Appendix E
Archeological Information

Northwest Territories Class 2 Permit 2016-004: Archaeological Impact Assessment

Proposed Granular Supply Sources Along the Mackenzie (No. 1) and Liard (No. 7) Highways, and a section of the 2011 Proposed Mackenzie Valley Highway, NWT

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The opinions, recommendations, omissions, and/or errors in this report are those of Stantec Consulting Ltd. alone and do not necessarily reflect the positions held by Government of Northwest Territories, Department of Transportation or the Prince of Wales Northern Heritage Centre.

Management Summary

This report details the results of Archaeological Impact Assessments (AIAs) conducted on proposed granular supply sources, bedrock supply sources, associated access roads and stockpile areas located along the Mackenzie (No. 1) and Liard (No.7) Highways, and a section of the 2011 Proposed Mackenzie Valley Highway (PMVH) between Norman Wells and Tulita. The AIA was conducted on behalf of Government of Northwest Territories (GNWT), Department of Transportation (DOT) as part of the land use approval process.

Stantec conducted Archaeological Overview Assessments (AOAs) of all proposed granular sources, bedrock sources, associated access roads and stockpile areas in advance of AIA fieldwork (Heffner et al. 2016a, 2016b). AIA fieldwork was conducted on proposed developments that overlapped with areas identified as having high archaeological potential during the AOA. A list of all archaeological sites recorded during the AIA is provided in Table 1, while Table 2 summarizes the results of the AIA.

In total, nine newly identified archaeological sites were recorded during the AIA (Table 1). Six sites (LfRr-8, LgRr-3, LgRr-4, LgRr-5, LhRt-4 and LhRt-5) were identified within or adjacent to proposed granular supply sources along the PMVH. One site, LgRr-2, was identified at a helicopter landing approximately 125 m west of a proposed granular supply source along the PMVH. Two sites, JgQl-1 and JhRb-1, were identified within proposed granular supply sources located along the Mackenzie Highway.

All sites consist of pre-contact surface and/or subsurface lithic artifacts. Detailed site assessments were completed at five of the sites (LfRr-8, LhRt-4, LhRt-5, JgQl-1 and JhRb-1). Site boundaries were established for these sites and 30 m site management buffers were flagged around their perimeters. Three sites (LgRr-3, LgRr-4 and LgRr-5) were not assessed due to weather constraints and one site (LgRr-2) was not assessed because of its location outside of the proposed development area. Maximum site extents anticipated for these sites, including site management buffers and all associated untested areas of archaeological potential, have been established as 'Avoidance Areas.' Site boundaries, site management buffers and avoidance areas were mapped in a GIS environment as polygon features and their associated shapefiles are included with this report.

It is recommended that the site management buffers and avoidance area boundaries be avoided. If these areas cannot be avoided, then further archaeological work is recommended.

Archaeological and historical sites older than 50 years are protected from unpermitted disturbances, alterations or surveys under the *Archaeological Sites Act*, whether they are located on public or private land (Government of Northwest Territories [GNWT] 2014a). Land use plans may further restrict activities within the proximity of known or suspected archaeological resources.

Table 2 AIA Results Summary

Highway Reference	Proposed Development Reference	Assessment Results
2011 Proposed Mackenzie Valley Highway	km 938.0 Rt.	Negative
2011 Proposed Mackenzie Valley Highway	km 940.0 Rt.	Negative
2011 Proposed Mackenzie Valley Highway	km 948.0 and Access Road	Negative
2011 Proposed Mackenzie Valley Highway	km 949.0 Rt. North and Access Road	**LgRr-4**. Site assessment not conducted.
2011 Proposed Mackenzie Valley Highway	km 949.0 Rt. West and Access Road	Negative. **LgRr-2** identified 125 m west of proposed development boundary. Site assessment not conducted.
2011 Proposed Mackenzie Valley Highway	km 949.0 Rt. South and Access Road	**LgRr-3** and **LgRr-5**. Site assessments not conducted.
2011 Proposed Mackenzie Valley Highway	km 949.2 Lt. and Access Road	Negative
2011 Proposed Mackenzie Valley Highway	km 951.0 Lt. North	Negative
2011 Proposed Mackenzie Valley Highway	km 951.0 Lt. South	**LfRr-8**. Site assessment completed.
2011 Proposed Mackenzie Valley Highway	km 954.0 Rt. South and Access Road	Negative
2011 Proposed Mackenzie Valley Highway	km 984.0 Rt. South	Negative
2011 Proposed Mackenzie Valley Highway	km 984.0 Rt. North	Negative
2011 Proposed Mackenzie Valley Highway	km 990.8 Rt. and Access Road	Negative
2011 Proposed Mackenzie Valley Highway	km 992.5 Rt.	Negative
2011 Proposed Mackenzie Valley Highway	km 993.7 Rt. North and Access Road	Negative
2011 Proposed Mackenzie Valley Highway	km 993.7 Rt. South	Negative
2011 Proposed Mackenzie Valley Highway	km 997.0 Rt. and Access Road	**LhRt-4** and **LhRt-5**. Site assessments completed.
2011 Proposed Mackenzie Valley Highway	km 1002.5 'Northeast of Norman Wells' Quarry Expansion	Negative
Mackenzie Highway (No. 1)	km 147.8	Negative
Mackenzie Highway (No. 1)	km 188.4 Rt.	Negative
Mackenzie Highway (No. 1)	km 205 Lt.	Negative

