DATE October 12, 2010 **PROJECT No.** 09-1416-0004/3100

TO Derek Holmes
BURNCO Rock Products

CC Mark Johannes, Fred Shrimer, Rowland Atkins

FROM Richard C. Butler, P.Eng. **EMAIL** rbutler@golder.com

GEOTECHNICAL STABILITY ASSESSMENT
COMPENSATION GROUNDWATER CHANNEL
MCNAB VALLEY PROJECT

BURNCO Rock Products Ltd. (BURNCO) and 0819042 BC Ltd. are proposing to develop a sand and gravel pit, processing facility and marine barge load-out facility as primary components of the McNab Valley Aggregate Project (the Project). McNab valley is located on the western shore of Howe Sound immediately north of Gambier Island, and northeast of Gibsons, BC. See the McNab Valley Aggregate Project Description for additional details (Golder 2010a).

This memorandum presents the results of geotechnical stability analyses of the existing slopes of the compensation groundwater channel located within the southerly portion of the overall McNab valley and an engineering assessment of the impact of these stability conditions on the safety and performance of the compensation channel.

1.0 SITE AND SURFICIAL GEOLOGY

The following provides a summary of the site and interpreted geological conditions. More detailed description is presented in the technical memorandum titled “McNab Valley Project – Geological Setting and Description” (Golder 2010b).

The overall McNab project site covers land on the west side of Howe Sound, a large fjord that extends north from its entrance on Burrard Inlet and the Strait of Georgia. The location of the property is shown in Figure 1. The mountainous terrain that typifies the Coast Mountains also characterizes the McNab valley, with mountains that rise from sea level to elevations of approximately 1500 m. The McNab valley is broadly U-shaped in form. McNab Creek currently occupies this glaciated valley, cutting into, mobilizing and redepositing sediments that are sourced from upstream and drains directly into the marine environment of Howe Sound.

The sediments in the valley exhibit characteristics of glaciofluvial outwash sediments for the most part. These have formed a valley fill that has encouraged the development of a U-shape to the McNab valley. The valley fill sediments are present as a series of terraces of varying elevation. In the upper terraces, the valley fill sediments are capped by till. In the lower terraces, the sediments appear to have an alluvial veneer. This is common in valleys on the BC coast.

In the lower reaches of McNab Creek (*e.g.,* the lower 1 km of the channel), the creek has deposited a bed of alluvial sediments derived from erosion of the terraces upstream. This has formed a fan-delta at the mouth of the stream. The alluvial material associated with the stream channel overlies the glaciofluvial valley fill. McNab Creek is presently reworking these alluvial sediments and continues to build the fan-delta into Howe Sound at the creek mouth.

Surficial geologic materials within the valley form thick deposits of sand and gravel, as observed within the fan-delta, to very thin veneers of silt and/or till materials, as exposed in the valley walls/slopes.

A series of geophysical seismic refraction lines, drillholes and test pits, combined with visual mapping indicates that the slopes of the valley are characterized by variable combinations of these granular materials, with thickness ranging from nil to several meters thickness, in some locations.

The bedrock surface on which the valley fill and subsequent fan-delta has accumulated is likely to be undulating and irregular, and the thickness of the deposit may range from approximately 50 to 100 m. Drillholes have defined at least 50 m depths of sediments within the fan-delta. The nature of the stratigraphy of the fan-delta is variable, with textural and compositional range consistent with the variable prevailing sedimentological and hydraulic conditions at the time and locale of deposition. Sediment provenance reflects local bedrock geology, and is dominated by granitic rock, with some volcanic, and metamorphic components.

Fan-delta deposits that are progressively built up in these settings tend to begin with the initial deposition of very fine sediments at depth. As additional sediment is supplied to the fan-delta, hydraulic sorting dictates that the fine sediments will be deposited further out, and that coarser material will be deposited in shallower water. This prograded structure is typical of river system fan-deltas, such that fines are often located near the bottom of a sequence, and coarser materials are deposited atop of the finer sediments. As the prograding stream transports additional materials into the area, the fan-delta develops further into deeper water. The stream providing sediment also tends to wander or migrate across the width of the fan-delta surface that it is developing. As a result, it is frequently observed that an interbedded, cross-bedded structure evolves.

Glacial/post-glacial outwash during the time of glacial decay within the valley is projected to have resulted in high water volumes and accompanying greater sediment transport capacity, such that thick deposits of quite coarse-textured glaciofluvial materials resulted. Exposures of some of these former glaciofluvial deposits over shallow bedrock are observed on the flanks of the valley, and at the location of the first major bend in the creek upstream of its mouth. At this site, the creek has cut through these earlier glacial outwash deposits, exposing them and transporting the sediments downstream.

Interpretation of the sedimentary sequences observable in the terraces indicates a geologic history in which McNab Creek has incised into glaciofluvial valley fill over the post-glacial period (*i.e.,* the last 10,000 years), leaving till capped glaciofluvial deposits exposed at or near surface or overlain by more recent alluvial deposits along the past and current creek channels. Sediments from local erosion of the glaciofluvial deposits as well as more recent alluvial sediments have been deposited in the lower reach as a fan-delta structure.

In June 2010, a recent drilling program was undertaken, with samples taken from the site for further analyses (Golder 2010c). These analyses are at this time are incomplete: only a selection of samples have been tested for grain size distribution. Overall, the drilling exploration encountered sand and sand-and-gravel units throughout much of the "target" area for potential aggregate extraction, with sand: gravel ratios on the order of 1:1, and minimal silt/fines contents. In general, the surficial geologic data indicates that the upper portion of the deposit is or can be frequently characterized by very coarse material, with boulders to 1.5 m diameter or more. Some significant zones of silt were encountered in drilling within the upper 10 m of the deposit in some drillholes.

2.0 COMPENSATION GROUNDWATER CHANNEL

A channel has been previously constructed through the middle of the lower portion of the overall McNab valley as a groundwater channel for fisheries habitat and as compensation for aquatic habitat loss in other areas of Howe Sound by other proponents. The exposed sediments observed in the channel and channel side slopes are typically sandy gravel and cobbles with small boulders to maximum observed sizes of about 0.5 m. Although the compensation channel was developed at least several years ago, vegetation growth on much of the channel side slopes is sparse to non-existent. Throughout much of the channel length, fine sediments are observed to have been deposited in the bed of the channel (Golder 2010d). This suggests limited flow velocities are available to renew the habitat and flush the fine sediment clear.

3.0 STABILITY ANALYSES

Figure 2 illustrates the location of compensation channel, those recent (2010) test holes located in the vicinity of the channel, as well as the locations of two cross sections selected for use in the stability analyses. As shown, one cross section, designated the North Section, is located adjacent to borehole DH10-01 to permit correlation with the soil stratigraphy encountered at that test hole. A second cross section, designated as South Section, was developed utilizing the subsurface conditions interpreted from borehole DH10-07 which is offset to the west of the channel but considered to provide reasonable information on subsurface conditions at the channel.

The ground surface profiles, including the slopes of the compensation channel at the North and South Section were derived from the available topographic mapping of the overall site. Groundwater levels at the cross sections are based on interpretation of recently available monitoring at the test hole locations.

North Cross Section

Ground surface at or adjacent to the crest of this cross section is approximately elevation 13 m and the toe of slope at the channel is estimated to be about elevation 3 m, for an overall slope height of 10 m. Using the existing topographic mapping, the slope is standing at an average angle of about 42 degrees to the horizontal.

Based on the subsurface conditions encountered at borehole DH10-01, there is a surficial layer of mixed topsoil and mineral soils, likely fill from previous site development or the construction of the compensation channel. The fill layer is underlain by a series of layers of generally granular soils. Coarse gravel with cobbles extends down close to the toe of channel slopes, and is underlain by a layer of silt, followed in turn by silty gravels and sands, generally becoming somewhat finer with depth.

The limited, recent monitoring indicates that the groundwater level is presently about 2 m above the silt layer, at about elevation 6 m. Visual observations during reconnaissance of these slopes also indicate that seepage discharges from the face of these slopes at least periodically.

South Cross Section

Ground surface at or adjacent to the crest of the channel slopes of this section is approximately 9 m and the toe of slope at the channel is about elevation 1.5 m, for an overall slope height of 7.5 m. From the existing topographic mapping, the slope is standing at an average angle of 31 degrees to the horizontal.

Based on the subsurface conditions encountered borehole DH10-07, gravel, some sand and silt, containing cobbles extends down close to the toe of slope, although it is possible that there is a surficial layer of loosened or disturbed natural soils or fill from previous activities. Underlying the coarser gravel layer or deposit, at and below the toe of slope and channel bottom a sequence of sand, some gravel, silt and sand extend below the maximum depth of the test hole.

The recent monitoring of the standpipes in the test holes indicates that the groundwater level at this cross section is about elevation 3 m.

Geotechnical Properties and Slope Stability Analyses

Figures 3 to 12, inclusive, illustrate the cross sections, interpreted soil stratigraphy and soil properties, as well as the results of the stability analyses. The soil stratigraphy is consistent with the overall geological setting and interpretation. In particular, the presence of coarser gravel, with greater cobble and possible boulder content at the North Section relative to that at the South Section, corresponds to the deposition of coarser material closer to the apex of the fan-delta, with finer sediments deposited further out. Similarly, the presence of finer materials overlain by coarser deposits, as encountered at the test holes, is typical of river system fan-deltas.

