

**ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT  
RESPONSE TO CEEA INFORMATION REQUEST PACKAGE 3, AUGUST 31, 2018**

Appendix IR45-2 SR1 – Cost Estimate Opinion  
May 2019

**APPENDIX IR45-2 SR1 – COST ESTIMATE OPINION**

**ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT  
RESPONSE TO CEEA INFORMATION REQUEST PACKAGE 3, AUGUST 31, 2018**

Appendix IR45-2 SR1 – Cost Estimate Opinion  
May 2019



**Stantec Consulting Ltd.**  
200-325 25 Street SE, Calgary AB T2A 7H8

April 22, 2019  
File: 110773396

**Attention: Syed Abbas, P. Eng**  
Director, Major Capital Projects Branch  
Alberta Transportation  
Suite 310 Twin Atria Building  
4999 – 98 Avenue  
Edmonton, AB T6B 2X3

Dear Mr. Abbas,

**Reference: SR1 – Cost Estimate Opinion**

## **Introduction**

On July 28, 2018, Alberta Transportation received Supplemental Information Requests from Alberta Environment (AEP) and Parks including questions from the Natural Resource Conservation Board (NRCB). One question from the NRCB (IR35 part b) requested an “updated cost for both the Project and MC1, if the cost is materially different.” This update to the SR1 cost estimate is in response to IR35b.

## **Cost Estimate Methodology**

The Civil Master Works Cost estimate is a comprehensive estimate intended to clearly define project cost elements, associated parameters, and current pricing.

The Cost Opinion is consistent with the requirements of a Type B Estimate as defined in the Alberta Transportation Engineering Consultant Guidelines for Highway, Bridge, and Water Projects. Unit prices were developed utilizing published Alberta Transportation cumulative unit price averages from the three lowest bidders on recent tenders, weighted by bid quantity. Average tenders were evaluated to establish unit pricing for most items. Price opinions for items unavailable in the recent tenders were developed based on local construction industry experience and engineering judgement.

The pay item structure is broken into major project components to delineate and define items associated with each feature. This methodology allows for a more thorough review of each component, versus quantifying all items globally. In addition, each component can be analyzed independently if budgetary constraints require cost reductions.

Pay items units are consistent with AT Civil Master Works Specifications, AT Standard Specifications for Highway Construction, and generally accepted industry standard methods of measurement.

**Design with community in mind**



April 22, 2019  
Syed Abbas, P. Eng  
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**Reference: SR1 – Updated Cost Estimate Opinion**

Methods and Assumptions

Published Alberta Transportation cumulative unit price averages have been used with modification in cases where there was material difference in the volumes or level of effort associated with that item. Adjustments have been made to recognize the increase/decrease in effort required for similar items of work. Where published Alberta Transportation unit prices did not exist, other methods of determining unit prices were obtained. This included using general engineering principles, and/or a comparison of unit costs to current and past projects

Suitable Material Assumptions

The geotechnical exploration indicates that the quality and quantity of materials needed to construct SR1 are available on site. Due to normal variances between actual conditions obtained during construction and the data identified during geotechnical exploration, both borrow and spoils areas have been included in this project. They provide the successful contractor with additional materials to use in the embankment construction and spoil areas for materials that are either not suitable or intentionally not used by the contractor.

Risk Contingency

A contingency factor of 15% is utilized to reflect the current level of study and knowledge. Because the diversion channel and off-stream dam have been appropriately characterized through geotechnical and hydraulic studies and because they comprise a large component of the Project cost, engineering judgment has been used to reduce contingency. Other elements of the design (e.g., structure) are at a level of detail more traditionally identified with projects at the 60% complete status.

**2019 Cost Estimate**

The revised Opinion of Costs is attached. The following SR1 components are included in the updated cost opinion:

- Addition of debris deflection barrier
- Updated engineering and environmental costs

The engineering and environmental costs reflect the new completion date, to include unapproved change orders currently submitted to the Province, and to reflect the additional Construction Administration fees associated with the construction schedule being revised from 24 months to 36 months.



