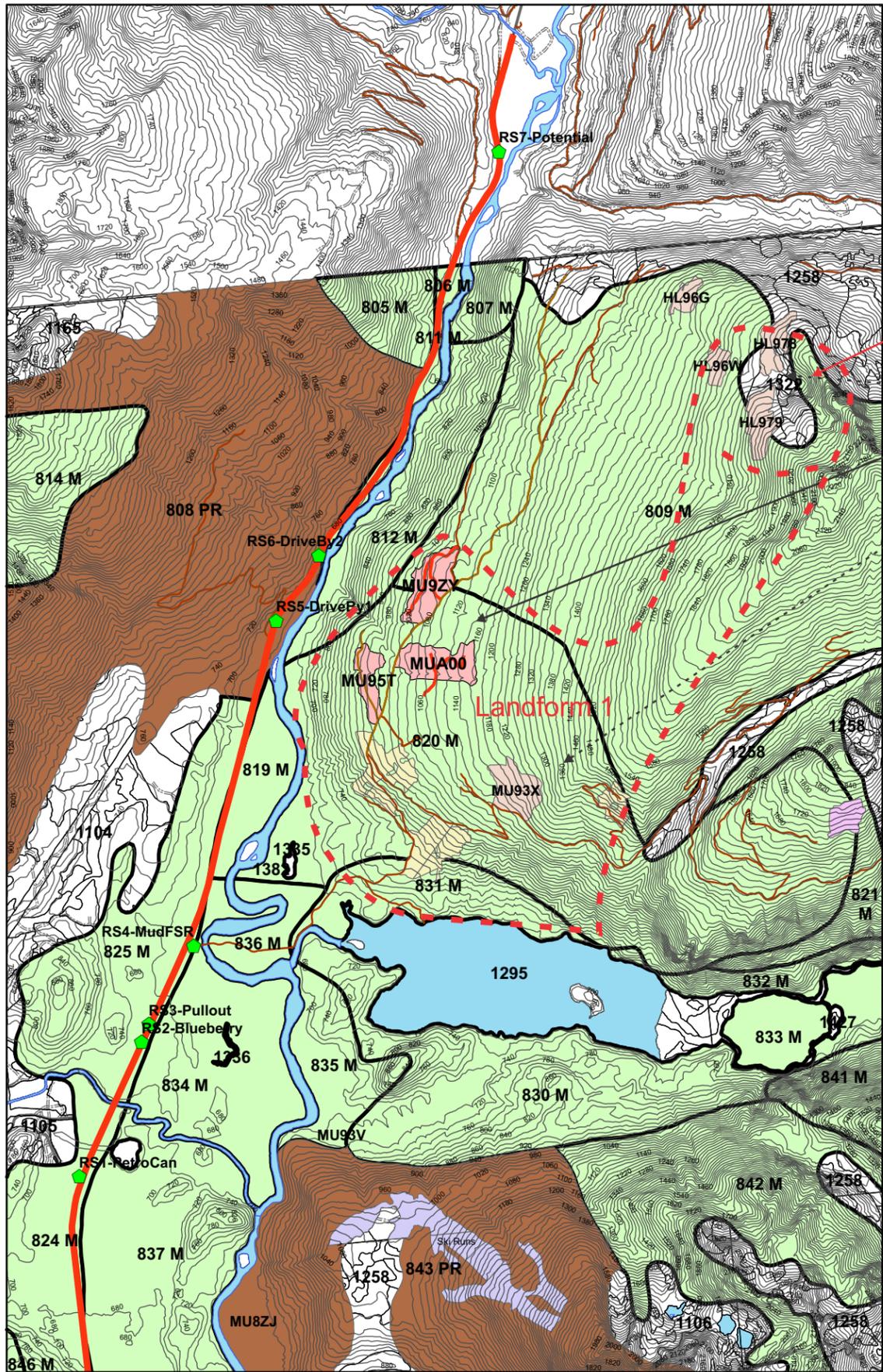


BCTS TA1208_Mud-Redsands
 Visual Assessment Key Map
 RDI Resource Design Inc
 June, 2020
 Modified June 30, 2020

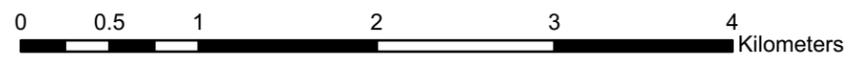


Legend

- ◆ Mud_Reedsands_Viewpoints
- HWY5_OK
- PeddieCTR
- 1208_Existing
- HWY5
- April_16,_2020_Existing_Roads
- June_6,_2020_Proposed_Roads
- WestMudRiver
- Adjacent_Existing
- MU95T,MU9ZY,MUA00_Block_Shapes
- MU93X,HL96G,HL978,HL96W,HL979_Block_Shapes (Schedule to be Determined at Later Date)
- North_Thompson_River-20
- Feb_18,_2020_TA0944,_TA0645,_TA0647_Block_Shapes
- Peddie_Existing_Blocks
- TA0643_PE9S2_WTRA
- PI7SA
- REC_EVQO_C**
- M
- PR
- Peddie-1718
- Mud-1718t
- TRIM_Transportation_2018
- RDI_trim_transportation2
- Mud_Lake
- TRIM_Transportation**
- FCODE**
- Airfield
- - - - - TRIM - Gravel Road
- TRIM - Paved Road
- - - - - Overgrown Road
- - - - - Winter Road
- Tunnel
- Bridge
- Rail Line
- Pipeline

Landform 1A

Landform 1



Contents

1	Cover Page / Key Map
2	Contents
3	Summary Notes
4	RS1 - Blue River Petrocan
5	RS1 - Blue River Petrocan Photos
6	RS1 - Percent Alteration - Blue River
7	RS2 - Blueberry Road Junction
8	RS3 - Highway Pullout
9	RS4 - Mud FSR near Railway tracks
10	RS4 - Percent Alteration
11	RS5 - Highway 5 Drive By
12	RS6 - Highway 5 Drive By
13	RS7- Highway 5 Drive By
14	RS7 - Percent Alteration
15	RS3 and RS7 Aerial Obliques for Cutblock Validation in VNS

Introduction

RDI conducted this Visual Assessment for BCTS Kamloops Business Area under contract PD18TEB007. The project was requested by Ches Clem, RPF, Planning Forester, Clearwater Field Team, BCTS Kamloops Business Area on June 5, 2020. Two sets of cutblocks were provided for analysis. Set 1 contains TSL TA1208 blocks MU95T, MUA00, and MU9ZY located in the Mud Operating Area off the Redsands Forest Service Road. This set was requested to be assessed independently of the second set. Set 2 contains 5 cutblocks: MU93X & TSL TA1036 blocks HL96G, HL978, HL96W, HL979. These blocks are currently not in the BCTS sales plans (due to access issues and poor timber quality) and have been requested for separate accounting for percent alteration calculations. All data was contained in a data package <https://www.for.gov.bc.ca/ftp/TKA/external/outgoing/RDI/> in a folder named "June 5, 2020 TA1208 VIA Package for Ken"

Mr. Clem identified 6 viewpoints where photos were taken by him between January and April, 2020. RDI added the "RS" nomenclature for ease of tracking:

RS1 52 06 34.6, 119 18 33.2 Blue River Petro Can: photos 9392 to 9395
 RS2 52 07 22.5 119 17 47.4 Blueberry Road JCT with Hwy 5: Photos 9396 to 9401
 RS3 52 07 28.9, 119 17 41.9 Pullout West Side of Hwy 5: photos 9402 to 9406
 RS4 52 07 56.6, 119 17 10.0 Mud FSR near Railway Tracks, glimpse view: photos 9407 to 9409
 RS5 52 09 54.8N 119 16 01.0 Drive by Hwy 5: photos 9251 to 9256
 RS6 52 10'17.7N 119 15'31.1 W Drive by Hwy 5: photos 9243 to 924

Upon preliminary review by RDI of the coverage afforded from the viewpoints in ArcGIS and VNS, RDI added an additional tentative viewpoint: RS7 52 12' 41.68N 119 13' 17.69 W Drive by Hwy 5. Ches kindly followed-up with photography from that viewpoint (photos 9423 to 9437), confirming its relevance as a view from the north towards the second set of cutblocks (in TA1036).

