

Wastewater Treatment and Reclaimed Water Irrigation Systems (ME-12214)

2022 Annual Report: Town of Osoyoos



March 2023

Project No. 302-1352-09

ENGINEERING ■ PLANNING ■ URBAN DESIGN ■ LAND SURVEYING

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List of Acronyms

BOD ₅	5-day Biochemical Oxygen Demand
MOE	Ministry of Environment and Climate Change Strategy
OC	Operating Certificate ME-12214
TRUE	TRUE Consulting
TSS	Total Suspended Solids
WWA	Western Water Associates Ltd.

Units of Measure

ft	feet
lgpm	Imperial gallons per minute
km	kilometre
L/d	Litres per day
L/m	Litres per minute
L/s	Litres per second
lpcd	Litres per capita per day
m	metre
mg/L	milligrams per Litre
mm	millimetre
NTU	Nephelometric Turbidity Units
psi	pounds per square inch
USgpm	US gallons per minute

1.0 Wastewater Influent Flows (OC 1.0)

1.1 Wastewater Flow (OC 5.1, 7.2.4.1)

The Town of Osoyoos discharges wastewater from the Main Lift Station (Legion Beach Lift Station, E230277) and the Golf Course Lift Station (Desert Park Lift Station, E232882) to a treatment system, as authorized by Operating Certificate ME-12214 (OC), issued by the Ministry of Environment and Climate Change Strategy (MOE). Table 1-1 following summarizes the wastewater flow from these lift station sources in 2022.

TABLE 1-1: WASTEWATER INFLUENT FLOWS

2022 Monthly Flows							
Month	E230277 Main Lift Station (m³)	E232882 Golf Course Lift Station (m³)	2022 Monthly Totals (m³)	2021 Monthly Totals (m³)	2020 Monthly Totals (m³)	2019 Monthly Totals (m³)	2017 Monthly Totals (m³)
January	61,140	3,902	65,042	61,634	61,289	61,144	59,886
February	54,964	3,847	58,811	56,335	56,636	55,302	56,320
March	62,106	4,303	66,409	64,972	62,283	64,145	62,640
April	63,454	4,521	67,975	63,770	59,325	63,601	61,997
May	71,229	4,589	75,818	70,902	67,563	70,726	75,009
June	79,236	4,661	83,896	76,994	76,744	76,568	79,411
July	99,011	5,321	104,332	99,216	102,448	98,750	96,265
August	95,078	5,670	100,748	98,176	106,325	98,153	99,749
September	76,067	4,610	80,677	78,112	88,123	77,100	75,508
October	68,805	4,813	73,617	65,810	76,788	65,184	66,681
November	57,833	3,871	61,704	58,075	66,256	57,318	58,421
December	62,952	4,055	67,006	58,957	65,240	58,292	56,583
TOTALS	851,873	54,162	906,035	904,695	889,020	846,282	848,470
Summer Flow (May-Sept)			445,470	434,898	441,203	421,297	434,898
Winter Flow (Oct-Apr)			460,564	469,797	447,817	424,985	469,797

The Golf Course Lift Station flow meter was connected to the Town's SCADA system in September 2019, enabling tabulation of flows on a daily basis. Daily flow measurements for both the Golf Course Lift Station and the Main Lift Station are included in Appendix A. The Golf Course Lift Station's monthly flows prior to installation of the SCADA system were obtained from the system's totalizer.

Table 1-2 summarizes influent sewage flow data for a 28-year period from 1994 – 2022.

In 2012, the Northwest Sector Area Sanitary Sewer extensions were completed. These extensions service about 130 properties. All the properties are outside the Town boundaries; therefore, the population would be additional to the population reported by the Statistics Canada or BC Stats. Since 2013, it has been estimated that this represents a total population of 375 to be added to the population of the Town of Osoyoos.

Trends and other noteworthy items from Table 1-2 are summarized as follows.

- The per capita sewage flow rate from 1994 to 2022 has ranged between 0.388 to 0.466 m³/capita/day.
- Average daily flows, maximum average monthly flows, and average winter influent flows from 1992-2022 can be seen graphically in Figure 1-1. Historical population estimates and permit annual average/maximum month average flows (as authorized in the OC) are also denoted.
- The OC for the Town's wastewater treatment and water reuse systems is dated December 18, 1998 (see Appendix B). The OC projected the annual average daily sewage flow to increase from 1,760 m³/day in 1997 to 2,720 m³/day in 2008. As shown in Table 1-2, annual average daily sewage flows have not yet reached that projected for 2008. The 2022 annual average daily flow was 2,482 m³/day.
- The OC also provides a projection of the maximum monthly average increasing from 3,250 m³/day in 2000 to 4,340 m³/day in 2008. The maximum monthly average in 2022 was 3,366 m³/day.

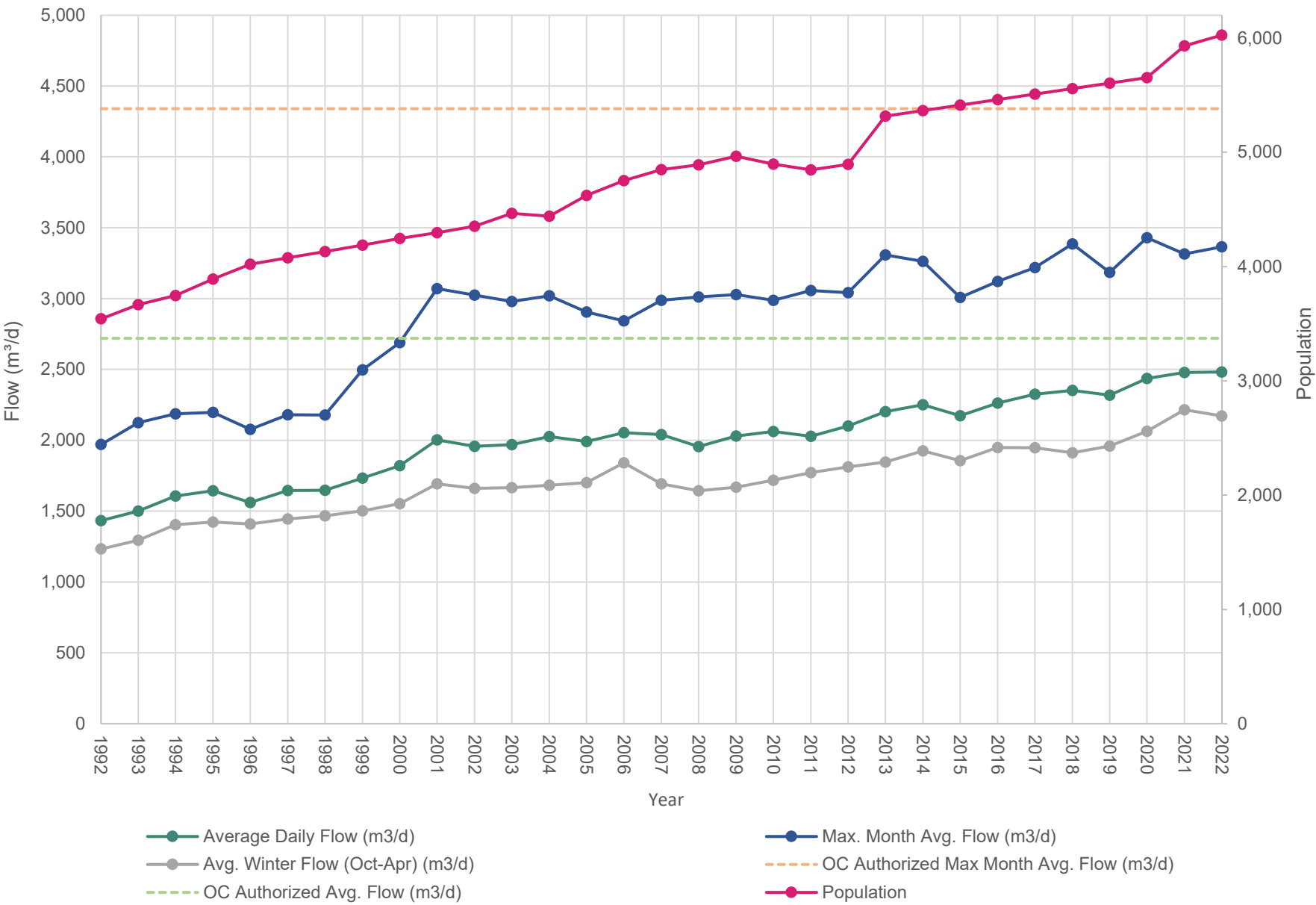
Overall, total annual, average daily and maximum month average daily sewage flows remain well within projections presented in Section 1.1.1 of the OC. The total volume of influent in 2022 was similar to 2021.

TABLE 1-2: HISTORICAL INFLUENT SEWAGE FLOW DATA

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Population Osoyoos (BC Stats)	3,746	3,890	4,021	4,076	4,131	4,188	4,245	4,295	4,353	4,466	4,441	4,623	4,752	4,848	4,889
Population Northwest Sector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Population	3,746	3,890	4,021	4,076	4,131	4,188	4,245	4,295	4,353	4,466	4,441	4,623	4,752	4,848	4,889
Total Flow (Main Lift) (m³)	572,678	583,903	551,576	579,686	577,999	607,413	638,527	703,823	686,031	689,695	709,562	696,018	718,297	712,704	680,972
Total Est. Flow (Golf Course Lift) (m³)	13,797	16,097	18,396	20,696	22,995	25,295	26,280	27,375	28,105	29,018	29,930	30,660	31,390	32,120	33,033
Total Combined Flow (m³)	586,475	600,000	569,972	600,382	600,994	632,708	664,807	731,198	714,136	718,713	739,492	726,678	749,687	744,824	714,005
Average Daily Flow (m³/d)	1,607	1,644	1,562	1,645	1,647	1,733	1,821	2,003	1,957	1,969	2,026	1,991	2,054	2,041	1,956
Average per capita Flow (m³/cap/d)	0.429	0.423	0.388	0.404	0.399	0.414	0.429	0.466	0.449	0.441	0.456	0.431	0.432	0.421	0.400
Max. Month Avg. Flow (m³/d)	2,187	2,197	2,077	2,181	2,179	2,496	2,688	3,071	3,025	2,979	3,019	2,904	2,842	2,988	3,011
Max. Month Avg. Flow per capita (m³/cap/d)	0.584	0.565	0.517	0.535	0.527	0.596	0.633	0.715	0.695	0.667	0.680	0.628	0.598	0.616	0.616
Avg. Winter Flow (Oct-Apr) (m³/d)	1,404	1,423	1,409	1,445	1,467	1,502	1,553	1,693	1,660	1,665	1,683	1,700	1,841	1,692	1,644
Avg. Winter Flow per capita (Oct-Apr) (m³/cap/d)	0.375	0.366	0.351	0.354	0.355	0.359	0.366	0.394	0.381	0.373	0.379	0.368	0.387	0.349	0.336

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Population Osoyoos (BC Stats)	4,965	4,896	4,845	4,893	4,941	4,989	5,037	5,085	5,133	5,181	5,248	5,319	5,556	5,650
Population Northwest Sector	-	-	-	-	375	375	375	375	375	375	375	375	375	375
Total Population	4,965	4,896	4,845	4,893	5,316	5,364	5,412	5,460	5,508	5,556	5,623	5,694	5,931	6,025
Total Flow (Main Lift) (m³)	707,321	719,126	701,765	722,804	760,112	774,427	744,992	780,129	799,795	818,786	800,271	839,020	852,013	851,873
Total Est. Flow (Golf Course Lift) (m³)	33,580	33,580	32,120	45,902	43,319	47,009	47,986	47,769	48,675	39,898	46,011	50,000	52,682	54,162
Total Combined Flow (m³)	740,901	752,706	733,885	768,706	803,431	821,436	792,978	827,898	848,470	858,684	846,282	889,020	904,695	906,035
Average Daily Flow (m³/d)	2,030	2,062	2,027	2,100	2,201	2,251	2,173	2,262	2,325	2,353	2,319	2,429	2,479	2,482
Average per capita Flow (m³/cap/d)	0.409	0.421	0.418	0.429	0.414	0.420	0.401	0.414	0.422	0.423	0.412	0.427	0.418	0.412
Max. Month Avg. Flow (m³/d)	3,028	2,987	3,056	3,041	3,307	3,262	3,007	3,121	3,218	3,385	3,185	3,430	3,315	3,366
Max. Month Avg. Flow per capita (m³/cap/d)	0.610	0.610	0.631	0.621	0.622	0.608	0.556	0.572	0.584	0.609	0.566	0.602	0.559	0.558
Avg. Winter Flow (Oct-Apr) (m³/d)	1,669	1,717	1,772	1,812	1,845	1,925	1,855	1,948	1,993	1,956	2,004	2,101	2,216	2,171
Avg. Winter Flow per capita (Oct-Apr) (m³/cap/d)	0.336	0.351	0.366	0.370	0.347	0.359	0.343	0.357	0.362	0.352	0.356	0.369	0.374	0.360

FIGURE 1-1: TOWN OF OSOYOOS WWTP INFLUENT FLOW TRENDS



1.2 Influent Quality (OC 5.2, 7.2.4.2)

As per the requirements of the OC, grab sampling of influent to the wastewater treatment plant is to be completed semi-annually. The Town samples the influent for:

- a) total phosphorus and ortho phosphorus, expressed as P in mg/L.
- b) 5-day biochemical oxygen demand (BOD₅), mg/L.

As displayed in Table 1-3, the Town did not meet the requirements of semi-annual influent grab sampling in 2022, no samples were collected.

TABLE 1-3: INFLUENT MONITORING (E230037)

Date	BOD ₅	Total Phosphorus (mg/L)	Ortho Phosphate (mg/L)

2.0 Wastewater Treatment and Winter Storage Facilities

This section discusses the Town's wastewater treatment facilities, winter storage facilities, reclaimed water irrigation system and reclaimed water infiltration bed.

2.1 Description

The Town's wastewater treatment facility and reclaimed water irrigation areas are located on the Osoyoos West Bench as illustrated on Figure 2-1. The Fairway Hills / Dividend Ridge development area, which is serviced by the Golf Course lift station referenced in Section 1.0, is the neighbourhood to the south (right side) of the wastewater treatment facility, shown on Figure 2-1. Figure 2-2 illustrates the Town's wastewater treatment, effluent storage, and reclaimed water supply works. From the inlet, the system components and upgrades are described in Table 2-1.

TABLE 2-1: WASTEWATER TREATMENT AND RECLAIMED WATER IRRIGATION SYSTEM COMPONENTS

Component	Size/Volume	Year Constructed/Status
Aerated Cell No. 1	3,300 m ³	Liner replaced in 1994 and aeration system upgraded in 1998. De-sludged in 2021.
Aerated Cell No. 2	27,00 m ³	De-sludged and liner/aeration system replaced in 2010. De-ragging in 2021.
Aerated Cell No. 3	58,000 m ³	Liner 1978 – aeration system upgrade in 2002. Lowering of Cell in Oct. 2017 and desludging in Nov./Dec. 2017. Liner replacement and aeration system upgrade completed in 2018.
Winter Storage 1	270,000 m ³	Expanded and liner replaced in 2008.
Winter Storage 2	295,000 m ³	Constructed 1990.
Aeration System Blowers		Replaced and upgraded in 2010. Solar power system installed in 2010 and expanded in 2018.
Effluent Pump Station		Upgraded – 2008.
Chlorine Contact Basin		Constructed – 2008.
Infiltration Bed		Constructed – 2013.
Reclaimed Booster Station		Constructed – 2014.
Reclaimed Booster Supply Main		Upgraded section from chlorine contact basin to golf course maintenance building – 2014.
Flushing Standpipe Installation		Flushing standpipe installation on reclaimed water system at the Secondary School for system flushing in 2017.
Main Lift Station		Replacement and upgrading begun in 2019 and completed in 2020.

In 2008, major capital improvements were completed at the treatment plant. Improvements comprised reconstruction and enlargement of reclaimed water storage basin No. 1, upgrading of the effluent supply pump station and appurtenant supply mains, and construction of a reinforced cast in place concrete chlorine contact basin, to replace an existing earthen basin built in 1990.

In 2010, aerated lagoon Cell No. 2 was removed from service, drained, and accumulated sludge from 32 years of service was removed. After sludge removal, the liner was replaced with a 60 mil HDPE liner. The static tube aeration system, in service since 1978, was removed and replaced with a more energy efficient fine bubble system. Concurrently, a solar panel array was installed with the objective of supplying a portion of the blower electrical energy requirements.

An infiltration bed was constructed at Desert Park in January 2013. It has an area of approximately 740 m² and is used to dispose of reclaimed water in excess of irrigation requirements.

In 2014, construction of the reclaimed booster station and installation of a 400 mm diameter supply main from the chlorine contact basin to the golf course maintenance building was completed. The reclaimed booster station is currently used to supply reclaimed water to the secondary school for irrigation of playing fields.

In 2017, aerated lagoon Cell No.3 was drained and de-sludged in preparation for replacement of the liner and aeration system. Sludge removal was completed in November and December of 2017. Biosolids were pumped into geotubes and located on the former Tree Farm site south of the secondary school for dewatering. This location was also used for sludge dewatering of Cell No. 2 in 2010. A standpipe was also installed on the reclaimed water system at the former Tree Farm site in 2017, allowing the Town to flush the supply system at the start and end of each irrigation season.

The liner and aeration system in Cell No. 3 were replaced and upgraded in the winter and spring of 2018.

In 2019 construction of a replacement for the main lift station commenced. The replacement main lift station was completed and commissioned in 2020. The aeration system diffuser membranes on aerated lagoon Cell No. 1 and No. 2 were replaced in 2020.

In 2021 Cell 1 was drained, de-sludged and the aerators cleaned. The aerators in Cell 2 were raised three successive times to be cleaned. All waste was transported to the Town of Osoyoos Landfill.

The Main Lift station, commissioned in 2020, has a screening rack to manage the debris entering the treatment plant, limiting deleterious materials to flows from the Golf Course Lift Station. By cleaning Cells 1 and 2 the Town intended to stabilize the accumulation of debris in the plant.

In 2022 the Town completed the upgrades to the chlorine gas monitoring system. The system now includes improved alarming, including audible and visual alarms in the event of a release of chlorine gas at the site, and is now integrated with the existing SCADA system.