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**Reference: SR1 – Updated Cost Estimate Opinion**

Should there be any questions regarding this updated Opinion of Cost, please contact the undersigned.

Regards,

**STANTEC CONSULTING LTD.**

Graham Harmar, P.Eng., PMP  
Principal / Senior Project Manager

c. Ghulam Ahmed, Alberta Transportation  
Dave Brescia, Stantec



**Springbank Off-Stream Storage Project (SR1)**  
**Civil Works Cost Opinion - Type B**  
**Revised February 8, 2019**

	Item	Unit	Quantity	Unit Price	Estimated Cost
1	<b>General</b>				
2	Mob./Demobilization	lump sum	5% of Const. Cost	\$ 10,220,000.00	\$ 10,220,000
3	Project Advertising Signs	ea.	4	\$ 3,500.00	\$ 14,000
4	Maintenance Existing and Temporary Roads	lump sum		\$ 500,000.00	\$ 500,000
5	Care of Water	lump sum		\$ 2,500,000.00	\$ 2,500,000
6					
7	<b>Removals</b>				
8	Clearing & Timber Salvage	hectares	53	\$ 11,000.00	\$ 583,000
9	Existing Fence - Remove and Dispose	km	3.125	\$ 3,000.00	\$ 9,375
10					
11	<b>Demolition:</b>				
12	Remove Existing Buildings	ea.	26	\$ 50,000.00	\$ 1,300,000
13	Abandon Water Wells	ea.	3	\$ 4,500.00	\$ 13,500
14	Asphalt surface (Driveways) - Remove & Dispose	m <sup>2</sup>	20,500	\$ 7.00	\$ 143,500
15					
16	<b>Reinstate disrupted services to residents</b>				
17	Reinstate Existing Gas Service	ea.	5	\$ 8,000.00	\$ 40,000
18	Reinstate Electrical Service	ea.	5	\$ 17,500.00	\$ 87,500
19	Reinstate Telecommunication Service	ea.	5	\$ 17,500.00	\$ 87,500
20					
21	<b>Landscaping</b>				
22	Drill Seeding	hectares	953	\$ 1,260.00	\$ 1,200,780
23	Hydroseeding	hectares	0	\$ 8,000.00	\$ -
24					
25	<b>Roadway Crossings</b>				
26	Highway 22 Bridge Crossing		See Separate Breakout		\$ 4,768,000
27	Township Road 242 Bridge Crossing		See Separate Breakout		\$ 3,708,400
28					
29	<b>Highway 22 and Springbank Road Modifications</b>				
30	Grade and Resurface Hwy 22 and Springbank Rd.		See Separate Breakout		\$ 12,244,340
31					
32	<b>Site Access Roads: Diversion Structure</b>				
33	Prepare Subgrade Surface (First Layer)	m <sup>2</sup>	7,670	\$ 1.00	\$ 7,670
34	Zone 4A - Base Gravel (2-25 GBC) - 75 mm depth	m <sup>3</sup>	575	\$ 56.00	\$ 32,214
35	Supply of Aggregate - No Option	t	1,352	\$ 0.60	\$ 811
36	High Tension Cable Barrier - Supply and Install	m	205	\$ 82.50	\$ 16,913
37	Crash Attenuators - TL-3	ea.	2	\$ 4,950.00	\$ 9,900
38					
39	<b>Site Access Roads: Diversion Channel</b>				
40	Prepare Subgrade Surface (First Layer)	m <sup>2</sup>	30,000	\$ 1.00	\$ 30,000
41	Zone 4A - Base Gravel (2-25 GBC) - 75 mm depth	m <sup>3</sup>	2,250	\$ 56.00	\$ 126,000
42	Supply of Aggregate - No Option	t	5,288	\$ 0.60	\$ 3,173
43					
44	<b>Site Access Roads: Off-Stream Storage Dam</b>				
45	Prepare Subgrade Surface (First Layer)	m <sup>2</sup>	21,960	\$ 1.00	\$ 21,960
46	Zone 4A - Base Gravel (2-25 GBC) - 75 mm depth	m <sup>3</sup>	1,647	\$ 56.00	\$ 92,232
47	Supply of Aggregate - No Option	t	3,870	\$ 0.60	\$ 2,322
48	High Tension Cable Barrier - Supply and Install	m	6,570	\$ 82.50	\$ 542,025
49					
50	<b>Site Security:</b>				
51	New Fence - Supply & Install - Class B (wildlife friendly barbwire)	km	27.45	\$ 12,100.00	\$ 332,145
52	New Fence - Supply & Install - Class H (Chain-link)	m	2625	\$ 48.50	\$ 127,313
53	Vehicle Access Control Gate	ea.	8	\$ 5,500.00	\$ 44,000
54	Supply of Signs, Aluminum	m <sup>2</sup>	92	\$ 250.00	\$ 23,040
55	Supply and Install Post (100mm X 150mm)	ea.	64	\$ 220.00	\$ 14,080
56					
57	<b>General Subtotal</b>				<b>\$ 38,845,692</b>



