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Memo

To:	Cam Scott, Daryl Hockley	**Date:**	April 19, 2006
cc:		**From:**	Dan Mackie, John Chapman
Subject:	Interim Groundwater Capture at the ETA, Faro Mine	**Project #:**	1CD003.073

1 Introduction

Two areas adjacent to the Faro waste dumps are currently discharging significant quantities of dissolved metals to the local groundwater systems and/or downstream environment. These areas are the Emergency Tailings Area (ETA) and the area above the North Fork of Rose Creek, (known as the S-cluster well area). The ETA is believed to contribute roughly 70 tonnes of zinc contamination per year to the Rose Creek aquifer that underlies the tailings area. Of less current significance is the S-cluster area, which may be discharging contaminated water into the North Fork of Rose Creek.

As part of the development of closure plan alternatives for the Faro site, a draft remedial plan involving a permanent collection system at the ETA area has been developed. However, the implementation of a permanent collection system at the ETA is anticipated to require several years when option selection, permitting, detailed design, contracting and construction installation time are accounted for. Based on the extent of the ongoing contamination associated with the ETA area, the Faro Mine Closure Planning Office has agreed with SRK that there is real benefit to be gained from the installation of an interim seepage collection system as soon as possible, i.e. as early as 2006 or 2007. The intent of this interim system would be to significantly reduce the loading to the Rose Creek Aquifer, but it may not be linked to the permanent collection system associated with the closure plan.

There is currently no allowance for remedial activities at this area in the 2006/07 budget prepared by the Interim Receiver. This document has been prepared to initiate the discussion of funding for the implementation of an action plan in 2006. As such, it includes scoping level cost estimates, which will need to be refined if the work proceeds.

2 Description of the Proposed Interim Collection System

Collection would be focused at the area below the seepage face located immediately downstream of the mine access road, where it crosses the ETA. The collection system would require a small sump excavated to (or even into) bedrock. Surrounding overburden materials would be re-sloped to provide stable conditions and an appropriate pond area. Flow from the nearby culvert, which represents surface waters from the surrounding waste rock dumps, would be directed into the sump using a short pipeline connection. Water would be directed to the Intermediate Dam using a combination of piping and/or lined ditch. The pipeline/ditch alignment for the interim collection system will likely not be the same as

that for the final capture system. Details regarding the need for insulation and/or heating will be addressed as part of the design process.

Monitoring wells should be installed to determine the contaminant loading that escapes the interim system and to provide baseline monitoring for the final interception system. Locations will include the base of Faro Canyon and along the alignment of the recommended cut-off wall interception system, up gradient of the mine access road. Monitoring wells would be completed at three different depths: overburden, weathered bedrock and deep bedrock. Nested monitoring wells would be completed with standard 2" PVC monitoring wells in each zone using a 4" or 6" diameter borehole to provide improved completion quality control. Monitoring well nests would have protective, heated, shacks. Figures 1 through 3 show the approximate locations of the collection trench and pipeline, as well as proposed monitoring wells. Quarterly sampling and water level measurements of groundwater monitoring wells in the ETA area should continue to determine baseline values for the adaptive management plan.

3 Estimated Costs

Tasks for the Interim collection system include: planning and logistics, construction and quality control, drilling and preliminary monitoring. Costs for routine surface water and groundwater sampling are not included. Table 1 summarises estimated costs. A detailed breakdown is attached to this document.

