

**REGIONAL DISTRICT OF
EAST KOOTENAY**

**EDGEWATER SEWAGE
LAGOON MONITORING
2016 ANNUAL REPORT**

ECO/LOGIC ENVIRONMENTAL

JUNE 2017



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- B. Effluent Quality Data
- C. Flow Data
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1. INTRODUCTION

Registration number RE-17372, under the Municipal Sewage Regulation (MSR) was issued July 2003 in the name of the Regional District of East Kootenay. The letter of instruction, accompanying the Registration specifies the quantity (417m³/d) and quality (BOD=45, TSS=60) restrictions, applicable to effluent discharged to the Columbia River.

The Letter of Instruction also details monitoring requirements designed to determine compliance with the MSR as well as assess impact on the receiving environment (Columbia River). Furthermore, the RDEK is required to submit an annual report, which addresses both the compliance and impact issues as well as make recommendations on future monitoring programs.

The Letter of Instruction was amended January 12, 2010 (Appendix A) to reflect constantly high effluent quality and the demonstrated lack of impact on the receiving environment.

The Municipal Sewage Regulation (MSR) was replaced by the Municipal Wastewater Regulation (MWR) B.C. Reg. 87/2012 O.C. 230/2012 in 2012.

The 2016 annual report indicates that the effluent quality is in compliance with the standards presented in the Municipal Wastewater Regulation.

2. MONITORING REQUIREMENTS

Table 1. MWR Monitoring Requirements

Maximum Daily Flow Range (m ³ /d)	Frequency of Data Submission to Director	Flow	BOD, TSS		Fecal Coliform		Toxicity	
		Freq.	Freq.	Type	Freq.	Type	Freq.	Type
>10 - <500	2/Y	W	Q	G	Q	G	1X/3YR	G

Table 2. 2010 Registration Letter Monitoring Requirements

Parameter	Site		
	Columbia River		Sewage Treatment Facility
	Upstream	Initial Dilution Zone (IDZ)	Effluent
pH (field test)	WS/G/2Y	WS/G/2Y	WS/G
Temp (field test)	WS/G/2Y	WS/G/2Y	WS/G
Flow			W
BOD			Q/G
TSS			Q/G
Ammonia (as Nitrogen)	WS/G/2Y	WS/G/2Y	
Nitrate (as Nitrogen)	WS/G/2Y	WS/G/2Y	
Nitrite (as Nitrogen)	WS/G/2Y	WS/G/2Y	
Sodium	WS/G/2Y	WS/G/2Y	
Chloride	WS/G/2Y	WS/G/2Y	
Fecal Coliform	WS/G/2Y	WS/G/2Y	Q/G
Enterococci	WS/G/2Y	WS/G/2Y	
E-Coli	WS/G/2Y	WS/G/2Y	
Toxicity			1/2Y/G

Sample Frequencies

W = Weekly

WS = Weekly seasonal (five consecutive weeks during late summer or early autumn every second year).

1X/2Y/G = Once every two years

Sample Types

G = Grab

Table 3. MSR Effluent Quality Requirements (maximum daily flows > 50m³/d)

Parameter	Concentration	
BOD	45 mg/l	
TSS	60 mg/l	Specified by Letter of Instruction and Part 1, Interpretation of the MWR.
pH	6.0-9.0	

3. REPORTING REQUIREMENTS

The RDEK is required to submit an annual report to a director before May 1 of each year.

All analytical data must be uploaded to the Provincial data base (EMS) on an annual basis or more frequently if required.

In 2016 the Ministry of Environment introduced an additional reporting requirement. Quarterly and Annual reports are to be submitted to EnvironmentalReporting@gov.bc.ca. in a format specified on the Ministry website.