Although no specific investigation or testing has been conducted to determine the geotechnical properties of the various soil types or strata, review of the available test hole data suggests that these soils are generally compact to very dense and granular in nature. The strength (angle of internal friction) of the various natural soil layers is considered to vary from 38 degrees for the coarse gravel with cobbles, decreasing with increase in fines content to 25 degrees for the layer of silt encountered at both cross sections. The surficial fill or topsoil present at least locally adjacent to the crest of the channel slopes is considered to have an angle of internal friction of 20 degrees.

Because the currently available information on groundwater or seepage levels within the McNab valley deposits is limited, with an ongoing monitoring program presently underway to establish actual groundwater conditions and seasonal or climatic fluctuations, a series of stability analyses were conducted to evaluate the impact of differing groundwater or saturated soil conditions, based on the following scenarios:

- Completely dry conditions at surface and extending to depth below the base of the compensation channel;
- Completely dry conditions extending below the base of the compensation channel, with 1 m saturated surface layer above and along the channel slopes as a result of infiltration from precipitation, runoff and/or snowmelt; and
- Groundwater level within the lower portion of the gravelly deposit above the toe of the channel slope, based on interpretation of recent groundwater level monitoring.

The stability analyses considered both shallow, near surface potential slope failure mechanisms, and deep seated failure mechanisms. All analyses were conducted using the commercially available Slope/W stability analysis program which determines the location and Factor of Safety of the critical slip surface. A Factor of Safety of 1.0 or less indicates that the driving forces are greater than the available strength to resist these forces, and that slope movements and failure are likely or probable.

Based on these analyses, the following presents a summary of the computed Factors of Safety for the various scenarios:

Scenario	Shallow or Deep Failure	North Section	South Section
Completely dry conditions	Shallow	0.90	1.22
Groundwater Level within lower portion of slope	Shallow	0.76	1.11
Completely dry at depth 1 m saturated surface layer	Shallow	0.63	0.99
Completely dry conditions	Deep	1.07	1.39
Groundwater Level within lower portion of slope	Deep	0.80	1.1

4.0 GEOTECHNICAL ASSESSMENT

As described above, the existing slopes of the compensation channel have low Factors of Safety varying from about 0.9 to 1.2 for shallow failures and 1.1 to 1.4 considering deep seated failures for the most optimistic, but unrealistic, scenario in which the slopes are completely dry, with no groundwater level, seepage areas or surficial saturation layers within the channel slopes. Even under these most favourable conditions, these Factors of Safety indicate that both the North and South cross sections have a significant risk of shallow slope failures.

For the scenario considering only the groundwater level within the lower portion of the overall slope, but dry conditions above that level, the Factors of Safety for shallow failures decrease to values of about 0.8 and 1.1, such that there is increased risk of and potential for slope movements and failure.

In the scenario where the upper 1 m of the otherwise completely dry soils forming the channel slopes become saturated, the Factors of Safety against shallow slope failure are less than 1.0 for both the North and South Sections, with the steeper North Section slopes having a Factor of Safety of about 0.6 and a high probability that such shallow failures occur frequently during periods of sustained wet weather, locations where surface runoff is directed onto the slope, and during or following periods of significant snow accumulation and melt.

The results of these stability analyses, in which computed Factors of Safety against shallow slope movements or failures are low even under the most optimistic scenario and at or below 1.0 under more realistic groundwater or seepage conditions are considered to be consistent with and the probable cause of the sparse or non-existent vegetation cover on these slopes.

Even under completely dry conditions, the steeper North Section is at best marginally stable against deep seated failure while the flatter, and lesser height South Section has a Factor of Safety of more than 1.3, which is generally considered the minimum acceptable Factor of Safety for sites and uses which do not present a risk to human life or significant environmental damage. However, considering the more realistic but still favourable condition in which groundwater levels are limited to the lower portion of the gravelly soils forming much of the compensation channel slopes, the computed Factors of Safety against deep seated slope failures are less than 1.3 for both the North and South cross sections, with the steeper slopes at the North having a Factor of Safety of 0.8 representing significant risk of larger scale or deep seated instability and failure.

5.0 SUMMARY AND CONCLUSION

Based on the results of review of the available topographic mapping, test hole data and recently available groundwater level monitoring, the stability analyses results confirm that the existing compensation channel slopes do not achieve adequate Factors of Safety of 1.3 or more against deep seated slope failure. The steeper portions of the compensation channel, such as that represented by the North Section, are considered to represent a significant risk of large scale instability or slope movements.

In addition, these analyses also indicate that the channel slopes are at high risk of shallow slope movements and failures and that such shallow instability has, in all probability, been ongoing since initial excavation and development of the compensation channel, which is consistent with the observations of sparse to non-existent vegetation cover on these slopes after a period of at least several years. Typically, it is recommended that permanent slopes within granular deposits be developed not steeper than 2 Horizontal to 1 Vertical to minimize the risk of shallow slope failures and permit revegetation.

We trust that this information is sufficient for your immediate requirements.

GOLDER ASSOCIATES LTD.

ORIGINAL SIGNED

Richard C. Butler, FEC, P.Eng.
Principal

RCB/asd

Attachments: Figures 1 to 12

o:\final\2009\1416\09-1416-0004\phase 3100\tm 1012_10 mcnab valley final\tm 1012_10 geotechnical stability-compensation groundwater channel_final.docx

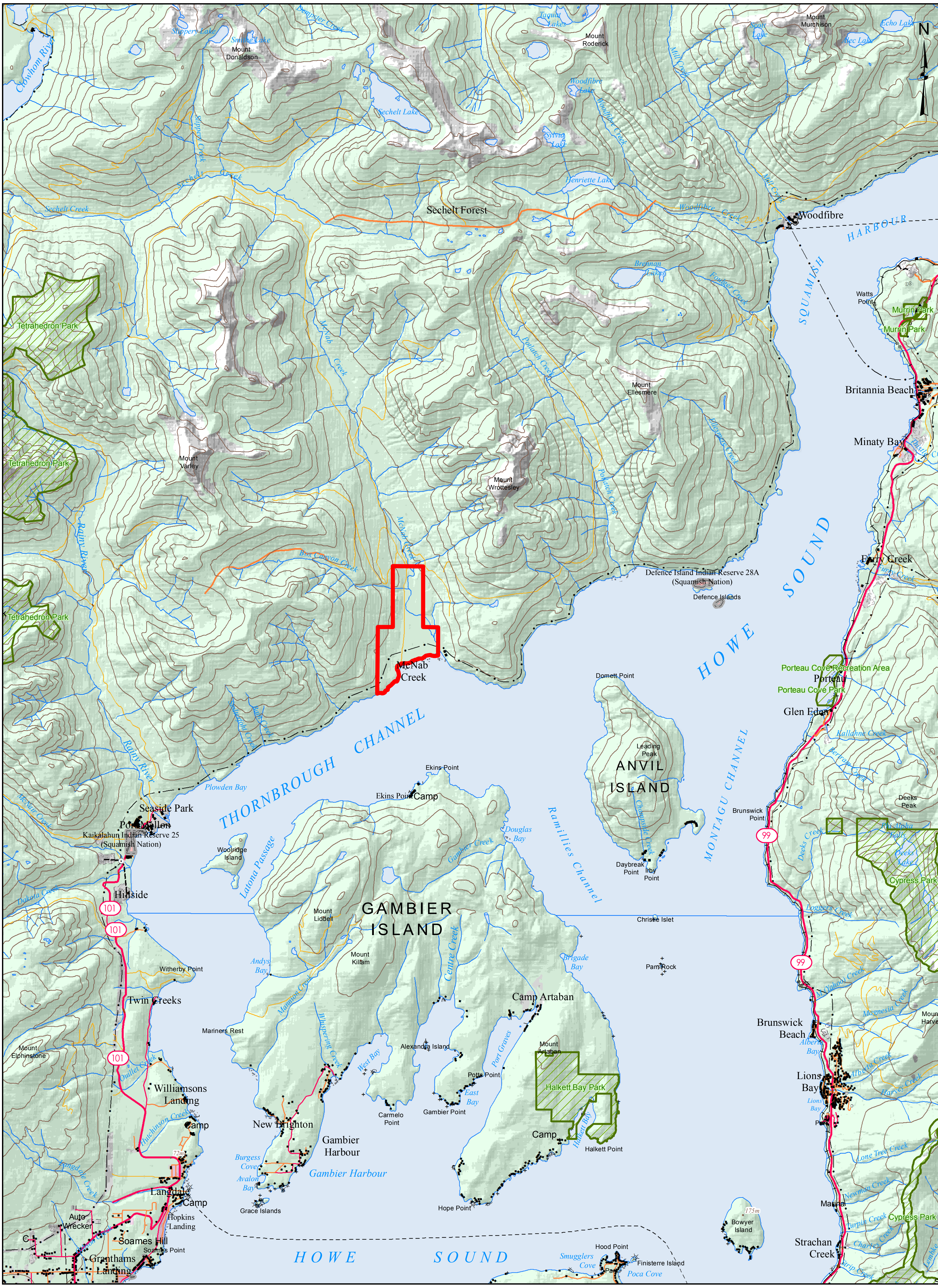
6.0 REFERENCES

Golder 2010a. McNab Valley Aggregate Project, Howe Sound, BC, Project Description. October 6, 2010. Submitted to BC Environmental Assessment Office, Victoria, BC. 34p. Appendices A, B and C.

