



**Geotechnical and Materials Engineering  
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## **Junction 93 Quarry No. 2563**

### **2021 Technical Information Report**

**Location:** Southeast of the Junction of Hwy 3 and Hwy 93. The pit entrance is located approximately 1km south of the junction on the east side of Hwy 93. Pit coordinates are 49.288151, -115.124589.



**Legal Description:** Those portions of Sublots 9 and 10 of District Lot 321, Kootenay District, Plan X4, more particularly shown on the Legal Description Schedule and containing 16.7 hectares, more or less.

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**Aggregate Quality:** A summary of aggregate quality tests performed on samples obtained from the quarry are as follows:

<b>TEST</b>	<b>AVERAGE</b>
<b>Bag No. 5 - Bulk Relative Density (Coarse)</b>	2.675
<b>Bag No. 5 - Bulk Relative Density (Fine)</b>	2.638
<b>Bag No. 5 - Absorption (Coarse)</b>	0.55
<b>Bag No. 5 - Absorption (Fine)</b>	0.79
<b>Bag No. 5 – Micro Deval Abrasion</b>	12.1
<b>Bag No. 6 - Bulk Relative Density (Coarse)</b>	2.688
<b>Bag No. 6 - Bulk Relative Density (Fine)</b>	2.661
<b>Bag No. 6 - Absorption (Coarse)</b>	0.49
<b>Bag No. 6 - Absorption (Fine)</b>	0.79
<b>Bag No. 6 – Micro Deval Abrasion</b>	13.0

A table containing the results of the following tests are available in Appendix A:

- Metals by Aqua Regia Digestion with ICP-MS Finish
- Modified Acid-Base Accounting

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**Volume:**

- The site was visited in August, 2018 and approximately 1500 m<sup>3</sup> of rock with varied amounts of 300 kg and 500 kg class were in stockpile.
- Additional rock is available at the main rock face and talus. Sorting will be required.
- Should additional rock be needed the main rock face will require development.

**Quarry Development and Recommendations:**

- Quarry development must be carried out in accordance with the Health, Safety, and Reclamation Code for Mines in BC, the current Standard Specifications for Highway Construction, and the Aggregate Operators Best Management Practices Handbook for BC.
- Development Area A and the overburden stockpile area will require clearing. Development area will require grubbing & stripping of overburden.
- Quarry excavation must not take place within a minimum distance of 5m from the reserve boundary & minimum 2m from the edge of cleared & stripped areas.
- Extract rock in a multiple bench system of mining with minimum 8m wide benches and maximum 8m high rock faces.
- Before vacating the site, the contractor/blaster must certify that no unexploded charges remain at the site, any loose unfired explosives have been collected and destroyed and all loose rock from the faces has been scaled.
- Provide daily blast logs to Ministry Representative.
- No dumping of debris or petroleum products is permitted. The pit must be left in a clean and safe condition.
- The quarry shall be worked in accordance with Section 204 of the MoTI Standard Specifications for Highway Construction.
- If more than 10 metres of rock is blasted from the upper rock cut into the face, blasting must be stopped and a secondary ML/ARD assessment is recommended to be done.
- At the completion of mining, overburden must be stripped a minimum of 2 metres back from active quarry faces.
- **All reject materials resulting from aggregate production are to be placed in separate stockpiles free from deleterious material and in an easily accessible location. No stockpiling against the pit face is permitted without the permission from the Aggregate Resource Manager.**

**Site Photographs:**



Unsorted rock (2021)



Toward quarried face (2021)



Unsorted rock (2021)



Unsorted rock (2018)



Unsorted rock (2021)



Toward quarried face (2021)

Steven Lee  
Senior Aggregate Resource Specialist

# **APPENDIX A**

Sample ID	Paste pH	TIC %	CaCO3 NP	S(T) %	S(SO4) %	S(S-2) %	Insoluble S %	AP	NP	Net NP	Fizz Test
Method Code	Sobek	CSB02V	Calc.	CSA06V	CSA07V	CSA08D	Calc.	Calc.	Modified	Calc.	Sobek
LOD	0.2	0.01	#N/A	0.01	0.01	0.01	#N/A	#N/A	0.5	#N/A	#N/A
Junction 93 Pit - 5	8.91	0.02	1.7	0.026	<0.01	0.02	<0.01	0.6	3.1	2.5	None
Junction 93 Pit - 6	8.89	0.05	4.2	0.028	<0.01	0.02	<0.01	0.6	4.5	3.9	None
<b>Duplicates</b>											
	8.5			0.024	<0.01				2.2		None
<b>QC</b>		<0.01			<0.01						
GTS-2A				0.327							
RTS-3A					1.04	2.26					
SY4		0.92							42.0		Slight
NBM-1											
Expected Values		0.91		0.341	0.98	2.46			42.0		Slight
Tolerance (+/-)		0.07		0.030	0.12	0.25			4.0		

**Note:**

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET NP = NP - AP

Carbonate NP is calculated from TIC originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCl Leach with S by ICP Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with S by ICP Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).