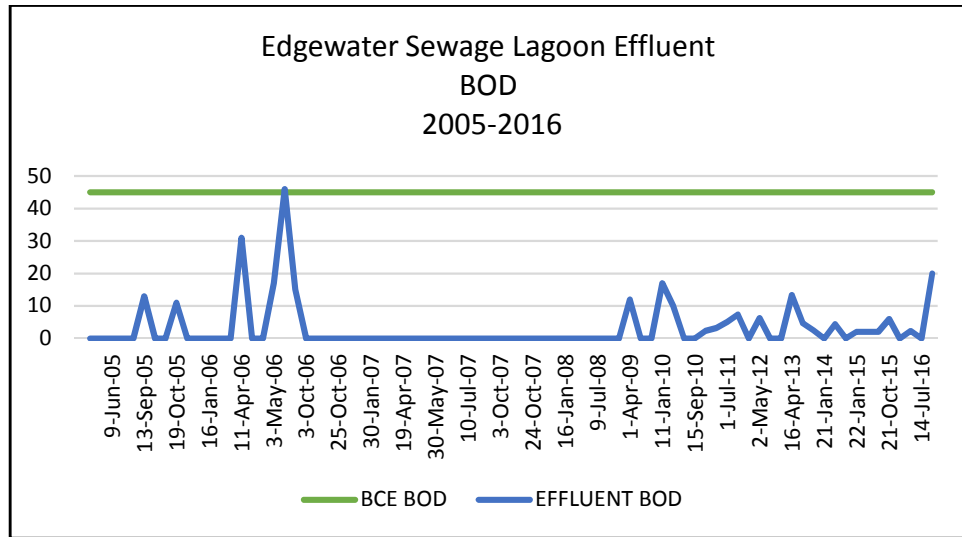
Eco/Logic Environmental will submit the 2016 report as per instructions. 2016 Quarterly data would need to be reformatted prior to submission.

4. 2012 MONITORING PROGRAM

4.1 Effluent Quality

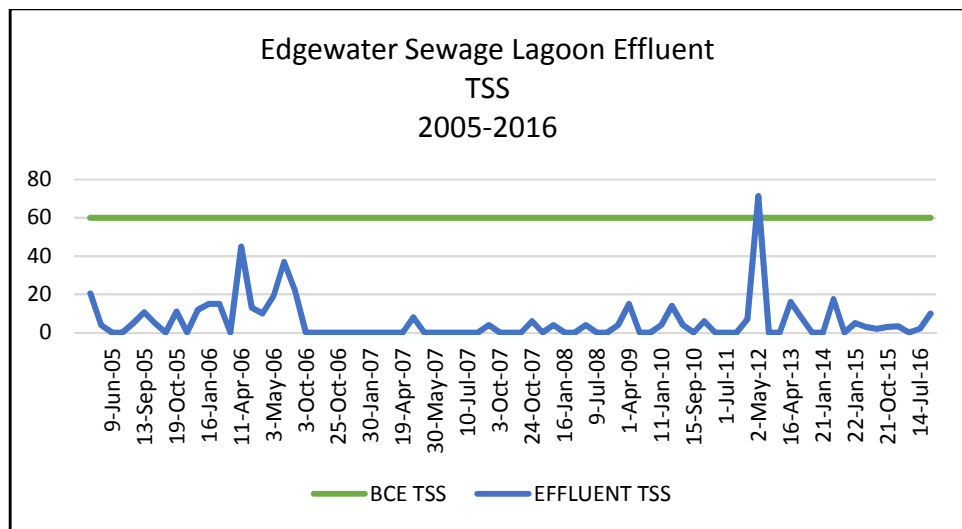
Effluent quality was monitored as per MWR during 2016. The effluent quality results are tabulated in Appendixes B.

4.1.1 Biochemical Oxygen Demand (BOD)



Effluent BOD data indicated compliance with the limits prescribed by the MWR.