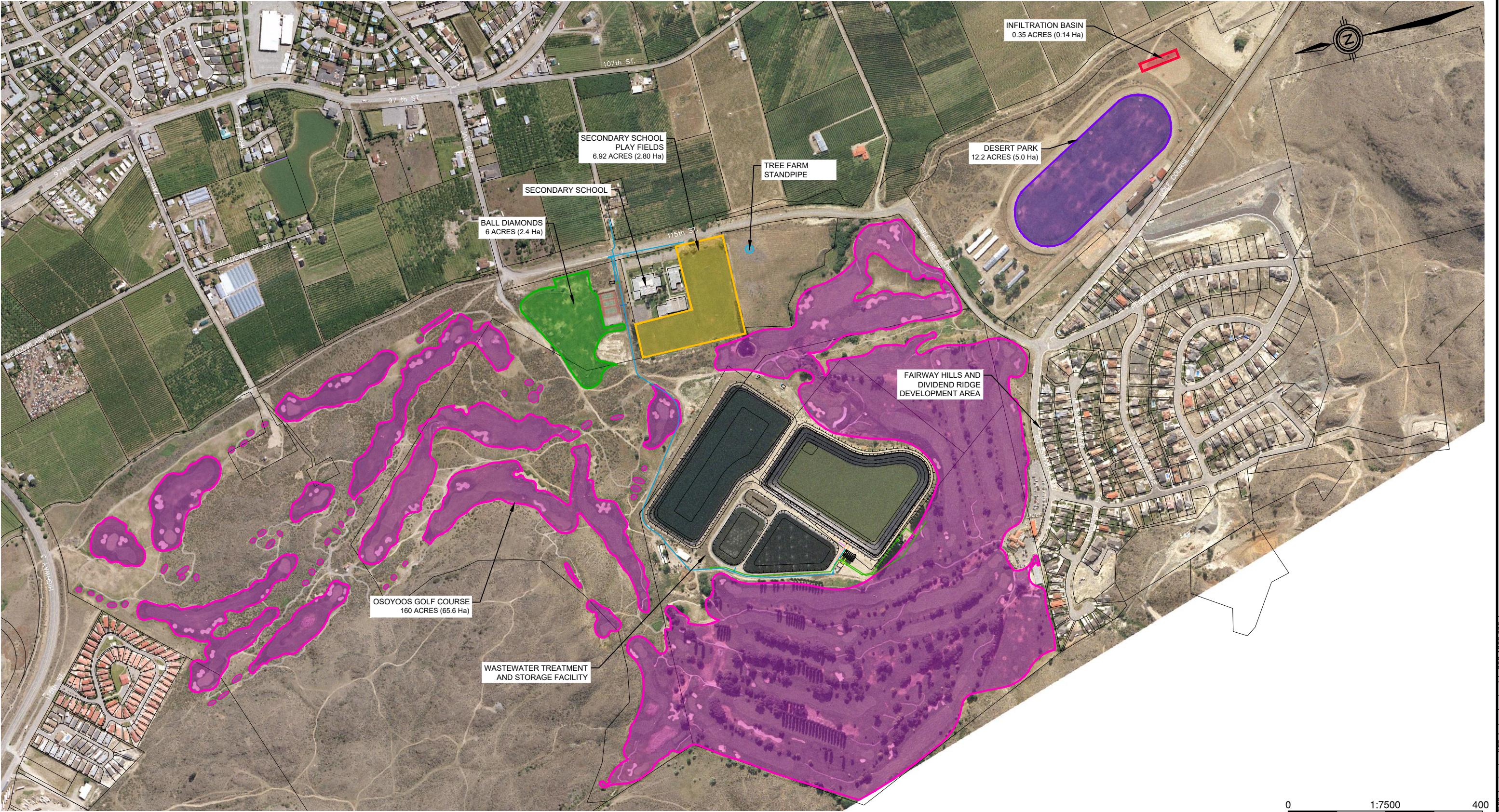
2.1.1 Lagoon Solar Power Generation

A solar power generation system was installed at the lagoons in 2010 with system upgrades and expansion in 2018. The total kilowatt hours (kWh) produced in 2022 was approximately 100,000 kWh. Totalizer readings were sporadic throughout 2022. There were no readings taken in the month of May, or October through December. Monthly data within these ranges was extrapolated based on proportional monthly energy generation during previous years. Monthly power generation from 2018 to 2022 is summarized in Table 2-2.

TABLE 2-2: LAGOON SOLAR POWER GENERATION SUMMARY FOR 2018 – 2022

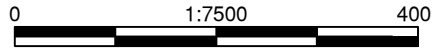
Month	Power Generation (kWh)				
	2018	2019	2020	2021	2022
January	655	1,250	1,590	1,641	1,370
February	2,544	2,703	6,254	6,457	6,023
March	5,058	5,640	10,448	10,787	8,366
April	5,335	6,096	11,623	12,000	10,977
May	6,710	6,541	12,134	12,527	11,940
June	7,476	7,716	11,486	15,306	9,508
July	8,183	6,928	14,245	13,094	13,042
August	5,319	13,774	13,645	10,327	11,481
September	5,521	8,249	9,279	8,812	8,538
October	3,913	7,814	6,911	6,852	6,770
November	2,266	3,773	3,583	2,752	3,018
December	744	1,602	2,280	1,940	2,295
Total	53,724	72,087	103,478	102,495	93,327

*Extrapolated values.



LEGEND

-  THE OSOYOOS GOLF AND COUNTRY CLUB
-  THE BALL DIAMONDS LOCATED WEST OF OSOYOOS SECONDARY SCHOOL
-  THE INFIELD AREA OF DESERT PARK
-  THE SECONDARY SCHOOL PLAYING FIELDS
-  TREE FARM STANDPIPE
-  INFILTRATION BASIN



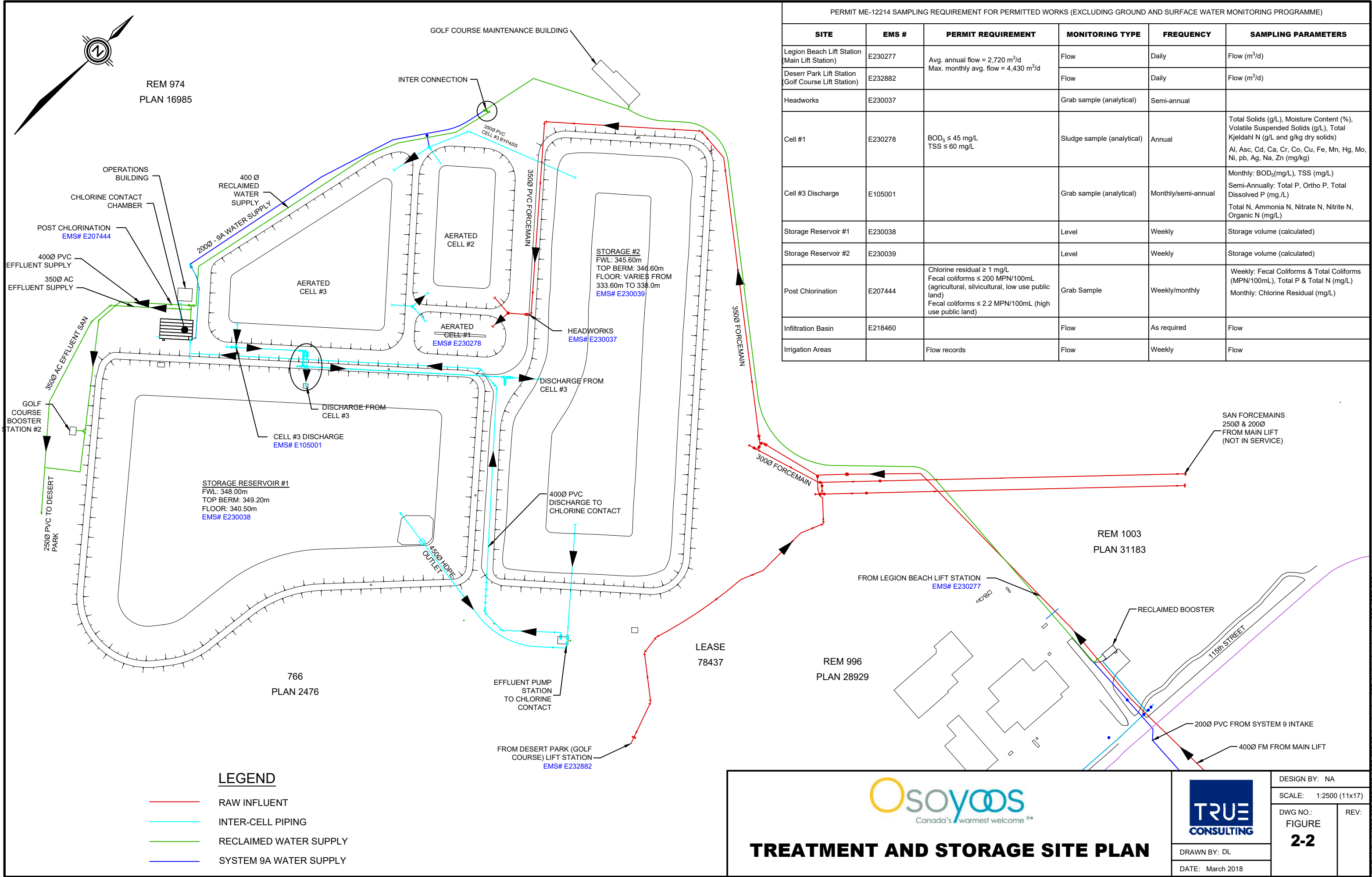
**WWT & RW ANNUAL REPORT
RECLAIMED WATER IRRIGATION AREAS**



DRAWN BY: DL
DATE: February 2020

DESIGN BY: NA	
SCALE: 1:7500 (11x17)	
DWG NO.: FIGURE 2-1	REV:

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2.2 Effluent Quality (OC 1.2.1, 5.3, 7.2.4.3)

The OC for the Town's wastewater treatment system requires that the effluent quality after Cell No. 3 and prior to storage, shall be equivalent to or better than:

5 Day Biochemical Oxygen Demand (BOD₅)– 45 mg/L

Total Suspended Solids (TSS) – 60 mg/L

The OC specifies that the effluent after Cell No. 3 (EMS site number E105001) be sampled as follows:

- a) **Monthly:** 5-day biochemical oxygen demand, mg/L;
- b) **Monthly:** total suspended solids (non-filterable residue), mg/L;
- c) **Semi-annually:** total phosphorus, ortho phosphorus, and total dissolved phosphorus, all expressed as mg/L P;
- d) **Semi-annually:** total nitrogen, ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, and organic nitrogen, all expressed as mg/L N.

2022 sampling results for the effluent quality at the outlet of Cell No. 3 (E105001) are summarized in Table 2-3.

TABLE 2-3: AERATED LAGOON CELL NO. 3 – EFFLUENT QUALITY DATA (E105001)

Date	BOD-5 (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorus (mg/L)	Total Dissolved Phosphorus (mg/L)	Ortho Phosphorus (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia (mg/L)	Nitrate (as N) (mg/L)	Nitrite (as N) (mg/L)	Organic Nitrogen (mg/L)
(2022) Feb. 08	14.6	16.5	-	-	-	-	-	-	-	-
(2022) Mar. 29	14.9	12.7	-	-	-	-	-	-	-	-
(2022) Apr. 19	13.0	10.3	5.5	5.3	4.2	34.2	31.8	1.9	1.3	-
(2022) May. 31	18.4	33.0	8.14	-	-	60.5	-	0.677	0.024	-
(2022) Jun. 15	65.3	16.5	-	-	-	-	-	-	-	-
(2022) Jul. 12	15.8	22.4	-	-	-	-	-	-	-	-
(2022) Aug. 09	35.8	58.3	-	-	-	-	-	-	-	-
(2022) Sep. 06	7.8	48.4	6.61	6.19	< 0.0500	7.14	3.37	19.7	0.019	-
(2022) Oct. 05	7.1	9.2	-	-	-	-	-	-	-	-
(2022) Nov. 01	11.0	8.4	-	-	-	-	-	-	-	-
(2022) Nov. 29	< 6.9	8.7	-	-	-	-	-	-	-	-
(2022) Dec. 20	14.3	14.0	-	-	-	-	-	-	-	-

A BOD₅ exceedance was observed in June 2022. This appears to be an anomaly and will be monitored.

Per the requirements of the OC, the Town is to measure organic nitrogen concentrations in semi-annual sampling. This was not completed in 2022.

All other samples were in compliance with the OC.

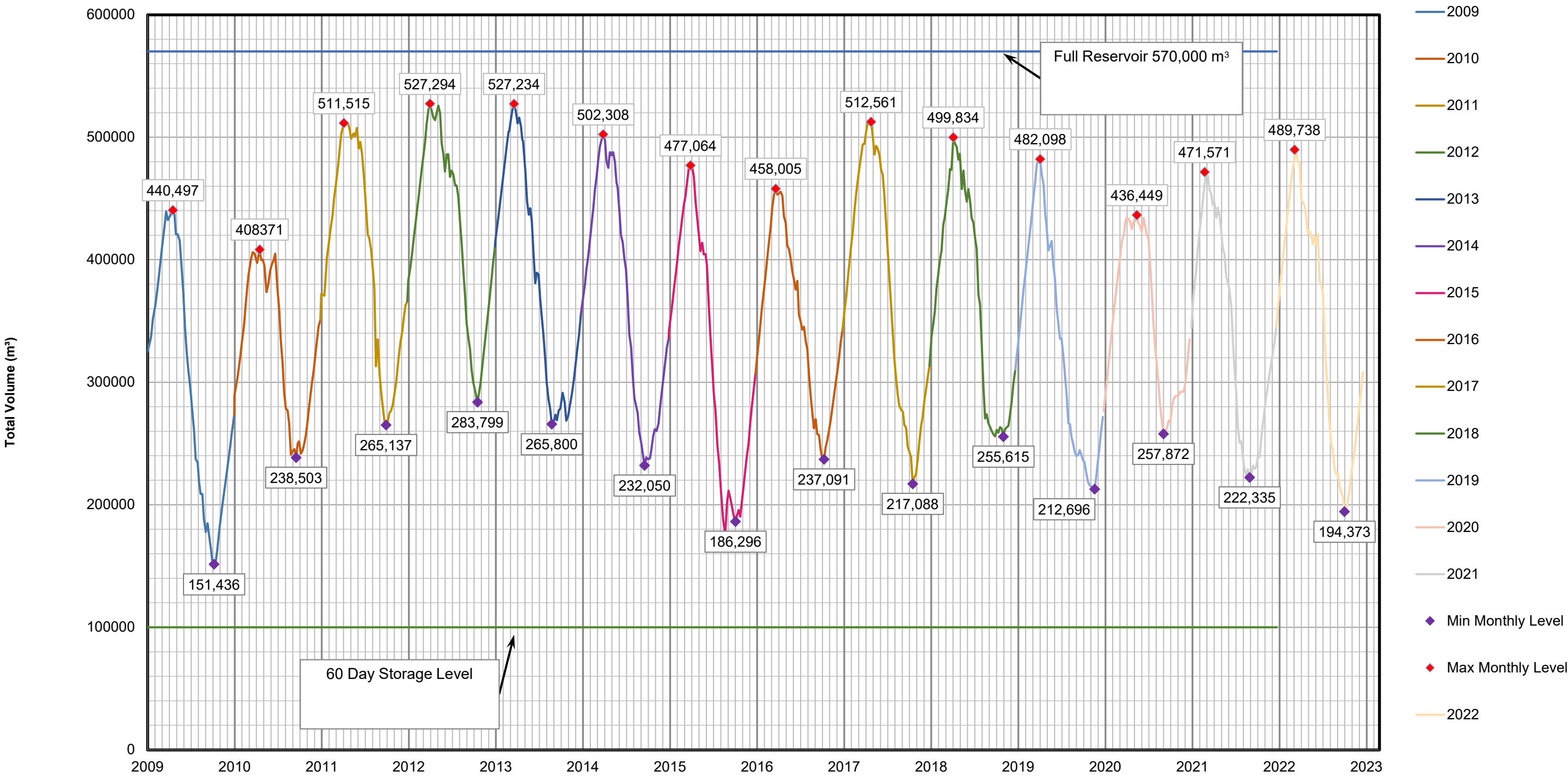
2.3 Winter Storage Facilities (OC 5.4, 7.2.4.4)

As illustrated in Figure 2-2, the Town's wastewater treatment and appurtenant facilities include two winter effluent storage reservoirs. Storage volumes from 2009-2022 are shown graphically in Figure 2-3. This includes the maximum and minimum monthly water level, full reservoir volume notation, and 60-day storage level notation. As per OC Section 5.4, weekly operational data and the percent full storage volume for 2022 is presented in Table 2-4. The percent full for each storage reservoir can be used to reference the corresponding storage volumes using the calibration curves provided in Appendix C.