Golder 2010b. McNab Valley Project – Geologic Setting and Description. October 7, 2010. Submitted to BURNCO Rock Products Ltd. 8p.

Golder 2010c. McNab Valley Project – Groundwater technical review. Submitted to BURNCO Rock Products Ltd. XXp.

Golder 2010d. McNab groundwater channel fisheries technical review: fisheries update. October 6, 2010. Submitted to BURNCO Rock Products Ltd. XXp.



LEGEND

- Project Area (Approximate)
- Building
- Elevation Point
- Hazard to Navigation
- Historic Site
- Navigation Aid
- Picnic Area
- Tank
- Communication Tower
- Other Infrastructure
- Contour - Index (500 ft)
- Dam
- Cable
- Transmission Line
- Railway
- Bridge
- Highway
- Major Road
- Local Road
- Limited Use Road
- Ferry Route
- Tunnel
- Watercourse
- Conduit
- Wharf
- Facility
- Rocky Ledge
- Mining Area
- Sand
- Waterbody
- Built-up Area
- Vegetation
- Aboriginal Title Area
- Park/Protected Area

2,500 0 2,500

SCALE 1:100,000 METRES

REFERENCE

Parks, and protected areas provided by B.C. LRDW. Aboriginal Areas provided by Geobase. Base features from geogratis.ca NTDB data.
For map symbology not included in legend, see http://cartes.rncan-nrcan.gc.ca/cartospecs/mainindex50_e.php.
Projection: UTM Zone 10 Datum: NAD 83

PROJECT

BURNCO ROCK PRODUCTS LTD.
MCNAB VALLEY AGGREGATE PROJECT
HOWE SOUND, B.C.

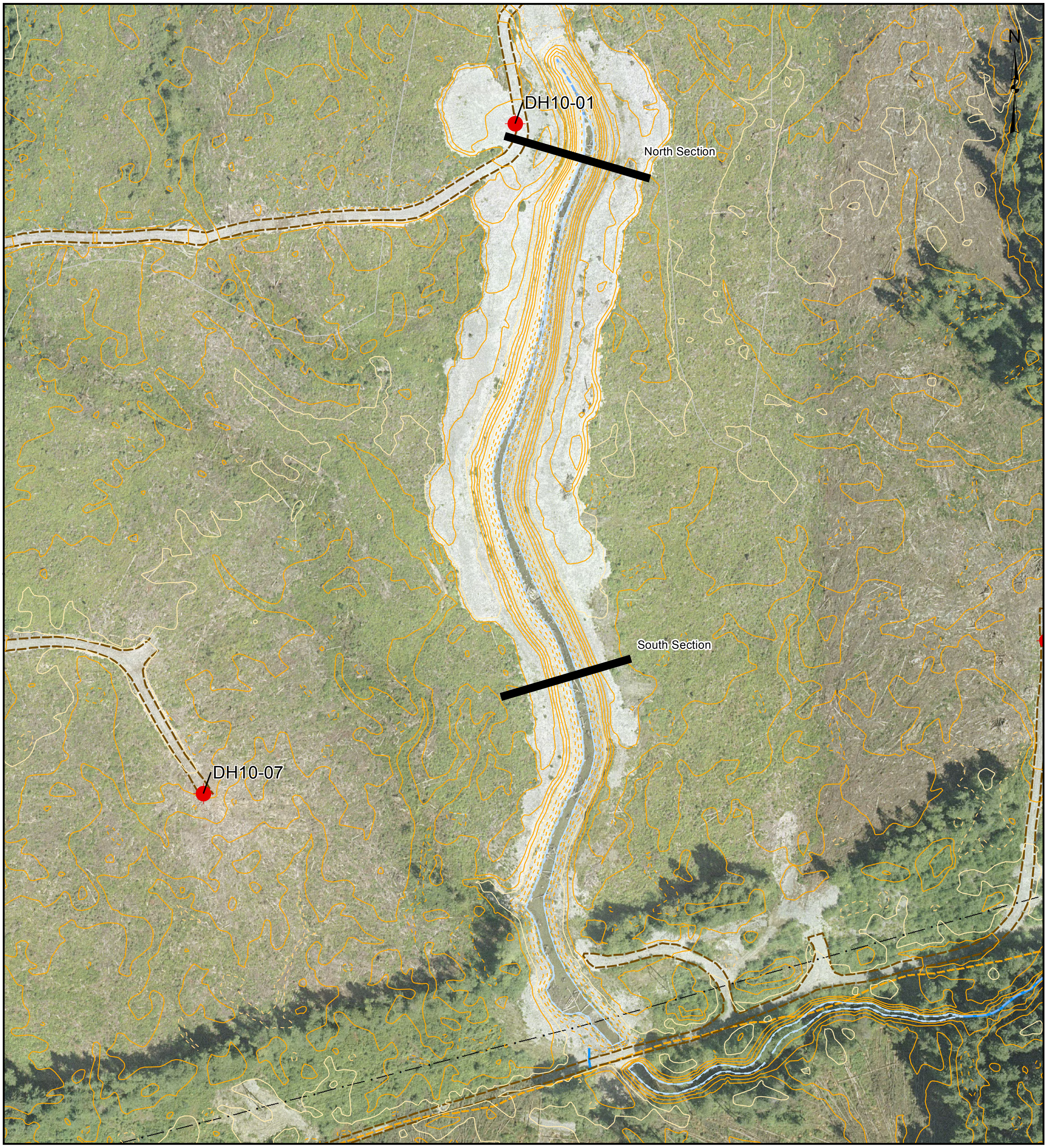
TITLE

KEYPLAN

Golder Associates
Greater Vancouver Office, B.C.

PROJECT No. 09-1416-0004			PHASE No. 6000	
DESIGN	MJ	06OCT10	SCALE AS SHOWN	REV. 0
GIS	KG	06OCT10	**FIGURE 1**	
CHECK	RA	12OCT10		
REVIEW	RB	12OCT10		

N:\Bur-Graphics\Projects\2009\1416\09-1416-0004\GIS\projects\Geology\figure-01_keyplan_100kNTS.mxd



LEGEND

- Borehole
- Cross Section
- Contour - Index
- Contour - Index - Depression
- Contour - Intermediate
- Contour - Intermediate - Depression
- Canal
- Creek - Indefinite
- Ditch
- River Shore
- Bridge
- Gravel Road
- Rough Road

75 0 75

SCALE 1:3,000 METRES

REFERENCE

Cross sections and borehole locations provided by Peter Gordon Surveys. Additional site features provided by McElhanney.
Projection: UTM Zone 10 Datum: NAD 83

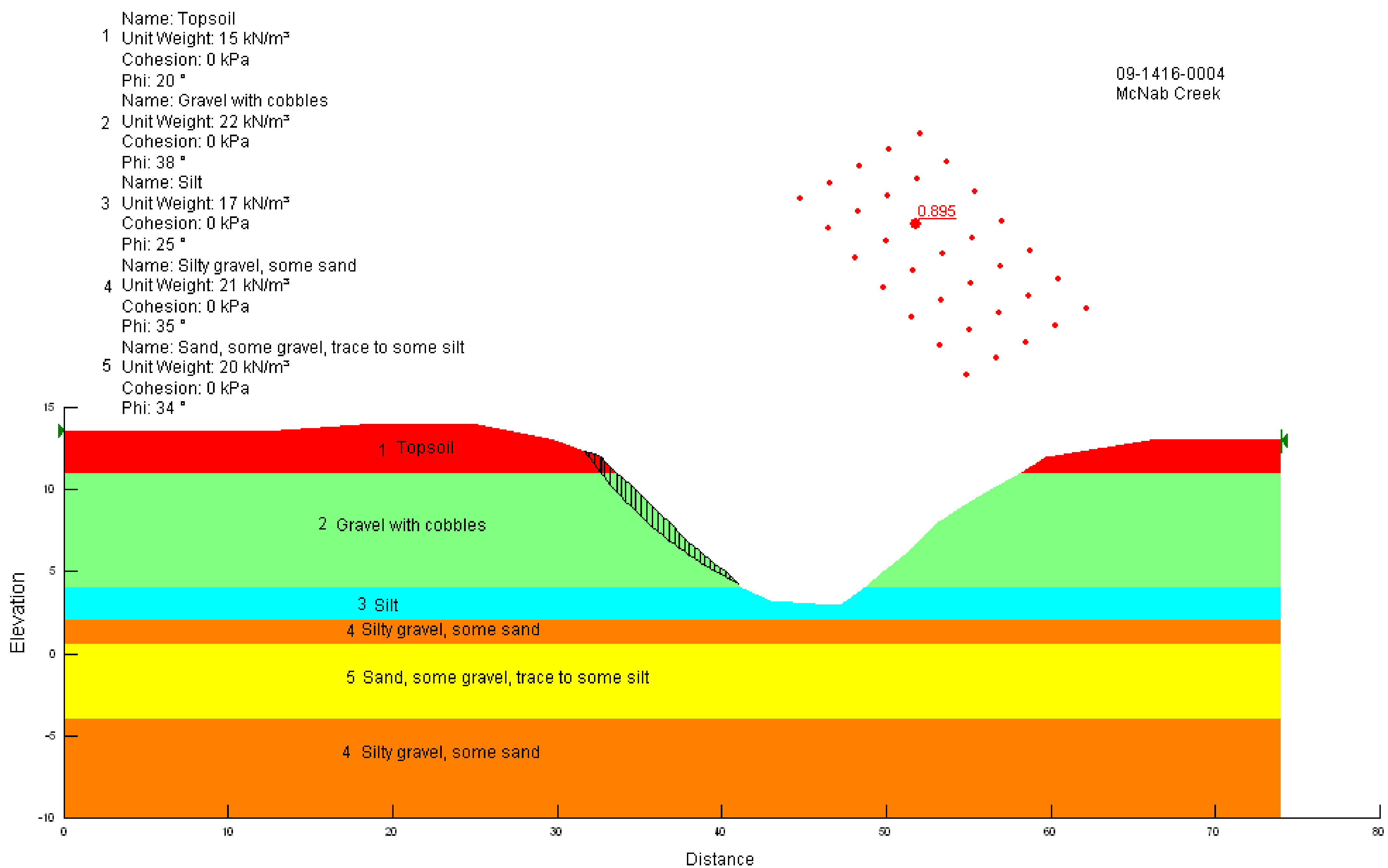
PROJECT
BURNCO ROCK PRODUCTS LTD.
MCNAB VALLEY AGGREGATE PROJECT
HOWE SOUND, B.C.