Sample ID	Ag ppm	Al %	Ba ppm	Ca %	Cr ppm	Cu ppm	Fe %	K %	Li ppm	Mg %	Mn ppm	Na %	Ni ppm	P %	S %	Sr ppm	Ti %	V ppm
Method Code	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B
LOD	0.01	0.01	5	0.01	1	0.5	0.01	0.01	1	0.01	2	0.01	0.5	0.005	0.01	0.5	0.01	1
Junction 93 Pit - 5	0.02	1.13	78	0.12	84	9.1	1.89	0.17	26	0.71	67	0.02	13.8	0.04	0.02	2.8	<0.01	4
Junction 93 Pit - 6	<0.01	0.88	254	0.13	90	7.3	1.6	0.16	21	0.58	63	0.02	13.8	0.01	0.03	7.2	<0.01	4
Duplicate																		
QC	0.03	0.57	63	0.53	75	10.8	2.06	0.23	20	0.34	458	0.09	7.2	0.1	<0.01	37.5	0.15	35
OREAS 905	0.48	0.72	232	0.31	16	1520	3.33	0.29	4	0.15	347	0.09	8.7	0.02	0.07	12	0.02	5
Certified Values	0.516	0.817	249	0.337	17.6	1562	3.50	0.322	4.87	0.158	350	0.092	8.9	0.023	0.065	12.3	0.019	6.05
Tolerance (%)	15.90	14.01	16.05	18.48	30.07	10.94	11.48	21.31	83.55	24.34	12.12	42.11	26.75	78.79	73.68	22.62	89.86	67.4

Sample ID	Zn ppm	Zr ppm	As ppm	Be ppm	Bi ppm	Cd ppm	Ce ppm	Co ppm	Cs ppm	Ga ppm	Ge ppm	Hf ppm	Hg ppm	In ppm	La ppm	Lu ppm	Mo ppm	Nb ppm
Method Code	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B
LOD	1	0.5	1	0.1	0.02	0.01	0.05	0.1	0.05	0.1	0.1	0.05	0.01	0.02	0.1	0.01	0.05	0.05
Junction 93 Pit - 5	30	1.9	<1	0.5	0.03	0.05	39.19	4.1	0.55	3.2	<0.1	<0.05	0.05	<0.02	18.1	0.03	1.81	<0.05
Junction 93 Pit - 6	22	1.7	<1	0.4	0.04	0.04	32.74	5	0.46	2.3	<0.1	<0.05	0.03	<0.02	15	0.02	2.15	<0.05
Duplicate																		
QC	55	36.2	2	1.3	0.11	0.08	106	3.9	0.78	5.8	0.2	1.25	<0.01	<0.02	56.7	0.12	2.84	8.73
OREAS 905	63	42.3	30	0.7	5.52	0.34	73.48	13.7	1.09	5.9	0.1	1.18	<0.01	0.56	37.7	0.03	2.99	0.59
Certified Values	67	47.5	31.7	0.93	5.74	0.34	80	13.9	1.32	6.43	<1	1.22	<0.05	0.58	39.8	0.034	3.02	#N/A
Tolerance (%)	14.40	13.48	18.72	43.14	11.42	19.35	10.66	12.21	21.85	15.59	BDL	22.83	BDL	20.95	11.14	109.09	15.33	#N/A

Sample ID	Pb ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sn ppm	Ta ppm	Tb ppm	Te ppm	Th ppm	Tl ppm	U ppm	W ppm	Y ppm	Yb ppm
Method Code	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B
LOD	0.2	0.2	0.05	0.1	1	0.3	0.05	0.02	0.05	0.1	0.02	0.05	0.1	0.05	0.1
Junction 93 Pit - 5	1.8	8	0.07	0.7	<1	<0.3	<0.05	0.24	<0.05	4.7	0.05	0.43	<0.1	2.81	0.2
Junction 93 Pit - 6	1.5	7.3	0.09	0.6	<1	<0.3	<0.05	0.18	<0.05	3.8	0.05	0.34	<0.1	1.88	0.2
Duplicate															
Rock Candy Pit - 1	17.7	18.7	0.09	2	<1	0.9	<0.05	0.51	<0.05	23.8	0.09	3.52	0.5	12.22	0.9
QC															
OREAS 905	15.4	17	1.13	1.6	2	0.9	<0.05	0.45	<0.05	7.9	0.1	2.07	0.6	6.67	0.2
Certified Values	17.1	19.3	1.12	1.89	2.32	1.27	<0.01	0.44	0.065	8.88	0.11	2.37	<1	7.08	0.27
Tolerance (%)	13.75	13.26	24.00	23.01	73.22	53.60	BDL	22.78	101.89	14.23	75.00	16.44	BDL	12.45	75.86