Procedures and Analysis

RDI placed new data into pre-existing ArcGIS and VNS models. Extension of Forest cover was required to the north. All viewpoints were simulated, showing Sets 1 and 2 cutblocks together while keeping their percent alteration contributions separate. Each viewpoint was rendered with forest cover and with bare land showing VQO coverage. All cutblocks were located in a single landform called Landform 1. The northern cutblocks were considered to be in a mountainous part of the landform interspersed with unclassified (NVS) areas in the Visual Landscape Inventory. RDI called this portion Landform 1A. The landform lines are identified on the Key Map on page 1 of the report, and labelled on the simulations. Set 1 blocks are fully located in VLI_Polygon 820 with a Modification VQO. MU9ZY extends into the adjacent VSU to the north, VLI_Polygon 809, also having M VQO. Set 2 has MU93X in Landform 1 and all of TA1208 in either Landform 1A or in unclassified area as seen from Viewpoint RS7 and as depicted in blue in the RS7 Viewpoint simulations. RDI has extended the M VQO to all area that can be seen in Landform 1A from RS7. VLI_Polygons 820 and 809 are fronted along the east side of the North Thompson River by VLI_Polygons 812 and 807 which have steep terrain fully excluding cutblock viewing opportunities from Viewpoints RS5 and RS6. VLI_Polygon (M) completes the viewshed below VLI_Polygon 820 along the north side of Mud Lake.

RDI requested updates of regeneration performance of several previous openings within Landform 1. These have been depicted in purple in the simulations for ease of differentiation. Although according to Tyson Leutdke "these are not govt/BCTS blocks so detailed survey data is not available", he provided updates from 2018 analysis and extended the findings to 2020:

E1 - 1.5m (Existing Opening ID 109532): Gilbert Smith cutblock, 9.5ha IMM ART, last update 2015 – Sx (Cw) 1.7-2.1m height, est (conservative) 30cm/yr leader, projected 2020 height ~4m.

E2 - 2.2m (Existing Opening ID 90894): Gilbert Smith cutblock, 19.3m IMM ART, last update 2011 - Fd (CwHw) 2.0m height, est 40cm/yr leader, projected 2020 height ~6m

E3 - 1.5m (Existing Opening ID 90895): Gilbert Smith cutblock, 30.8ha IMM ART, last update 2012 – SxCwFd 2+m height, est 40cm/yr, projected 2020 height ~5.5m

The 50% probability of achieving summer Visually Effective Green-up (VEG) is 5.5 m and approx. 5.7m for winter VEG, not considering slope class assessment or professional opinion. All other older openings in Landform 1 are considered by RDI to fully exhibit VEG.

RDI employed its standard application if Visual Nature Studio to render each viewpoint coverage of the cutblocks within the landform. RDI adjusted roadside vegetation from VRI to better emulate that seen in the photos. Aerial obliques from above RS3 and RS7 are provided on Page 15 for cutblock validation in VNS.

Results

Set 1

The table below indicates the range of openings and their visibility and viewing distance from each of the viewpoints which were selected by Ches Clem for best viewing opportunities. Of the 3 Set 1 Cutblocks, only MUA00 in Landform 1 will have any possible viewing exposure, and will appear as a narrow sliver in middleground at the north end of the landform conforming to the visual forces of the ridgeline as seen from RS1 (PetroCan), RS2, RS3, and RS4. Percent Alteration was calculated from RS1 and RS4 with results shown on those pages and summarized as follows:

RS1 Viewpoint - MUA00: 0.30% alteration of 6.32% total, including nonVEG but excluding Set 2 contribution.

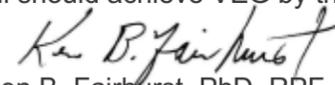
RS4 Viewpoint - MUA00: 0.06% alteration of 10.32% total, including nonVEG but excluding Set 2 contribution. Total Percent Alteration may vary slightly higher or lower with actual roadside screening. All views meet the VQO.

Set 2

The prominent cutblock MU93X will be clearly seen in middleground from all 4 southern viewpoints but has shape and form which conforms with the visual forces of the landform. Percent Alteration from RS1 (Petrocan) will be 3.63% of 9.65% including nonVEG (no Set 1). TA0136 block HL979 comes into view from RS2, RS3, and RS4 and has good shape and form in background view. From RS4 Viewpoint, Percent Alteration for Set 2 only, including nonVEG will be 2.91% for MU93X plus 0.17% for HL979, with a total of 13.96% alteration including nonVEG but excluding Set 1. HL978 and 979 will be seen in middleground from RS7, representing a total of 4.43% alteration in perspective view, meeting the VQO with the NVS (UA-rated) areas included.

Conclusions

The layout plan for both Sets of cutblocks has taken advantage of the upper terrain break behind the steep terrain east of the river to obscure most views. MUA00 (Set 1) is not a significant intrusion in the landform while MU95T and MU9ZY remain unseen. Set 2's MU93X, HL978 and HL979 fit comfortably in Landform 1 and 1A and the visual forces, while HL96W and HL96G remain unseen. Both sets separately, and together meet, at minimum, the Modification VQO, or better. See details on the simulations sheets, including percent alteration calculations for RS1 (PetroCan) and RS4 (Mud FSR Junction). and RS7. Of the 3 identified previously harvested areas, only E1 is shy of the 50% probability of achieving VEG in 2020, but all should achieve VEG by the time MU93X is harvested.