TITLE
LOCATION OF COMPENSATION CHANNEL, BOREHOLES AND SECTIONS

Golder Associates
Greater Vancouver Office, B.C.

PROJECT No. 09-1416-0004			PHASE No. 3100	
DESIGN	CHC	07OCT10	SCALE AS SHOWN	REV. 0
GIS	KG	07OCT10	**FIGURE 2**	
CHECK	RA	12OCT10		
REVIEW	RB	12OCT10		

N:\Bur-Graphics\Projects\2009\1416\09-1416-0004\GIS\projects\Geotechnical\figure-X_2000_xsections_ProjectSite.mxd



O:\Active_2009\1416\09-1416-0004 Burnco McNab Ck\Phase 3100 Geotech Studies\Slope Stability Analysis\ North Section (DH10-01) Dry.gsz

Approximate Scale - 1:300

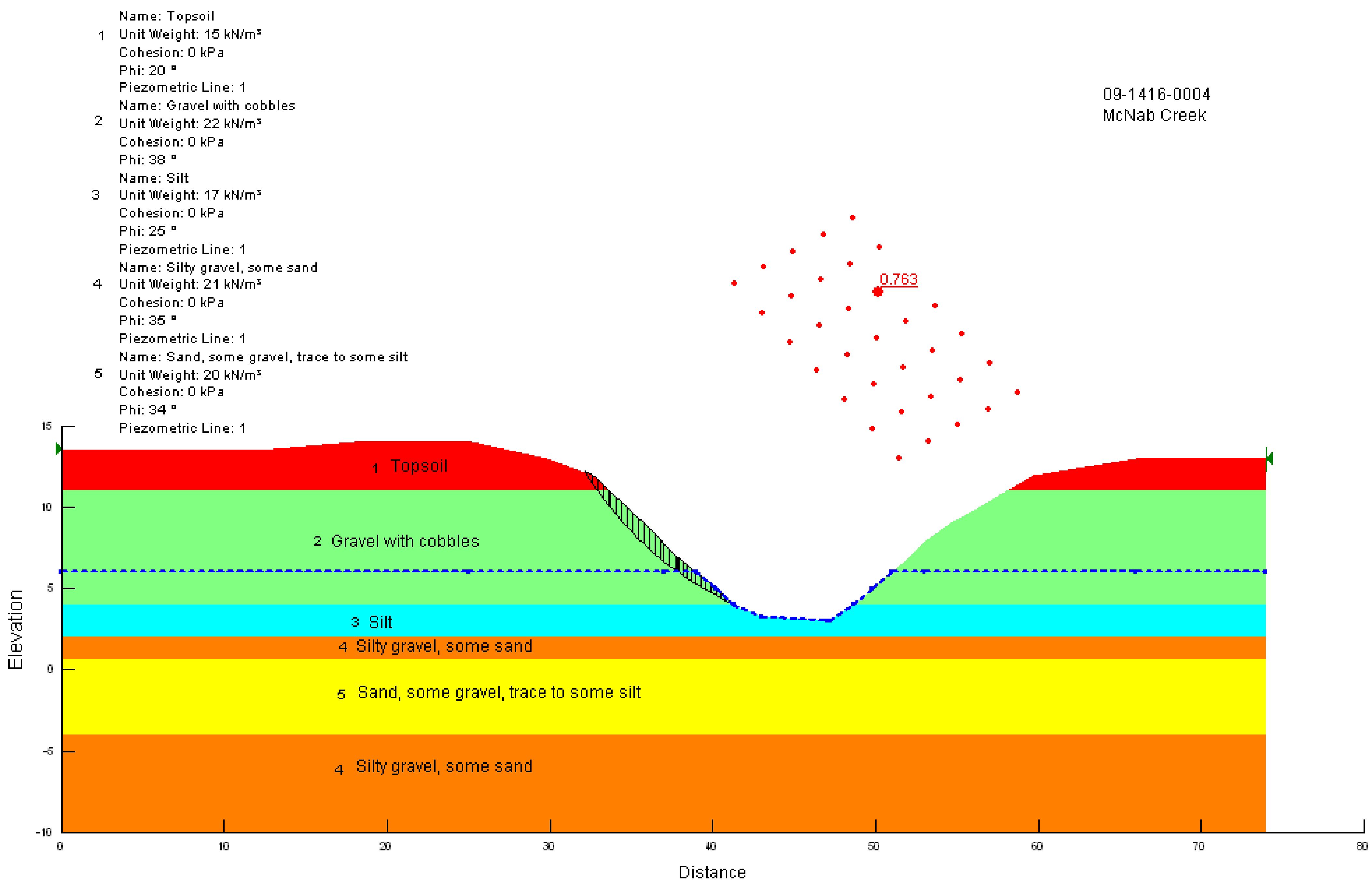
PROJECT
BURNCO
MCNAB VALLEY AGGREGATE PROJECT
HOWE SOUND, BC

TITLE
NORTH SECTION – SHALLOW FAILURE
COMPLETELY DRY CONDITIONS

PROJECT No.	09-1416-0004		PHASE No.	3100
DESIGN	CHC	06OCT10	SCALE	REV.
CADD	CHC	06OCT10		
CHECK	CHC	08OCT10	**FIGURE 3**	
REVIEW	RCB	08OCT10		

Golder Associates

FILE: O:\Active_2008\1221 - Montréal\08-1221-3012\4000 - Temp. Shaft Support and Liner Design\SHAFT SUPPORT TO 600m DEPTH\REPORT\DRAFT REPORT\Landscape Figures for report_KLB_20 JAN 2009.ppt



Approximate Scale - 1:300

O:\Active_2009\1416\09-1416-0004 Burnco McNab Ck\Phase 3100 Geotech Studies\Slope Stability Analysis\ North Section (DH10-01) Normal.gsz