**Springbank Off-Stream Storage Project (SR1)**  
**Civil Works Cost Opinion - Type B**  
**Revised February 8, 2019**

Item	Unit	Quantity	Unit Price	Estimated Cost
<b>58</b>	<b>Diversion Structure</b>			
59	<b>Service Spillway (SS)</b>			
60	Structural Concrete - Class A1 (30 MPa @ 28)	m <sup>3</sup>	0	\$ 1,340.00 \$ -
61	Structural Concrete - Class B1 (30 MPa @ 90)	m <sup>3</sup>	2,276	\$ 1,340.00 \$ 3,049,840
62	Mass Concrete (20 MPa @ 90)	m <sup>3</sup>	8,306	\$ 890.00 \$ 7,392,340
63	Service Spillway Right Abutment (Semi Circular Block)	m <sup>3</sup>	1,865	\$ 623.00 \$ 1,161,895
64	HPC (Bridge Mixture) (40 MPa @ 28)	m <sup>3</sup>	18.5	\$ 2,080.00 \$ 38,480
65	Parapet Railing	m	65	\$ 450.00 \$ 29,250
66	Gate/Bladder Systems - Crest Gates - Supply	lump sum		\$ 4,000,000.00 \$ 4,000,000
67	Gate/Bladder Systems - Crest Gates - Installation	lump sum		\$ 40,000.00 \$ 40,000
68	Controls/Instrumentation	lump sum		\$ 400,000.00 \$ 400,000
69				
70	<b>Diversion Inlet (DI)</b>			
71	Structural Concrete - Class A1 (30 MPa @ 28)	m <sup>3</sup>	671	\$ 1,340.00 \$ 899,140
72	Structural Concrete - Class B1 (30 MPa @ 90)	m <sup>3</sup>	2,616	\$ 1,340.00 \$ 3,505,440
73	Mass Concrete (20 MPa @ 90)	m <sup>3</sup>	9,102	\$ 890.00 \$ 8,100,780
74	HPC (Bridge Mixture) (40 MPa @ 28)	m <sup>3</sup>	111.0	\$ 2,080.00 \$ 230,880
75	Structural Metal Framing Hoist Bridge Support Steel	kg	44,230	\$ 21.45 \$ 948,633
76	Parapet Railing	m	176	\$ 450.00 \$ 79,200
77	Gate/Hoist Systems - Fixed Wheel Lift Gates - Supply	lump sum		\$ 3,300,000.00 \$ 3,300,000
78	Gate/Hoist Systems - Fixed Wheel Lift Gates - Installation	lump sum		\$ 600,000.00 \$ 600,000
79	Controls/Instrumentation	lump sum		\$ 330,000.00 \$ 330,000
80				
81	<b>Concrete Seepage Cut-off Wall (Between DI &amp; SS)</b>			
82	Rock Socket - Rock Excavation	m <sup>3</sup>	45	\$ 45.00 \$ 2,025.00
83	Rock Socket - Concrete	m <sup>3</sup>	45	\$ 890.00 \$ 40,050.00
84	Structural Concrete - Class A1 (30 MPa @ 28)	m <sup>3</sup>	250	\$ 1,340.00 \$ 335,000.00
85				
86	<b>Control Building</b>			
87	Electrical Service 3 Phase, 400 Amp	lump sum		\$ 100,000.00 \$ 100,000
88	Control Building Structure	lump sum		\$ 400,000.00 \$ 400,000
89				
90	<b>SS &amp; DI Excavation, Backfill and Apron</b>			
91	Topsoil and Subsoil Stripping	m <sup>3</sup>	9,714	\$ 3.00 \$ 29,142
92	Topsoil Placement	m <sup>3</sup>	4,857	\$ 3.50 \$ 17,000
93	Common Excavation	m <sup>3</sup>	211,388	\$ 5.50 \$ 1,162,634
94	Overhaul of Common Excavation	m <sup>3</sup> *km	10,041	\$ 0.50 \$ 5,021
95	Rock Excavation	m <sup>3</sup>	143,194	\$ 8.75 \$ 1,252,948
96	Random Fill from Common Excavation	m <sup>3</sup>	129,356	\$ - \$ -
97	Riprap Zone 6C	m <sup>3</sup>	1,996	\$ 165.00 \$ 329,261
98	Foundation Grouting	Grout Hole	120	\$ 10,000.00 \$ 1,200,000
99	Foundation Treatment	m <sup>2</sup>	6055	\$ 200.00 \$ 1,211,000
100	Structure Foundation Drains	m	206	\$ 550.00 \$ 113,300
101	Wall Drains	m	215	\$ 1,800.00 \$ 387,000
102				
103	<b>Portage</b>			
104	Portage Route Pathway	m <sup>2</sup>	1,860	\$ 35.00 \$ 65,100
105				
106	<b>Riprap Revetment</b>			
107	Riprap Zone 6C	m <sup>3</sup>	4,550	\$ 165.00 \$ 750,750
108	Topsoil Placement	m <sup>3</sup>	468	\$ 3.50 \$ 1,638
109	Landscaping (Willow cuttings or potted stock)	m <sup>2</sup>	750	\$ 6.00 \$ 4,500
110				