4.1.2. Total Suspended Solids

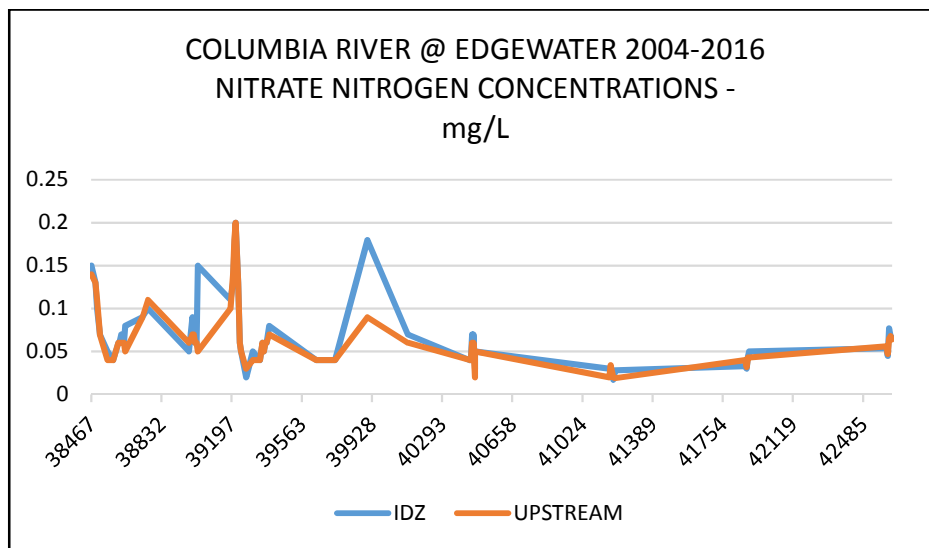
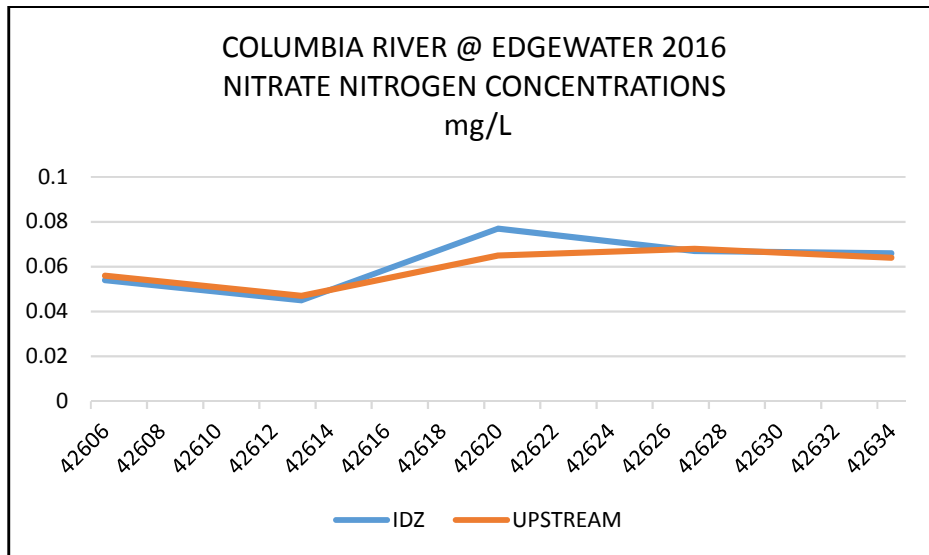


Effluent TSS data complied with the limits prescribed by the MWR during 2016.

4.2 Effluent Impact on Columbia River

The Columbia River was sampled during the fall of 2016. The next scheduled sampling event is scheduled for the fall of 2019 as per instruction.

4.2.1 Nitrate Nitrogen



The 2016 monitoring program indicated no significant increase in Nitrate Nitrogen levels within the Initial Dilution Zone (IDZ).

Nitrate Nitrogen concentrations indicate a significant downward trend since 2009.