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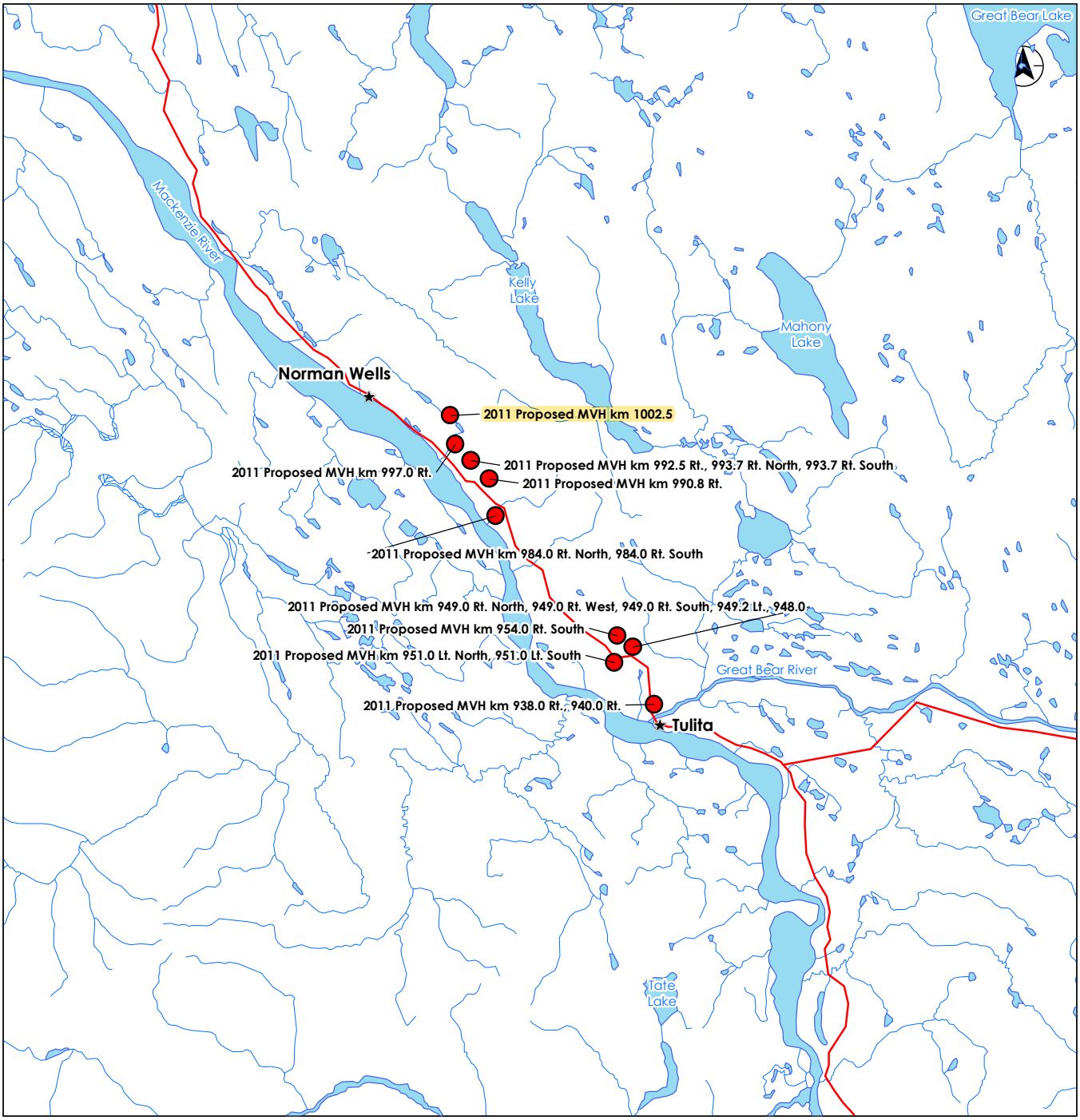