TABLE 2-4: STORAGE POND LEVELS

Date	Storage 1 %	Storage 2 %	Total Volume m ³	Date	Storage 1 %	Storage 2 %	Total Volume m ³
28-Dec-21	70.7	72.0	345,400	5-Jul-22	82.0	72.0	380,516
4-Jan-22	75.3	72.0	359,491	12-Jul-22	88.2	64.5	372,614
11-Jan-22	79.8	72.2	374,205	19-Jul-22	77.3	64.6	338,102
18-Jan-22	80.3	75.1	387,264	26-Jul-22	61.6	70.0	311,196
25-Jan-22	80.4	78.5	401,139	2-Aug-22	47.1	74.6	288,680
1-Feb-22	80.3	81.5	413,823	9-Aug-22	56.1	61.8	265,702
8-Feb-22	80.1	84.5	425,913	16-Aug-22	62.2	51.6	250,337
15-Feb-22	80.3	87.4	439,551	23-Aug-22	61.9	50.1	244,883
22-Feb-22	80.2	90.3	452,032	30-Aug-22	50.1	55.7	229,304
1-Mar-22	80.1	93.2	465,776	6-Sep-22	42.1	60.7	224,803
8-Mar-22	83.1	93.1	474,432	13-Sep-22	43.5	60.1	226,194
15-Mar-22	87.0	92.4	483,898	20-Sep-22	48.8	52.5	215,687
22-Mar-22	87.8	93.1	489,738	27-Sep-22	53.9	45.9	210,341
29-Mar-22	86.0	92.3	480,021	4-Oct-22	57.4	40.9	206,711
5-Apr-22	88.5	90.5	479,908	11-Oct-22	48.0	45.9	194,373
12-Apr-22	80.7	89.4	449,664	18-Oct-22	43.4	50.6	195,774
19-Apr-22	75.0	92.6	446,639	25-Oct-22	40.9	54.8	202,327
26-Apr-22	77.9	90.2	444,292	1-Nov-22	39.7	58.8	212,123
3-May-22	82.0	84.9	433,653	8-Nov-22	43.2	60.1	225,406
10-May-22	86.1	78.9	421,348	15-Nov-22	47.8	59.1	234,171
17-May-22	86.3	79.2	423,236	22-Nov-22	52.3	58.2	243,343
24-May-22	80.7	82.9	420,603	29-Nov-22	56.8	58.4	256,124
31-May-22	74.2	85.7	412,601	6-Dec-22	61.2	58.5	269,167
7-Jun-22	70.2	89.9	419,376	13-Dec-22	65.7	58.5	282,320
14-Jun-22	64.9	91.8	412,856	20-Dec-22	69.6	58.6	294,011
21-Jun-22	70.6	90.0	421,169	27-Dec-22	74.1	58.7	308,336
28-Jun-22	75.7	77.5	382,615				

FIGURE 2-3: TOWN OF OSOYOOS RECLAIMED WATER STORAGE POND VOLUMES 2009-2022



3.0 Reclaimed Water Irrigation System

3.1 System Overview

Reclaimed water from the Town's wastewater treatment facility supplies irrigation water to areas within the West Bench. These locations are depicted on Figure 2-1 and described as follows:

- i. Osoyoos Golf and Country Club:
 - Metered from Golf Course Booster Station.
 - Total area = 160 ac (65.6 ha).
 - Irrigation type = reclaimed water.
 - Crop = turf grass.
- ii. Osoyoos Ball Diamonds:
 - Located west of 115th street adjacent to the Osoyoos Secondary School.
 - Metered from the Golf Course Booster Station.
 - Total area = 6 ac (2.4 ha).
 - Irrigation type = reclaimed water.
 - Crop = turf grass.
- iii. Desert Park Infield Area:
 - Located southeast of wastewater treatment facility.
 - Metered from Desert Park Irrigation Booster (Desert Park Reclaimed Water Meter Account #5560099005).
 - Total area = 12.2 ac (5.0 ha).
 - Irrigation type = reclaimed water.
 - Crop = turf grass.
- iv. Secondary School Playing Fields:
 - Located west of wastewater treatment facility.
 - Metered from High School Booster Station (Secondary School Irrigation Meter Account #70235020).
 - Constructed in 2013-2014.
 - First started irrigating with reclaimed water in 2015.
 - Total area = 6.92 ac (2.8 ha).
 - Irrigation type = *domestic and reclaimed water*.
 - Crop = turf grass.

- v. Former Tree Farm Standpipe:
 - Located south of secondary school playing field.
 - Metered from High School Booster Station.
 - Irrigation type = reclaimed water.
 - Crop type = tree farm and infiltration.

The combined area of the above users excluding the former Tree Farm site is approximately 185 ac (76 ha).

Figure 3-1 provides a schematic overview of the reclaimed water distribution system and metering. Chlorinated reclaimed water is supplied by gravity from the Chlorine Contact Basin to the Golf Course Booster Station and Desert Park Booster Station.

The Golf Course Booster Station supplies reclaimed water to:

- Osoyoos Golf and Country Club
- Osoyoos Ball Diamonds

The Desert Park Booster Station provides reclaimed water to the Desert Park infield. This reclaimed water supply was constructed in 2012. The High School Booster Station provides reclaimed water to the secondary school playing fields and the former Tree Farm standpipe.

If needed, the Town can supplement the reclaimed water system using the 9A Pumphouse on Osoyoos Lake, as shown in Figure 2-2. The 9A Pumphouse was formerly owned and operated by the South Okanagan Lands Irrigation District and is currently used only as a supplemental water source to the Town's reclaimed water system.

In 2013 and 2014, supply works were constructed to supply reclaimed water to the secondary school playing fields. These works are planned to be extended in the future to provide reclaimed water to the airport area.

3.2 Reclaimed Water Usage Data (OC 5.5, 7.2.4.5)

As described in Section 3.1, reclaimed water usage is measured by three flow meter stations. Two of the meters are on supply mains to the golf course and are designated as the “Desert” and “Meadows” meters. The third meter station is in the High School Booster Station and comprises both low flow (Jockey) and high flow (Main) meters.

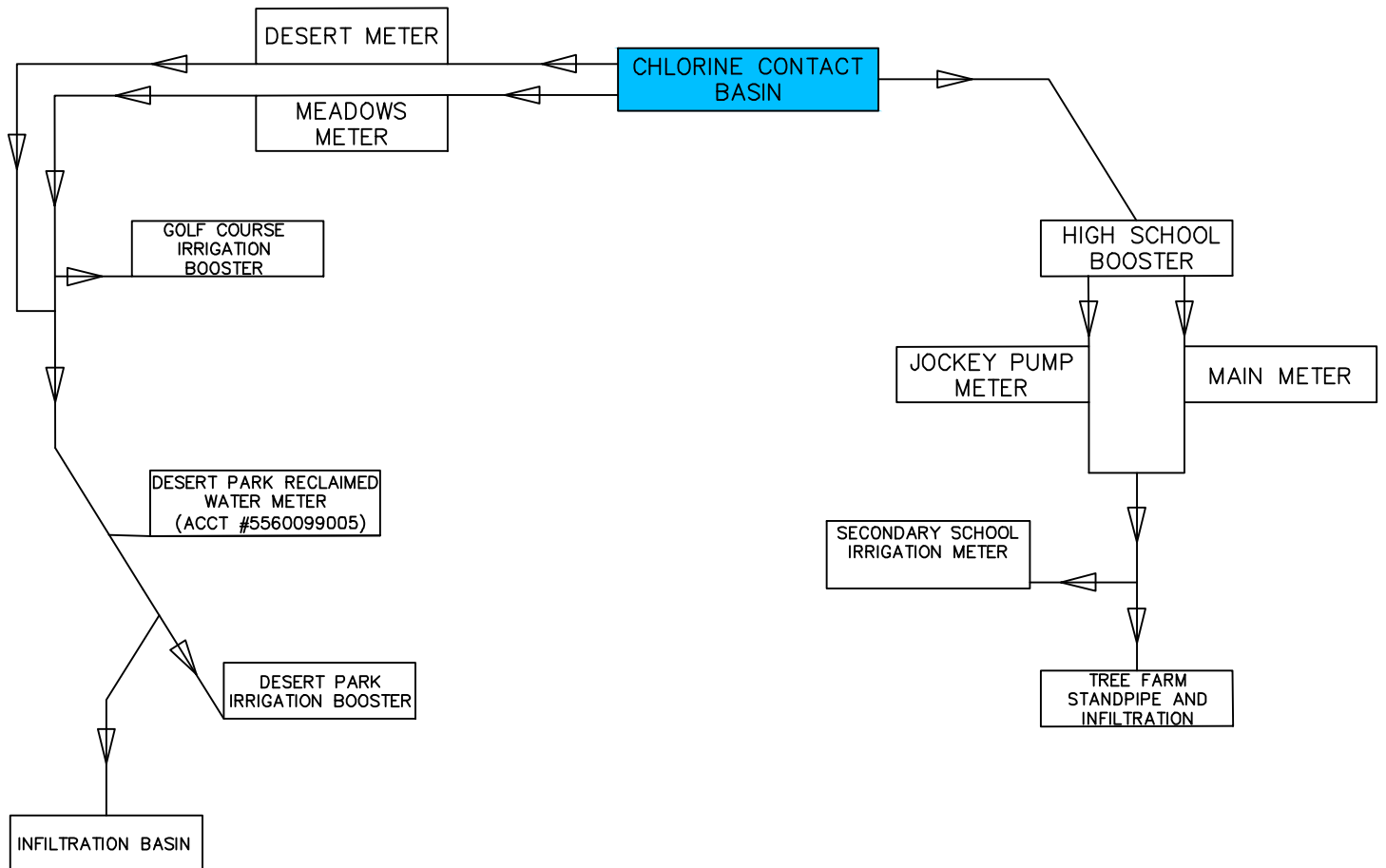
The Desert and Meadows meters measure reclaimed water volumes to the Golf Course, Desert Park, and Infiltration Basin.

The meters in the “High School Booster” measure reclaimed water to the secondary school and former Tree Farm standpipe. A schematic illustration of the system downstream of the chlorine contact basin is presented in Figure 3-1.

The records of total reclaimed water use by month, as measured by the Desert, Meadows, and High School Booster meters from 2016 to 2022 are presented in Table 3-1. Operating records indicate that the irrigation was discontinued in November for the Meadows and Desert Nine meters and in October for the High School Booster Station meter. Daily flow readings for the Desert, Meadows, and High School Booster meters for 2022 can be found in Appendix D.

The Secondary School meter only measured domestic use from February to April 2022. As such it was not possible to determine the distribution of irrigation water between the Tree Farm standpipe and secondary school.

Historical data for seasonal precipitation for Osoyoos is presented in Appendix E.



METERING SCHEMATIC OF RECLAIMED WATER SYSTEM



DWN. BY: NA

DATE: APRIL 2018

DSGN. BY: TU

SCALE: N.T.S.

DWG. NO.:

REV.:

FIG
3-1

TABLE 3-1: RECLAIMED WATER USAGE

Month	2022 Desert Nine Volumes m ³	2022 Meadows Volumes m ³	2022 High School Volumes m ³	2022 Total Volumes m ³	2021 Total Volumes m ³	2020 Total Volumes m ³	2019 Total Volumes m ³	2018 Total Volumes m ³	2017 Total Volumes m ³
January	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0
March	24,952	6,241	0	31,193	57,615	11,635	3,105	697	24,301
April	58,895	41,402	0	100,297	53,950	75,595	78,915	65,395	50,144
May	45,678	40,066	0	85,744	90,973	56,043	80,262	127,319	100,097
June	43,095	43,732	11,235	98,062	112,584	76,240	106,908	108,886	123,251
July	75,357	70,072	21,184	166,613	147,687	157,551	137,778	177,376	163,787
August	72,770	71,128	15,768	159,666	94,268	152,967	132,576	163,461	131,477
September	51,246	47,973	1,050	100,269	52,717	69,978	67,976	104,178	83,834
October	40,443	29,539	475	70,457	32,184	37,192	101,958	67,823	105,854
November	334	34	0	368	373	43,039	83,591	56,674	7,330
December	0	0	0	0	71	9,592	0	0	0
Totals	412,769	350,187	49,712	812,669	642,422	689,830	793,069	871,809	790,075

*Assumed from Town of Osoyoos Customer Account reading history. Daily flow data not recorded in field by Public Works staff.

Referencing Figure 3-1, derivation of reclaimed water supply to irrigated areas is described as follows.

For the supply to Desert Park:

- Total metered reclaimed water use in 2022 was 144,442 m³
 (minus) calculated volume to infiltration Not provided
 (equals) calculation volume to Desert Park Not provided

The Town does not have meters for the infiltration ponds or Desert Park irrigation booster. The dates the infiltration basins were in operation were, March 4th to November 23rd. This corresponds to 264 total days of infiltration basin use. At an estimated 500 m³/day of infiltration this corresponds to a volume of 132,000 m³ of reclaim water infiltrated. This is suspected to be a reporting error. To approximate the total volume to Desert Park, the application rate from 2015-2021 was averaged. As shown in Table 3-2, the average application rate was 1.29m/yr. This equates to an approximated volume of 64,500 m³ for reclaimed water use in 2022.

TABLE 3-2 ANNUAL APPLICATION RATE TO DESERT PARK 2015-2021

	Application Rate (m/yr)
2015	1.33
2016	1.20
2017	1.44
2018	1.40
2019	1.10
2020 ¹	0
2021 ²	2.80
Average	1.29

¹ Data not provided. Excluded from "Average" calculation.

² Infiltration data not provided. Excluded from "Average" calculation.

For the supply to the High School Area

- Total metered reclaimed water at the High School 49,712 m³
 (minus) metered irrigation use to school* 0 m³
 (equals) calculated volume to Tree Farm Site** 0 m³
 *Metered irrigation at secondary school in 2022 only included the domestic supply.
 **No data provided

For the Golf Course and Playing Fields:

- Total measured flow (Desert and Meadows) was 762,957 m³
 (minus) total flow to Desert Park 144,422 m³
 (equals) calculated use by Golf Course 618,535 m³

Golf Course and Ball Diamonds:

- i. Total usage: 618,535 m³
- ii. Application over an area of 68 ha
- iii. Calculated application rate: 0.91 m

Desert Park:

- i. Total usage: 64,500 m³
- ii. Application over an area of 5 ha
- iii. Calculated application rate: 1.29 m

As noted above, this usage has been approximated based on the average application rate from 2015-2021, excluding years with missing data.

Secondary School:

- i. Total usage of 49,712 m³
- ii. Application over an area of 2.8 ha
- iii. Calculated application rate of 1.78 m

3.3 Reclaimed Water Quality Data (OC 5.5.3, 7.2.4.6)

The operational certificate specifies the following sampling and analysis program for reclaimed water (EMS site reference number E207444).

- a) **Monthly:** fecal and total coliforms, MPN/100 mL.
- b) **Monthly:** total phosphorus, mg/L.
- c) **Monthly:** total nitrogen, mg/L.
- d) **Weekly:** chlorine residual, mg/L.

Disinfection is to be maintained in the reclaimed water discharged from the storage reservoirs to the irrigation system. Compliance requires a chlorine residual of ≥ 1 mg/L to be maintained at all times, immediately prior to irrigating. In addition, fecal coliforms shall not exceed 200 MPN per 100 mL for agricultural, silvicultural and low public use lands, or exceed 2.2 MPN per 100 mL for high public use lands. The authorized discharge period for irrigation is during the period of March 15 to November 15 each year.

Sampling data for reclaimed water (EMS Site E207444) is summarized in Table 3-3 and Table 3-4. Daily readings were recorded and are presented in Appendix F.

TABLE 3-3: RECLAIMED WATER QUALITY DATA (E207444)

Date	Fecal Coliforms (MPN/100mL)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)
(2022) Mar. 23	<1	-	-
(2022) Mar. 29	<1	27.1	4.75
(2022) Apr. 19	<1	19.7	5.79
(2022) May. 31	<1	-	-
(2022) Jun. 15	<1	21.6	5.46
(2022) Jul. 12	<1	-	-
(2022) Jul. 19	<1	28.1	5.06
(2022) Aug. 09	<1	26.7	4.64
(2022) Sep. 06	<1	25.3	4.92
(2022) Oct. 05	<1	21.3	7

As seen in Table 3-3, there were no fecal coliform exceedances observed in 2022.

TABLE 3-4 RECLAIMED WATER USE – CHLORINE RESIDUAL

Date	Chlorine Residual (mg/L)	Date	Chlorine Residual (mg/L)
(2022) Mar. 21	0.94	(2022) Jul. 11	0.37
(2022) Mar. 28	2.3	(2022) Jul. 18	0.7
(2022) Apr. 04	2.5	(2022) Jul. 25	0.68
(2022) Apr. 11	4.5	(2022) Aug. 02	0.53
(2022) Apr. 19	0.4	(2022) Aug. 08	0.46
(2022) Apr. 25	0.24	(2022) Aug. 15	0.64
(2022) May. 03	3.2	(2022) Aug. 22	0.39
(2022) May. 10	4.5	(2022) Aug. 29	0.42
(2022) May. 20	0.35	(2022) Sep. 04	0.68
(2022) May. 29	8.8	(2022) Sep. 12	0.03
(2022) Jun. 01	2.5	(2022) Sep. 18	0.55
(2022) Jun. 06	0.37	(2022) Sep. 26	8.8
(2022) Jun. 13	0.39	(2022) Oct. 03	0.41
(2022) Jun. 20	0.37	(2022) Oct. 10	1.56
(2022) Jun. 27	0.68	(2022) Oct. 19	0.39
(2022) Jul. 04	0.85	(2022) Oct. 24	0.58

Per the requirements for reclaimed wastewater irrigation in the Town's OC Section 4.1.2, a chlorine residual of at least 1 mg/L must be maintained at all times, immediately prior to irrigating. As seen in Table 3-4 this residual is not being achieved consistently during sampling. The Town's operators have described that there is an apparent time difference (approx. 2-6 hours) from the stop of irrigation and chlorination to chlorine residual sampling, during which time free chlorine consumption takes place.

To address these treatment deficiencies, it is TRUE's recommendation to:

- Install an in-line chlorine analyzer which will allow for representative chlorine residual sampling results.
- Re-circulate stagnant treated reclaimed water back into the chlorination system.
- Adjust chlorination as required to achieve the 1 mg/L chlorine residual objective.

These upgrades will assist with observed fecal coliform exceedances and chlorine residual objectives.

3.4 Reclaimed Water Infiltration Bed

In 2013, an infiltration bed was constructed for surplus reclaimed water quantities from the Town's wastewater treatment facility. The infiltration bed was designed for a flow rate of 500 m³/d. In 2022, the reclaimed water infiltration bed was used from March 4th to November 23rd. The calculated volume of water over this 264-day period is 132,000 m³. This is suspected to be a recording error. As such, the flow to Desert Park was approximated based on the average application rate from 2015-2022., the remained was assumed to go to the infiltration bed.

In 2022, it is approximated that 79,922 m³ went to the infiltration bed. It is recommended that the Town install a flow meter at this site.

4.0 Sludge – Monitoring Program (OC 3.20, 5.6)

In accordance with the Town of Osoyoos' OC Section 3.20, a Sludge Management Plan was prepared for the wastewater treatment facility in April 2019 and included in Appendix H of the 2018 Annual report submission. No changes, nor amendments, have been made to the Sludge Management Plan. This document outlines the monitoring, management, and beneficial use of the Town's municipal biosolids.

Please note that analytical sampling of sludge was not completed in 2022. Sludge monitoring will be required in 2023.

4.1 Historic Operations Summary (7.2.4.8)

The following summarizes the frequency and volumes of desludging activities to date and an operations overview for sludge removal within each cell:

- Cell No. 1 generally requires sludge removal every 5 years, based on public works operating experience. This is completed by vacuum truck removal and disposal at the Town's municipal landfill hauled liquid waste ponds. This was done most recently in 2021.
- Cell No. 2 was de-sludged once (in 2010) since its initial construction in 1978. During de-sludging, approximately 10,500 m³ of sludge was removed. This equates to an annual production rate of 330 m³/year. In 2021 the Cell was partially drained, and rags were removed from the diffusers.
- Cell No. 3 was de-sludged for the first time in 2018. A total of approximately 7,000 m³ of sludge was removed. This equates to an annual production rate of 175 m³/year.

4.2 Analytical Sampling (OC 5.6, 7.2.4.7)

Cell #1 is sampled annually as a part of the sludge monitoring program outlined in Section 5.6 of the OC. As shown in Table 4-1 below, sampling was not completed in 2022.