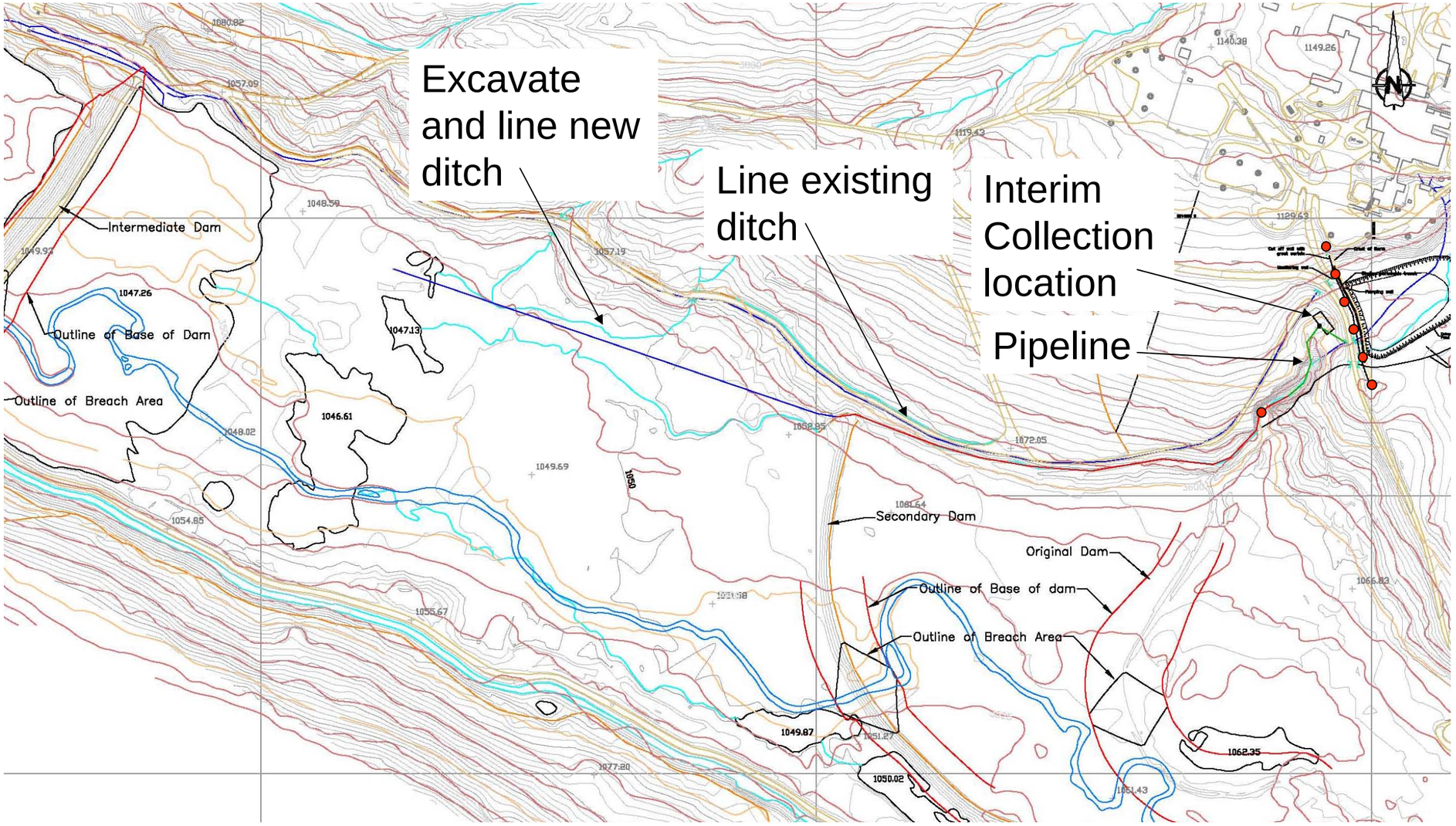
The collected water will need to be treated. Annual water treatment costs have been estimated at $680,000 assuming use of the existing Down Valley Treatment System at its current lime utilization rate of only 16%. Better lime use and significantly lower costs could be attained by improving the treatment system. That option should be looked at more fully in the design stage.