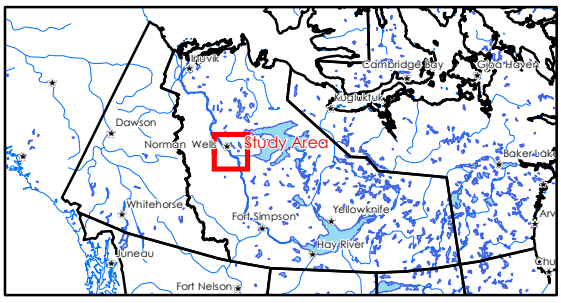

Legend

- Granular Supply Source
- Place
- Road
- Watercourse
- Waterbody
- Provincial/Territorial Boundary

0 50 100 Kilometres

1:1,000,000 (at original document size of 8.5x11)

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Northwest Territories

Project Location 144902383

NTS Mapsheet(s): 096 C, 096 E, 096 F

Prepared by J. MacMillan on 2017-03-20
Quality Review by S. Heffner on 2017-03-23
Independent Review by K. Peach on 2017-03-23

Client/Project

Client: Government of the Northwest Territories
Project: Archaeological Impact Assessment of Proposed Granular Supply Sources Along NWT Highways

Figure No.

1

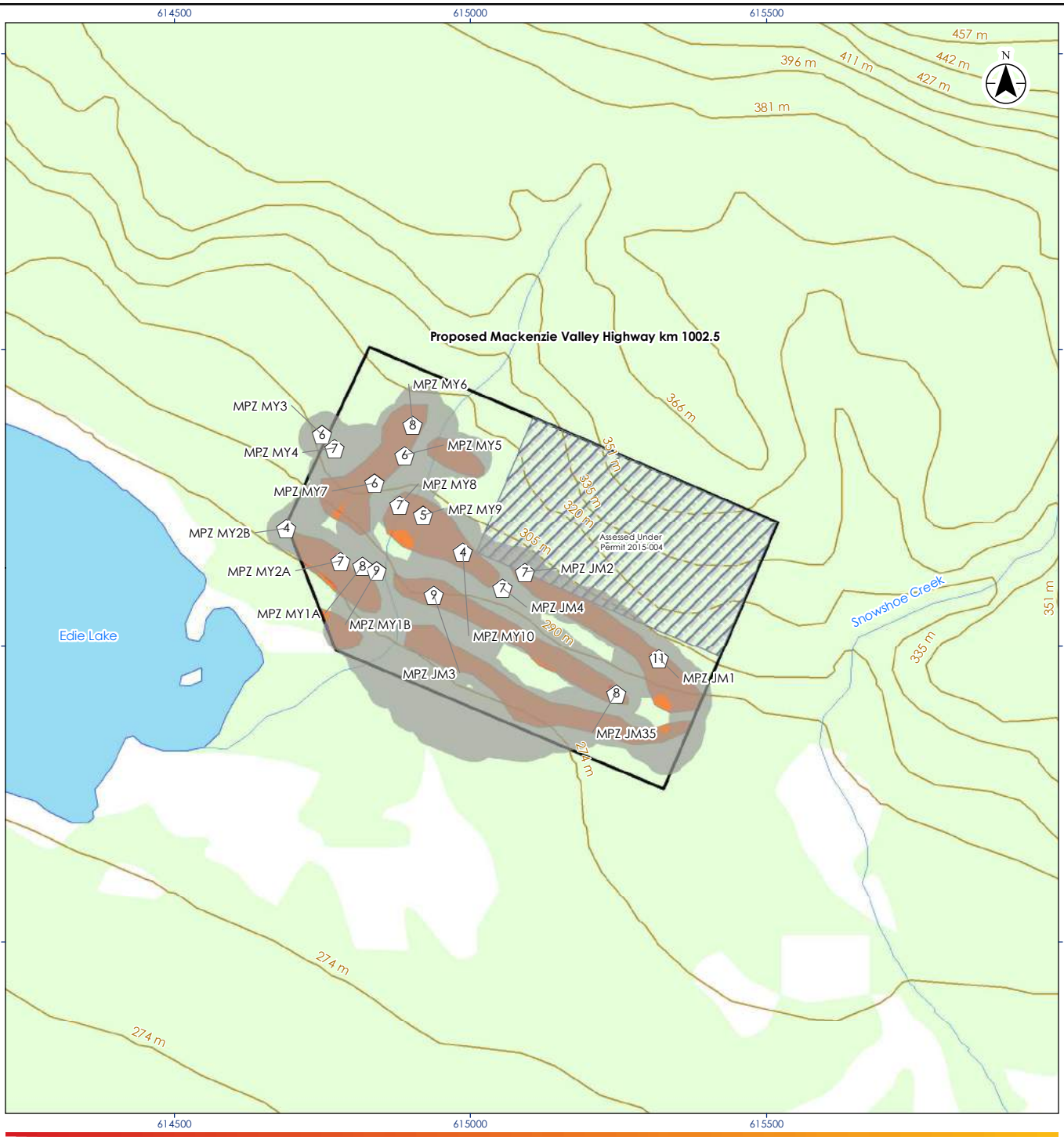
Title

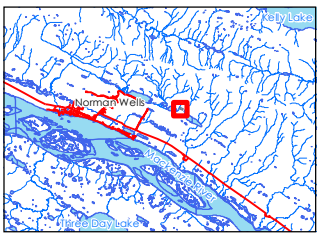
Study Area Location

Notes

1. Coordinate System: NAD83 / NWT Lambert

F:\2016\144902382\gis\Figures\interim_report\final\fig_12_2011_proposed_mackenzie_valley_highway_1002_5_survey_map.mxd Revised: 2016-10-24 By: jmacmillan





- Road
- Contour
- Cut Line
- Watercourse
- Waterbody
- Wetland
- Wooded Area
- Granular Supply Source
- Archaeological Potential
- Previously Assessed Area
- Transect Buffer
- Shovel Test Number

0 100 200 metres

1:10,000 (at original document size of 8.5x11)

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Northwest Territories

Notes
1. Coordinate System: NAD 1983 UTM Zone 9N
2. Source: CanVec produced Natural Resources Canada

Project Location
NTS Mapsheet(s):
096 E/07

144902382.500
Prepared by J. MacMillan on 2016-10-19
Technical Review by T. Heffner on 2016-10-24

Client/Project
Client: Government of the Northwest Territories
Project: Archaeological Impact Assessments of Highway Corridor Granular Supply Sources

Figure No.