TABLE 4-1: AERATED LAGOON CELL NO. 1 – SLUDGE SAMPLING RESULTS (E230278)

Sludge Monitoring Program	
Analysis Parameter	Cell #1 Sewer Site (E230278)
Date Sampled	
Date Reported	
Work Order	
General Parameters	
Total Solids*	
Moisture	
Total Volatile Solids*	
Total Kjeldahl Nitrogen*	
Strong Acid Leachable Metals	
Aluminum	
Arsenic	
Cadmium	
Calcium	
Chromium	
Cobalt	
Copper	
Iron	
Lead	
Manganese	
Mercury	
Molybdenum	
Nickel	
Silver	
Sodium	
Zinc	

5.0 System Hydraulic Balance (OC 3.16)

As defined in the OC Section 3.16, the Town is required to operate and maintain the aerated lagoons and the reclaimed wastewater storage reservoir to minimize leakage. A system hydraulic balance represents a methodology to confirm that the system is being operated in accordance with Section 3.16 of the operational certificate. A hydraulic balance for the Town of Osoyoos system in 2022 is presented in Table 5-1.

TABLE 5-1: 2022 SYSTEM HYDRAULIC BALANCE

		<u>As per data</u>	
	Volume in Storage – December 28, 2021	345,400	m ³
(plus)	Total Sewage Inflow	906,035	m ³
(plus)	Freshwater Inflow	0	m ³
(minus)	Total Reclaimed Water Use	816,669	m ³
(minus)	Unaccounted Gains/Losses	126,430	m ³
	Volume in Storage – December 27, 2022	308,336	m ³

As seen in the hydraulic balance, there is an unaccounted loss of 126,430 m³. With a surface area of 11.6 ha and an evaporation rate of 0.8 m/year, there is a potential evaporation loss of 93,000 m³/year, which can account for most of the system losses observed. It is suspected that reclaimed water was used at the Tree Farm site, however data was not provided at the time of writing this report.

6.0 Groundwater Monitoring (OC 5.7, 7.2.4.9)

As per sections 5.7 and 7.2.4.9 of the OC, records of groundwater well elevations and ground/surface water quality are to be reported annually with results reviewed by a qualified professional engineer (hydrogeologist). Presented herein are the 2022 sampling results for the groundwater monitoring programme. A hydrogeological review of the Town of Osoyoos' reclaimed wastewater irrigation and disposal system environmental monitoring programme was reviewed by Wester Water Associates Ltd (WWA) in 2019.

Following this review, the Town of Osoyoos installed two of the three recommended additional groundwater monitoring wells in 2021, with the third scheduled to be constructed in 2023. Once the third well is installed, a well commissioning report will be prepared, and these wells will become part of the groundwater monitoring programme.

Additionally, a detailed review of the 2022 groundwater monitoring results will be completed by WWA and submitted to the Ministry as an addendum to this report.

6.1 Groundwater Monitoring

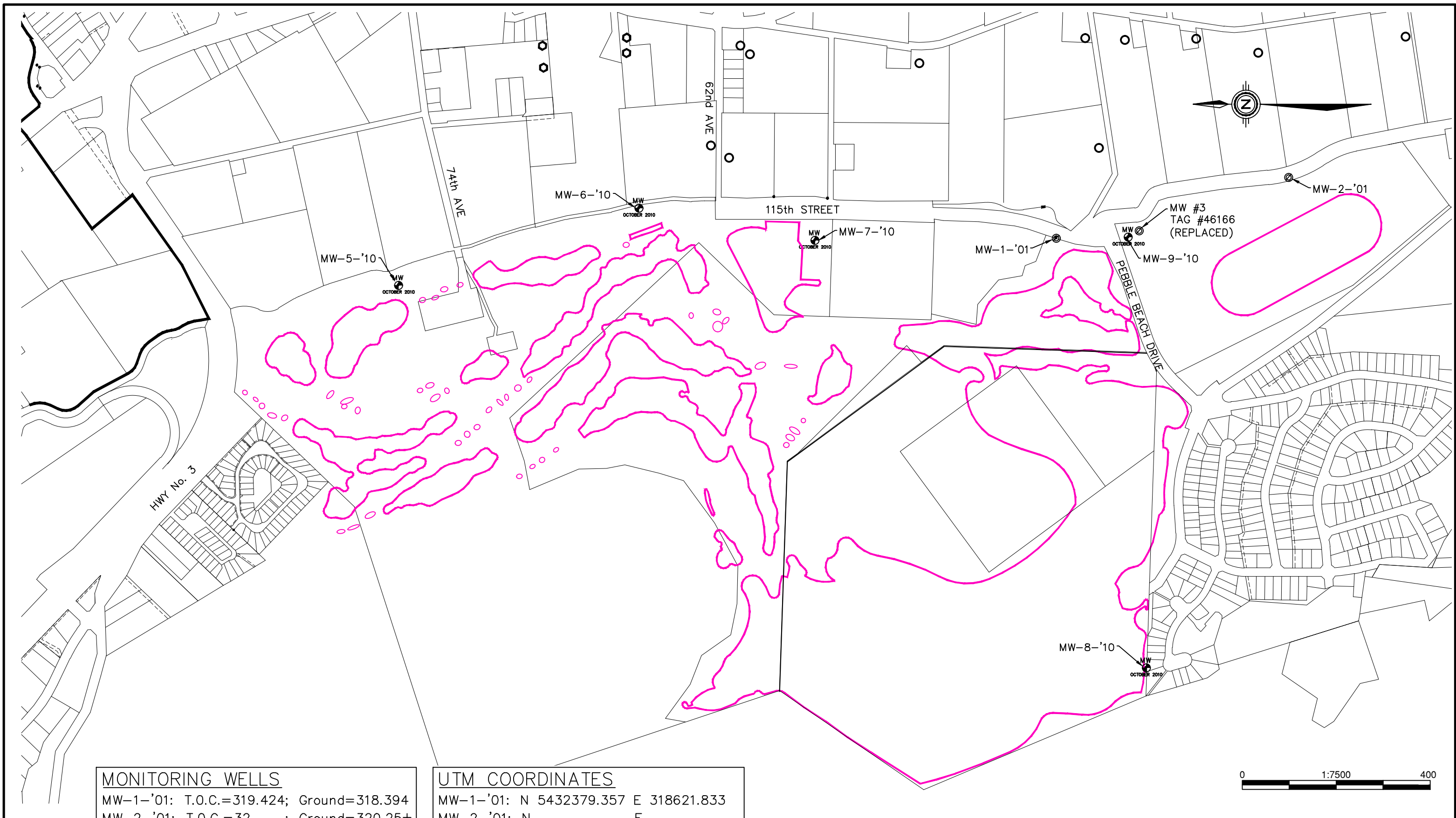
6.1.1 Monitoring Programme

The groundwater monitoring programme consists of bi-annual (May and September) monitoring of groundwater quality and monthly monitoring of water levels in the seven monitoring wells surrounding the treatment facility.

Figure 6-1 illustrates groundwater monitoring wells on the Osoyoos West Bench. Monitoring wells MW 1-'01 and MW 2-'01 represent the original wells drilled in 2001, used to monitor down gradient groundwater quality. MW-5-'10, MW-6-'10, MW-7-'10, MW-8-'10, and MW-9-'10 were drilled in 2010.

The location of the 7 monitoring wells is illustrated on Figure 6-1. The groundwater monitoring programme consists of the following:

- Monthly measurement of the depth to the groundwater table;
- Semi-annual (May and September) analytical sampling of:
 - Total Dissolved Phosphorus
 - Ammonia (as N)
 - Nitrate-Nitrite (as N)
 - Chloride
 - Sodium
 - Hardness



MONITORING WELLS	
MW-1-'01:	T.O.C.=319.424; Ground=318.394
MW-2-'01:	T.O.C.=32.____; Ground=320.25±
MW-5-'10:	T.O.C.=328.867; Ground=328.217
MW-6-'10:	T.O.C.=320.506; Ground=319.906
MW-7-'10:	T.O.C.=328.810; Ground=328.280
MW-8-'10:	T.O.C.=372.078; Ground=371.498
MW-9-'10:	T.O.C.=320.190; Ground=319.420

UTM COORDINATES	
MW-1-'01:	N 5432379.357 E 318621.833
MW-2-'01:	N _____ E _____
MW-5-'10:	N 5433779.638 E 318521.980
MW-6-'10:	N 5433267.733 E 318686.135
MW-7-'10:	N 5432893.203 E 318617.742
MW-8-'10:	N 5432187.920 E 317707.195
MW-9-'10:	N 5432226.168 E 318624.341



GOLF COURSE AREA
GROUNDWATER MONITORING WELLS



DRAWN BY: DL
DATE: March 2018

DESIGN BY: NA	FIGURE 6-1	REV:
SCALE: 1:7500 (11x17)		
DWG NO.:		

FILE: P:\GIS\100-330\102-302-1-152\103 drawings\cad\102-152-2\101.dwg

6.1.2 Groundwater Monitoring Data

Two of the seven wells (MW-02-'01 and MW-06-'10) were dry as of the year of 2011. In June 2013, groundwater in MW-02-'01 was once again observed and thus measured. Monthly depth to groundwater levels are measured in each monitoring well.

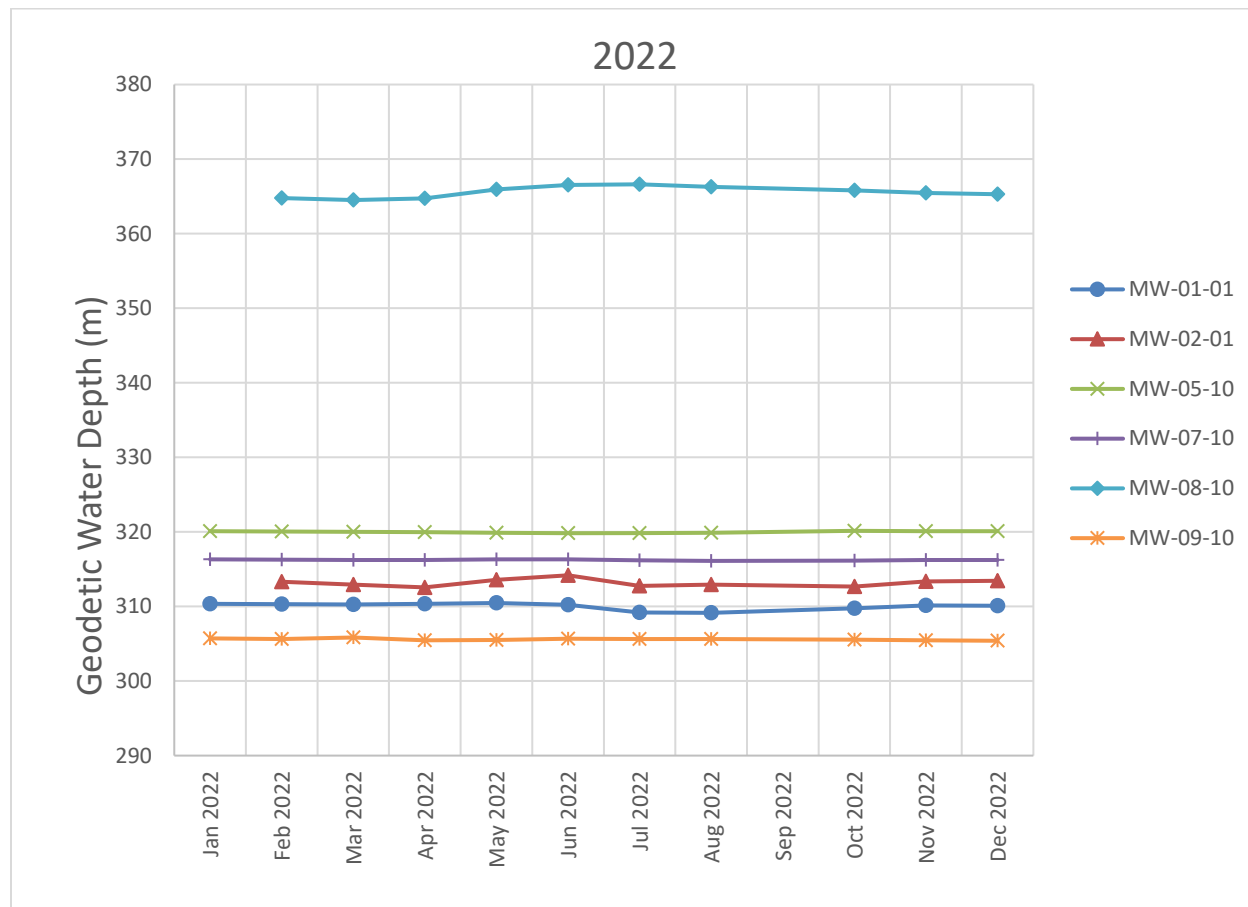


FIGURE 6-2 DEPTH TO GROUNDWATER IN MONITORING WELLS - GOLF COURSE AREA - 2022

As depicted in the above plot of the geodetic levels recorded over 2022, the depth to groundwater is relatively constant.

The analytical results for the five wells with sufficient groundwater to sample are summarized in the following table. The complete analytical reports for each well can be found in Appendix G.

TABLE 6-1: 2022 GROUNDWATER MONITORING WELL DATA

Analysis Parameter	MW-1-01		MW-5-10	
Date	(2022) Apr. 27	-	(2022) Apr. 27	-
Total Dissolved Phosphorus	0.0133	-	0.017	-
Ammonia as N	<0.050	-	<0.050	-
Nitrate+nitrite as N	<0.0200	-	7.83	-
Chloride	15.6	-	203	-
Sodium	38.2	-	99.9	-
Total Hardness (as CaCO₃)	530	-	508	-

Analysis Parameter	MW-7-10		MW-8-10 (Up Gradient)		MW-9-10	
Date	(2022) Apr. 27	-	(2022) Apr. 27	-	(2022) Apr. 27	-
Total Dissolved Phosphorus	0.02	-	0.0166	-	0.0412	-
Ammonia as N	<0.050	-	<0.050	-	0.119	-
Nitrate+nitrite as N	0.057	-	3.07	-	0.194	-
Chloride	4.37	-	34.2	-	2.36	-
Sodium	13.2	-	50.5	-	16.8	-
Total Hardness (as CaCO₃)	433	-	1910	-	165	-

6.2 Groundwater Monitoring Program Review

In May 2019 a hydrogeological review of the Town's reclaimed wastewater irrigation and disposal system environmental monitoring program was completed by Western Water Associates Ltd. (WWAL). This report consisted of all available data up to and including 2017. An update to this report with data collected in 2018 and 2019 was completed in 2020. The updated 2020 report included the following conclusions and recommendations:

- Continued monitoring of water levels and bi-annual sampling at the wells currently being sampled;
- Consider sampling the low flow monitoring wells (MW-2-'01 and MW-6-'10) using low flow sampling techniques (peristaltic or bladder pump);
- Installation and monitoring of two new high priority wells and one new low priority well;
- Detailed review of historical land use in the vicinity of MW-5-'10 in order to identify potential reasons for anomalous quality results;
- Addition of chloride and sodium analysis of reclaimed water at EMS sampling site E207444.

Sampling was only completed once in 2022. Per the recommendations of WWA, the Town should complete biannual groundwater analytical sampling. The 2022 data in April is consistent with previous historic trends and these conclusions remain relevant.

7.0 Operator Certification

The Town of Osoyoos is a Municipal Wastewater Treatment Class I (MWWT-I) facility under the Environmental Operators Certification Program (Facility #243). This classification was renewed in 2018. In compliance with OC Section 3.8, operator certification is summarized as follows:

Frank Zandvliet (#5657)	Wastewater Collection Level II Water Distribution Level I Municipal Wastewater Treatment Level I
David Stene (#6851)	Wastewater Collection Level I Water Distribution Level II Multi Utility Operator Level II Municipal Wastewater Treatment Level I
Karl Fichter (#6840)	Wastewater Collection Level I Water Distribution Level II Multi Utility Operator Level II Municipal Wastewater Treatment Level I

8.0 Non-Compliance and Recommendations

Table 8-1 provides a summary of non-compliance items and recommended remedial actions to be completed by the Town.

TABLE 8-1 2022 NON-COMPLIANCE ITEMS

OC Section	Non-Compliance	Remedial Action
4.1.2, 5.5.3	Weekly chlorine residual of at least 1 mg/L must be maintained at all times, immediately prior to irrigating. This residual is not being achieved consistently during sampling.	It is recommended that the Town: • Install an in-line chlorine analyzer which will allow for representative chlorine residual sampling results. • Re-circulate stagnant treated reclaimed water back into the chlorination system. • Adjust chlorination as required to achieve the 1 mg/L chlorine residual objective.
5.2, 7.2.4.2	Influent sampling to the wastewater treatment plant was not completed in 2022.	The Town is to complete semi-annual influent sampling as per Section 5.2 of the OC in 2023.
5.3.2 (d), 7.2.4.3	5.3.2 of the OC specifies that the effluent after Cell No. 3 be sampled as follows: d) Semi-annually: total nitrogen, ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, and organic nitrogen, all expressed as mg/L N. Organic Nitrogen is not currently part of the lab analysis.	The Town must ensure that organic nitrogen is included on future lab analysis.
5.6, 7.2.4.7	Aerated Lagoon Cell No. 1 sludge sampling was not completed in 2022.	The Town is to schedule and complete annual sampling of Cell #1 as a part of the sludge monitoring program outlined in Section 5.6 of the OC in 2023.
5.5, 7.2.4.5	With the switch of the secondary school irrigation water to domestic, there is no longer enough meters to get an accurate split of the reclaimed irrigation water volumes.	The Town should install additional meters at the following locations: 1. Infiltration Basins 2. Desert Park Irrigation Booster 3. Tree Farm Standpipe 4. Golf Course Booster Additionally, the high school booster pump records should be added to the SCADA system.

9.0 Capital Project Budget 2023

The town has the following capital projects anticipated for 2023:

- Complete decommissioning of the old Main Lift Station.
- Replacement of the Gala Lift Station.
- Preparation of a Capital and Asset Management Plan.
- Continue working on odor problems with Biomax application in sewer forcemains.