Ken B. Fairhurst, PhD, RPF
 RDI Resource Design Inc
 June 29, 2020

Mud-Redsands Visual Assessment - Visibility										
Licence ID	Block Number	RS1 Blue River Petrocan	RS2 @ Blueberry	RS3 Pullout	RS4 @ Mud FSR	RS5 Drive-by	RS6 Drive-by	RS7	RDI Landform	VLI_Poly
Primary	TA1208 Cutblocks									
TA1208	MU95T	NVS	NVS	NVS	NVS	NVS	NVS	NVS	1	820-M
TA1208	MUA00	V 7.3km	V 5.6km	V 5.4km	V 4.3km	NVS	NVS	NVS	1	820-M
TA1208	MU9ZY	NVS	NVS	NVS	NVS	NVS	NVS	NVS	1	820/809-M
Secondary	These Cutblocks are currently not in current BCTS sales plans and are evaluated separately									
!Clearwater	MU93X	V 6.7km	V 5.2km	V 5.0km	V 4.2km	NVS	NVS	NVS	1	820-M
TA0136	HL96W	NVS	NVS	NVS	NVS	NVS	NVS	NVS	1A	809-M
TA0136	HL978	NVS	NVS	NVS	NVS	NVS	NVS	V 3.9km	1A	UA/809-M
TA0136	HL979	NVS	V 10.2km	V 9.9km	V 9.0km	NVS	NVS	V 4.4km	1A	UA/809-M
TA0136	HL96G	NVS	NVS	NVS	NVS	NVS	NVS	NVS	1A	809-M

* roadside trees adjusted in VNS model to match photography - may be more or less screening than presented

Summary Notes



RDI Resource Design Inc
 June 29, 2020

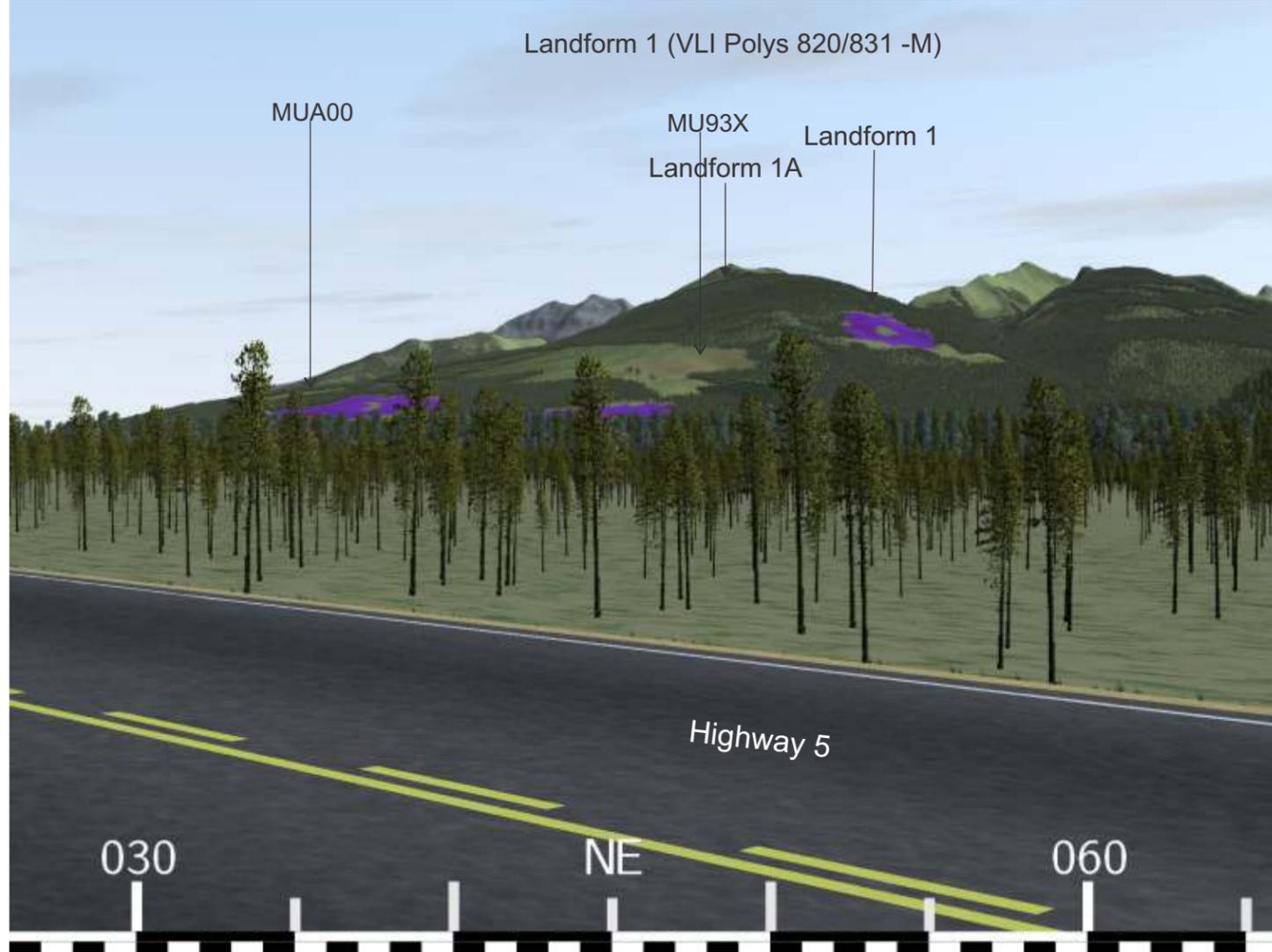


Photo by Ches Clem

52 06 34.6, 119 18 33.2 Blue River Petro Can: photos 9392 to 9395

VNS Simulation by RDI

TA1208 MUA00 will be seen as a narrow sliver aligned to the main ridgeline of Landform 1 on the far left of the landform. Associated proposed TA1208 cutblocks MU95T and MU9ZY are NVS. TA0136- MU93X will be seen openly from Blue River in Landform 1, 7.5 km distant (see next 2 pages for detailed analyses). All four TA1036 cutblocks are NVS beyond the left ridgeline.