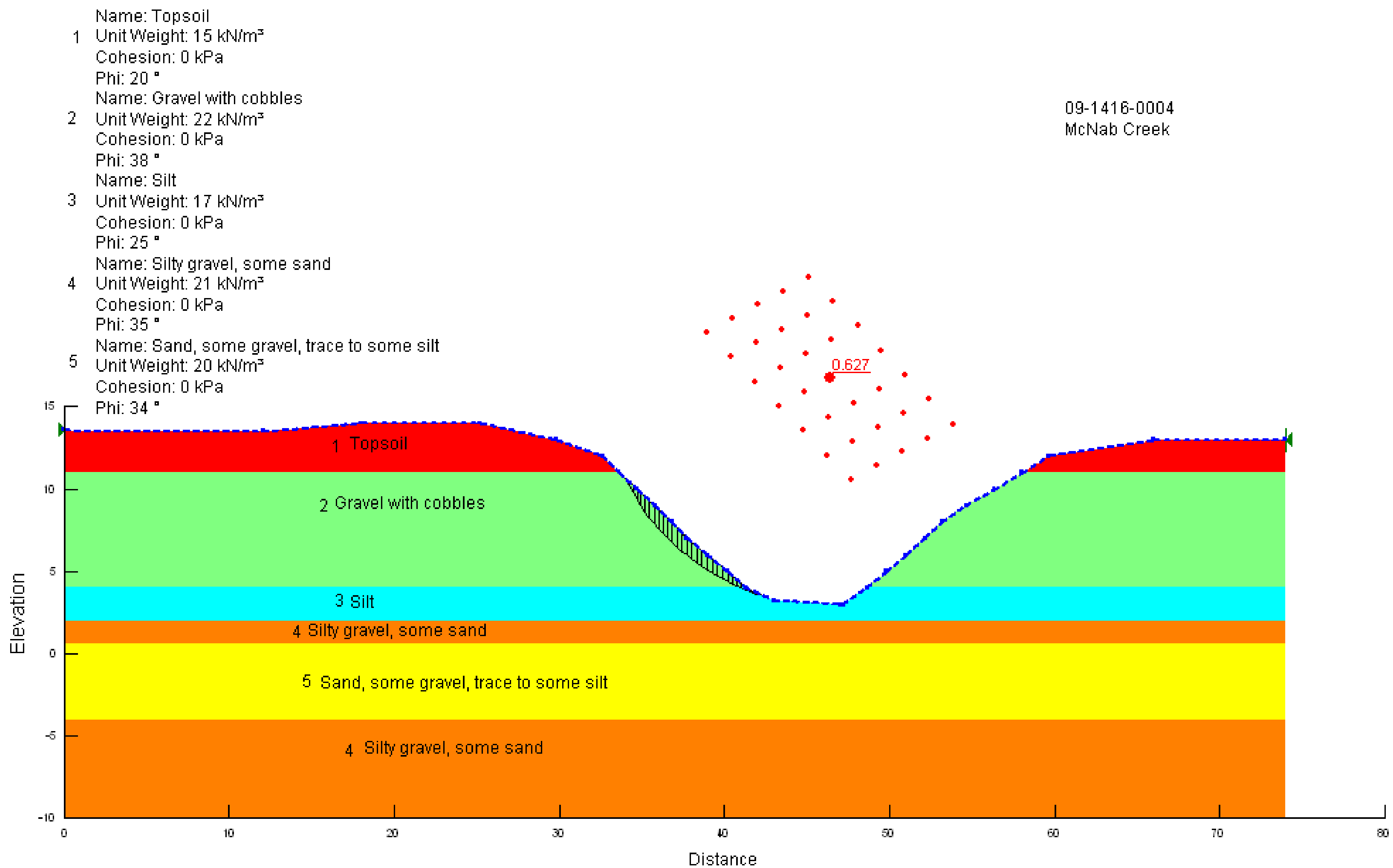
PROJECT **BURNCO**
MCNAB VALLEY AGGREGATE PROJECT
HOWE SOUND, BC

TITLE **NORTH SECTION – SHALLOW FAILURE**
GROUNDWATER LEVEL WITHIN
LOWER PORTION OF SLOPE

Golder Associates

PROJECT No.	09-1416-0004		PHASE No.	3100
DESIGN	CHC	06OCT10	SCALE	REV.
CADD	CHC	06OCT10		
CHECK	CHC	08OCT10	**FIGURE 4**	
REVIEW	RCB	08OCT10		

FILE: O:\Active_2008\1221 - Montreal\08-1221-3012\4000 - Temp. Shaft Support and Liner Design\SHAFT SUPPORT TO 600m DEPTH\REPORT\DRAFT REPORT\Landscape Figures for report_KLB_20 JAN 2009.ppt

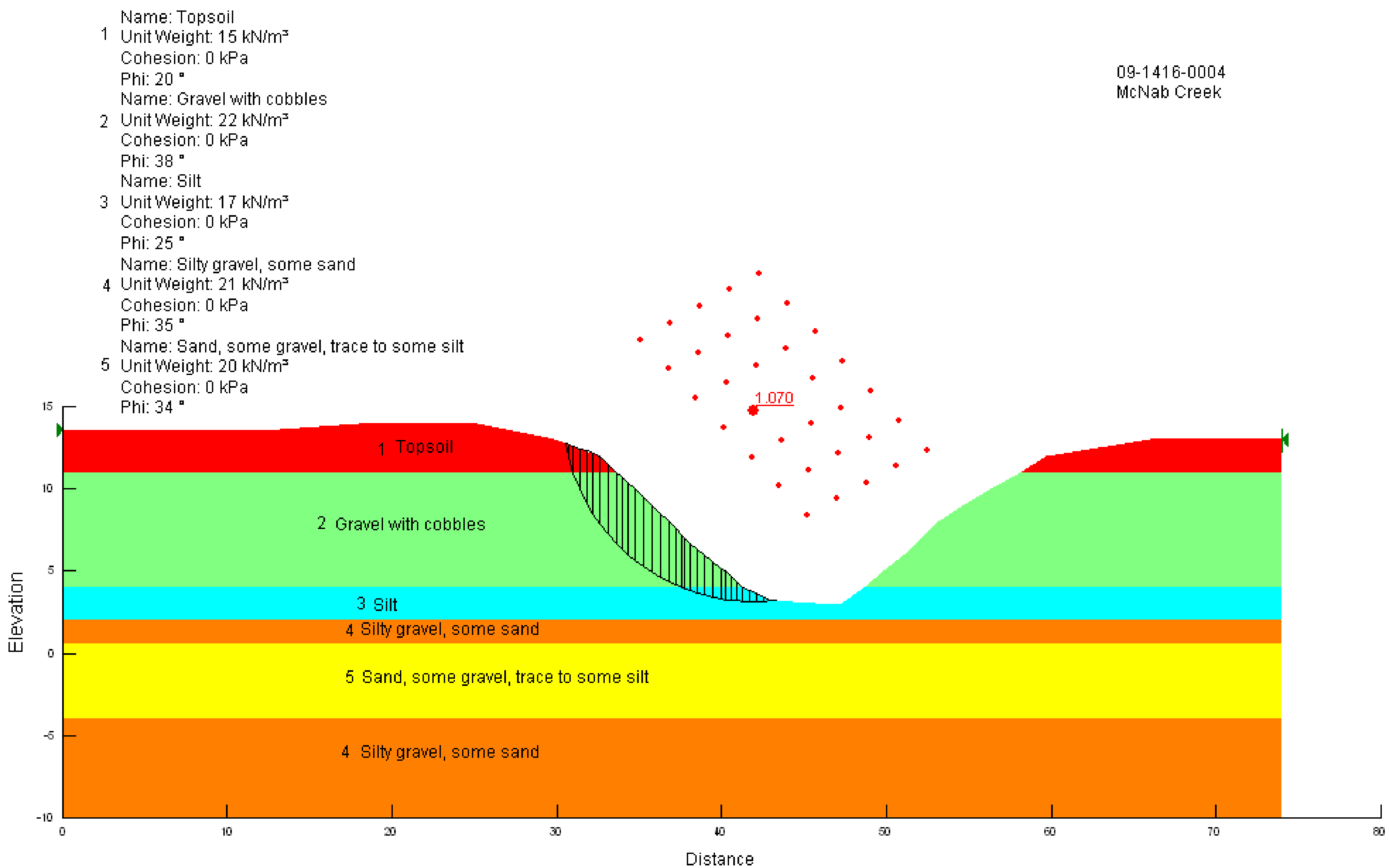


O:\Active_2009\1416\09-1416-0004 Burnco McNab Ck\Phase 3100 Geotech Studies\Slope Stability Analysis\ North Section (DH10-01) Saturated Surface.gsz

Approximate Scale - 1:300

PROJECT	**BURNCO MCNAB VALLEY AGGREGATE PROJECT HOWE SOUND, BC**			
TITLE	**NORTH SECTION – SHALLOW FAILURE SATURATED SURFACE CONDITIONS**			
Golder Associates	PROJECT No.	09-1416-0004	PHASE No.	3100
	DESIGN	CHC	06OCT10	SCALE / REV.
	CADD	CHC	06OCT10	
	CHECK	CHC	08OCT10	**FIGURE 5**
	REVIEW	RCB	08OCT10	

FILE: O:\Active_2008\1221 - Montréal\08-1221-3012\4000 - Temp. Shaft Support and Liner Design\SHAFT SUPPORT TO 600m DEPTH\REPORT\DRAFT REPORT\Landscape Figures for report_KLB_20 JAN 2009.ppt