4 Schedule

Planning and design would commence with a detailed topographic survey and, potentially, the completion of test pits. A design phase would follow. Only a modest level of design effort is expected for the sump, pipe and/or ditch system, depending on the site-specific topography and geotechnical conditions. More effort is expected to be needed to assess the possible water treatment system upgrades. It is unclear what, if any, construction contracts would be necessary, but it may be possible to rely on the existing Care and Maintenance equipment and crew for implementing all but the drilling. A drilling company would have to be contracted for the installation of the monitoring wells.

Component	Cost Estimate
Survey and Design	$60,000
Collection System Capital Cost	$375,000
Monitoring Wells	$95,000
Total Estimated Cost (including indirect costs and contingency)	$740,000
Annual Water Treatment	$680,000

Option	Item	Task	Sub-task	Activity	Task	Quantity	Unit	Unit Cost	Activity Total	Subtotals	Source / Comments
DIRECT CAPITAL											
Site Preparation										$14,204	
1	1	1	1	Construct access roads	Clear access road area (LENGTH X 3m)	5,850	m2	$1.40	$8,204		
1	1	1	2		Construct access road	500	m	$12.00	$6,000		
Collection Sump										$9,929	
1	2	1	1	Excavate	Excavate to bedrock	2,034	m3	$3.69	$7,500		
1	2	2	1	Install sump	Precast 20' deep manholes: supplied and installed	1	ea.	$2,429.41	$2,429		
Channel to Intermediate Pond										$350,510	
1	3	1	1	Piping	Supply and install insulated 150mm HDPE pipe	200	m	$155.84	$31,168		
1	3	2	1	Line existing channel	Supply and install HDPE liner	5,850	m2	$21.57	$126,156		
1	3	2	2		Bedding layer: Produce, screen and stockpile	2,925	m3	$3.87	$11,306		
1	3	2	3		Bedding Layer: Load, haul, place and compact	2,925	m3	$7.47	$21,850		
1	3	3	1	Excavate new channel	Excavate ditch	2,550	m3	$3.75	$9,563		
1	3	3	2		Supply and install HDPE liner	5,525	m	$21.57	$119,147		
1	3	3	3		Bedding layer: Produce, screen and stockpile	2,763	m3	$3.87	$10,680		
1	3	3	4		Bedding Layer: Load, haul, place and compact	2,763	m3	$7.47	$20,640		
Monitoring Well Installation										$94,961	
1	4	1	1	Monitoring wells	Mob/demob	1	ea.	$20,000.00	$20,000		
1	4	1	2		Drill wells (Air Rotary Drill Rig, Average 10m depth)	21	ea.	$2,265.10	$47,567		
1	4	1	3		Install Monitoring Well	21	m	$750.00	$15,750		
1	4	1	4		Install protective well cover	21	ea.	$554.48	$11,644		
Subtotal Direct Costs											
					Subtotal direct costs					**$469,605**	
INDIRECT											
	100	1	1	Project Management	2.5% of direct costs	$ 469,605	x	2.5%		$11,740	
	100	2	1	Ground Survey		1	lump	$10,000		$10,000	
	100	3	1	Engineering Design	(including site visit)	1	lump	$50,000		$50,000	
	100	4	1	Treatment System Options Review		1	lump	$20,000		$20,000	
	100	5	1	Field Engineering and QA	10% of direct costs	$ 469,605	x	10.0%		$46,960	
	100	6	1	Taxes	7% of taxable direct and indirect costs	$ 514,384	x	7.0%		$36,007	
Subtotal Indirect Costs										**$174,707**	
CONTINGENCY											
				Contingency	20% of direct costs	$469,605	x	20.0%		**$93,921**	
TOTAL											
				Total direct and indirect costs						**$738,233**	



Scale approximate

- Monitoring Well Location

NOTE: Location of collection sump to be finalised on basis of detailed survey and design