RS1 -Mud-Redsands - Petrocan Viewpoint

Photos by Ches Clem 20/04/21
Panorama Construction by RDI



52 06 34.6, 119 18 33.2 Blue River Petro Can: photos 9392 to 9395

RS1 - Mud-Redsands - Petrocan Viewpoint



RDI Resource Design Inc
June 29, 2020



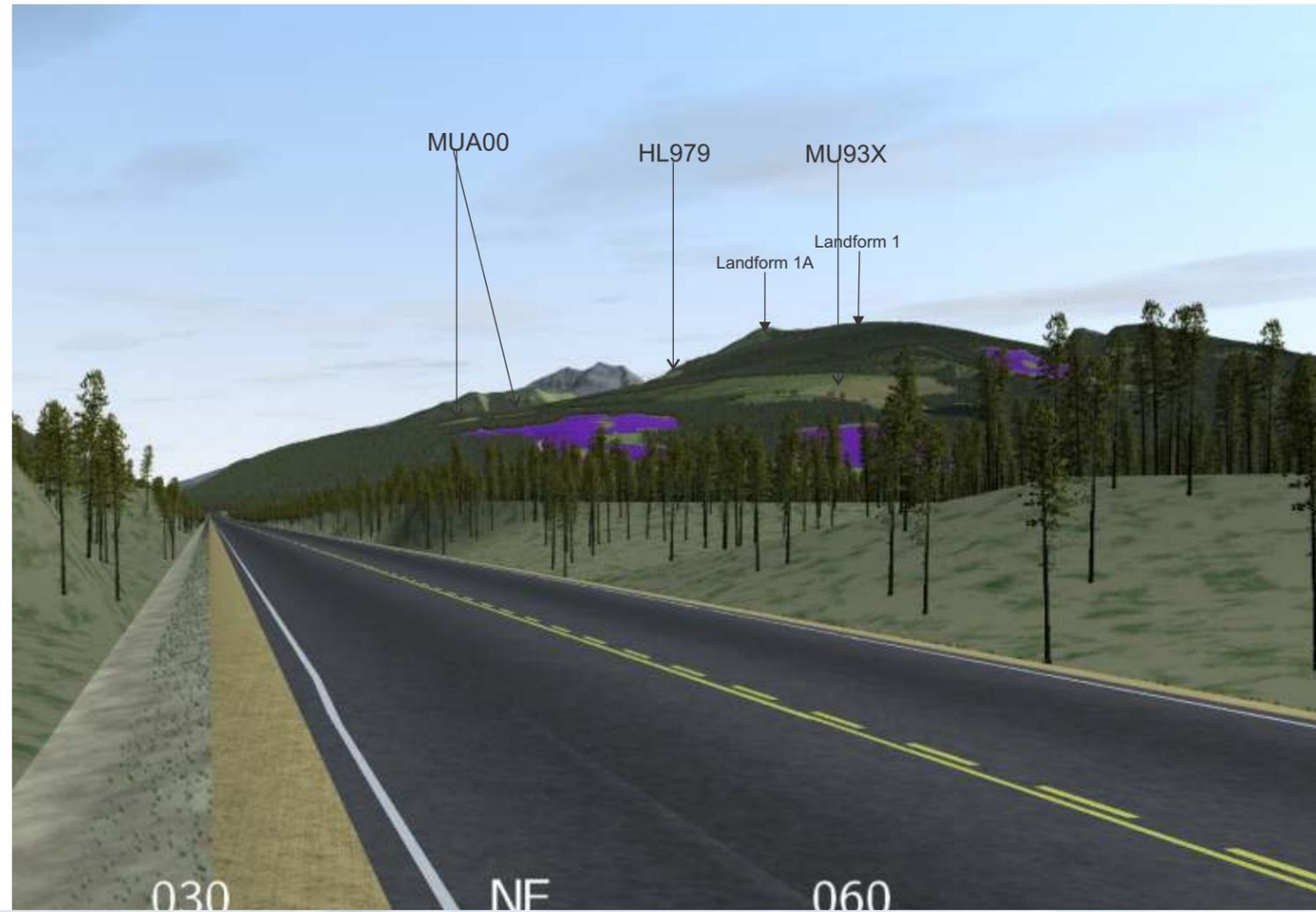
Roadside Screening Estimated from Photos - Actual Percent Alteration may differ slightly up or down

Meets Modification VQO by Percentage, shape and form, and visual force

Visual Forces follow primary and secondary rigelines and draws

Landform 1 (VQO Modification) has a diverse pattern of existing alteration ranging in heights of 4m to 6m (identified in purple in the image and by height in the table). There are regenerating openings of greater height surrounding proposed cutblock MU93X with revegetation considered to have achieved, or soon to have achieved Visually Effective Green-up (VEG). There will be a total of 6.32% Percent Alteration in the Landform, within the upper end Partial Retention category of visual alteration, when MUA00 is considered together with nonVEG, but not MU93X which is not in the current sales plan. When MU93X together with MUA00 and nonVEG are considered, total alteration in perspective (camera) view will be 9.95% - in the lower range of the Modification category of visual alteration. The shape of MU93X conforms with the major visual forces, being the ridge lines, and fits the pattern of diverse alteration in the landform. The block is in far middleground (6.7 km). MUA00 is seen 7.3 km away as a narrow sliver, parallel to the ridgeline.

Percent Alteration Petrocan Viewpoint, by Cutblock Set		
Set 1	AREA2	% Alt
Landform 1	164121.79	
MUA00-1	181.27	0.11%
MUA00-2	311.60	0.19%
E1 - 109532	4346.29	2.65%
109532-leave-deduct	292.92	0.18%
E1 - 109532-Net (Proj. Ht. 2020: 4m)	4053.36	2.47%
E2 - 90894-1 (Proj. Ht. 2020: 6m)	296.74	0.18%
E2 - 90894-1 (Proj. Ht. 2020: 6m)	1542.72	0.94%
E3 - 90895-1 (Proj. Ht. 2020: 5.5m)	155.80	0.09%
E3 - 90895-2 (Proj. Ht. 2020: 5.5m)	3627.14	2.21%
E3 - 90895-3 (Proj. Ht. 2020: 5.5m)	209.72	0.13%
Sum Alt Set 1 plus nonVEG	10378.36	6.32%
Set 2	AREA2	% Alt
MU93X alone	5951.42	3.63%
Set 1 + Set 2 with nonVEG	16329.78	9.95%



Photos by Ches Clem 20/04/21
Panorama Construction by RDI

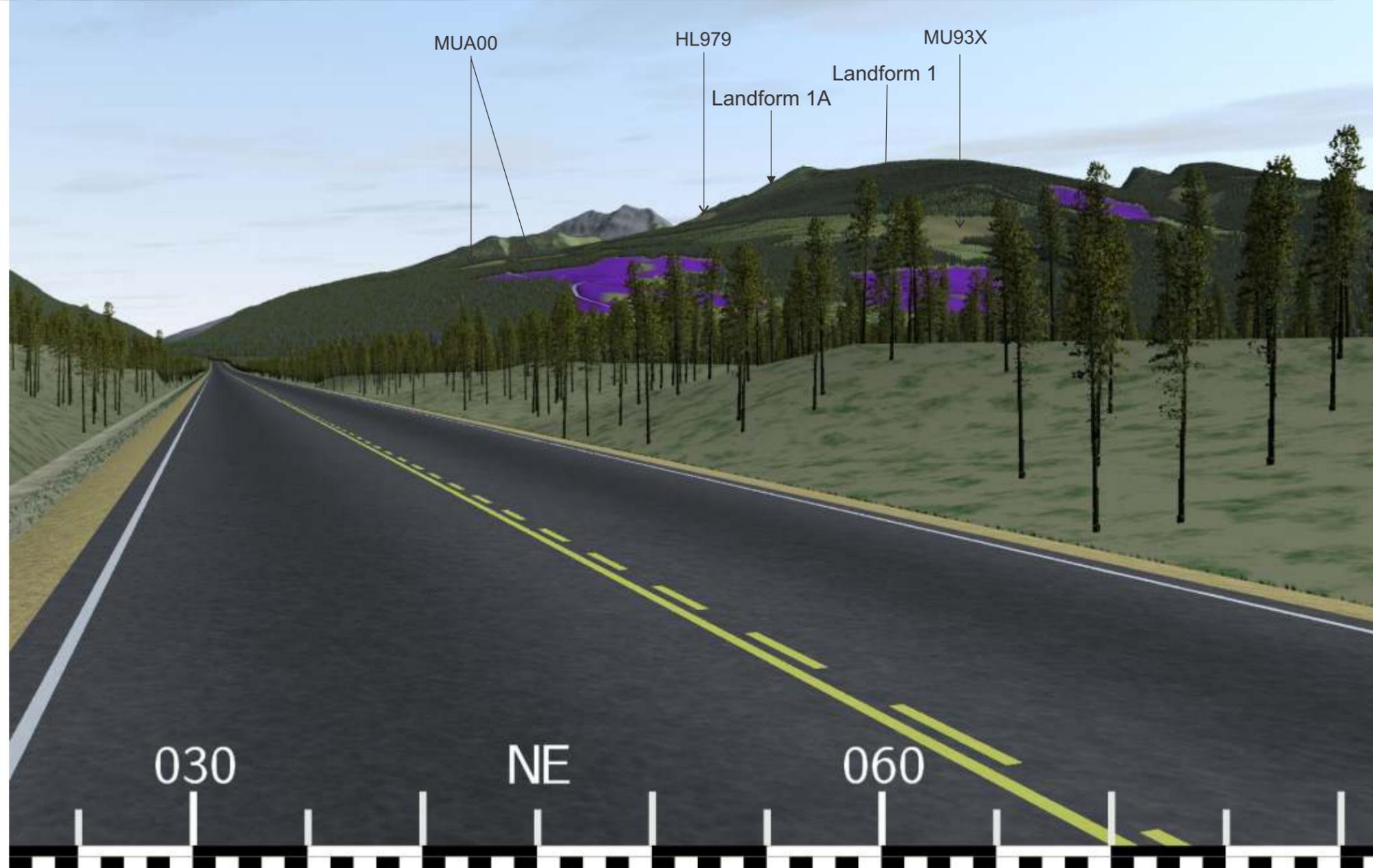
52 07 22.5 119 17 47.4 Blueberry Road JCT with Hwy 5: Photos 9396 to 9401