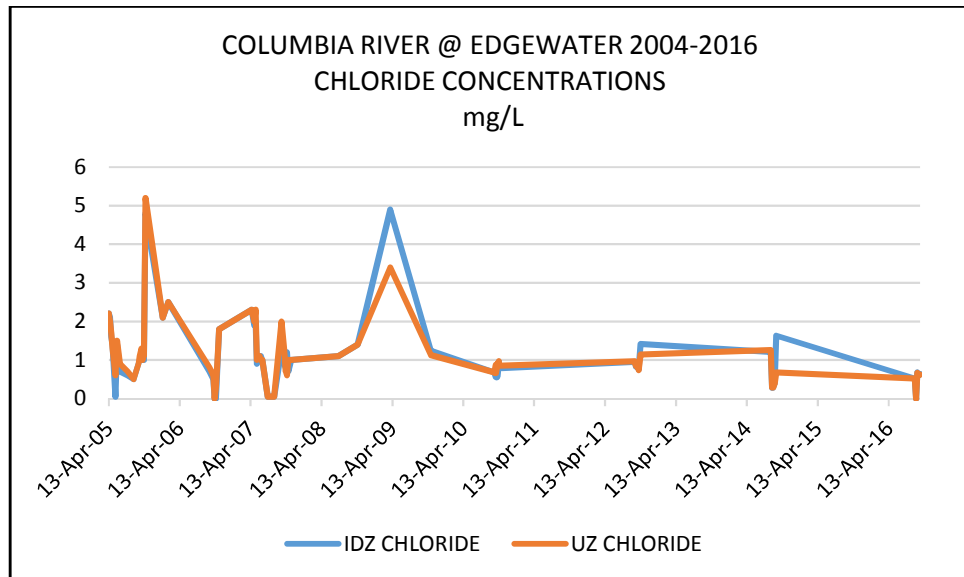
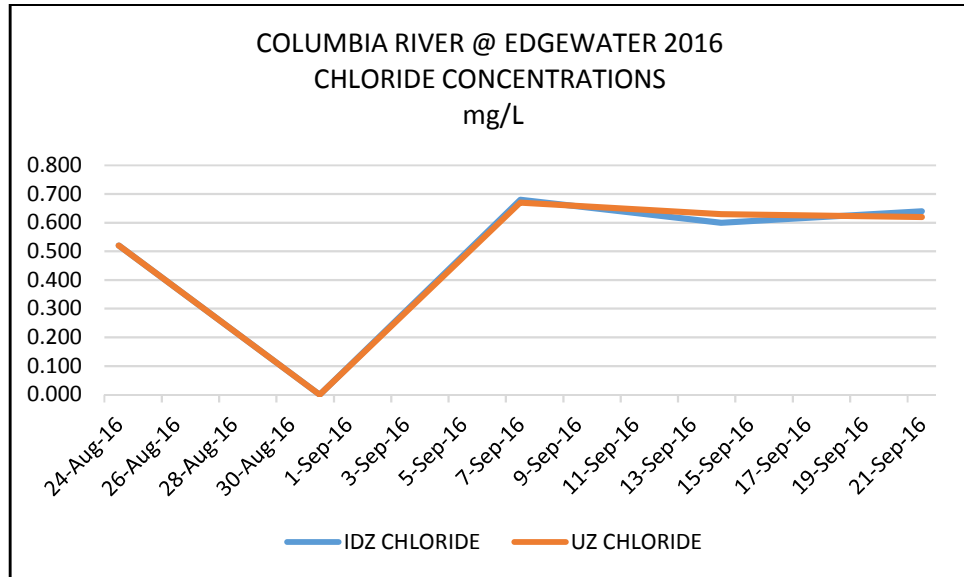
Nitrate Nitrogen levels met or exceeded the British Columbia "Compendium of Working Water Quality Guidelines, 2006 Edition.