Figure 1. Location of interim collection system and monitoring wells

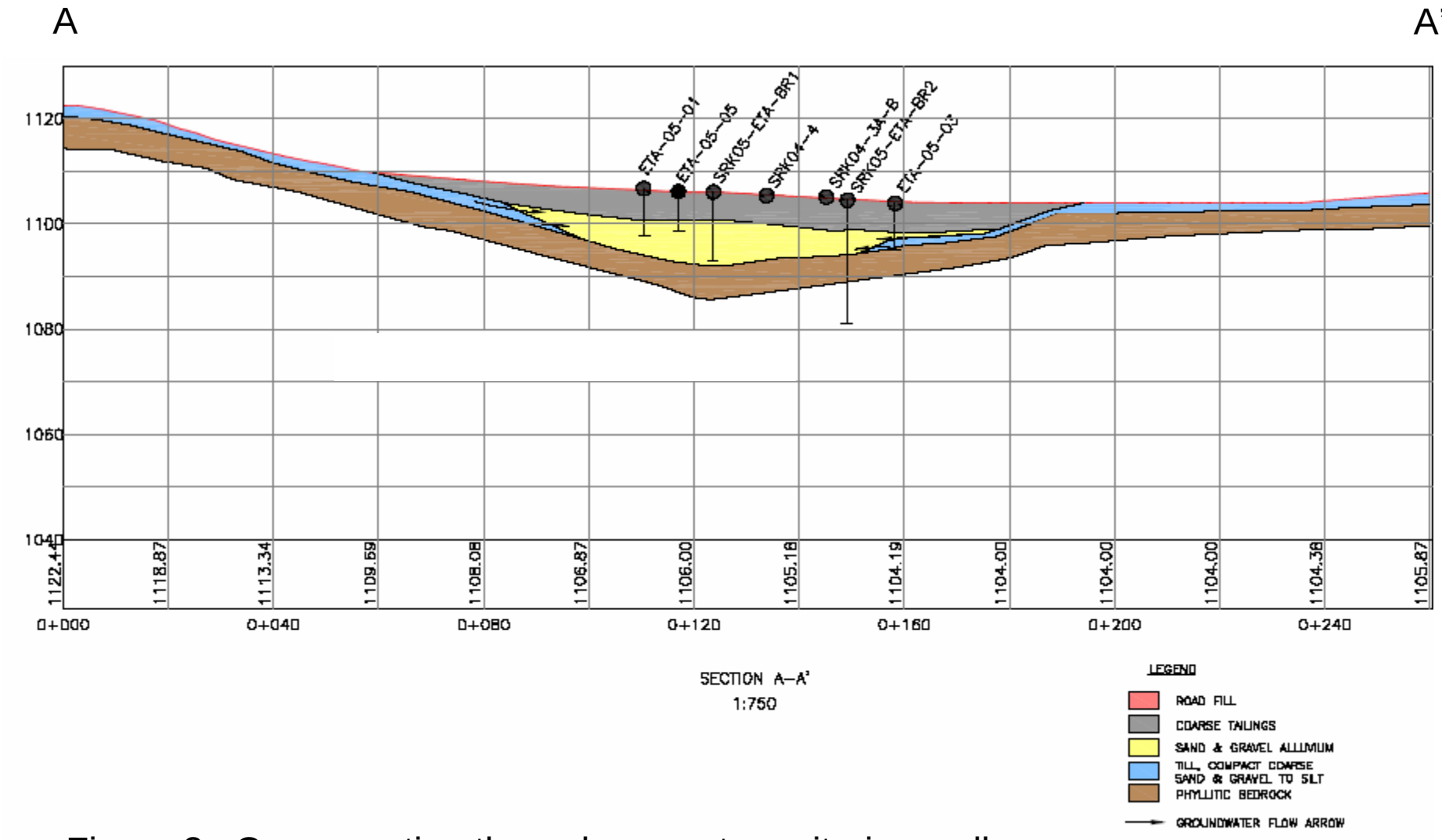


Figure 2. Cross-section