RS2 - Mud-Redsands - Landform 1 - Viewpoint Blueberry Road Junction



RDI Resource Design Inc
June 29, 2020

Aerial obliques from above RS3 and RS7 are provided on Page 15 for cutblock validation in VNS.



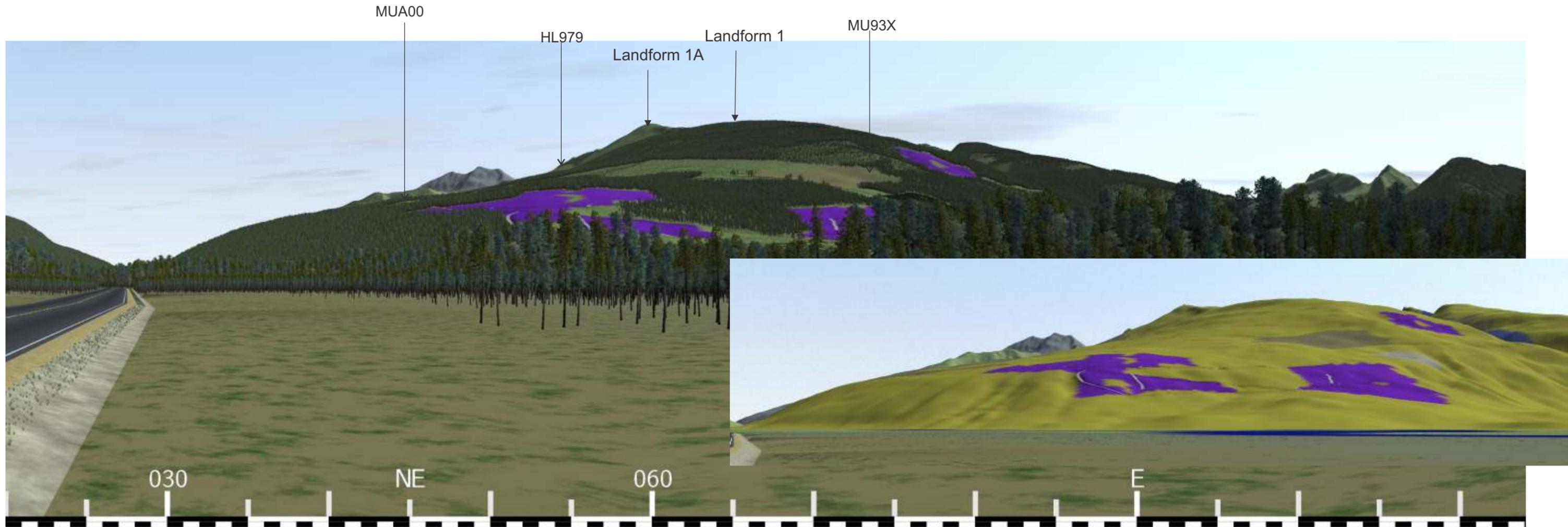
52 07 28.9, 119 17 41.9 Pullout West Side of Hwy 5: photos 9402 to 9406

RS3 - Mud-Redsands - Landform 1 - Viewpoint Pullout - west side of highway



Photos by Ches Clem 20/04/21
Panorama Construction by RDI

Photos 9407-9409

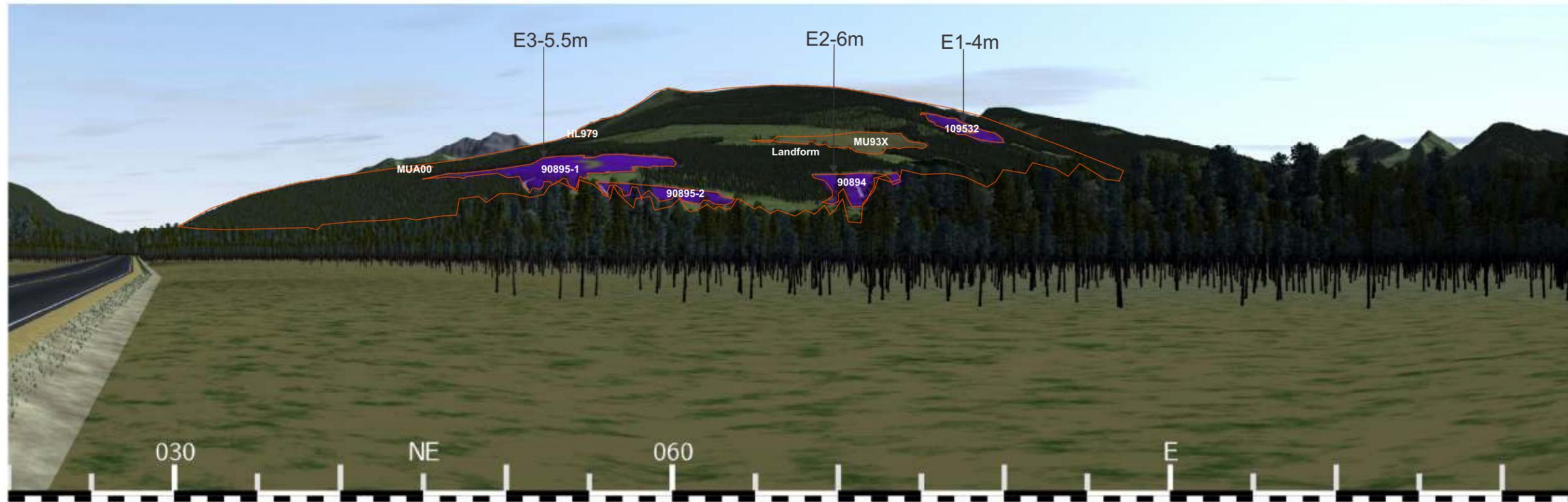


52 07 56.6, 119 17 10.0 Mud FSR near Railway Tracks, glimpse view: photos 9407 to 9409

RS4 - Mud-Redsands - Landform 1 - Viewpoint Mud FSR near Railway Tracks



RDI Resource Design Inc
June 29, 2020



Roadside Screening Estimated from Photos - Actual Percent Alteration may differ slightly up or down
 Visual Forces follow primary and secondary rigelines and draws