APPENDIX A

Influent Flow Summaries (OC 7.2.4.10)

Osoyoos Lift Stations				Month	Jan-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Jan-22	3.1	3.0	0.0	2085.1	1.4	1.9	132.8
2-Jan-22	3.4	2.9	0.0	2133.7	1.4	1.9	133.1
3-Jan-22	3.4	3.2	0.0	2135.3	1.4	1.8	124.7
4-Jan-22	3.1	3.2	0.0	2150.5	1.4	1.9	128.3
5-Jan-22	3.1	3.0	0.0	2134.4	1.3	1.9	122.8
6-Jan-22	2.9	3.0	0.0	2025.4	1.3	1.8	121.8
7-Jan-22	2.9	2.8	0.0	1965.6	1.3	1.5	116.3
8-Jan-22	2.9	2.8	0.0	1965.6	1.3	1.8	120.9
9-Jan-22	2.9	2.8	0.0	1903.8	1.5	1.9	130.6
10-Jan-22	2.7	2.8	0.0	1893.1	1.3	2.7	127.3
11-Jan-22	3.0	2.9	0.0	2025.0	1.4	2.1	128.6
12-Jan-22	3.0	2.9	0.0	2025.0	1.6	1.9	168.3
13-Jan-22	2.8	2.8	0.0	1938.6	1.3	1.4	127.6
14-Jan-22	3.0	2.8	0.0	1938.6	1.2	1.3	116.3
15-Jan-22	3.0	2.8	0.0	1931.2	1.3	1.4	126.9
16-Jan-22	3.0	2.8	0.0	1929.6	1.3	1.2	119.9
17-Jan-22	3.0	2.8	0.0	1920.3	1.3	1.2	119.5
18-Jan-22	2.8	2.8	0.0	1916.1	1.2	1.3	119.1
19-Jan-22	2.7	2.8	0.0	1918.1	1.3	1.5	134.4
20-Jan-22	3.0	2.8	0.0	2007.6	1.3	1.3	125.3
21-Jan-22	3.0	2.8	0.0	2007.6	1.3	1.2	117.2
22-Jan-22	2.7	2.8	0.0	1912.6	1.4	1.3	126.5
23-Jan-22	2.9	2.6	0.0	1882.0	1.4	1.4	128.7
24-Jan-22	3.0	2.7	0.0	1957.5	1.3	1.4	128.2
25-Jan-22	3.0	2.9	0.0	1988.8	1.3	1.3	120.8
26-Jan-22	2.9	2.9	0.0	1988.8	1.3	1.3	121.4
27-Jan-22	2.7	2.6	0.0	1838.0	1.3	1.3	123.6
28-Jan-22	2.7	2.9	0.0	1938.6	1.3	1.1	117.6
29-Jan-22	2.8	2.9	0.0	1938.6	1.3	1.2	121.2
30-Jan-22	2.8	2.6	0.0	1806.2	1.4	1.2	125.2
31-Jan-22	2.7	2.9	0.0	1938.6	1.4	1.4	127.6
Total	91.2	88.5	0.1	61139.7	42.0	48.1	3902.2
Average	2.9	2.9	0.0	1972.2	1.4	1.6	125.9
Min	2.7	2.6	0.0	1806.2	1.2	1.1	116.3
Max	3.4	3.2	0.0	2150.5	1.6	2.7	168.3

Osoyoos Lift Stations				Month	Feb-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Feb-22	2.7	2.9	0.0	1938.6	1.3	1.4	126.7
2-Feb-22	2.8	2.6	0.0	1865.1	1.3	1.4	129.8
3-Feb-22	2.8	2.6	0.9	1865.1	1.4	1.2	123.2
4-Feb-22	2.1	2.3	2.0	2034.1	1.3	1.3	117.2
5-Feb-22	2.1	1.9	2.0	2047.4	1.3	1.2	118.9
6-Feb-22	1.9	1.9	1.8	1923.6	1.3	1.2	126.7
7-Feb-22	1.9	1.9	1.9	1912.3	1.5	1.2	135.4
8-Feb-22	1.9	1.7	1.9	1876.3	1.3	1.2	125.4
9-Feb-22	1.6	1.7	1.6	1719.1	1.1	1.0	109.7
10-Feb-22	3.4	1.7	1.6	1919.3	1.4	1.1	123.5
11-Feb-22	3.4	1.9	1.6	1919.3	1.4	1.2	128.7
12-Feb-22	2.2	1.9	1.8	1937.4	1.4	1.3	131.0
13-Feb-22	2.2	1.9	1.8	1941.8	1.4	1.3	133.9
14-Feb-22	2.0	1.9	1.8	1941.8	1.3	1.2	127.8
15-Feb-22	2.0	1.9	1.7	1843.4	1.4	1.2	130.8
16-Feb-22	1.8	1.9	1.6	1814.0	1.4	1.3	131.2
17-Feb-22	1.9	1.7	1.8	1867.2	1.3	1.2	123.3
18-Feb-22	2.3	2.2	1.9	2196.2	1.4	1.2	123.1
19-Feb-22	2.4	2.2	1.9	2213.6	1.5	1.2	134.3
20-Feb-22	2.3	1.9	1.8	2026.5	1.9	1.6	169.8
21-Feb-22	2.3	2.0	1.8	2026.5	2.3	1.8	192.2
22-Feb-22	2.4	2.1	1.8	2120.7	2.4	1.7	185.7
23-Feb-22	2.4	2.1	2.0	2120.7	2.4	1.8	191.9
24-Feb-22	1.9	1.9	2.0	2033.4	1.9	1.5	157.4
25-Feb-22	2.0	1.9	1.7	1974.5	1.7	1.3	132.8
26-Feb-22	2.0	1.9	1.8	1974.5	1.5	1.4	137.8
27-Feb-22	2.0	1.8	1.8	1888.3	1.6	1.4	142.5
28-Feb-22	2.2	1.9	1.9	2022.9	1.7	1.3	136.1
Total	63.1	56.0	46.4	54963.7	42.9	37.2	3846.9
Average	2.3	2.0	1.7	1963.0	1.5	1.3	137.4
Min	1.6	1.7	0.0	1719.1	1.1	1.0	109.7
Max	3.4	2.9	2.0	2213.6	2.4	1.8	192.2

Osoyoos Lift Stations				Month	Mar-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Mar-22	2.2	1.9	1.9	2027.8	1.5	1.2	129.5
2-Mar-22	1.8	1.8	1.6	1812.0	1.5	1.2	132.3
3-Mar-22	1.8	1.8	1.8	1853.4	1.6	1.3	141.5
4-Mar-22	2.1	1.9	1.8	2019.4	1.4	1.2	129.1
5-Mar-22	2.1	1.9	1.8	2033.8	1.8	1.3	135.8
6-Mar-22	1.9	1.8	1.8	1838.5	1.6	1.4	140.1
7-Mar-22	1.8	1.7	1.8	1830.3	1.6	1.4	138.3
8-Mar-22	1.9	1.6	1.6	1785.3	1.5	1.2	127.4
9-Mar-22	1.9	1.6	1.6	1785.3	1.6	1.2	133.2
10-Mar-22	1.8	1.9	1.8	1908.9	1.6	1.3	129.3
11-Mar-22	2.0	1.9	1.9	2029.3	1.6	1.3	133.3
12-Mar-22	2.4	1.9	1.9	2158.9	1.6	1.4	138.9
13-Mar-22	2.4	1.9	1.9	2158.9	1.5	1.5	141.4
14-Mar-22	1.9	1.9	1.8	1972.7	1.6	1.5	145.5
15-Mar-22	1.5	1.3	1.5	1391.3	1.6	1.4	147.0
16-Mar-22	2.0	1.9	1.8	1956.9	1.4	1.4	138.7
17-Mar-22	2.2	1.9	1.8	2083.8	1.5	1.4	140.9
18-Mar-22	2.2	2.0	2.0	2133.8	1.7	1.3	139.9
19-Mar-22	2.1	2.0	2.0	2138.8	1.7	1.5	150.1
20-Mar-22	2.1	2.0	1.9	2135.3	1.7	1.5	150.9
21-Mar-22	2.1	2.0	1.9	2100.4	1.8	1.5	143.5
22-Mar-22	2.1	2.1	1.9	2068.6	1.8	1.5	145.0
23-Mar-22	2.1	2.1	2.0	2135.4	1.5	1.4	130.6
24-Mar-22	2.1	2.2	2.0	2135.4	1.5	1.3	138.5
25-Mar-22	2.1	2.2	1.9	2166.5	1.6	1.3	139.9
26-Mar-22	2.1	2.2	1.9	2166.5	1.6	1.3	139.1
27-Mar-22	2.1	2.0	1.9	2107.6	1.6	1.3	145.9
28-Mar-22	2.1	2.0	2.0	2081.9	1.7	1.4	147.3
29-Mar-22	2.1	2.0	2.0	2081.9	1.7	1.3	140.3
30-Mar-22	2.1	2.0	1.7	1970.0	1.5	1.2	135.0
31-Mar-22	2.1	2.0	1.8	2037.0	1.6	1.3	134.6
Total	64.0	59.7	57.3	62105.7	49.6	42.1	4302.9
Average	2.1	1.9	1.8	2003.4	1.6	1.4	138.8
Min	1.5	1.3	1.5	1391.3	1.4	1.2	127.4
Max	2.4	2.2	2.0	2166.5	1.8	1.5	150.9

Osoyoos Lift Stations				Month	Apr-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Apr-22	2.1	2.0	1.9	2037.0	1.8	1.5	147.2
2-Apr-22	2.0	2.0	1.9	2042.0	1.9	1.7	164.2
3-Apr-22	2.1	2.0	1.9	2048.2	1.9	1.7	165.7
4-Apr-22	2.1	1.9	1.9	2048.2	1.8	1.5	153.3
5-Apr-22	2.0	1.9	1.8	1913.1	1.8	1.4	154.8
6-Apr-22	2.0	1.9	1.8	2007.9	1.7	1.4	148.3
7-Apr-22	2.0	2.0	1.8	2007.9	1.7	1.4	149.8
8-Apr-22	2.0	2.0	1.8	2044.2	1.8	1.4	144.4
9-Apr-22	2.0	2.0	1.9	2057.2	1.8	1.3	141.8
10-Apr-22	2.1	2.0	2.0	2124.0	1.9	1.4	146.2
11-Apr-22	2.1	2.0	2.0	2124.0	1.9	1.4	147.7
12-Apr-22	2.1	1.9	1.9	2025.5	1.9	1.5	150.9
13-Apr-22	1.9	1.9	1.6	1925.9	1.7	1.5	152.3
14-Apr-22	1.9	1.9	1.6	1925.9	1.7	1.3	143.0
15-Apr-22	2.1	2.2	2.0	2197.6	1.7	1.5	155.0
16-Apr-22	2.5	2.3	2.0	2331.8	1.9	1.5	158.3
17-Apr-22	2.5	2.3	2.1	2331.8	1.9	1.4	159.8
18-Apr-22	2.3	2.2	2.1	2277.0	1.8	1.5	156.8
19-Apr-22	2.3	2.2	2.0	2240.6	1.8	1.5	158.3
20-Apr-22	2.3	2.0	2.0	2174.0	1.7	1.4	151.0
21-Apr-22	2.1	2.1	1.9	2122.9	1.6	1.3	139.6
22-Apr-22	2.1	2.2	1.9	2133.8	1.6	1.3	139.2
23-Apr-22	2.3	2.0	2.1	2218.7	1.6	1.3	135.1
24-Apr-22	2.3	2.3	2.2	2290.6	1.7	1.5	151.7
25-Apr-22	2.1	2.3	2.2	2290.6	1.8	1.5	152.4
26-Apr-22	2.0	2.1	1.9	2074.8	1.8	1.5	155.1
27-Apr-22	2.1	1.9	1.9	2075.9	1.7	1.5	155.1
28-Apr-22	2.2	1.9	1.9	2081.1	1.7	1.5	145.7
29-Apr-22	2.2	2.1	1.9	2092.8	1.7	1.5	145.7
30-Apr-22	2.1	2.1	2.1	2189.1	1.7	1.6	152.7
Total	64.2	62.0	58.3	63453.8	53.0	44.3	4521.2
Average	2.1	2.1	1.9	2115.1	1.8	1.5	150.7
Min	1.9	1.9	1.6	1913.1	1.6	1.3	135.1
Max	2.5	2.3	2.2	2331.8	1.9	1.7	165.7

Osoyoos Lift Stations				Month	May-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-May-22	2.4	2.0	2.1	2189.1	1.7	1.6	154.2
2-May-22	2.4	2.1	1.9	2152.6	1.7	1.5	152.3
3-May-22	2.0	2.1	1.9	2083.5	1.8	1.5	152.1
4-May-22	2.0	2.0	2.1	2071.8	1.8	1.4	149.4
5-May-22	2.3	2.0	2.1	2156.8	1.6	1.4	151.8
6-May-22	2.3	2.0	1.9	2156.8	1.6	1.4	153.3
7-May-22	2.0	2.0	2.0	2114.1	1.6	1.3	147.5
8-May-22	2.1	2.0	2.0	2144.2	1.6	1.4	149.0
9-May-22	2.2	2.2	2.0	2222.5	1.6	1.5	156.5
10-May-22	2.2	2.2	2.1	2222.5	1.6	1.5	157.9
11-May-22	2.1	2.0	2.1	2138.2	1.6	1.5	157.3
12-May-22	2.2	2.2	2.0	2212.3	1.6	1.4	152.0
13-May-22	2.2	2.2	2.0	2212.3	1.6	1.4	153.5
14-May-22	2.3	2.2	2.0	2229.5	1.6	1.5	157.1
15-May-22	2.4	2.2	2.2	2349.9	1.7	1.5	163.1
16-May-22	2.4	2.3	2.2	2349.9	1.7	1.5	164.6
17-May-22	2.4	2.3	2.1	2295.3	1.5	1.4	149.7
18-May-22	2.4	2.1	1.9	2111.4	1.5	1.2	139.5
19-May-22	2.1	2.1	1.8	2068.1	1.5	1.3	139.5
20-May-22	2.4	2.1	2.2	2325.2	1.5	1.3	140.3
21-May-22	2.5	2.7	2.3	2644.1	1.6	1.3	147.8
22-May-22	2.6	2.7	2.4	2645.0	1.6	1.4	150.0
23-May-22	2.9	2.5	2.4	2645.0	1.6	1.4	151.4
24-May-22	2.9	2.3	2.3	2558.6	1.6	1.3	146.2
25-May-22	2.5	2.2	2.2	2367.6	1.4	1.2	137.1
26-May-22	2.3	2.4	2.2	2407.5	1.4	1.2	131.4
27-May-22	2.7	2.6	2.2	2615.3	1.6	1.2	131.0
28-May-22	2.7	2.6	2.2	2615.3	1.6	1.2	133.4
29-May-22	2.5	2.2	2.2	2380.9	1.6	1.3	138.6
30-May-22	2.4	2.2	2.1	2283.7	1.6	1.4	140.1
31-May-22	2.2	2.2	2.1	2259.8	1.6	1.4	141.0
Total	73.1	68.9	65.5	71228.9	49.7	43.3	4588.6
Average	2.4	2.2	2.1	2297.7	1.6	1.4	148.0
Min	2.0	2.0	1.8	2068.1	1.4	1.2	131.0
Max	2.9	2.7	2.4	2645.0	1.8	1.6	164.6

Osoyoos Lift Stations				Month	Jun-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Jun-22	2.4	2.5	2.3	2497.3	1.6	1.3	140.7
2-Jun-22	2.4	2.5	2.3	2497.3	1.7	1.4	146.8
3-Jun-22	2.6	2.4	2.2	2509.1	2.5	1.8	199.5
4-Jun-22	2.7	2.4	2.2	2509.1	2.5	1.8	200.9
5-Jun-22	2.7	2.6	2.1	2507.4	1.7	1.4	153.7
6-Jun-22	2.5	2.6	2.3	2507.4	1.7	1.4	151.4
7-Jun-22	2.4	2.3	2.3	2451.2	1.5	1.2	134.7
8-Jun-22	2.3	2.1	2.2	2273.6	1.6	1.2	137.6
9-Jun-22	2.6	2.5	2.5	2644.7	1.7	1.3	141.5
10-Jun-22	2.6	2.5	2.5	2644.7	1.7	1.3	142.9
11-Jun-22	2.6	2.3	2.2	2511.4	1.7	1.4	146.9
12-Jun-22	2.6	2.4	2.2	2511.4	1.6	1.4	148.0
13-Jun-22	2.4	2.4	2.2	2471.4	1.6	1.3	144.2
14-Jun-22	2.4	2.3	2.1	2379.2	1.7	1.4	151.1
15-Jun-22	2.6	2.5	2.3	2575.6	1.7	1.4	152.6
16-Jun-22	2.7	2.6	2.4	2666.8	1.7	1.4	152.5
17-Jun-22	2.7	2.8	2.4	2689.5	1.8	1.4	154.1
18-Jun-22	2.6	2.8	2.6	2689.5	1.8	1.4	153.0
19-Jun-22	2.9	2.5	2.6	2713.4	2.1	1.6	174.6
20-Jun-22	2.9	2.5	2.3	2713.4	2.1	1.6	176.0
21-Jun-22	2.9	2.8	2.3	2736.4	1.7	1.3	146.2
22-Jun-22	3.0	2.8	2.4	2750.5	1.7	1.4	152.2
23-Jun-22	3.0	2.7	2.4	2760.3	1.7	1.4	153.6
24-Jun-22	2.9	2.7	2.6	2846.9	1.6	1.4	146.3
25-Jun-22	3.0	2.6	2.6	2846.9	1.7	1.4	147.8
26-Jun-22	3.0	2.7	2.4	2679.7	1.7	1.4	149.3
27-Jun-22	2.9	2.7	2.6	2814.1	1.7	1.4	151.5
28-Jun-22	2.9	2.8	2.6	2840.8	1.7	1.4	155.5
29-Jun-22	3.0	2.8	2.6	2857.3	1.7	1.7	177.0
30-Jun-22	3.0	3.1	2.9	3139.7	1.7	1.7	178.5
Total	81.4	77.0	71.8	79235.6	52.8	43.1	4660.7
Average	2.7	2.6	2.4	2641.2	1.8	1.4	155.4
Min	2.3	2.1	2.1	2273.6	1.5	1.2	134.7
Max	3.0	3.1	2.9	3139.7	2.5	1.8	200.9