through current monitoring wells

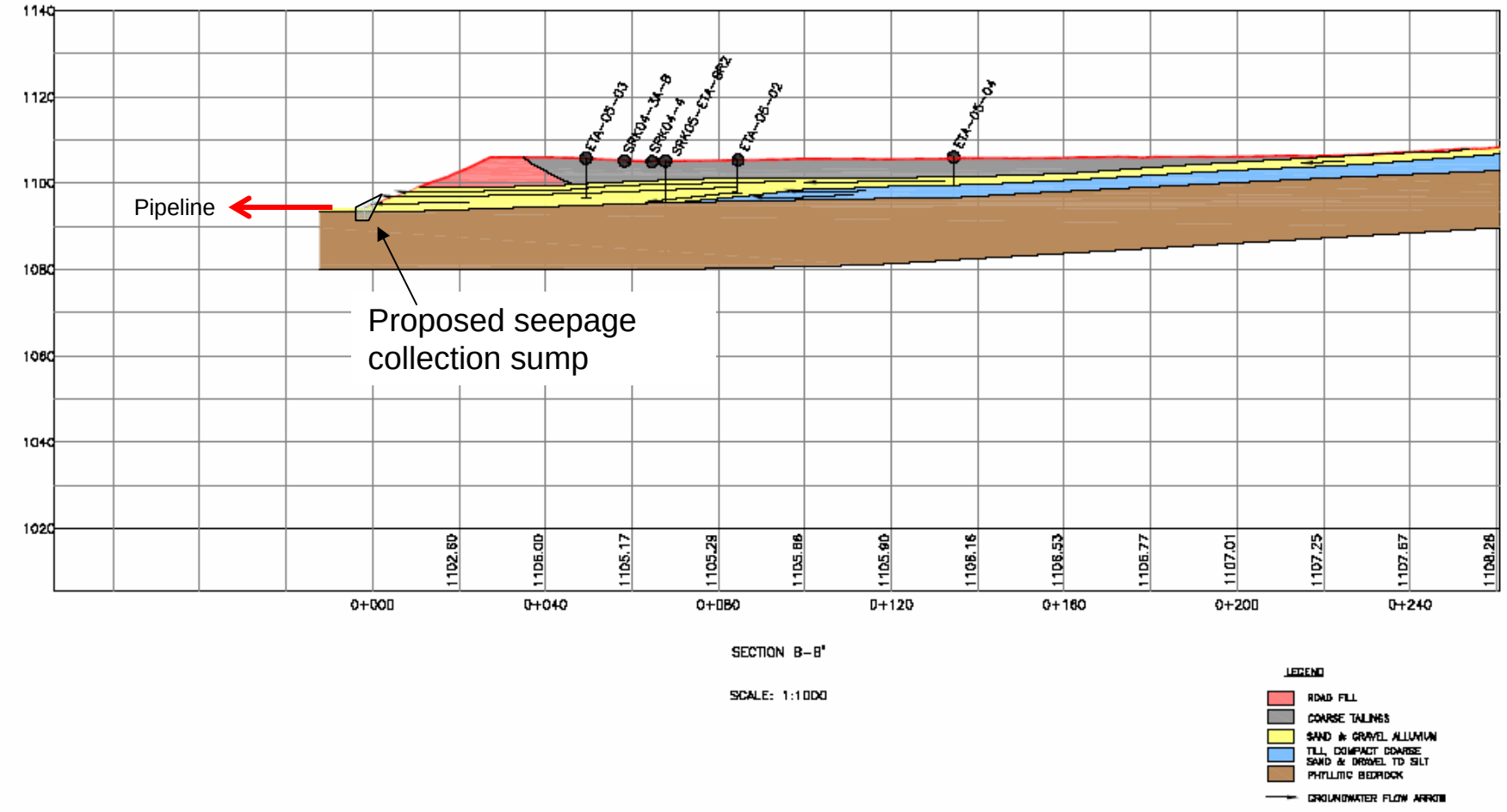


Figure 3. Cross-section of interim collection system