**Springbank Off-Stream Storage Project (SR1)**  
**Civil Works Cost Opinion - Type B**  
**Revised February 8, 2019**

Item	Unit	Quantity	Unit Price	Estimated Cost
111	<b>Floodplain Berm</b>			
112	Topsoil and Subsoil Stripping	m <sup>3</sup>	13,710	\$ 3.00 \$ 41,130
113	Topsoil Placement	m <sup>3</sup>	6,855	\$ 3.50 \$ 23,993
114	Common Excavation	m <sup>3</sup>	32,869	\$ 5.50 \$ 180,780
115	Overhaul of Common Excavation	m <sup>2</sup> *km	0	\$ 0.85 \$ -
116	Zone 1A - Impervious Fill	m <sup>3</sup>	69,988	\$ 3.00 \$ 209,964
117	Zone 2A - Random Fill	m <sup>3</sup>	44,914	\$ 1.50 \$ 67,371
118	Fine Filter - Zone 3A	m <sup>3</sup>	8,901	\$ 55.00 \$ 489,555
119	Riprap Zone 6B	m <sup>3</sup>	13,150	\$ 165.00 \$ 2,169,750
120	Non-Woven Geotextile	m <sup>2</sup>	9,628	\$3.50 \$ 33,698
121				
122	<b>Auxiliary Spillway Transition Wall</b>			
123	Topsoil and Subsoil Stripping	m <sup>3</sup>	555	\$ 3.00 \$ 1,665
124	Topsoil Placement	m <sup>3</sup>	278	\$ 3.50 \$ 973
124	Common Excavation	m <sup>3</sup>	3,661	\$ 5.50 \$ 20,136
125	Rock Excavation	m <sup>3</sup>	1,350	\$ 8.75 \$ 11,813
126	RCC (Roller Compacted Concrete)	m <sup>3</sup>	4,073	\$ 265.00 \$ 1,079,345
127	Zone 1A - Impervious Fill	m <sup>3</sup>	2,017	\$ 3.00 \$ 6,051
128	Zone 2A - Random Fill	m <sup>3</sup>	478	\$ 1.50 \$ 717
129	Riprap Zone 6B	m <sup>3</sup>	870	\$ 165.00 \$ 143,550
130	Non-Woven Geotextile	m <sup>2</sup>	806	\$3.50 \$ 2,821
131				
132	<b>Auxiliary Spillway</b>			
133	Common Excavation	m <sup>3</sup>	33,791	\$ 5.50 \$ 185,851
134	Topsoil and Subsoil Stripping	m <sup>3</sup>	2,012	\$ 3.50 \$ 7,042
135	Topsoil Placement	m <sup>3</sup>	1,006	\$ 3.50 \$ 3,521
135	Rock Excavation	m <sup>3</sup>	5,072	\$ 8.75 \$ 44,378
136	Zone 1A - Impervious Fill	m <sup>3</sup>	0	\$ 3.00 \$ -
137	Random Fill from Common Excavation	m <sup>3</sup>	32,405	\$ - \$ -
138	RCC (Roller Compacted Concrete)	m <sup>3</sup>	18,532	\$ 265.00 \$ 4,910,980
139				
140	<b>Debris Deflection Barrier</b>			
141	Common Excavation	m <sup>3</sup>	7,508	\$ 5.50 \$ 41,291
142	Foundation Treatment	m <sup>2</sup>	990	\$ 200.00 \$ 198,000
143	Structural Concrete - Class A1 (30 MPa @ 28)	m <sup>3</sup>	1,359	\$ 1,340.82 \$ 1,822,697
144	Structural Steel Fabrication	kg	233,746	\$ 21.45 \$ 5,013,852
145	Steel Erection	days	17	\$ 9,035.00 \$ 153,595