Osoyoos Lift Stations					Month	Jul-22	
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Jul-22	3.6	3.4	3.1	3513.8	1.7	1.6	169.5
2-Jul-22	3.9	3.7	3.1	3571.7	1.8	1.7	179.6
3-Jul-22	3.9	3.7	3.3	3571.7	1.8	1.8	193.1
4-Jul-22	3.6	3.2	3.3	3386.4	2.0	2.0	209.4
5-Jul-22	3.6	3.1	2.9	3343.2	2.0	2.0	211.0
6-Jul-22	3.2	3.1	3.1	3307.2	1.7	1.5	172.1
7-Jul-22	3.3	3.1	3.1	3307.2	1.7	1.8	175.1
8-Jul-22	3.3	3.0	3.0	3259.6	1.7	1.8	176.6
9-Jul-22	3.2	3.1	3.0	3156.2	1.7	1.6	164.7
10-Jul-22	3.2	3.1	2.9	3117.0	1.8	1.5	161.9
11-Jul-22	3.2	3.0	2.8	3083.8	1.8	1.5	161.5
12-Jul-22	3.1	3.0	2.8	3084.6	1.6	1.5	162.5
13-Jul-22	3.1	2.9	2.8	3013.5	1.6	1.5	158.9
14-Jul-22	3.0	2.9	2.8	3004.1	1.6	1.5	159.1
15-Jul-22	3.3	3.1	2.7	3156.4	1.7	1.5	162.3
16-Jul-22	3.3	3.1	2.8	3156.4	1.7	1.6	165.9
17-Jul-22	3.1	3.0	2.8	3047.7	1.7	1.6	167.0
18-Jul-22	3.2	3.2	2.8	3154.0	1.7	1.6	163.3
19-Jul-22	3.2	3.2	2.7	3154.0	1.7	1.6	164.6
20-Jul-22	2.9	3.0	2.8	3013.6	1.8	1.6	162.8
21-Jul-22	3.0	3.0	2.8	3024.5	1.8	1.6	163.0
22-Jul-22	3.3	3.0	3.0	3148.8	1.8	1.6	164.2
23-Jul-22	3.3	3.2	3.0	3148.8	1.8	1.6	167.1
24-Jul-22	3.3	3.2	2.8	3129.9	1.7	1.7	170.9
25-Jul-22	3.3	3.1	2.9	3113.7	1.7	1.7	172.8
26-Jul-22	3.1	3.1	2.9	3113.7	1.7	1.7	174.4
27-Jul-22	3.1	3.0	2.7	2978.9	1.7	1.6	173.8
28-Jul-22	3.1	3.0	2.9	3026.7	1.7	1.6	170.5
29-Jul-22	3.1	3.1	3.0	3203.0	1.7	1.6	171.0
30-Jul-22	3.3	3.2	3.1	3346.7	1.8	1.7	172.3
31-Jul-22	3.4	3.2	3.1	3374.5	1.9	1.7	180.1
Total	101.9	97.1	90.5	99011.2	54.2	51.0	5321.0
Average	3.3	3.1	2.9	3193.9	1.7	1.6	171.6
Min	2.9	2.9	2.7	2978.9	1.6	1.5	158.9
Max	3.9	3.7	3.3	3571.7	2.0	2.0	211.0

Osoyoos Lift Stations				Month	Aug-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Aug-22	3.4	3.2	3.1	3374.5	1.94	1.73	185.93
2-Aug-22	3.3	3.2	3.1	3369.4	1.95	1.72	187.4
3-Aug-22	3.3	3.2	2.9	3244.5	1.63	1.55	169.91
4-Aug-22	3.3	3.0	3.0	3244.5	1.5676	1.55	162.07
5-Aug-22	3.3	2.9	3.0	3237.5	1.63	1.55	163.46
6-Aug-22	3.3	2.9	3.0	3237.5	1.6369	1.53	165.1
7-Aug-22	3.3	3.1	3.0	3179.8	1.64	1.51	166.6
8-Aug-22	3.0	3.1	2.9	3123.3	1.66	1.5064	164.72
9-Aug-22	3.1	2.8	2.7	2984.5	1.6896	1.51	163.75
10-Aug-22	3.1	3.0	2.9	3187.9	1.8151	1.43	155.68
11-Aug-22	3.1	3.0	3.0	3209.4	1.8774	1.43	158.69
12-Aug-22	3.1	3.1	2.7	3027.5	1.88	1.49	160.25
13-Aug-22	3.2	3.1	3.0	3170.7	1.87	1.49	159.65
14-Aug-22	3.2	3.0	3.0	3170.7	1.81	1.42	155.03
15-Aug-22	3.0	3.0	2.8	2989.0	2.03	1.407	156.5
16-Aug-22	3.0	2.7	2.8	2989.0	3.1966	1.77	213.45
17-Aug-22	3.1	2.7	2.7	2895.6	3.23	2.0096	236.38
18-Aug-22	3.0	2.7	2.8	2966.8	3.23	2.0588	255.27
19-Aug-22	3.1	3.0	2.8	3127.1	3.2886	2.4292	300.43
20-Aug-22	3.1	3.0	2.8	3127.1	3.3	2.45	303.58
21-Aug-22	2.8	3.0	2.9	2934.8	1.7393	1.49	162.49
22-Aug-22	3.2	2.7	2.9	3016.2	1.74	1.49	164.06
23-Aug-22	3.2	2.9	2.6	3016.2	1.71	1.48	162.86
24-Aug-22	3.0	2.9	2.8	2983.5	2.565	1.79	215.12
25-Aug-22	3.0	2.8	2.8	2968.2	2.57	1.79	216.64
26-Aug-22	3.2	2.9	3.0	3153.1	1.78	1.4445	161.08
27-Aug-22	3.2	2.9	3.0	3153.1	1.78	1.46	162.65
28-Aug-22	2.9	2.8	2.5	2900.6	1.75	1.43	159.5
29-Aug-22	2.7	2.8	2.4	2784.2	1.7326	1.44	160.22
30-Aug-22	2.7	2.5	2.6	2664.7	1.76	1.44	161.78
31-Aug-22	2.7	2.4	2.6	2647.4	1.74	1.45	159.45
Total	96.4	90.6	88.1	95077.9	63.7	50.2	5669.7
Average	3.1	2.9	2.8	3067.0	2.1	1.6	182.9
Min	2.7	2.4	2.4	2647.4	1.6	1.4	155.0
Max	3.4	3.2	3.1	3374.5	3.3	2.4	303.6

Osoyoos Lift Stations				Month	Sep-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Sep-22	2.7	2.6	2.5	2731.6	1.8	1.4	154.4
2-Sep-22	2.7	2.8	2.7	2896.7	1.8	1.5	157.7
3-Sep-22	3.0	2.8	2.7	2935.4	1.9	1.5	170.0
4-Sep-22	3.0	2.7	2.7	2955.4	2.4	1.9	208.9
5-Sep-22	3.0	2.7	2.7	2917.2	2.4	1.9	210.4
6-Sep-22	3.0	2.5	2.4	2778.7	2.3	1.7	188.1
7-Sep-22	2.8	2.7	2.4	2742.7	1.9	1.4	160.9
8-Sep-22	2.8	2.7	2.4	2752.5	2.0	1.3	149.1
9-Sep-22	2.8	2.8	2.4	2812.6	1.9	1.3	144.7
10-Sep-22	2.8	2.8	2.4	2831.9	2.0	1.4	155.0
11-Sep-22	2.4	2.4	2.5	2538.0	2.0	1.4	155.9
12-Sep-22	2.4	2.3	2.1	2398.8	1.8	1.3	146.4
13-Sep-22	2.3	2.3	2.2	2346.0	1.5	1.3	147.8
14-Sep-22	2.3	2.3	2.2	2346.0	1.5	1.3	149.5
15-Sep-22	2.4	2.2	2.1	2290.0	1.7	1.3	146.1
16-Sep-22	2.4	2.4	2.2	2464.8	1.8	1.3	147.5
17-Sep-22	2.5	2.4	2.3	2485.8	1.7	1.3	146.8
18-Sep-22	2.6	2.3	2.3	2519.0	1.8	1.3	146.6
19-Sep-22	2.6	2.3	2.2	2519.0	1.8	1.3	148.6
20-Sep-22	2.3	2.3	2.2	2372.2	1.8	1.3	150.1
21-Sep-22	2.3	2.3	2.2	2347.4	1.6	1.3	138.5
22-Sep-22	2.3	2.2	2.2	2324.7	1.5	1.3	140.6
23-Sep-22	2.3	2.2	2.1	2324.7	1.6	1.3	142.1
24-Sep-22	2.4	2.2	2.1	2365.2	1.7	1.3	144.0
25-Sep-22	2.4	2.4	2.1	2444.3	1.7	1.3	144.3
26-Sep-22	2.4	2.4	2.3	2444.3	1.7	1.4	143.8
27-Sep-22	2.4	2.3	2.3	2316.6	1.8	1.4	144.3
28-Sep-22	2.4	2.3	2.1	2316.6	1.8	1.3	140.2
29-Sep-22	2.2	2.2	2.1	2204.7	1.8	1.3	143.2
30-Sep-22	2.2	2.2	2.2	2343.7	1.7	1.3	144.8
Total	76.1	73.4	69.6	76066.5	55.2	41.6	4610.1
Average	2.5	2.4	2.3	2535.6	1.8	1.4	153.7
Min	2.2	2.2	2.1	2204.7	1.5	1.3	138.5
Max	3.0	2.8	2.7	2955.4	2.4	1.9	210.4

Osoyoos Lift Stations				Month	Oct-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Oct-22	2.3	2.3	2.2	2343.9	1.8	1.4	149.0
2-Oct-22	2.4	2.3	2.1	2358.8	1.6	1.4	150.2
3-Oct-22	2.4	2.2	2.1	2318.3	1.6	1.3	150.0
4-Oct-22	2.3	2.1	2.1	2249.1	1.5	1.3	144.2
5-Oct-22	2.3	2.1	2.0	2249.1	1.5	1.3	139.6
6-Oct-22	2.1	2.0	2.0	2123.6	1.5	1.3	141.2
7-Oct-22	2.2	2.2	2.0	2229.5	1.5	1.3	142.3
8-Oct-22	2.2	2.2	2.1	2251.3	1.6	1.3	141.1
9-Oct-22	2.2	2.4	2.3	2412.9	1.9	1.4	156.7
10-Oct-22	2.5	2.4	2.3	2424.9	2.0	1.5	167.0
11-Oct-22	2.6	2.4	2.4	2528.6	2.0	1.5	168.4
12-Oct-22	2.6	2.2	2.4	2528.6	3.6	1.7	241.5
13-Oct-22	2.1	2.1	1.9	2167.0	3.7	1.8	244.7
14-Oct-22	2.1	2.1	1.9	2177.1	3.0	1.8	223.1
15-Oct-22	2.1	2.1	1.9	2177.1	1.8	1.4	152.6
16-Oct-22	2.0	2.0	1.9	2060.1	1.8	1.3	150.5
17-Oct-22	2.3	2.3	2.4	2480.4	1.7	1.3	150.6
18-Oct-22	2.4	2.3	2.4	2480.4	1.6	1.3	140.3
19-Oct-22	2.4	2.1	2.0	2294.7	1.5	1.2	138.5
20-Oct-22	2.1	1.9	1.9	2007.3	1.6	1.2	138.3
21-Oct-22	2.1	1.7	1.8	1981.7	1.6	1.3	140.1
22-Oct-22	2.0	2.0	1.8	2025.9	1.5	1.3	141.6
23-Oct-22	2.1	2.0	2.1	2207.1	1.6	1.2	137.8
24-Oct-22	2.1	2.0	2.1	2207.1	1.7	1.2	136.7
25-Oct-22	2.2	2.0	2.0	2171.3	1.7	1.2	136.5
26-Oct-22	2.2	2.0	2.0	2197.4	1.8	1.4	155.7
27-Oct-22	2.1	2.0	2.0	2123.2	1.8	1.4	158.8
28-Oct-22	2.1	2.0	1.9	2113.6	1.8	1.4	155.7
29-Oct-22	1.9	2.0	1.9	2035.7	1.6	1.2	139.5
30-Oct-22	1.9	2.0	1.9	1927.0	1.6	1.2	141.1
31-Oct-22	1.9	2.0	1.8	1952.3	1.6	1.2	139.3
Total	68.4	65.6	63.6	68804.8	57.1	41.8	4812.7
Average	2.2	2.1	2.1	2219.5	1.8	1.3	155.2
Min	1.9	1.7	1.8	1927.0	1.5	1.2	136.5
Max	2.6	2.4	2.4	2528.6	3.7	1.8	244.7

Osoyoos Lift Stations				Month	Nov-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Nov-22	2.2	2.0	1.7	2020.4	2.0	1.3	152.3
2-Nov-22	2.2	2.0	1.7	2020.4	2.0	1.3	153.8
3-Nov-22	2.0	1.9	1.8	2034.7	1.7	1.2	129.5
4-Nov-22	2.1	2.0	2.0	2161.5	1.8	1.2	139.7
5-Nov-22	2.1	2.0	2.0	2161.5	1.8	1.2	143.2
6-Nov-22	2.0	1.9	1.9	1925.6	1.5	1.3	135.9
7-Nov-22	1.9	1.8	2.1	2079.1	1.7	1.2	136.8
8-Nov-22	2.0	1.9	1.6	1951.4	1.6	1.1	126.2
9-Nov-22	1.9	1.6	1.9	1898.7	1.6	1.2	132.9
10-Nov-22	1.7	1.7	1.6	1771.5	1.5	1.1	126.6
11-Nov-22	2.0	1.9	1.8	2006.1	1.5	1.1	128.0
12-Nov-22	2.0	1.9	1.8	2022.7	1.4	1.1	124.8
13-Nov-22	2.0	1.9	1.9	2035.3	1.5	1.1	127.6
14-Nov-22	2.2	2.2	2.0	2263.0	1.4	1.1	122.0
15-Nov-22	1.7	1.9	1.9	1928.9	1.3	1.1	119.0
16-Nov-22	1.7	1.6	1.9	1845.1	1.4	1.1	124.0
17-Nov-22	1.9	1.7	1.6	1801.5	1.4	1.1	124.8
18-Nov-22	1.7	1.7	1.6	1770.5	1.4	1.0	120.4
19-Nov-22	1.6	1.7	1.7	1740.0	1.6	1.2	134.6
20-Nov-22	1.7	1.9	1.6	1812.9	1.9	1.1	137.0
21-Nov-22	2.1	1.9	1.9	2089.2	1.6	1.2	125.3
22-Nov-22	1.7	1.9	1.6	1853.0	1.5	1.1	123.1
23-Nov-22	1.8	1.8	1.9	1961.7	1.4	1.2	127.0
24-Nov-22	1.7	1.6	1.6	1759.5	1.4	1.1	121.4
25-Nov-22	1.9	1.7	1.6	1839.1	1.4	1.0	109.1
26-Nov-22	1.7	1.9	1.8	1897.3	1.5	1.1	121.8
27-Nov-22	1.9	1.6	1.6	1813.8	1.2	1.1	126.7
28-Nov-22	1.7	1.9	1.4	1750.2	1.2	1.1	123.6
29-Nov-22	1.7	1.6	1.8	1805.9	1.3	1.1	127.9
30-Nov-22	1.9	1.6	1.6	1812.5	1.3	1.1	126.3
Total	56.9	55.3	53.2	57833.0	45.9	34.3	3871.4
Average	1.9	1.8	1.8	1927.8	1.5	1.1	129.0
Min	1.6	1.6	1.4	1740.0	1.2	1.0	109.1
Max	2.2	2.2	2.1	2263.0	2.0	1.3	153.8

Osoyoos Lift Stations				Month	Dec-22		
	Main Lift				Golf		
Date	Pump 1	Pump 2	Pump 3	Flow	Pump 1	Pump 2	Flow
	Min	Min	Min	m3	HOURS	HOURS	m3
1-Dec-22	1.7	1.9	1.6	1821.3	1.3	1.1	123.9
2-Dec-22	1.7	1.9	1.9	1863.1	1.3	1.2	122.1
3-Dec-22	1.9	1.7	1.9	1867.7	1.5	1.2	128.6
4-Dec-22	1.9	1.9	1.8	1898.1	1.5	1.2	134.3
5-Dec-22	2.3	1.9	1.9	2112.5	1.4	1.2	129.8
6-Dec-22	2.3	2.0	1.9	2128.4	1.3	1.1	125.8
7-Dec-22	1.7	1.8	1.8	1843.1	1.3	1.1	122.7
8-Dec-22	2.1	2.1	1.8	1978.9	1.3	1.0	117.1
9-Dec-22	2.1	2.1	1.7	1978.9	1.3	1.1	118.6
10-Dec-22	1.7	1.7	1.8	1824.3	1.3	1.2	130.8
11-Dec-22	1.9	1.8	1.8	1920.2	1.5	1.3	142.8
12-Dec-22	1.9	1.8	1.8	1925.2	1.5	1.2	137.5
13-Dec-22	1.7	1.7	1.6	1767.7	1.3	1.1	121.3
14-Dec-22	1.7	1.6	1.6	1751.7	1.2	1.0	119.5
15-Dec-22	1.7	1.6	1.6	1722.5	1.3	1.1	127.3
16-Dec-22	1.6	1.7	1.7	1733.8	1.2	1.0	120.1
17-Dec-22	1.7	1.7	1.6	1733.8	1.3	1.1	126.1
18-Dec-22	1.7	1.6	1.5	1710.6	1.2	1.1	121.7
19-Dec-22	1.9	1.6	1.8	1856.7	1.4	1.1	125.2
20-Dec-22	1.9	1.8	1.8	1856.7	1.3	1.1	126.2
21-Dec-22	2.4	2.4	2.2	2471.7	1.3	1.0	115.4
22-Dec-22	2.4	2.4	2.2	2471.7	1.2	1.0	117.9
23-Dec-22	1.9	1.9	1.9	1985.7	1.4	1.1	129.8
24-Dec-22	1.9	1.9	1.8	1985.7	1.5	1.2	136.3
25-Dec-22	1.7	1.8	1.8	1798.7	1.5	1.1	132.3
26-Dec-22	1.9	1.9	1.8	1971.0	1.6	1.4	154.1
27-Dec-22	3.7	3.3	2.9	3423.9	2.8	2.1	235.9
28-Dec-22	3.7	3.3	2.9	3423.9	1.3	1.1	124.5
29-Dec-22	2.3	1.9	1.9	2076.3	1.3	1.1	121.9
30-Dec-22	2.0	1.9	1.9	2005.3	1.5	1.2	138.9
31-Dec-22	2.1	2.0	1.9	2042.5	1.4	1.1	126.2
Total	63.4	61.0	58.1	62951.7	43.6	35.9	4054.7
Average	2.0	2.0	1.9	2030.7	1.4	1.2	130.8
Min	1.6	1.6	1.5	1710.6	1.2	1.0	115.4
Max	3.7	3.3	2.9	3423.9	2.8	2.1	235.9

APPENDIX B

Operational Certificate No. ME-12214

December 18, 1998

File: 76750-40/ME-12214(01)
PE-00086(02)

REGISTERED MAIL

Town of Osoyoos
PO Box 3010
Osoyoos BC V0H 1V0

Dear Ms. Elsie Lemke:

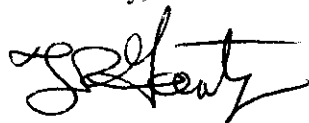
Enclosed is Operational Certificate ME-12214 issued under the provisions of the *Waste Management Act*. This Operational Certificate supercedes Permit PE-86 which is hereby cancelled in accordance with Section 18(12) of the *Waste Management Act*. Your attention is respectfully directed to the terms and conditions outlined in the Operational Certificate. An annual fee will be determined according to the *Waste Management Permit Fees Regulation*.