Approximate Scale - 1:300

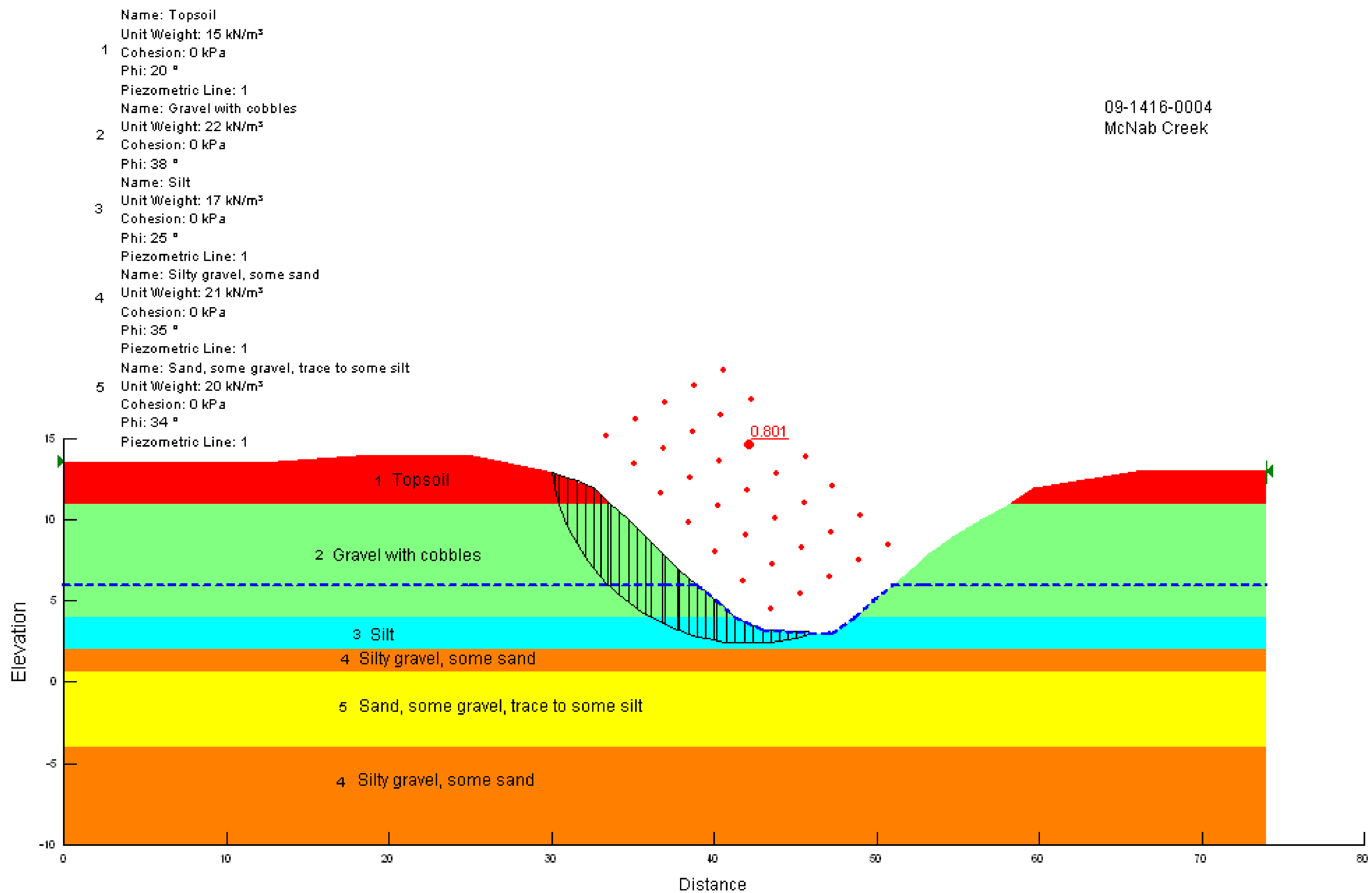
O:\Active_2009\1416\09-1416-0004 Burnco McNab Ck\Phase 3100 Geotech Studies\Slope Stability Analysis\ North Section (DH10-01) Dry Deep Seated.gsz

PROJECT	**BURNCO** **MCNAB VALLEY AGGREGATE PROJECT** **HOWE SOUND, BC**
TITLE	**NORTH SECTION – DEEP FAILURE** **COMPLETELY DRY CONDITIONS**

Golder Associates

PROJECT No.	09-1416-0004		PHASE No.	3100
DESIGN	CHC	06OCT10	SCALE	REV.
CADD	CHC	06OCT10		
CHECK	CHC	08OCT10	**FIGURE 6**	
REVIEW	RCB	08OCT10		

FILE: O:\Active_2008\1221 - Montréal\08-1221-3012\4000 - Temp. Shaft Support and Liner Design\SHAFT SUPPORT TO 600m DEPTH\REPORT\DRAFT REPORT\Landscape Figures for report_KLB_20 JAN 2009.ppt



Approximate Scale - 1:300

O:\Active_2009\1416\09-1416-0004 Burnco McNab Ck\Phase 3100 Geotech Studies\Slope Stability Analysis\ North Section (DH10-01) Normal-Deep Seated Failure.gsz

PROJECT

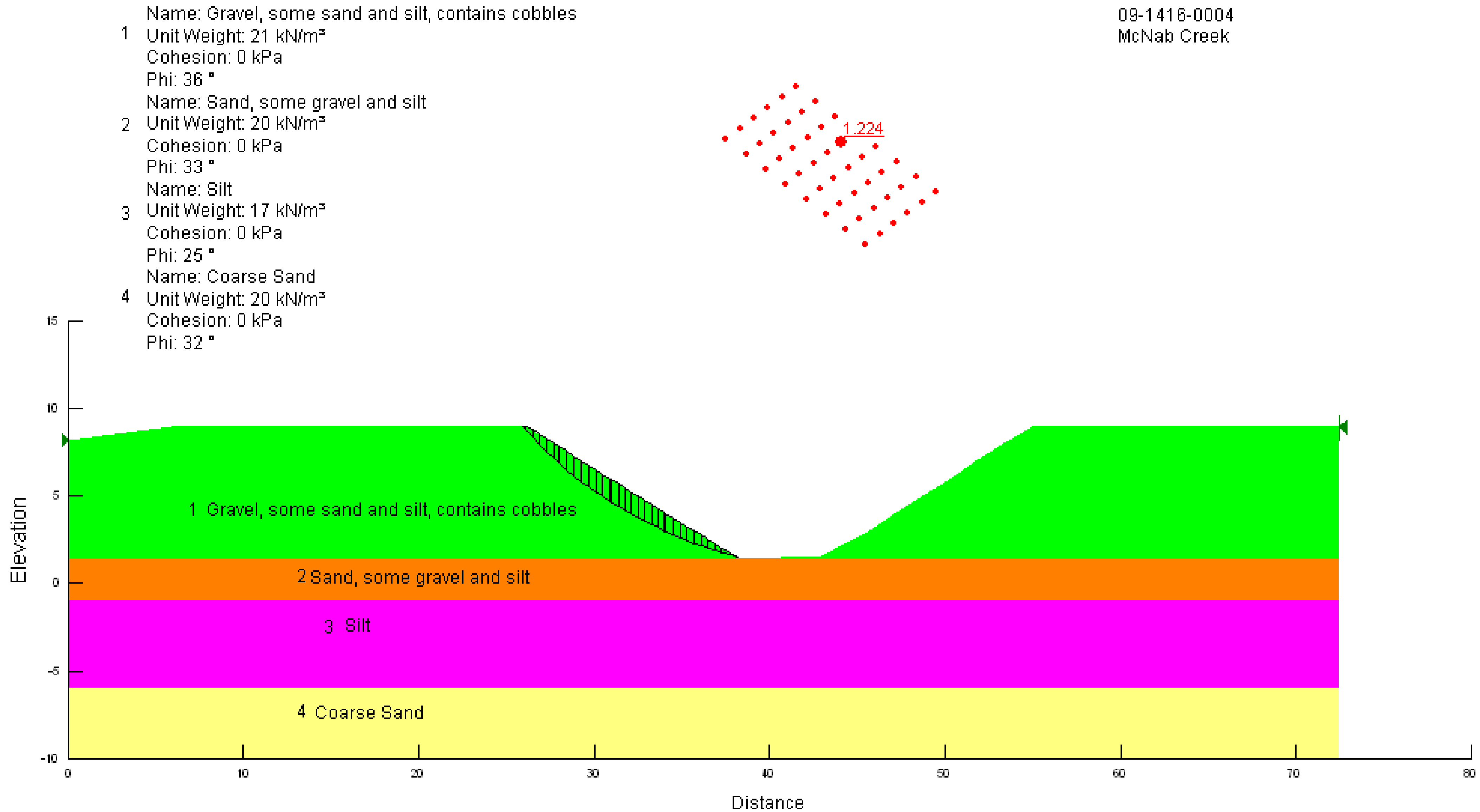
BURNCO
MCNAB VALLEY AGGREGATE PROJECT
HOWE SOUND, BC

TITLE

NORTH SECTION – DEEP FAILURE
GROUNDWATER LEVEL WITHIN
LOWER PORTION OF SLOPE

Golder Associates

PROJECT No.	09-1416-0004		PHASE No.	3100
DESIGN	CHC	06OCT10	SCALE	REV.
CADD	CHC	06OCT10		
CHECK	CHC	08OCT10	**FIGURE 7**	
REVIEW	RCB	08OCT10		



O:\Active_2009\1416\09-1416-0004 Burnco McNab Ck\Phase 3100 Geotech Studies\Slope Stability Analysis\ South Section Dry.gsz