146	Random Fill from Common Excavation	m <sup>3</sup>	3,465	\$ 1.50 \$ 5,198
147	Caissons	each	68	\$ 2,000.00 \$ 136,000
148				
149	<b>Diversion Structure Subtotal</b>			<b>\$ 58,517,960</b>





**Springbank Off-Stream Storage Project (SR1)**  
**Civil Works Cost Opinion - Type B**  
**Revised February 8, 2019**

Item	Unit	Quantity	Unit Price	Estimated Cost
<b>150</b>	<b>Diversion Channel</b>			
151	<b>Emergency Spillway (EMS)</b>			
152	Structural Concrete - Class A1 (30 MPa @ 28)	m <sup>3</sup>	859	\$ 1,151,060
153	Structural Concrete - Class B1 (30 MPa @ 90)	m <sup>3</sup>	3,977	\$ 5,329,180
154	Metal Railings	m	140	\$ 63,000
155	Foundation Treatment	m <sup>2</sup>	3,321	\$ 664,200
156	Structure Foundation Drains	m	135	\$ 74,250
157				
158	<b>Diversion Channel</b>			
159	Topsoil and Subsoil Stripping	m <sup>3</sup>	232,014	\$ 696,042
160	Topsoil Placement	m <sup>3</sup>	110,464	\$ 386,624
161	Common Excavation	m <sup>3</sup>	4,162,400	\$ 22,893,200
162	Overhaul of Common Excavation	m <sup>3</sup> *km	20,256,850	\$ 17,218,323
163	Rock Excavation	m <sup>3</sup>	1,035,442	\$ 9,060,118
164				
165	<b>Diversion Channel Embankment Fill Sections</b>			
166	Zone 1A - Impervious Fill	m <sup>3</sup>	124,133	\$ 372,399
167	Zone 2A - Random Fill	m <sup>3</sup>	0	\$ -
168				
169	<b>Diversion Channel Erosion Control</b>			
170	Riprap Zone 6B	m <sup>3</sup>	26,116	\$ 4,309,140
171	Riprap Zone 6C	m <sup>3</sup>	63,579	\$ 10,490,535
172	Closed Cell Articulated Concrete Block	m <sup>2</sup>	900	\$ 306,000
173	Non-Woven Geotextile	m <sup>2</sup>	114,231	\$ 399,809
174				
175	<b>Seepage Control</b>			
176	Vertical Toe Drain (Sand) - Fine Filter - Zone 3A	m <sup>3</sup>	8,487	\$ 466,785
177	150mm Perforated Pipe	m	2,829	\$ 424,350
178	150mm Pipe	m	1,226	\$ 171,640
179	Headwall	ea.	96	\$ 28,800
180				
181	<b>Diversion Channel Outlet (RCC Grade Control Structure)</b>			
182	RCC Stepped Overlay	m <sup>3</sup>	10,542	\$ 2,793,630
183	Fine Filter - Zone 3A	m <sup>3</sup>	6,594	\$ 362,670
184	Structural Concrete - Class A1 (30 MPa @ 28)	m <sup>3</sup>	536	\$ 718,240
185				
186	<b>Pipeline Crossings Protection</b>			
187	Closed Cell Articulated Concrete Block	m <sup>2</sup>	900	\$ 306,000
188				
189	<b>Diversion Channel Subtotal</b>			<b>\$ 78,685,994</b>