This Operational Certificate does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority shall rest with the holder of the Operational Certificate. This Operational Certificate is issued pursuant to the provisions of the *Waste Management Act*, which makes it an offence to discharge waste without proper authorization. It is also the responsibility of the holder of the Operational Certificate to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

This Operational Certificate may be appealed by persons who consider themselves aggrieved by this decision in accordance with Part 7 of the *Waste Management Act*. Written notice of intent to appeal must be received by the Regional Waste Manager within thirty (30) days.

Administration of this Operational Certificate will be carried out by staff from our Regional Office located at Suite 201, 3547 Skaha Lake Road, Penticton, B.C., V2A 7K2. Plans, data and reports pertinent to the Operational Certificate are to be submitted to the Regional Waste Manager at this address.

Yours truly,



T.R. Forty, P.Eng.
Assistant Regional Waste Manager
Pollution Prevention
Southern Interior Region

Enclosure



MINISTRY OF ENVIRONMENT,
LANDS AND PARKS

OPERATIONAL CERTIFICATE

ME-12214

Under the Provisions of the Waste Management Act

TOWN OF OSOYOOS

PO BOX 3010

OSOYOOS BRITISH COLUMBIA

VOH 1VO

is authorized to discharge effluent, from a municipal sewage collection and treatment system, to the ground by irrigation and infiltration, at Osoyoos, British Columbia, subject to the conditions listed below. Contravention of any of these conditions is a violation of the Waste Management Act and may result in prosecution.

1. AUTHORIZED DISCHARGES

- 1.1.** This subsection applies to the discharge of effluent from the municipal sewage treatment facility to the reclaimed water storage reservoirs. The flow is measured at the Legion Beach Lift Station, the Environmental Monitoring (EMS) site reference number for this site is E230277 and at the Desert Park lift station EMS site reference number E232882.

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Assistant Regional Waste Manager

- 1.1.1.** The maximum authorized rate of sewage wastes received, and therefore the maximum authorized rate of effluent to be discharged from the aerated sewage treatment lagoon system to the reclaimed water storage reservoirs, averaged on a monthly basis is the total of the flow from the Legion Beach Lift Station and the Desert Park lift station:

Year	Projection Annual Average	Projection Maximum Month Average
1997	1760 m ³ /day	2820 m ³ /day
1998	1800 m ³ /day	2880 m ³ /day
1999	1830 m ³ /day	2930 m ³ /day
2000	2030 m ³ /day	3250 m ³ /day
2001	2240 m ³ /day	3580 m ³ /day
2002	2410 m ³ /day	3860 m ³ /day
2003	2460 m ³ /day	3930 m ³ /day
2004	2510 m ³ /day	4010 m ³ /day
2005	2560 m ³ /day	4090 m ³ /day
2006	2610 m ³ /day	4170 m ³ /day
2007	2660 m ³ /day	4260 m ³ /day
2008	2720 m ³ /day	4340 m ³ /day

- 1.1.2.** The authorized works are sewage collection system, sewage and effluent pumping stations, pressure forcemain, and related appurtenances approximately located as shown on Site Plan A.

- 1.1.3.** The location of the sewage collection system is described generally as Osoyoos and surrounding area.

- 1.2.** This subsection applies to the discharge of effluent from the aerated sewage treatment lagoon system, after Cell #3, prior to storage. The Environmental Monitoring (EMS) site reference number for this discharge is E105001.

- 1.2.1.** The characteristics of the effluent discharged from the aerated sewage treatment lagoon system, after Cell #3, prior to storage, shall be equivalent to, or better than:

5 Day Biochemical Oxygen Demand	45 mg/L; and
Total Suspended Solids	60 mg/L.



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- 1.2.2. The authorized works are aerated sewage treatment lagoon system and related appurtenances approximately located as shown on attached Site Plan A.
- 1.2.3. The location of the aerated sewage treatment lagoon system facilities is Lot 766, Plan 2476 and Lot 974, Plan 16985, SDYD.
- 1.3. This subsection applies to the reclaimed water which is beneficially used for trickle and spray irrigation, after storage and chlorination. The EMS site reference number for this discharge is E207444.
 - 1.3.1. There is no maximum authorized rate of reclaimed water which may be beneficially used for irrigation.
 - 1.3.2. The authorized works are two (2) effluent storage reservoirs, chlorination facilities, spray and trickle irrigation facilities, and related appurtenances approximately as shown on attached Site Plan A.
 - 1.3.3. The locations where reclaimed wastewater may be irrigated are described generally as Osoyoos and surrounding area, as indicated in the approved Town of Osoyoos Liquid Waste Management Plan.
- 1.4. This subsection applies to the discharge of surplus effluent to the infiltration basin facilities. The EMS site reference number for this discharge is E218460.
 - 1.4.1. The Town of Osoyoos is authorized to discharge effluent that is surplus to the needs of the effluent irrigation system to an infiltration basin facility. There is no maximum authorized amount, as this is, in effect, a safety valve for the system.
 - 1.4.2. The authorized works are infiltration facilities and related appurtenances approximately as shown on attached Site Plan A.
 - 1.4.3. The location of the point of discharge is Lot 766, Plan 2476, and Lot 974, Plan 16985, SDYD.

2. ANNUAL PERMIT FEE CALCULATION

For the purposes of permit fee calculation, the following discharge factors have been assumed for the characteristics of the reclaimed wastewater discharged from the reclaimed wastewater storage reservoirs and beneficially used for irrigation:

- 2.1. The reclaimed water flow irrigated is assumed to equal the flow of sewage into the aerated sewage treatment system, as measured at the Legion Beach Lift Station (E230277) and Desert Park lift station (E232882).



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- 2.2.** The quality parameters to be used for permit fee calculation purposes are:

5 Day Biochemical Oxygen Demand	10 mg/L; and
Total Suspended Solids	10 mg/L.

3. REQUIREMENTS - GENERAL

3.1. Maintenance of Works, Emergency Procedures and Non-Compliance Reporting

Inspect the pollution control works regularly and maintain them in good working order. In the event of an emergency or condition which prevents the Town of Osoyoos from complying with a requirement of the Operating Certificate that would otherwise be applicable, that requirement will be suspended for such time as the emergency exists or as otherwise directed by the Regional Waste Manager provided that:

- 3.1.2.** The Town can demonstrate the exercise of due diligence in relation to the process, operation or event which has caused the emergency, and that the emergency has occurred notwithstanding this exercise of due diligence;
- 3.1.3.** The Regional Waste Manager has been immediately notified of the emergency; and,
- 3.1.4.** The Town is proceeding with due diligence to correct the emergency condition.

3.2. Bypasses

The discharge of effluent which has bypassed the designated treatment works is prohibited unless the approval of the Regional Waste Manager is obtained and confirmed in writing.

3.3. Process Modifications

The Town shall notify the Regional Waste Manager prior to implementing changes to any process that may affect the quality and/or quantity of the discharge. The approval of the Regional Waste Manager shall be received prior to implementing the process modifications.

3.4. Alternate Water Supply

The Town shall provide alternate water supplies if any privately owned well should be adversely affected by irrigation with reclaimed water, as determined by the Regional Waste Manager.



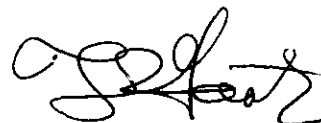
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3.5. Plans - New Works

- 3.5.1. Plans and specifications of any proposed new works, modifications or additions to the existing works authorized in this Operational Certificate, with the exception of the sewage collection system, shall be submitted to the Regional Waste Manager, and his written consent obtained before construction commences. Plans shall be signed and sealed by a Professional Engineer licensed to practise in the Province of British Columbia. The works shall be constructed in accordance with such plans.
- 3.5.2. Copies of all "as-built" plans and drawings for the sewage treatment system, signed and sealed by a Professional Engineer licensed to practise in the Province of British Columbia, shall be submitted to the Regional Waste Manager.
- 3.5.3. Retain a copy of all "as-built", plans of modifications and/or extensions to the sewage collection system for perusal by the Regional Waste Manager, or his designate, upon request.
- 3.5.4. Design and construct the irrigation works in accordance with best current agricultural practice, and in accord with:
- The "Pollution Control Guidelines for Municipal Effluent Application to Land", dated January 1983, and any amendments thereto, issued by the Ministry of Environment of British Columbia.
- The "B.C. Sprinkler Irrigation Manual" 1989 issue, prepared by the B.C. Ministry of Agriculture and Fisheries.
- The "B.C. Trickle Irrigation Manual" 1987 issue, prepared by the B.C. Ministry of Agriculture and Fisheries.
- The "Health and Safety Criteria for the Use of Reclaimed Wastewater", 1991, developed by the Ministry of Health and the Ministry of Environment.

3.6. Operation and Maintenance

- 3.6.1. Operate and maintain a system of preventative maintenance for the sewage treatment, reclaimed wastewater utilization and infiltration works.
- 3.6.2. Develop and maintain an Operation and Maintenance Manual for the sewage treatment, reclaimed wastewater utilization and infiltration works. The Operation and Maintenance Manual shall be completed by **December 31, 2003**. A copy of the Operation and Maintenance Manuals shall be retained at the treatment plant for inspection, by the Regional Waste Manager or designate.



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3.7. Facility Classification

Maintain the wastewater treatment facility classification as authorized in this Operational Certificate with the "Environmental Operator's Certification Program" (EOCP). The sewage treatment plant, reclaimed wastewater utilization system and the effluent disposal works are presently classified as a Level I facility.

3.8. Operator Certification

3.8.1. The works shall be operated and maintained by persons certified within and according to the program provided by the EOCP. Certification must be completed to the satisfaction of the Regional Waste Manager. In addition, the Regional Waste Manager shall be notified of the classification level of the facility and certification level of the operators, and changes of operators and/or operator certification levels within 30 days of any change. List of current Certified Operators shall be included in the annual report.

3.8.2. All operators in training (OIT) working at this facility currently classified by the EOCP as Level I, shall be required to successfully pass an OIT examination within three (3) months of commencement of employment at the facility. The OIT certificate shall be valid for fifteen (15) months from the date of issue. Prior to the expiry date of the OIT certificate, but not sooner than twelve (12) months from the date when the OIT commenced facility operation, the OIT shall successfully complete a Class I certification examination in order to continue to operate at the facility.

3.9. Improvement of Works

The Town shall acquire and/or reserve sufficient land for the construction or expansion of future sewage treatment facilities. The phasing of new works shall be in accord with the Town of Osoyoos Liquid Waste Management Plan.

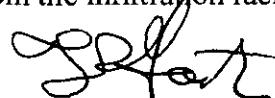
3.10. Infiltration Facilities

3.10.1. Details regarding any proposed discharge to infiltration shall be under the direction of a suitably qualified consultant. A copy of the proposed discharge details, including rate, volume and quality, and rationale for the discharge, is to be submitted to the Regional Waste Manager.

3.10.2. The use of the infiltration facilities shall occur only with the written authorization of the Regional Waste Manager.

3.10.3. The Town shall maintain a minimum freeboard of 0.5 m and ensure that there is no overflow from the infiltration facilities to the environment.

3.10.4. Surface drainage shall be diverted away from the infiltration facilities.



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Assistant Regional Waste Manager

3.10.5. Any residue removed from the infiltration facility shall be disposed of in a manner approved by the Regional Waste Manager.

3.10.6. Details of discharges to infiltration to be included in the Annual Report each year.

3.11. Fencing

The Operational Certificate holder shall erect a fence around the treatment plant facilities and such other areas, as required by the Regional Waste Manager. The height and type of fencing shall meet the approval of the Regional Waste Manager.

3.12. Odours

Should odours become objectionable, additional works shall be provided when so directed in writing by the Regional Waste Manager.

3.13. Influent Wastes Bylaw

In order to minimize the potential effect of heavy metals or other toxic materials in the effluent and/or sludge, amend as required, the Influent Wastes Bylaw, Building Bylaw, or other bylaws, to regulate the input of such wastes to the sewage collection system. The Town is encouraged to discourage the installation of devices to process household putrescible waste for disposal to the sewage collection system. Any amendments made to the Influent Bylaw shall be noted in the Annual Report.

3.14. Surface Water Diversionary Works

Surface water shall be intercepted and diverted away from the effluent treatment facilities to the greatest extent possible.

3.15. Signage

3.15.1. A suitable sign erected at the main entrance to the treatment plant site shall have the appropriate emergency phone numbers for use by the general public and others.

3.15.2. Prominent "No Trespassing" signs, acceptable to the Regional Waste Manager shall be erected and maintained around the reclaimed wastewater reservoir advising of the contents of the reservoir.

3.15.3. Prominent "NO TRESPASSING", signs shall be erected around agricultural and silvicultural sites irrigated with reclaimed wastewater, warning persons of the possible health hazard during the irrigation season and advising that the water used for irrigation is NOT POTABLE. The wording shall be in language or symbols readily comprehensible by the general public. e.g. "NO TRESPASSING - RECLAIMED WASTEWATER - DO NOT DRINK".



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3.16. Leakage

Operate and maintain the aerated lagoons and the reclaimed wastewater storage reservoirs to minimize fluid leakage. Leakage shall not aggravate or produce soil or bedrock instability or erosion, or contaminate ground or surface water.

3.17. Contingency Plan

The Town is to prepare a Contingency Plan that will address the appropriate course of action to be taken in any particular preconceived emergency situation. The Contingency Plan shall include Spill Procedures including other leaks and any potential point of concern in the collection, treatment and disposal systems. Attention is to be given to public safety and the protection of the environment. The Contingency Plan is to be completed by **December 31, 2003**, and updated annually, or as necessary, to reflect the current operation. A copy of the Contingency Plan, when complete shall be submitted to the Regional Waste Manager. Any changes or amendments to the Contingency Plan shall be included in the annual report.

3.18. Irrigation Plan

The Town is required to submit an Irrigation Plan of all new areas of land to be irrigated. The Irrigation Plan shall include: property location, owner, acreage, irrigation type, duration, rates, crops and intensity, or other wastewater use where reclaimed wastewater is beneficially used (i.e. dust control purposes).

To be included in the Irrigation Plan, a detailed Soils Assessment is required for any new areas of land to be irrigated.

Written authorization from the Regional Waste Manager is required prior to commencement of irrigation with reclaimed wastewater on any new areas.

A plan is to be submitted with the Annual Report each year showing all areas irrigated with reclaimed water during the previous year.

3.19. Soils Assessment

A detailed Soil Assessment shall be completed of any new agricultural areas to be irrigated. The Soils Assessment shall be submitted to the Regional Waste Manager and is to be included in the "Irrigation Plan", which shall be performed by a suitably qualified professional (Agrologist or Pedologist), using best current climate and soils data to substantiate that the proposed irrigation land is capable of accepting reclaimed wastewater for irrigation purposes. The Soils Assessment is to include any suggested restrictions or recommendations, also the assessment will include the recommendation as to the frequency required for further soil assessments of the agricultural areas irrigated.



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Written authorization from the Regional Waste Manager, to proceed with irrigation on any new agricultural area(s), must be received prior to commencing irrigation.

3.20. Sludge Management Plan

The frequency of withdrawal of sludge from the sewage treatment plant facilities and used for disposal and/or utilization shall be developed into a Sludge Management Plan. The Sludge Management Plan shall be prepared and submitted to the Regional Waste Manager for approval on or before **December 31, 1999**. The Sludge Management Plan shall be amended as required. Any changes or amendments to the Sludge Management Plan shall be included in the Annual Report.

4. REQUIREMENTS - RECLAIMED WASTEWATER IRRIGATION

4.1. Disinfection - Chlorination

- 4.1.1.** Disinfection shall be maintained in the reclaimed water discharged from the reclaimed water storage reservoirs to the irrigation system.
- 4.1.2.** Reclaimed water used for irrigation must have at least one hour of chlorine contact time at average flow rate. A chlorine residual of at least 1 mg/L must be maintained at all times, immediately prior to irrigating.
- 4.1.3.** Reclaimed water utilized for irrigation shall conform to the effluent irrigation guidelines developed by the B.C. Ministry of Health and Ministry of Environment, Lands and Parks. Fecal coliforms shall not exceed 200 MPN per 100 mL for agricultural, silvicultural and low public use lands, or exceed 2.2 MPN per 100 mL for high public use lands.

4.2. Annual Irrigation Period

- 4.2.1.** The authorized discharge period for irrigation using spray/trickle irrigation techniques is during the period **March 15 to November 15** each year.
- 4.2.2.** With the written authorization of the Regional Waste Manager, the irrigation schedule may be extended on a weekly basis beyond these limits. Any extension will be considered only upon receipt of a substantiated written request and submission of a soils assessment produced by a suitably qualified professional agrologist for those areas to receive irrigation.

4.3. Buffer Zones

- 4.3.1.** The requirement for formal buffer zones surrounding lands irrigated with reclaimed water is no longer in effect, however, buffer zones may be specified by the Regional Waste Manager.



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4.3.2. Reclaimed water applied by irrigation shall not be applied to the ground any closer than 15 metres from the edge of flowing streams or bodies of water.

4.3.3. There shall be no reclaimed water irrigated within 30 metres of any well or in-ground reservoir used for domestic supply purposes.

4.4. Surface Runoff

There shall be no surface runoff of irrigated reclaimed water from the irrigated lands.

4.5. Surfacing Reclaimed Water

Irrigation shall be managed in such a fashion as to preclude surfacing of irrigation tailwater downslope of the point of irrigation.

4.6. Spray Irrigation Drift

The following strategy shall be followed to minimize the necessity to shut down the irrigation system, or portions thereof, during windy conditions:

4.6.1. The reclaimed water irrigation system shall be managed in such a fashion as to preclude aerosol drift from leaving the irrigated lands.

4.7. Irrigation Rates

4.7.1. The general philosophy of the operation of the irrigation system shall be for beneficial utilization of reclaimed water, not disposal. This philosophy is necessary to prevent excessive irrigation and subsequent negative impact on the irrigated lands and lands downgradient of the irrigated lands.

4.7.2. Irrigation rates for spray irrigation shall not exceed the rates given in "B.C. Sprinkler Irrigation Manual", dated 1989, prepared by the B.C. Ministry of Agriculture and Fisheries.