Percent Alteration from Viewpoint RS4 - by Cutblock Set		
Set 1	AREA2	% Alt
Landform	575490.78	
MUA00	330.28	0.06%
109532	7359.59	1.28%
109532-deduct	492.29	0.09%
109532-Net	6867.30	1.19%
90894	13056.82	2.27%
90895-1	30884.19	5.37%
90895-2	11843.78	2.06%
Sum Alt Set 1 and nonVEG alone	62982.36	10.94%
Set 2	AREA2	% Alt
HL979	971.15	0.17%
MU93X	16719.77	2.91%
Sum Alt Set 2 alone	17690.91	3.07%
Set 1 + Set 2 with nonVEG	80673.28	14.02%

rounding error: 0.01%

Meets Modification VQO by Percentage, shape and form, and visual force

RS4 - Mud-Redsands - Percent Alteration - Viewpoint Mud FSR near Railway Tracks





Photos by Ches Clem 2020/01
Panorama Construction by RDI

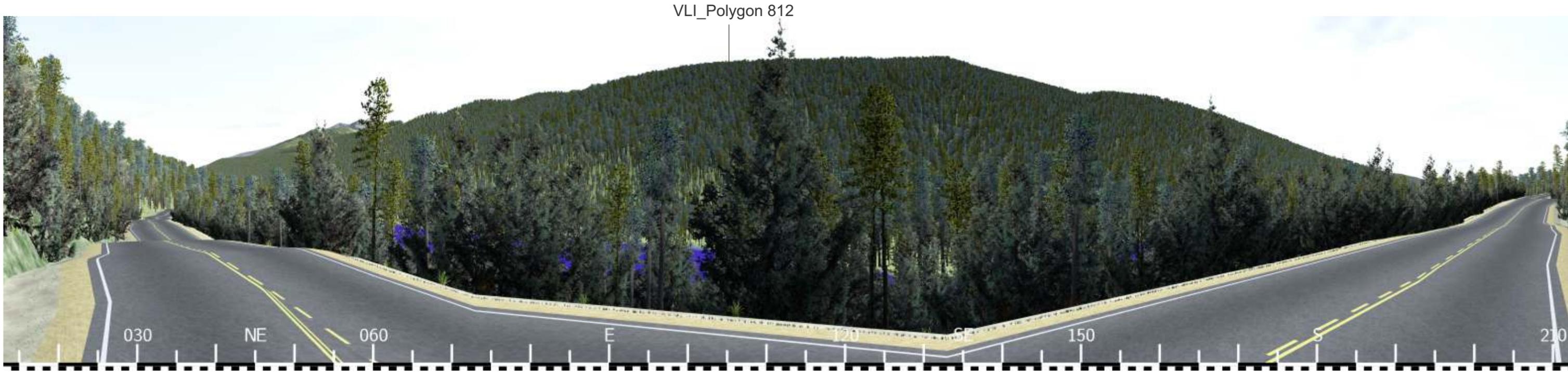
52 09 54.8N 119 16 01.0 Drive by Hwy 5: photos 9251 to 9256



VLI_Polygon 812

No Cutblocks Visible

RS5 - Mud-Redsands - Landform 1 - Drive-by Viewpoint



No Cutblocks Visible

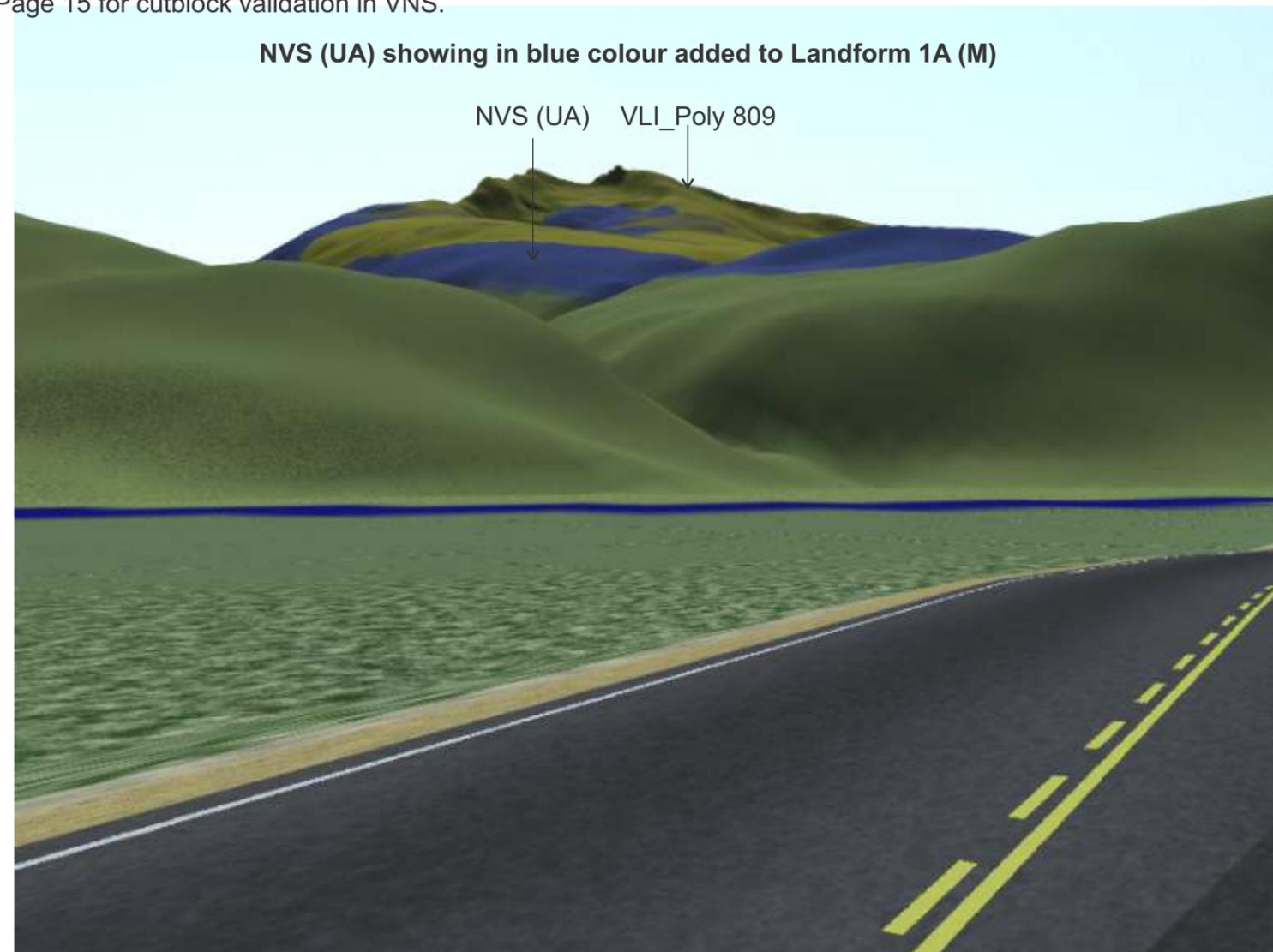
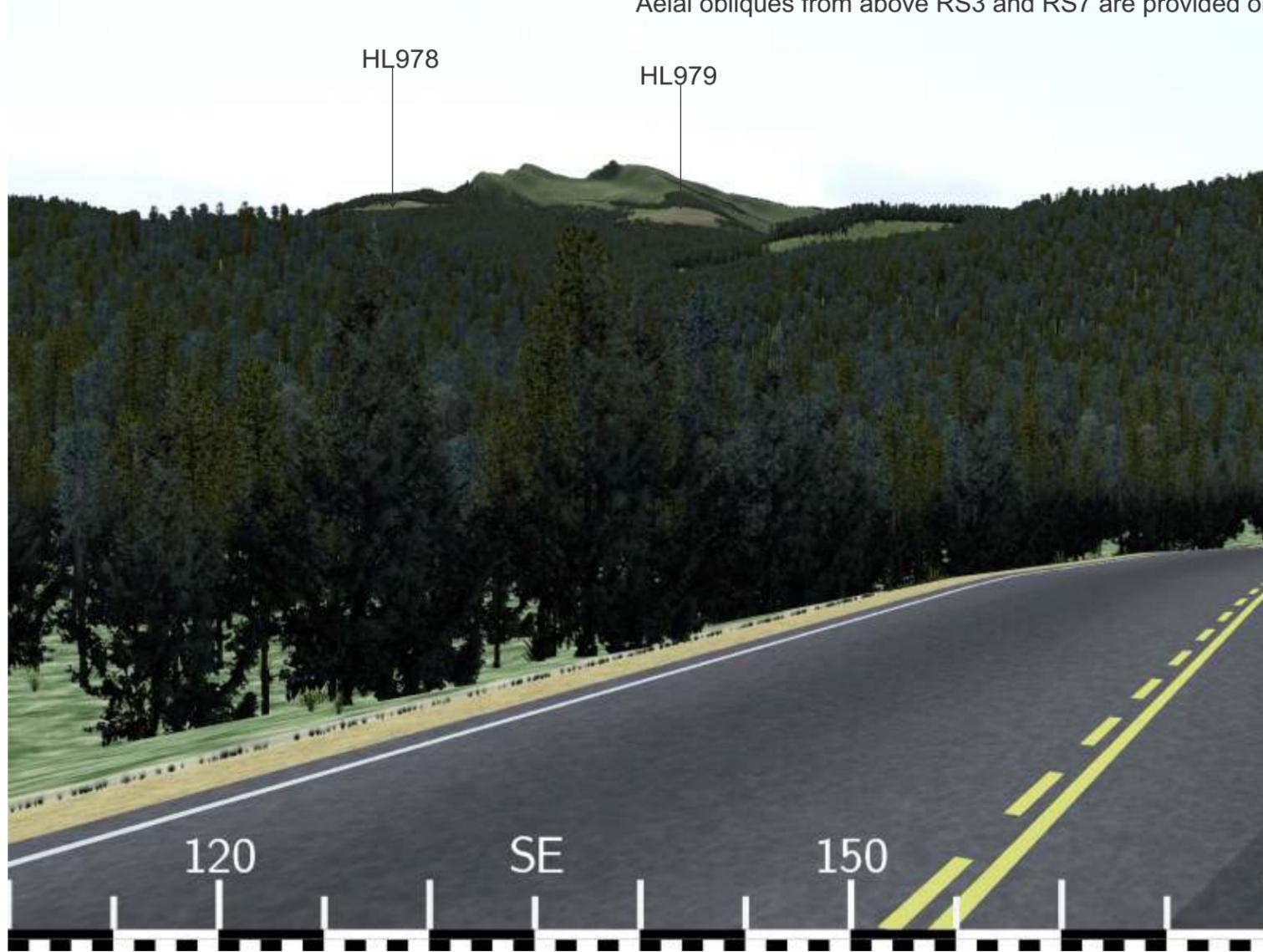