**Springbank Off-Stream Storage Project (SR1)**  
**Civil Works Cost Opinion - Type B**  
**Revised February 8, 2019**

Item	Unit	Quantity	Unit Price	Estimated Cost
<b>190</b>	<b>Off-Stream Storage Dam</b>			
191	<b>Dam Embankment</b>			
192	Topsoil and Subsoil Stripping	m <sup>3</sup>	240,811	\$ 3.00 \$ 722,433
193	Topsoil Placement	m <sup>3</sup>	67,527	\$ 3.50 \$ 236,345
194	Common Excavation	m <sup>3</sup>	443,057	\$ 5.50 \$ 2,436,814
195	Overhaul of Common Excavation	m <sup>3</sup> *km		\$ 0.85 \$ -
196	Zone 1A - Impervious Fill	m <sup>3</sup>	1,487,019	\$ 3.00 \$ 4,461,057
197	Zone 2A - Random Fill	m <sup>3</sup>	3,043,599	\$ 1.50 \$ 4,565,399
198	Toe Buttress - Random Fill Zone 2A(3)	m <sup>3</sup>	350,000	\$ 1.50 \$ 525,000
199	Fine Filter - Zone 3A	m <sup>3</sup>	229,658	\$ 55.00 \$ 12,631,190
200	Dam Face Drainage Flumes (Riprap Zone 6B)	m <sup>3</sup>	547	\$ 165.00 \$ 90,255
201	Non-Woven Geotextile	m <sup>2</sup>	811	\$ 3.50 \$ 2,839
202				
203	<b>Geotechnical Instruments</b>			
204	Instrumentation	lump sum		\$ 1,500,000.00 \$ 1,500,000
205				
206	<b>Vertical Toe Drain</b>			
207	Vertical Toe Drain (Sand) -Fine Filter - Zone 3A	m <sup>3</sup>	9,276	\$ 55.00 \$ 510,180
208	Vertical Toe Drain Fluvial-Fine Filter - Zone 3A	m <sup>3</sup>	2,200	\$ 55.00 \$ 121,000
209	Relief Wells 1.0 m by 3.0 m Depth	ea.	6	\$ 450.00 \$ 2,700
210	Perforated Pipe - Supply and Install (150 mm)	m	3,092	\$ 150.00 \$ 463,800
211	Non-Perforated Pipe - Supply and Install (150 mm)	m	234	\$ 140.00 \$ 32,760
212				
213	<b>Borrow</b>			
214	Borrow Area Excavation	m <sup>3</sup>	617,722	\$ 5.50 \$ 3,397,472
215	Overhaul of Borrow Area Excavation	m <sup>3</sup> *km	0	\$ 0.50 \$ -
216	Topsoil and Subsoil Stripping - Borrow Pit	m <sup>3</sup>	114,006	\$ 3.00 \$ 342,017
217	Topsoil Placement	m <sup>3</sup>	57,003	\$ 3.50 \$ 199,510
218	Drill Seeding	hectares	380	\$ 1,260.00 \$ 478,800
219				
220	<b>Low-Level Outlet Works (LLOW)</b>			
221	Structural Concrete - Class A1 (30 MPa @ 28)	m <sup>3</sup>	3,852	\$ 1,340.00 \$ 5,161,680
222	Foundation Concrete (15 MPa @ 28)	m <sup>3</sup>	135	\$ 890.00 \$ 120,150
223	Structural Metal Framing - Steel Trash Racks	kg	8,800	\$ 21.45 \$ 188,740
224	450 Dia. Air Vent Conduit (HDPE)	m	115	\$ 115.00 \$ 13,225
225	Metal Hand Rails	m	32	\$ 360.00 \$ 11,520
226	Gate/Hoist Systems - Heavy Duty Sluice Gate	lump sum		\$ 97,000.00 \$ 97,000
227	Controls/Instrumentation	lump sum		\$ 9,700.00 \$ 9,700
228	Electrical Service 3 Phase, 400 Amp	lump sum		\$ 100,000.00 \$ 100,000
229	Superstructure	lump sum		\$ 53,800.00 \$ 53,800
230				
231	<b>LLOW Channel Improvements</b>			
232	Riprap Class 6A	m <sup>3</sup>	478	\$ 165.00 \$ 78,870
233	Non-Woven Geotextile	m <sup>2</sup>	1367	\$ 3.50 \$ 4,783
234				
235	<b>LLOW Erosion Protection</b>			
236	Riprap Class 6A	m <sup>3</sup>	303	\$ 165.00 \$ 49,995
237	Riprap Class 6A	m <sup>3</sup>	175	\$ 165.00 \$ 28,875
238	Non-Woven Geotextile	m <sup>2</sup>	1,367	\$ 3.50 \$ 4,783
239				
240	<b>Off-Stream Storage Dam Subtotal</b>			<b>\$ 38,642,690</b>