4.2.2. Chloride

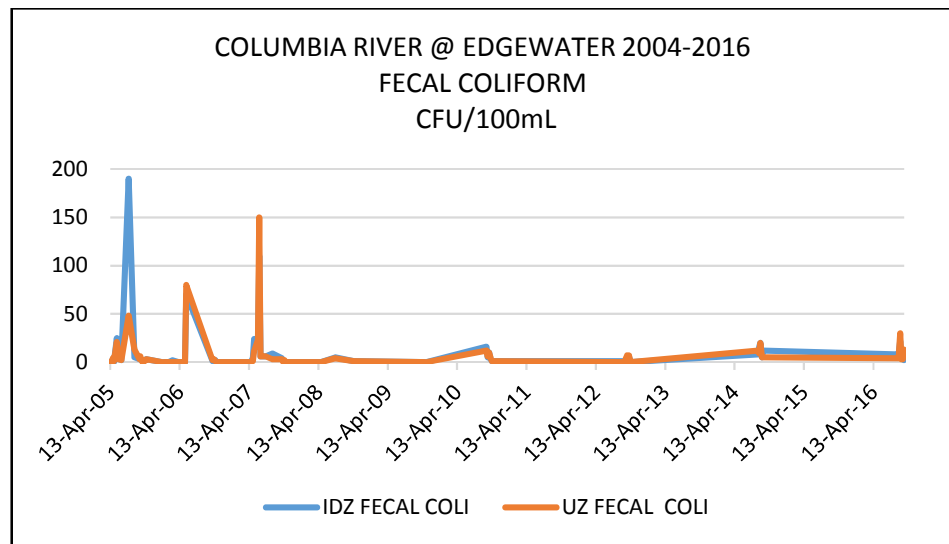
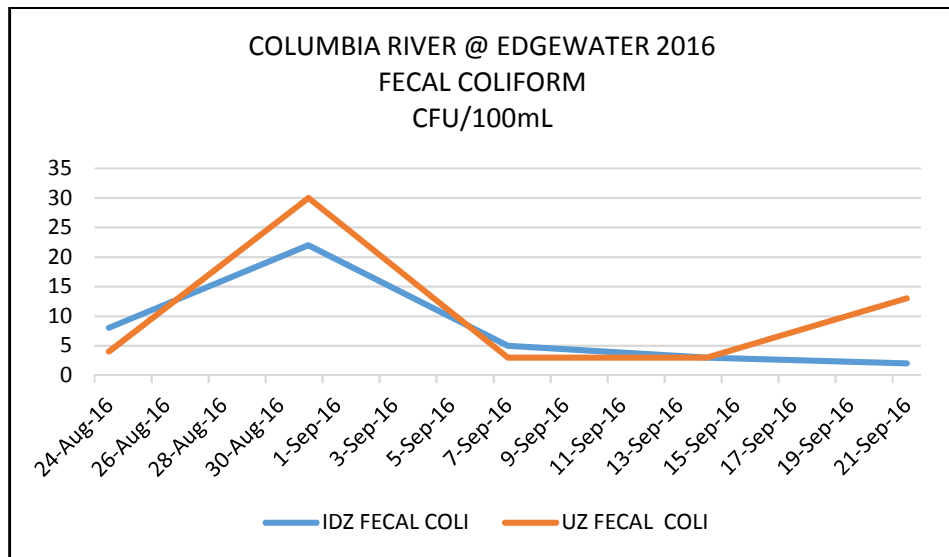
The 2016 monitoring program indicated no significant increase in Dissolved Chloride levels within the Initial Dilution Zone (IDZ).

Dissolved Chloride concentrations indicate a significant downward trend since 2009.

Dissolved Chloride levels met or exceeded the British Columbia “Compendium of Working Water Quality Guidelines, 2006 Edition.



