ^b	2005																																					
3444	2006								F																													
	2007								F																													

KEY:

F Sediment samples collected.

V Vegetation samples collected from various plant species.

Soil samples collected.

NOTES:

a. Work for 2007 is shown as <u>planned</u>, but not yet completed. This work will be conducted by BEESC.

b. Water-quality samples, as well as sediment, are being collected at these sites.

FIGURES