12

Title
2011 Proposed Mackenzie Valley Highway km 1002.5 - Survey Map

Recommendations

Management strategies designed to mitigate impacts to archaeological sites **LhRt-4 and LhRt-5** have been outlined below.

1) Avoidance. No potentially land-altering development within the site management buffers established around **LhRt-4** and **LhRt-5**. This could be accomplished by amending the proposed development to exclude the buffered areas.

2) Systematic data recovery. If the proponent plans to undertake any future development within the established site management buffer, then mitigation of site impacts through systematic data recovery (detailed recording, mapping and collection of artifacts and features) could be completed in advance of potentially land-altering development activities. This strategy would require discussion with Prince of Wales Northern Heritage Centre and the affected Aboriginal organizations.

Provided recommendation #1 is followed, no further archaeological assessment is recommended for km 997.0 Rt. or its associated access road.

km 1002.5 'Northeast of Norman Wells' Quarry Expansion

Administrative & Geographic Reference

Land&Water Board:	Sahtu	Land Use Plan:	N/A
1:50K NTS Map:	096 E/07	UTM:	9 E 615000 N 7242100
Area (ha):	24.8	Elevation (m):	260-330
Ecoregion (Level):	Taiga Plains (II), Low Subarctic (III), North Mackenzie Plain (IV)		

Survey Description

Survey Date(s):	September 14, 18, 25, 26, 29 and October 3, 2016.
Field Crew:	Jodie MacMillan, Mark Young, Jason Ayah (MRDC), Tony Menacho (MRDC), Bruce LeBlue (NWDC), Brian LeBlue (NWLC), Dakota Barney (NWLC) and Darren Whiteman (NWLC)
Assessment Area:	Proposed expansion of a bedrock supply source area as indicated on Figure 12.