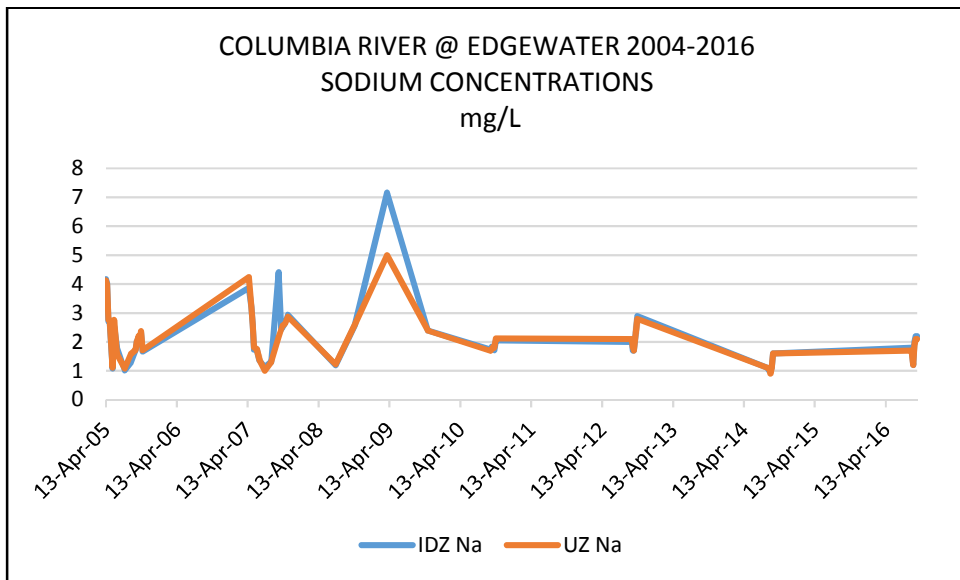
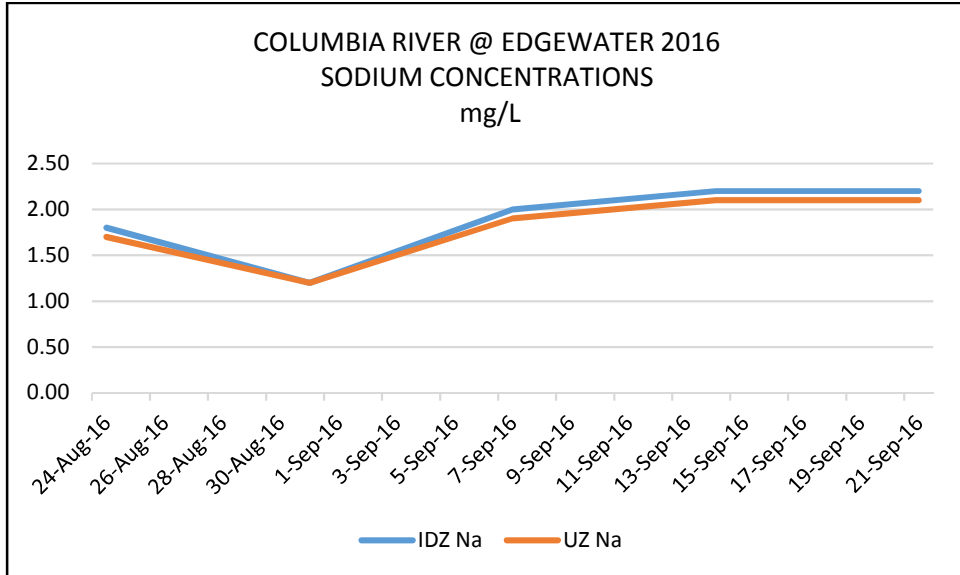
4.2.3. Fecal Coliform



The 2016 monitoring program indicated no increase in fecal coliform levels between upstream and the Initial Dilution Zone (IDZ). Fecal Coliform concentrations indicate a significant downward trend since 2007.

Fecal Coliform concentrations met the British Columbia "Compendium of Working Water Quality Guidelines, 2006 Edition" however exceeded the Drinking Water Guidelines. Since there are no consumptive water users upstream or within the IDZ the Aquatic Guidelines should apply.

4.2.4. Sodium



The 2016 monitoring program indicated an slight increase in Sodium levels between upstream and the Initial Dilution Zone (IDZ).

Sodium levels met or exceeded the British Columbia “Compendium of Working Water Quality Guidelines, 2006 Edition.

The next Columbia River impact assessment monitoring is to occur during 2019.