**Springbank Off-Stream Storage Project (SR1)  
Civil Works Cost Opinion - Type B  
Revised February 8, 2019**

	Item	Unit	Quantity	Unit Price	Estimated Cost
<b>241</b>	<b>Totals</b>				
242	General - Subtotal				\$ 38,845,692
243	Diversion Structure - Subtotal				\$ 58,517,960
244	Diversion Channel - Subtotal				\$ 78,685,994
245	Off-Stream Storage Dam - Subtotal				\$ 38,642,690
246	<b>Construction Subtotal</b>				<b>\$ 214,692,335</b>
247	Construction Contingencies (%)	15%			\$ 32,204,000
<b>248</b>	<b>Construction and Contingency Total</b>				<b>\$ 246,896,335</b>
249					
<b>250</b>	<b>Utility Relocations (Mobilization and Contingency - Not Included)</b>				
251	<b>Shallow Utility Relocations</b>				
252	FORTIS - Salvage and Reinstale Utilities				\$ 1,907,450
253	SHAW - Salvage and Reinstale Utilities				\$ 401,200
254	TELUS - Salvage and Reinstale Utilities				\$ 601,200
255	ATCO - Salvage and Reinstale Utilities				\$ 351,150
256	<b>Subtotal - Shallow Utilities</b>				<b>\$ 3,261,000</b>
257					
258	<b>Major Utility Relocations</b>				
259	TransCanada Pipelines Ltd.				\$ 3,030,000
260	Pengrowth Energy Corporation				\$ 718,750
261	Veresen Inc				\$ 722,500
262	Plains Midstream				\$ 7,672,500
263	Altalink				\$ 300,000
264	<b>Subtotal - Major Utilities</b>				<b>\$ 12,443,750</b>
<b>265</b>	<b>Utility Relocations Total</b>				<b>\$ 15,704,750</b>
266					
<b>267</b>	<b>Engineering, Permitting and Administration (Mobilization and Contingency - Not Included)</b>				
268	Stantec - Engineering/Environmental Fees				\$ 49,600,000
269					
270					
271					
<b>272</b>	<b>Engineering, Permitting and Administration Total</b>				<b>\$ 49,600,000</b>
273					
<b>274</b>	<b>Total Project Cost Opinion</b>				<b>\$ 312,201,085</b>