Approximate Scale - 1:300

PROJECT
BURNCO
MCNAB VALLEY AGGREGATE PROJECT
HOWE SOUND, BC

TITLE
SOUTH SECTION – SHALLOW FAILURE
COMPLETELY DRY CONDITIONS

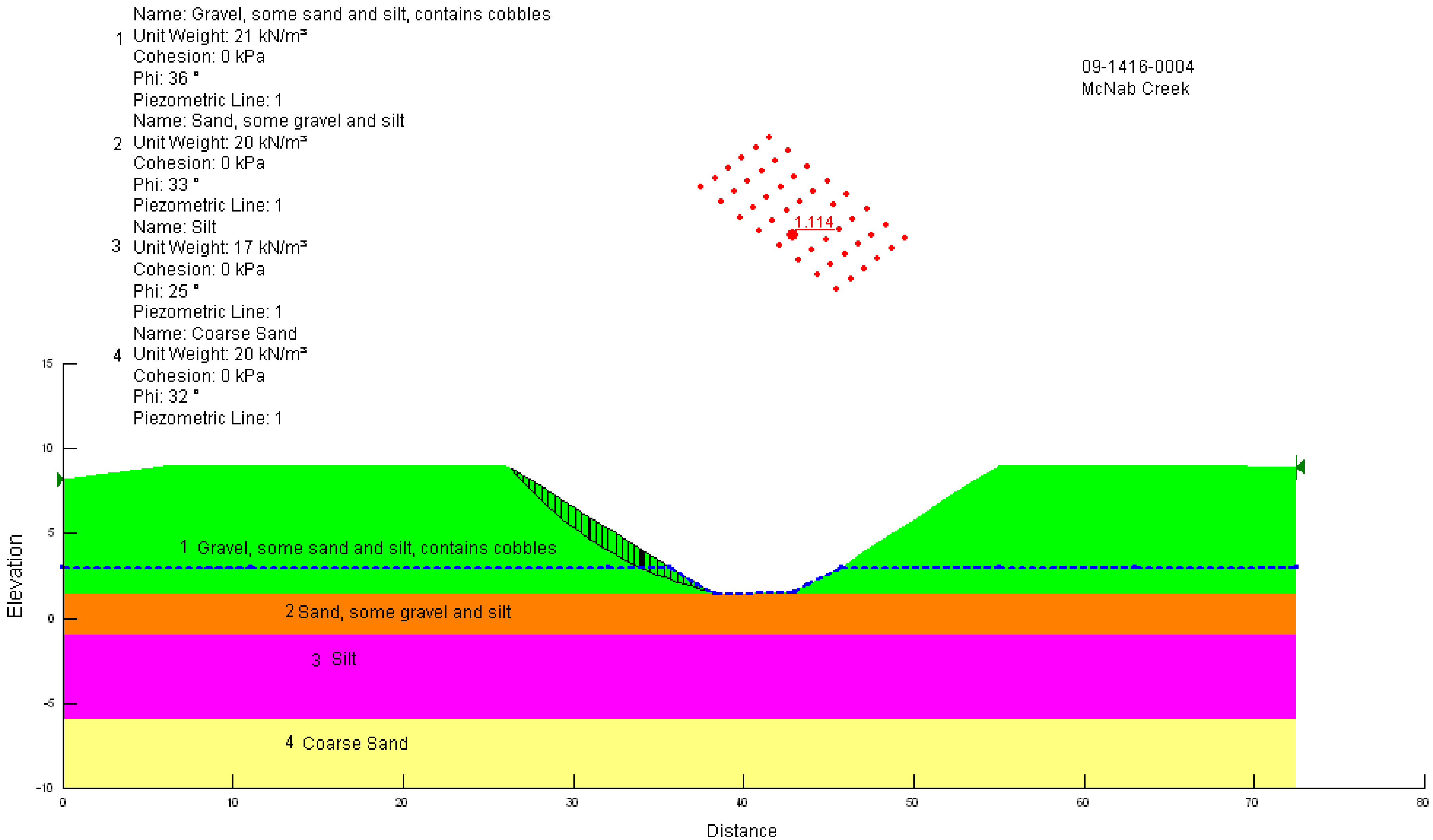
Golder Associates

PROJECT No.	09-1416-0004	PHASE No. 3100
DESIGN	CHC	06OCT10
CADD	CHC	06OCT10
CHECK	CHC	08OCT10
REVIEW	RCB	08OCT10

SCALE REV.

FIGURE 8

FILE: O:\Active_2008\1221 - Montréal\08-1221-3012\4000 - Temp. Shaft Support and Liner Design\SHAFT SUPPORT TO 600m DEPTH\REPORT\DRAFT REPORT\Landscape Figures for report_KLB_20 JAN 2009.ppt



O:\Active_2009\1416\09-1416-0004 Burnco McNab Ck\Phase 3100 Geotech Studies\Slope Stability Analysis\ South Section Normal.gsz

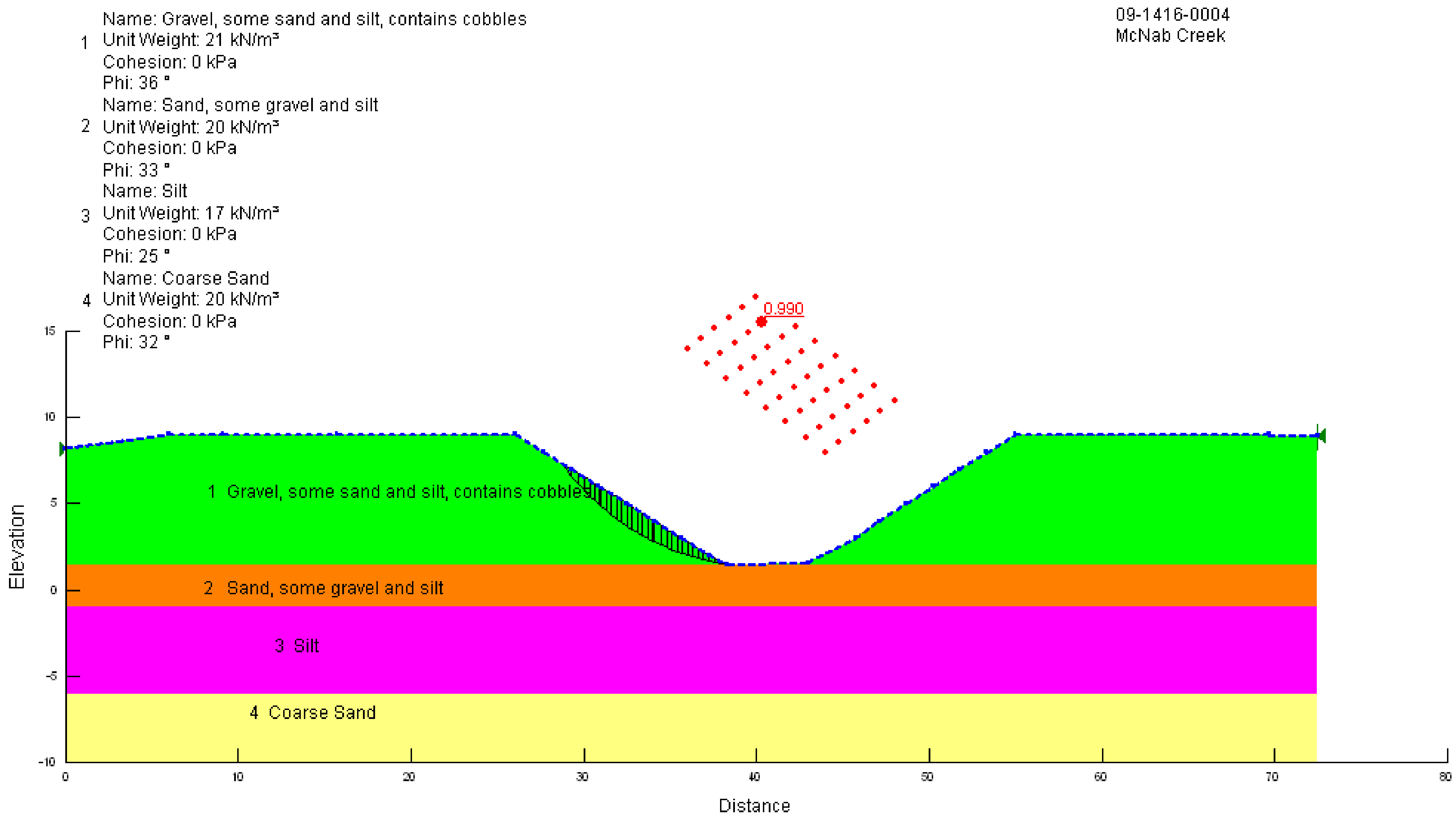
Approximate Scale - 1:300

PROJECT **BURNCO**
MCNAB VALLEY AGGREGATE PROJECT
HOWE SOUND, BC

TITLE **SOUTH SECTION – SHALLOW FAILURE GROUNDWATER LEVEL WITHIN LOWER PORTION OF SLOPE**

Golder Associates

PROJECT No. 09-1416-0004			PHASE No. 3100
DESIGN	CHC	06OCT10	SCALE REV.
CADD	CHC	06OCT10	**FIGURE 9**
CHECK	CHC	08OCT10	
REVIEW	RCB	08OCT10	



O:\Active_2009\1416\09-1416-0004 Burnco McNab Ck\Phase 3100 Geotech Studies\Slope Stability Analysis\South Section Saturated Surface.gsz