5. POPULATION STATISTICS

Census data indicates a significant decline in population in the Columbia Valley, with Area G (Edgewater area) showing a decline of 10.7%. Given these population statistics effluent flows are not expected to increase in the short term.

5.1. FLOWS.

The maximum flow recorded during 2016 was 442m³/d. Flows were estimated using volumetric test. A volumetric flow test protocol was established during 2012 and was implemented for the 2013 season.

RDEK- EDGWATER EFFLUENT FLOW DATA - 2016					
Date	Flow (m ³ /d)	Date	Flow (m ³ /d)	Date	Flow (m ³ /d)
4-Jan-16	41	4-Jun-16	0.0	17-Nov-16	39.0
15-Jan-16	55	9-Jun-16	95.0	19-Nov-16	60
19-Jan-16	103	14-Jun-16	56.0	22-Nov-16	40
28-Jan-16	153	23-Jun-16	50.0	7-Dec-16	33
31-Jan-15	147	5-Jul-16	79.0	16-Dec-16	31.0
1-Feb-16	137	12-Jul-16	83.0	20-Dec-16	26.0
12-Feb-16	442	21-Jul-16	83.0	28-Dec-16	17.0
16-Feb-16	116	25-Jul-16	74.0		
25-Feb-16	45	4-Aug-16	79.0		
7-Mar-16	105	11-Aug-16	90.0		
11-Mar-16	110	15-Aug-16	48.0		
15-Mar-16	92	25-Aug-16	69.0		
24-Mar-16	83	31-Aug-16	46.0		
6-Apr-16	37	7-Sep-16	45.0		
11-Apr-16	80	13-Sep-16	50.0		
17-Apr-16	97	20-Sep-16	54.0		
26-Apr-16	90	29-Sep-16	50.0		
2-May-16	50	4-Oct-16	43		
11-May-16	50	11-Oct-16	40		
18-May-16	42	17-Oct-16	43		
24-May-16	44	25-Oct-16	41.0		
		3-Nov-16	75.0		
		9-Nov-16	86.0		
HIGHEST RECORDED		12-Feb-16	442m³/d		
LOWEST RECORDED			0.0		

TOTAL FLOWS - 2016					
JANUARY	1781.0	MAY	693	SEPTEMBER	1328
FEBRUARY	2237.0	JUNE	1182	OCTOBER	
MARCH	2180.0	JULY	2000	NOVEMBER	1605
APRIL	1846.0	AUGUST	1640	DECEMBER	702
2016 TOTAL FLOW			17194 m ³ /d		
2116 AVERAGE DAILY FLOW			46.98 m ³ /d		

The 2016 flow records indicate that the RDEK exceeded authorized volumes on February 12, 2016. A review of the daily discharge volumes indicate that the authorized flow was only exceeded on the above date and that the average daily flow during 2016 was 46.98m³/day.

6. CONCLUSIONS

Effluent Quality complied with MWR limits during the 2016 sampling events.

The impact of the Edgewater effluent discharge on the Columbia River appears to be minimal.

Reporting requirements of the MWR are out of compliance as per;

- Annual Report not submitted on time (emergency flooding event during spring of 2017 took priority).
- Quarterly reports not submitted.

7. 2017 MONITORING PROGRAM

The 2017 monitoring program will consist of the following

EFFLUENT QUALITY MONITORING PROGRAM				
PARAMETERS	FREQUENCY			
	JANUARY	APRIL	JULY	OCTOBER
BOD	X	X	X	X
TSS	X	X	X	X
TOXICITY				X
Ph	WEEKLY			
Temp				
Flow	WEEKLY (24 HR)			

The effluent monitoring program should reflect normal operating conditions. Sampling during or immediately following spring draw-down should be avoided.

Ron Mickel
 Eco/Logic Environmental

APPENDIX A
REGISTRATION LETTER

APPENDIX B
EFFLUENT QUALITY DATA

APPENDIX C FLOW DATA

APPENDIX D
LAB/RDEK SUBMISSIONS

APPENDIX E
SAMPLE COC