Development Description

Development Type:	Proposed expansion of a bedrock supply source area. Development-related activities could commence as early as 2016.
Location:	The proposed development is located in the Northwest Territories, within the Sahtu Region, 13.6 km east (90°) of Norman Wells and 61.1km northwest (313°) of Tulita.
Archaeological Potential:	Stantec's AOA identified eight discrete areas within the bedrock supply source that were considered to possess high archaeological potential (See Fig. 12) due to the presence of distinct level ridge features above slope breaks.
Hydrology:	Edie Lake is 125 m west of the area. Snowshoe Creek is located 200 m to the east. An unnamed stream flows southwest through the western portion of the

	proposed quarry expansion and into the southeast end of Edie Lake. The Mackenzie River is 8 km to the south
Terrain:	The proposed quarry and expansion area are situated on the lower slope of Mount Hamar, which is part of the northwest/southeast trending Discovery Ridge. A small trough-like valley is located between Discovery Ridge and a smaller ridge to the southwest. This valley contains a number of alluvial fans and small lakes. Terrain is generally moderately sloping with a southwestern aspect. Stepped bedrock ridges trend northwest/southeast through the area. Leading edges of the ridges are level and elevated with low-lying swales located back from the slope breaks.
Previously Recorded Archaeological Sites:	No previously recorded archaeological sites are located within 5 km of the proposed development area. The original extent of the proposed quarry had an archaeological assessment completed in 2015 under Permit 2015-004. Areas of archaeological potential were confirmed in the field and tested but no archaeological resources were identified.

Survey Methodology

Transects:	A crew of four people conducted pedestrian traverses (~10 m apart, 20 - 30 m visibility) throughout portions of the proposed bedrock source that were identified during the AOA as having high archaeological potential. Survey transects are depicted on Figure 12. The transect buffer displayed on the survey map is representative of the pedestrian transect plus the zone of visibility.		
Previous Disturbance/ Exposures:	Ground disturbances within the proposed development included a previous access road, as well as several surface exposures, tree throws and game trails. All available surface and subsurface exposures encountered during survey were inspected for archaeological material.		
Total Number of Shovel Tests in Development Area:	119	Shovel Test Dimensions:	40 cm x 40 cm

Survey Results

Archaeological Sites Identified:	0	Post-contact Sites Identified:	0

Results Summary

Seventeen potential zones were identified and assessed within the proposed development area. Further details of all recorded potential zones are summarized in the following section.

No archaeological resources were identified within km 1002.5 'Northeast of Norman Wells' Quarry Expansion.

AIA Potential Zones

Potential Zone	Shovel Tests Completed	Size	Results
MPZ JM1	11	25 NW-SE m x 15 m NE-SW	Negative
MPZ JM2	7	15 m N-S x 15 m E-W	Negative
MPZ JM3	9	22 m NE-SW x 5 m NW-SE	Negative
MPZ JM4	7	25 m WNW-ESE x 10 m NNE-SSW	Negative

MPZ JM35	8	30 m NW-SE x 6 m NE-SW	Negative
MPZ MY1A	8	20 m WNW-ESE x 5 m NNE-SSW	Negative
MPZ MY1B	9	20 m E-W x 8 m N-S	Negative
MPZ MY2A	7	25 m WNW-ESE x 8 m NNE-SSW	Negative
MPZ MY2B	4	10 m N-S x 10 m E-W	Negative
MPZ MY3	6	15 m NNE-SSW x 7 m WNW-ESE	Negative
MPZ MY4	7	15 m NNW-SSE x 7 m ENE-WSW	Negative
MPZ MY5	6	10 m NNW-SSE x 5 m ENE-WSW	Negative
MPZ MY6	8	15 m NE-SW x 7 m NW-SE	Negative
MPZ MY7	6	12 m NW-SE 4 m NE-SW	Negative
MPZ MY8	7	12 m E-W x 8 m N-S	Negative
MPZ MY9	5	5 m N-S x 5 m E-W	Negative
MPZ MY10	4	8 m NE-SW x 5 m NW-SE	Negative

Potential Impacts

It is not anticipated that any archaeological resources will sustain impact within proposed quarry expansion area km 1002.5, provided that its boundaries are not modified to include unassessed areas.

Recommendations

No further archaeological assessments are recommended for km1002.5 Quarry Expansion, provided its boundaries are not modified to include unassessed areas.

Closure

Archaeological and historical sites older than 50 years are protected from unpermitted disturbances, alterations or surveys under the Archaeological Sites Act, whether they are located on public or private land. Land use plans may further restrict activities within the proximity of known or suspected archaeological resources.

To address the discovery of any unanticipated archaeological remains, it is recommended that the proponent inform their personnel and contractors that, in the event that possible archaeological materials are encountered, all development activities in the vicinity of the archaeological remains must be suspended immediately and the appropriate land use board must be notified.

The present study was designed solely to identify and assess evidence of past human activity protected under the Archaeological Sites Act. It is not the intent of this report to evaluate traditional aboriginal use; nor is the intent to address potential impacts to non-protected cultural heritage resources within the proposed development area.

October 24, 2016

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Date