Approximate Scale - 1:300

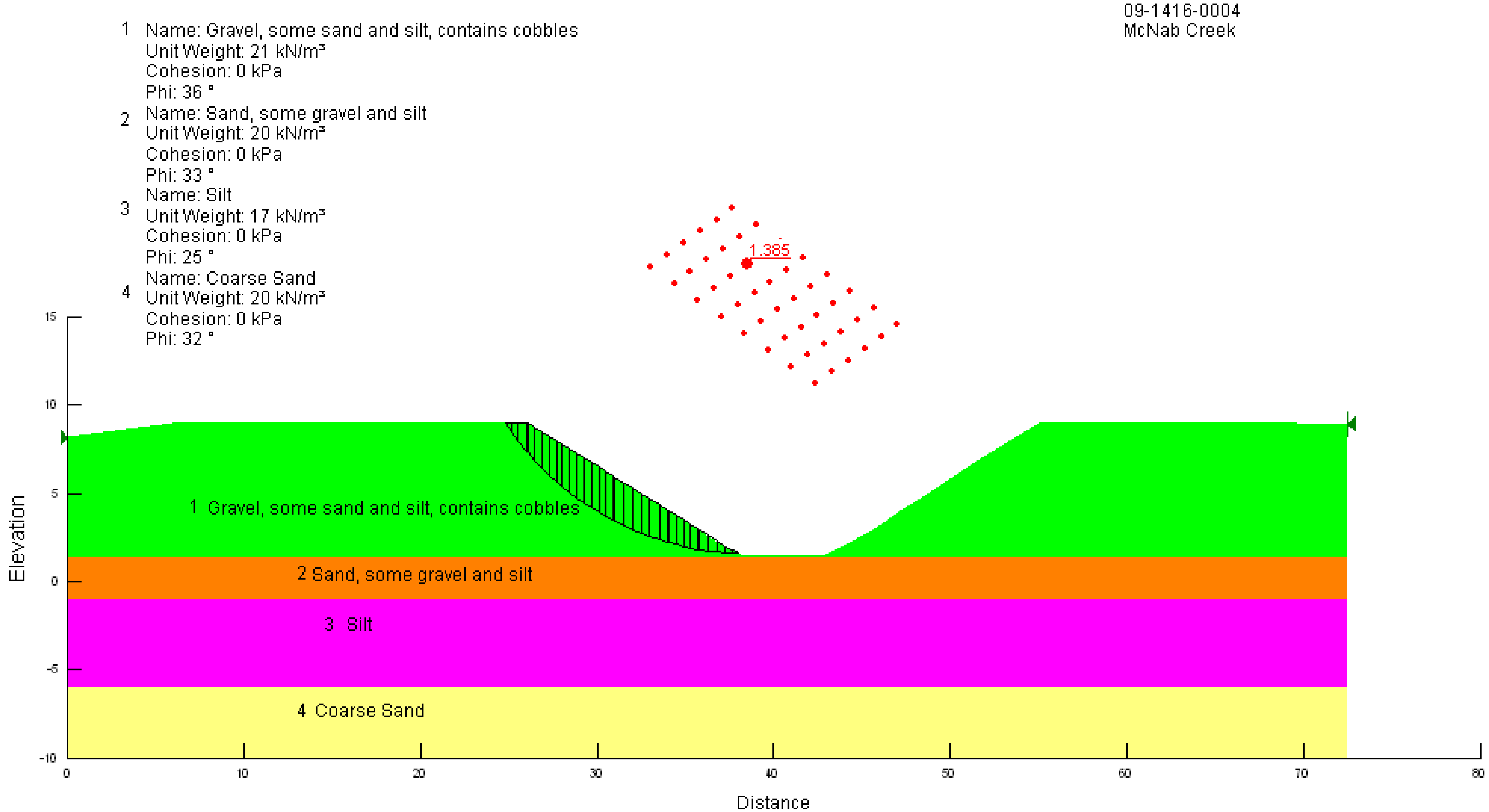
PROJECT
BURNCO
MCNAB VALLEY AGGREGATE PROJECT
HOWE SOUND, BC

TITLE
SOUTH SECTION – SHALLOW FAILURE
SATURATED SURFACE CONDITIONS

Golder Associates

PROJECT No.	09-1416-0004		PHASE No. 3100	
DESIGN	CHC	06OCT10	SCALE	REV.
CADD	CHC	06OCT10	**FIGURE 10**	
CHECK	CHC	08OCT10		
REVIEW	RCB	08OCT10		

FILE: O:\Active_2008\1221 - Montréal\08-1221-3012\4000 - Temp. Shaft Support and Liner Design\SHAFT SUPPORT TO 600m DEPTH\REPORT\DRAFT REPORT\Landscape Figures for report_KLB_20 JAN 2009.ppt



Approximate Scale - 1:300

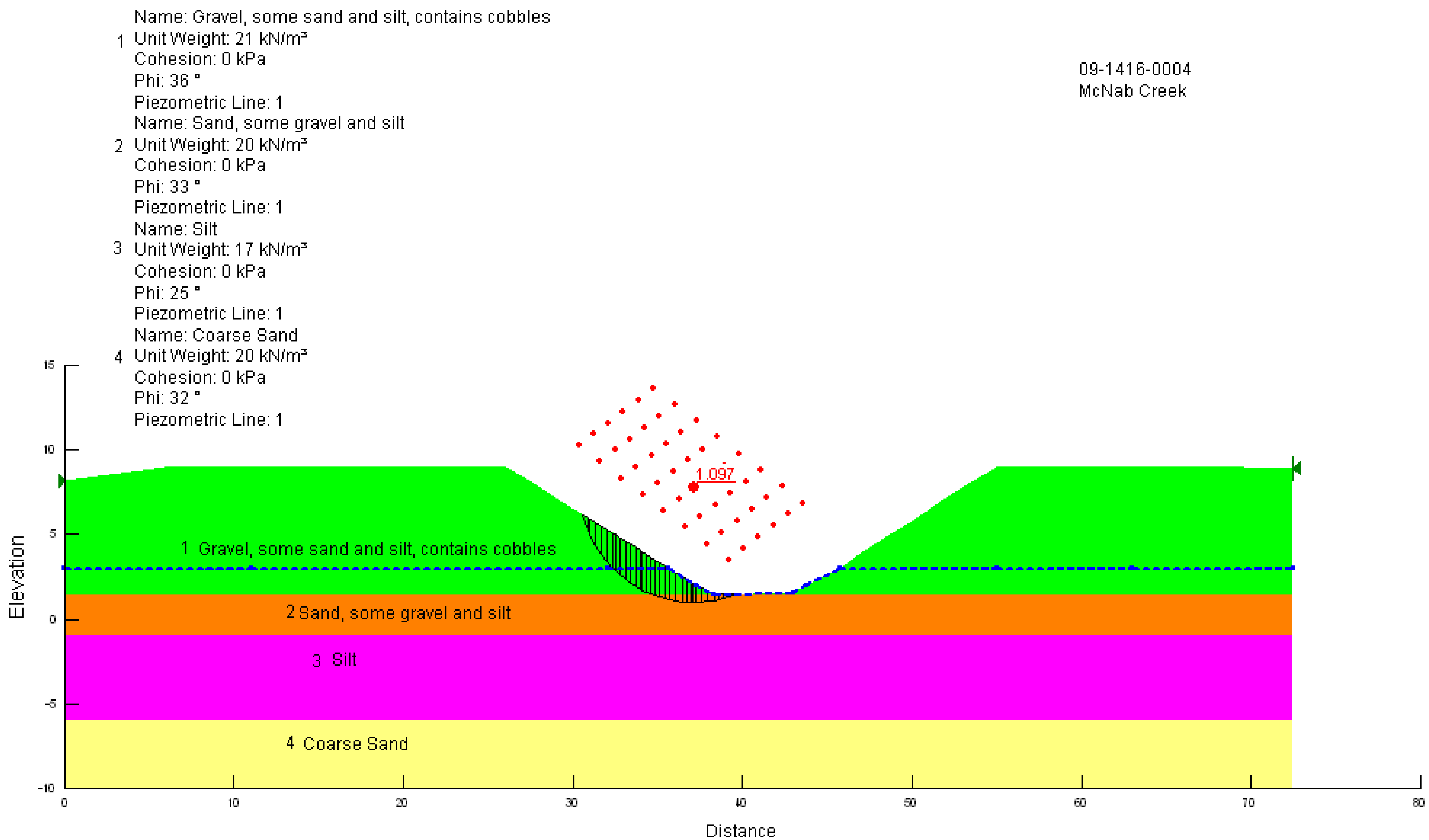
O:\Active_2009\1416\09-1416-0004 Burnco McNab Ck\Phase 3100 Geotech Studies\Slope Stability Analysis\ South Section Dry Deep Seated.gsz

PROJECT	**BURNCO** **MCNAB VALLEY AGGREGATE PROJECT** **HOWE SOUND, BC**
TITLE	**SOUTH SECTION – DEEP FAILURE** **COMPLETELY DRY CONDITIONS**

Golder Associates

PROJECT No.	09-1416-0004		PHASE No.	3100
DESIGN	CHC	06OCT10	SCALE	REV.
CADD	CHC	06OCT10		
CHECK	CHC	08OCT10	**FIGURE 11**	
REVIEW	RCB	08OCT10		

FILE: O:\Active_2008\1221\08-1221-3012\4000 - Temp. Shaft Support and Liner Design\SHAFT SUPPORT TO 600m DEPTH\REPORT\DRAFT REPORT\Landscape Figures for report_KLB_20 JAN 2009.ppt



Approximate Scale - 1:300

O:\Active_2009\1416\09-1416-0004 Burnco McNab Ck\Phase 3100 Geotech Studies\Slope Stability Analysis\ South Section Normal-Deep Seated Failure.gsz

FILE: O:\Active_2008\1221\08-1221-3012\4000 - Temp. Shaft Support and Liner Design\SHAFT SUPPORT TO 600m DEPTH\REPORT\DRAFT REPORT\Landscape Figures for report_KLB_20 JAN 2009.ppt

PROJECT
BURNCO
MCNAB VALLEY AGGREGATE PROJECT
HOWE SOUND, BC

TITLE
SOUTH SECTION – DEEP FAILURE
GROUNDWATER LEVEL WITHIN
LOWER PORTION OF SLOPE

Golder Associates

PROJECT No.	09-1416-0004		PHASE No.	3100
DESIGN	CHC	06OCT10	SCALE	REV.
CADD	CHC	06OCT10	**FIGURE 12**	
CHECK	CHC	08OCT10		
REVIEW	RCB	08OCT10		