Photos by Ches Clem 2020/01
Panorama Construction by RDI

52 10'17.7N 119 15'31.1 W Drive by Hwy 5: photos 9243 to 9249

RS6 - Mud-Redsands - Landform 1 - Drive-by Viewpoint

Aerial obliques from above RS3 and RS7 are provided on Page 15 for cutblock validation in VNS.



Photos by Ches Clem 20/06/19
Panorama Construction by RDI

52 12' 41.68N 119 13' 17.69 W Drive by Hwy 5: photos 9423 to 9437

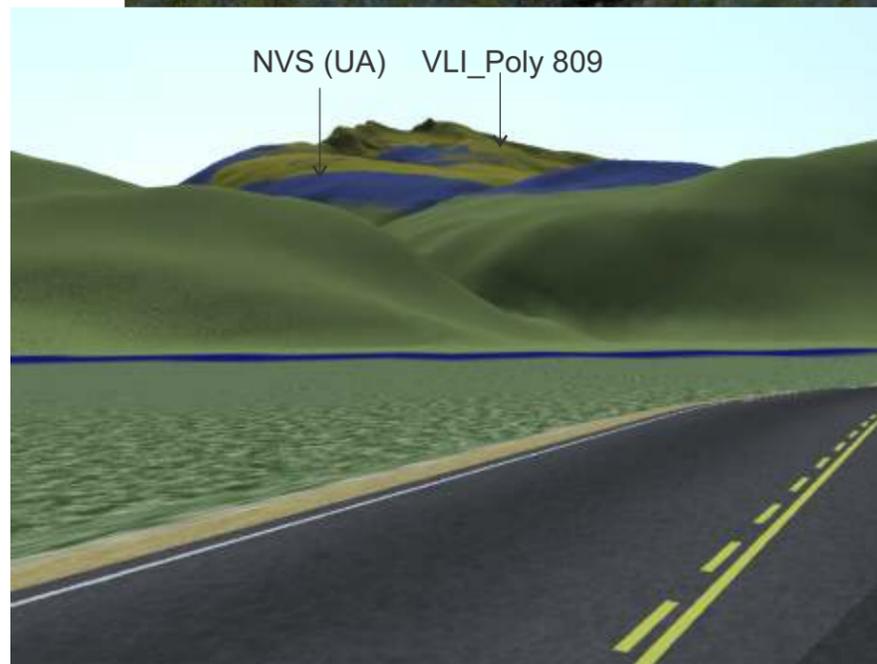
RS7 - Redsands VP Along Highway 5 - Requested by RDI; Verified by Ches Clem Photos



RDI Resource Design Inc
June 29, 2020

Landform 1A

Meets Partial Retention VQO by Percentage, shape and form, and visual force



Visual Forces follow primary and secondary rigelines and draws

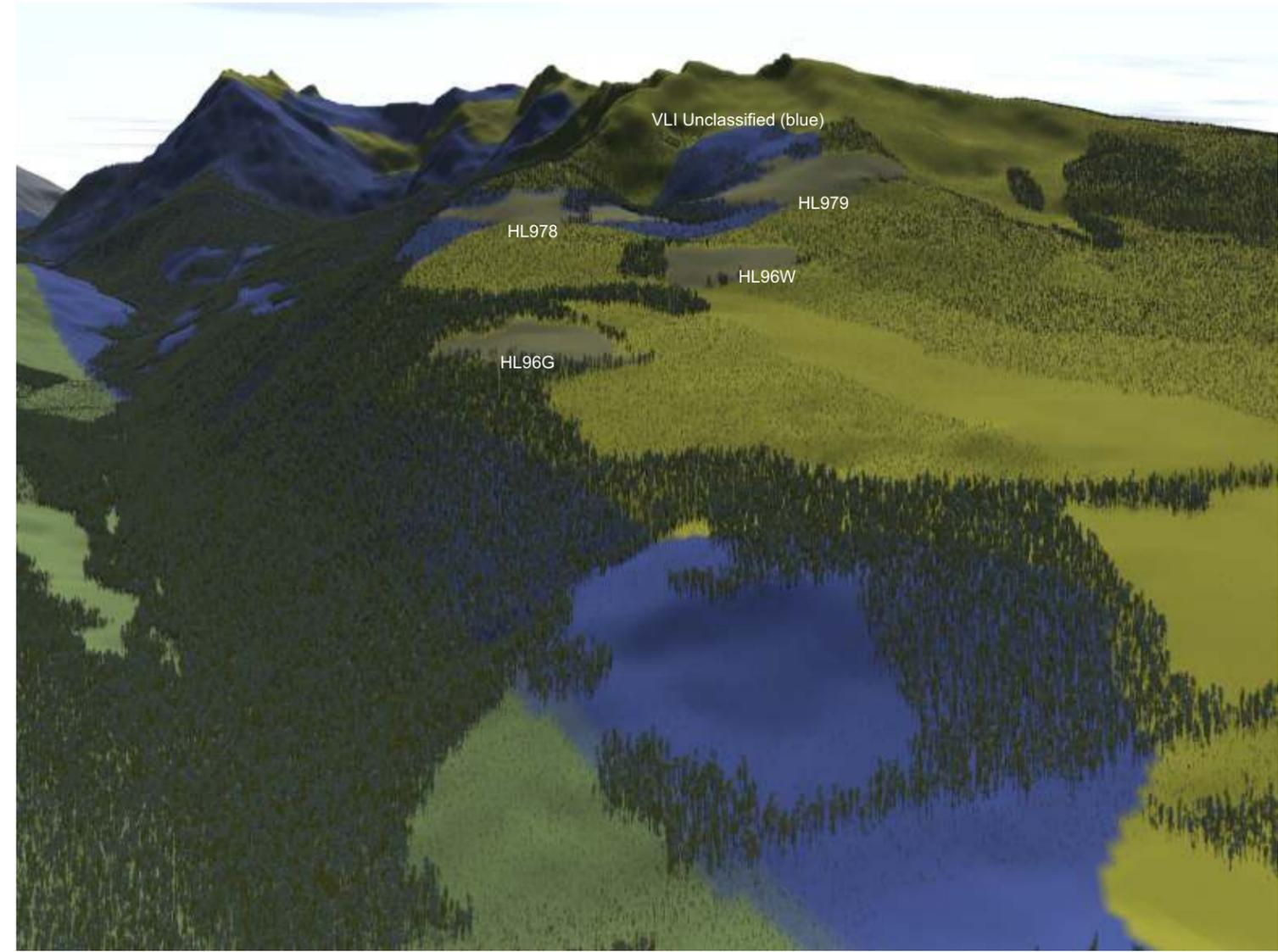
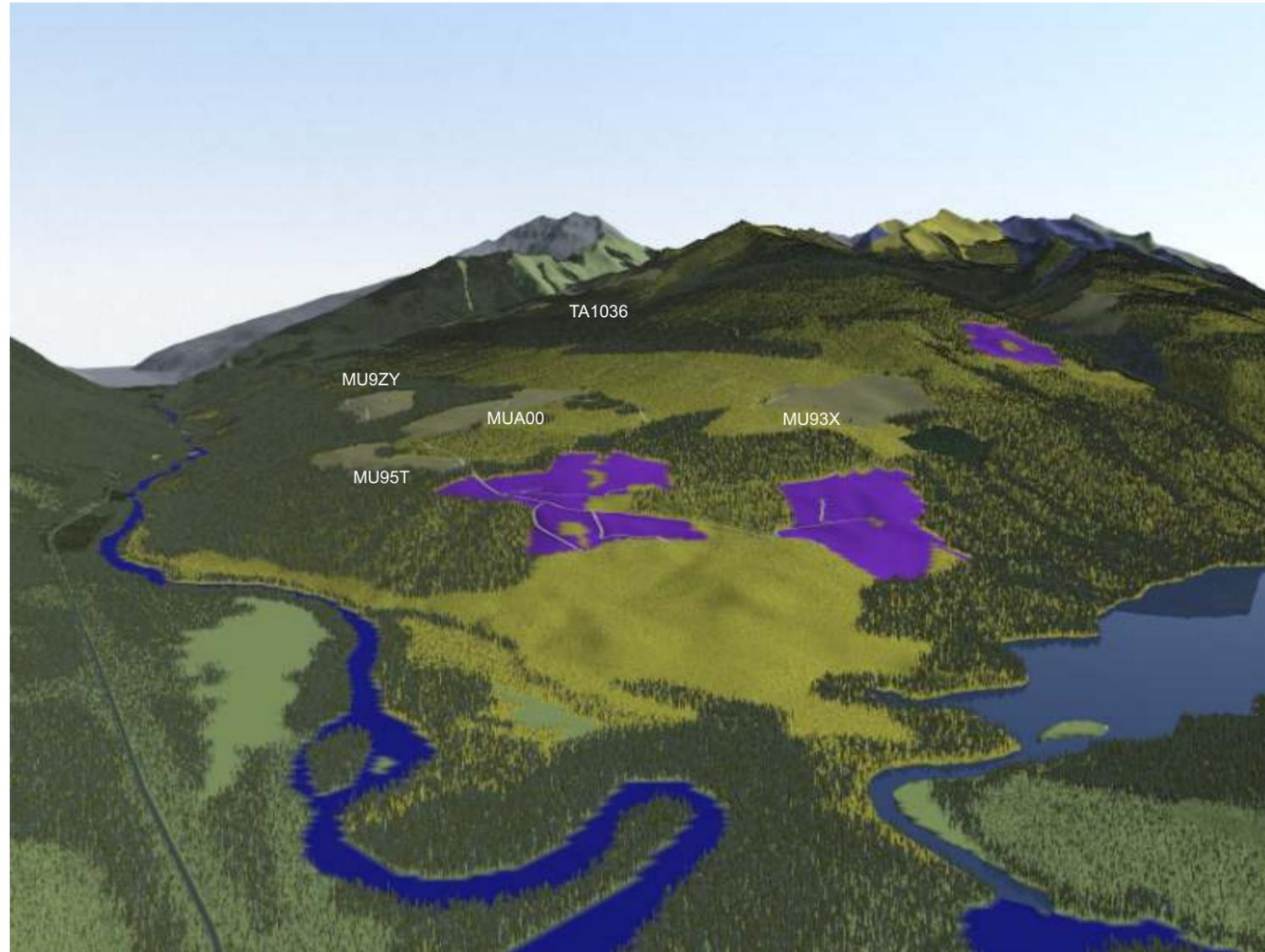
Percent Alteration from Viewpoint RS7		
Set 2	AREA2	% Alt
Landform 1A	90215.57	
HL978	861.43	0.95%
HL979	3133.62	3.47%
Sum Alt	3995.05	4.43%

rounding error: 0.01%

RS7 Viewpoint Percent Alteration - VLI_Poly 809 (M) plus NVS (UA)



RDI Resource Design Inc
June 29, 2020



RS3 and RS7 Aerial Obliques for Validation of Hidden Cutblocks and Unclassified VLI Area