4.7.3. Irrigation rates for trickle irrigation shall not exceed the rates given in "B.C. Trickle Irrigation Manual", dated 1987, prepared by the B.C. Ministry of Agriculture and Fisheries.

4.7.4. Irrigated lands shall be monitored to prevent saturation, erosion, surfacing tailwater, and instability both in the irrigated areas and downgradient of the irrigated lands.

4.8. Agricultural Products Lag Time

4.8.1. A three day lag time is required before uninspected livestock intended for human consumption are permitted on areas irrigated with reclaimed water. No lag time is required if livestock are subjected to the federal meat inspection program.



T.R. Forty, P.Eng.
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- 4.8.2. A six day lag time is required before dairy cattle are permitted in areas irrigated with reclaimed water.
- 4.8.3. A three day lag time, after irrigation has ceased, is required before a crop intended for animal feed is harvested.

5. MONITORING PROGRAMS

5.1. Wastewater Flow - Monitoring Program

5.1.1. Flow Measurement - Legion Beach Lift Station

Provide and maintain a suitable flow measuring device and **record once per day**, at the **Legion Beach lift station**, the water discharged to the sewage treatment facility over a 24-hour period. The EMS site reference number for this site is **E230277**.

5.1.2. Flow Measurement - Desert Park Lift Station

Provide and maintain a suitable flow measuring device and record once per day, at the **Desert Park Lift Station**, the water discharged to the sewage treatment facility over a 24-hour period. The EMS site reference number for this site is **E232882**.

5.2. Influent - Monitoring Program

5.2.1. Grab Sampling

Install and maintain a suitable sampling facility at the **headworks of the plant** and obtain a grab sample of the plant influent **semi-annually** (a proportional continuous sampler is desirable, but not mandatory). The EMS site reference number for this site is **E230037**.

5.2.2. Analyses

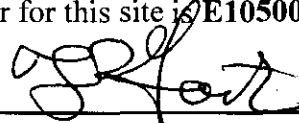
Obtain analyses of the influent sample for the following:

- (a) total phosphorus and ortho phosphorus, expressed as P in mg/L; and
- (b) 5-day biochemical oxygen demand, mg/L.

5.3. Effluent - Monitoring Program

5.3.1. Grab Sampling

The Town shall install and maintain a suitable sampling facility and obtain a grab sample of the effluent **from the aerated lagoons, after Cell #3 prior to storage**. The EMS site reference number for this site is **E105001**.



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5.3.2. Analyses

Obtain analyses of the sample for the following:

- a) 5-day biochemical oxygen demand, mg/L, **monthly**;
- b) total suspended solids (non-filterable residue), mg/L, **monthly**;
- c) total phosphorus, ortho phosphorus and total dissolved phosphorus, all expressed as mg/L P, **semi-annually**; and
- d) total nitrogen, ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, and organic nitrogen, all expressed as mg/L N, **semi-annually**.

5.3.3. Occasional full chemical analysis of the main cations and anions and other characteristics may be required at the discretion of the Regional Waste Manager.

5.4. Storage Reservoir - Monitoring Program

5.4.1. Water Levels

Provide and maintain suitable staff gauges or other similar devices, as approved by the Regional Waste Manager, **in the two (2) reclaimed water storage reservoirs**. Take **weekly measurements** of the water levels in the storage reservoirs on a year round basis. The EMS site reference numbers for the reservoirs are as follows:

Storage Reservoir #1 (older reservoir to south) - **E230038**

Storage Reservoir #2 (new reservoir to north) - **E230039**

5.4.2. Storage Volumes

Calculate and record the corresponding volumes of reclaimed water contained in each storage reservoir on a **weekly basis** for graphical analysis.

5.5. Irrigation - Monitoring Program

5.5.1. Flow Measurement

Provide and maintain a suitable flow measuring device and record, on a **weekly basis**, the **reclaimed water irrigation volumes**, location/area, property owner, irrigation type, duration, rate, and crop or other use. Submit the monthly and annual summaries to the Regional Waste Manager with the Annual Report.

5.5.2. Grab Sampling

The Town shall obtain a grab sample of the reclaimed water, **during the irrigation season, from the discharge end of the chlorine contact chamber**. The EMS site reference number is **E207444**.



T.R. Forty, P.Eng.
Assistant Regional Waste Manager

5.5.3. Analyses

Obtain analyses of the sample for the following:

- a) fecal coliforms MPN/100 ml, **monthly**;
- b) total coliforms MPN/100 ml, **monthly**;
- c) total phosphorus mg/L, **monthly**;
- d) total nitrogen, mg/L, **monthly**; and
- e) chlorine residual, mg/L, **weekly**.

5.6. Sludge - Monitoring Program

5.6.1. Sampling

Obtain a representative sample of the sludge produced at the treatment plant **once per year from the first aerated lagoon, Cell #1**. The EMS site reference number is **E230278**.

5.6.2. Analyses

Obtain analyses of the sludge sample for the following:

Total solids (TS), g/L;
Moisture content, %;
Volatile suspended solids (V.S.S), g/L;
Total Kjeldahl Nitrogen (T.K.N.), g/L and g/kg dry solids;
Aluminum, mg/kg;
Arsenic, mg/kg;
Cadmium, mg/kg;
Calcium, mg/kg;
Chromium, mg/kg;
Cobalt, mg/kg;
Copper, mg/kg;
Iron, mg/kg;
Manganese, mg/kg;
Mercury, mg/kg;
Molybdenum, mg/kg;
Nickel, mg/kg;
Lead, mg/kg;
Silver, mg/kg;
Sodium, mg/kg; and
Zinc, mg/kg.

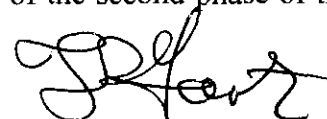


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- 5.6.3. Occasional full chemical analysis of the main cations and anions and other characteristics may be required at the discretion of the Regional Waste Manager.

5.7. Ground And Surface Water - Monitoring Program

- 5.7.1. A Ground and Surface Water Monitoring Program, shall be submitted to the Regional Waste Manager. The Monitoring Program shall be designed by a suitably qualified Professional Engineer (Hydrogeologist) or a Hydrogeological Technologist licensed to practice in the Province of British Columbia. The Monitoring Program is to establish with acceptable scientific accuracy, the groundwater flow pattern and nutrient removal capability of the soil to ensure reasonable notice of impending high phosphorus or nitrate levels that may adversely affect surface water, groundwater or domestic waterwells. The sampling, measurement frequency, water level elevations and analyses shall be conducted in accordance with the Monitoring Program upon its written authorization by the Regional Waste Manager.
- 5.7.2. The Monitoring Program will consist of two phases. The **first phase** will consist of an inventory of all existing ground and surface water monitoring sites. This inventory is to be completed and submitted to the Regional Waste Manager by **March 31, 1999**. The **second phase** of the program will assess and determine the most appropriate sites for monitoring; upgrade wells, if required; establish and install any additional new recommended monitoring sites; and submit the outline for Ground and Surface Water Monitoring Program. The second phase of the monitoring program is to be complete and submitted to the Regional Waste Manager by **December 31, 1999**.
- 5.7.3. The results of the Ground and Surface Water Monitoring Program is to be reviewed annually by a suitably qualified Professional Engineer (Hydrogeologist) or a Hydrogeological Technologist licensed to practice in the Province of British Columbia and any recommendations for changes to the Monitoring Program are to be included with the Annual Report each year.
- 5.7.4. The Ground and Surface Water Monitoring Program is to incorporate the existing EMS groundwater monitoring wells and the surface water monitoring sites that were previously monitored by the Ministry of Environment, Lands and Parks, or other agencies, and any proposed or future monitoring sites, as authorized by the Regional Waste Manager.
- 5.7.5. The Town shall provide precise latitude and longitude values, with an accuracy of at least plus or minus 10 metres, for each ground and surface water monitoring site established as part of the second phase of the Ground



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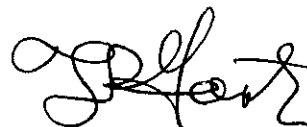
and Surface Water Monitoring Program, and for any additional sites that may be added each year. The data is to be submitted to the Regional Waste Manager with the Annual Report.

6. SAMPLING AND ANALYTICAL REQUIREMENTS

- 6.1. Proper care should be taken in sampling, storing and transporting the samples to adequately control temperature and avoid contamination, breakage, etc.
- 6.2. Occasional full chemical analysis of the main cations and anions and other characteristics may be required at the discretion of the Regional Waste Manager.
- 6.3. The Town is required to follow the terms and conditions of the Quality Assurance Regulation (EQDA), or other legislation that may be in effect at the time. Ten percent of the samples collected shall be duplicated to provide data quality assurance. Quality control information generated by the Permittee lab while analyzing parameters required by this Operational Certificate shall also be provided with the raw data required to be reported.
- 6.4. The sampling, flow and monitoring requirements specified in Section 8 (including all subsections) above shall be carried out in accordance with the appropriate procedures listed in the table below. Alternative test methods may be used provided that the alternative test methods are authorized by the Regional Waste Manager prior to performing the actual source testing. Test methods for parameters not listed below require the consent of the Regional Waste Manager.

LIQUID EFFLUENTS, SURFACE WATER, GROUND WATER, SOILS, SEDIMENTS, VEGETATIVE MATTER:		
Parameter	Source Testing Procedure	Analytical Procedure
Metals Nutrients Organics Toxicity	British Columbia Field Sampling Manual for Continuous Monitoring plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples, 1996 Permittee Edition	British Columbia Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials, March, 1994, Permittee Edition

The above manuals are available from Queen's Printer Publications Centre, P.O. Box 9452, Stn. Prov. Govt, Victoria, BC, V8W 9V7 (1-800-663-6105 or (250)387-4609). The above manuals are also available for inspection at all Pollution Prevention offices.



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Assistant Regional Waste Manager

7. REPORTING

7.1. General Reporting

- 7.1.1.** Maintain all monitoring data required for inspection by the Regional Waste Manager or his designate.
- 7.1.2.** The influent, effluent, spray/trickle reclaimed water irrigation, infiltration and sludge analyses and related flow data is to be submitted to the Regional Waste Manager such that they are received by the Regional Waste Manager within 30 days of the results being received, or produced, by the Town.
- 7.1.3.** Monitoring data shall be entered into EMS electronically and submitted in electronic and printed format satisfactory to the Regional Waste Manager.

7.2. Annual Reporting

- 7.2.1.** Submit an Annual Report which includes a summary of the results of all sampling and monitoring programs as specified in this Operational Certificate. Provide data interpretation and trend analyses where appropriate.
- 7.2.2.** The Annual Report is to be in a format which is suitable for review by the public and/or other government agencies.
- 7.2.3.** The Annual Report is due on or before 90 days following the end of a calendar year for that year's monitoring. Raw data, suitably tabulated, including the EDQA quality control information, are to be attached as appendices to the report.
- 7.2.4.** Maintain and submit records of the following, each year, which are to be part of the Annual Report:
 - 7.2.4.1.** Records of sewage flow to the aerated treatment lagoons as required under the Wastewater Flow - Monitoring Program.
 - 7.2.4.2.** Records of sewage treatment plant influent quality, as required under the Influent - Monitoring Program.
 - 7.2.4.3.** Records of effluent quality prior to the storage reservoirs as required in the Effluent - Monitoring Program.
 - 7.2.4.4.** Records of the elevations for both reclaimed water storage reservoirs and the corresponding annual storage volumes available, as required under the Storage Reservoir - Monitoring Program.
 - 7.2.4.5.** Records of the reclaimed water quality and volumes beneficially used, as well as, property location, owner, acreage, irrigation type,



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duration, rate, crop and intensity, or other use, where irrigation occurs, as required under the Irrigation - Monitoring Program.

- 7.2.4.6. Records of effluent quantity and quality for discharges to the infiltration facilities.
- 7.2.4.7. Records of sludge quality as per the Sludge - Monitoring Program.
- 7.2.4.8. Frequency of withdrawal and volumes for disposal and/or utilization, as required in the Sludge Management Plan.
- 7.2.4.9. Records of groundwater well elevations and ground and surface water quality, as required under the Ground and Surface Water - Monitoring Program.
- 7.2.4.10. Copy of the Annual Flow Summaries.
- 7.2.4.11. Copy of the Annual Irrigation Summaries.
- 7.2.4.12. Copy of monthly precipitation records for Osoyoos area (arrangements can be made to obtain precipitation information, contact Gary Myers, Climate Services, Environmental Canada, at 604-664-9067).



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Assistant Regional Waste Manager

APPENDIX A

Requirements of Reclaimed Wastewater Users

The holder of this Operational Certificate (The reclaimed wastewater supplier) shall be responsible for ensuring that contractual agreement(s) with each Reclaimed Wastewater User are in accordance with the Operational Certificate.

A copy of this Appendix is to be provided to EACH USER prior to the commencement of irrigation EACH YEAR.

8. GENERAL REQUIREMENTS

8.1. Plans - New Works - New Agricultural Areas

- 8.1.1. Plans for modifications and/or extensions to the reclaimed water irrigation system shall be approved by a person qualified in the design of irrigation systems and the Irrigation Plan and the Soils Assessment is to be submitted to the Regional Waste Manager for authorization prior to the commencement of irrigation on new agricultural areas.
- 8.1.2. Design and construct the irrigation works in accordance with best current agricultural practice and the "Pollution Control Guidelines for Municipal Effluent Application to Land", dated January 1983, and any amendments thereto, issued by the Ministry of Environment of British Columbia, and also in accordance with the "B.C. Sprinkler Irrigation Manual", dated 1989, prepared by the B.C. Ministry of Agriculture and Fisheries or the "B.C. Trickle Irrigation Manual", dated 1987, prepared by the B.C. Ministry of Agriculture and Fisheries.

8.2. Construction Criteria

- 8.2.1. All reclaimed water user valves, shall be of a type, or secured in a manner, that permits operation by only personnel authorized by each wastewater user. All piping, valves and outlets should be clearly marked to differentiate reclaimed wastewater from domestic water. All reclaimed wastewater controllers, valves, etc., shall be affixed with reclaimed water warning signs. It is recommended that, where possible purple coloured pipe and fixtures be utilized to facilitate identification of reclaimed water piping and fixtures.



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- 8.2.2. Use or installation of hose-bibs on any irrigation system presently operating, or designated to operate with reclaimed wastewater, regardless of the hose-bib construction or identification, is not permitted.
- 8.2.3. There shall be at least a 3 metre horizontal and a 0.3 metre vertical separation (with domestic water pipeline above the reclaimed water pipeline) between all pipelines transporting reclaimed water and those transporting domestic water.
- 8.2.4. There shall be no connection between a potable water supply, irrigation water or industrial well, and piping containing reclaimed wastewater, except through an air gap separation or reduced pressure principle device.

8.3. Fencing

The reclaimed water user **may be** required by the Regional Waste Manager to erect a fence around the disposal area to restrict public access. The height and type of fencing shall meet the approval of the Regional Waste Manager.

8.4. Signage

- 8.4.1. Prominent "NO TRESPASSING", signs shall be erected around agricultural and silvicultural sites irrigated with reclaimed water, warning persons of the possible health hazard during the irrigation season and advising that the water used for irrigation is NOT POTABLE. The wording shall be in language or symbols readily comprehensible by the general public. e.g. "NO TRESPASSING - RECLAIMED WASTEWATER - DO NOT DRINK"
- 8.4.2. Warning signs shall be posted in sufficient numbers and size and at strategic locations to advise the public that reclaimed water is being used. Additional signage may be required as directed by the Regional Waste Manager.

9. GENERAL REQUIREMENTS - RECLAIMED WASTEWATER IRRIGATION

9.1. Buffer Zones

- 9.1.1. The requirement for formal buffer zones surrounding lands irrigated with reclaimed water is no longer in effect, however, a buffer zone may be specified by the Regional Waste Manager.
- 9.1.2. Reclaimed water applied by irrigation shall not be applied to the ground any closer than 15 metres from the edge of flowing streams or bodies of water.
- 9.1.3. There shall be no reclaimed water irrigated within 30 metres of any well or in-ground reservoir for domestic supply.



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9.2. Surface Runoff

- 9.2.1. There shall be no surface runoff of irrigated reclaimed wastewater from the irrigated lands.
- 9.2.2. The maximum ground slope shall not exceed 20% without the written consent of the Regional Waste Manager.

9.3. Surfacing Reclaimed Water

- 9.3.1. Irrigation shall be managed in such a fashion as to preclude surfacing of irrigation tail water down slope of the point of irrigation.
- 9.3.2. Irrigation shall be managed as to prevent ponding.

9.4. Spray Irrigation Drift

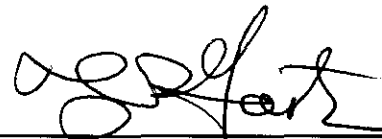
- 9.4.1. Reclaimed water shall be confined to the area designated and approved for irrigation with reclaimed water. The reclaimed water irrigation system shall be managed in such a fashion as to prevent aerosol drift from leaving the irrigated lands.
- 9.4.2. Precautions shall be taken to ensure that reclaimed water will not have contact with any facility or area not designated for reclamation, such as passing vehicles, buildings, domestic water facilities, fruit and vegetable gardens, or food handling facilities.
- 9.4.3. Drinking water facilities shall be protected from direct or wind blown reclaimed water spray.

9.5. Irrigation Rates

- 9.5.1. Irrigation rates for spray irrigation shall not exceed the rates given in "B.C. Sprinkler Irrigation Manual", dated 1989, prepared by the B.C. Ministry of Agriculture and Fisheries and irrigation rates for trickle irrigation shall not exceed the rates given in those given in "B.C. Trickle Irrigation Manual", dated 1987, prepared by the B.C. Ministry of Agriculture and Fisheries.
- 9.5.2. Soils of the irrigated lands will be monitored periodically or as otherwise directed by the Regional Waste Manager or the Town, to prevent saturation, erosion, and instability.

9.6. Agricultural Products Lag Time

- 9.6.1. A three day lag time is required before uninspected livestock intended for human consumption are permitted on areas irrigated with reclaimed water. No lag time is required if livestock are subjected to the federal meat inspection program.



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9.6.2. A six day lag time is required before dairy cattle are permitted in areas irrigated with reclaimed wastewater.

9.6.3. A three day lag time, after irrigation has ceased, is required before a crop intended for animal feed is harvested.

9.7. Insect and Vector Control

Adequate measures shall be taken to prevent the breeding of insects and other vectors of health significance, and the creation of odours, slimes or unsightly deposits.

9.8. Irrigation of Public Areas

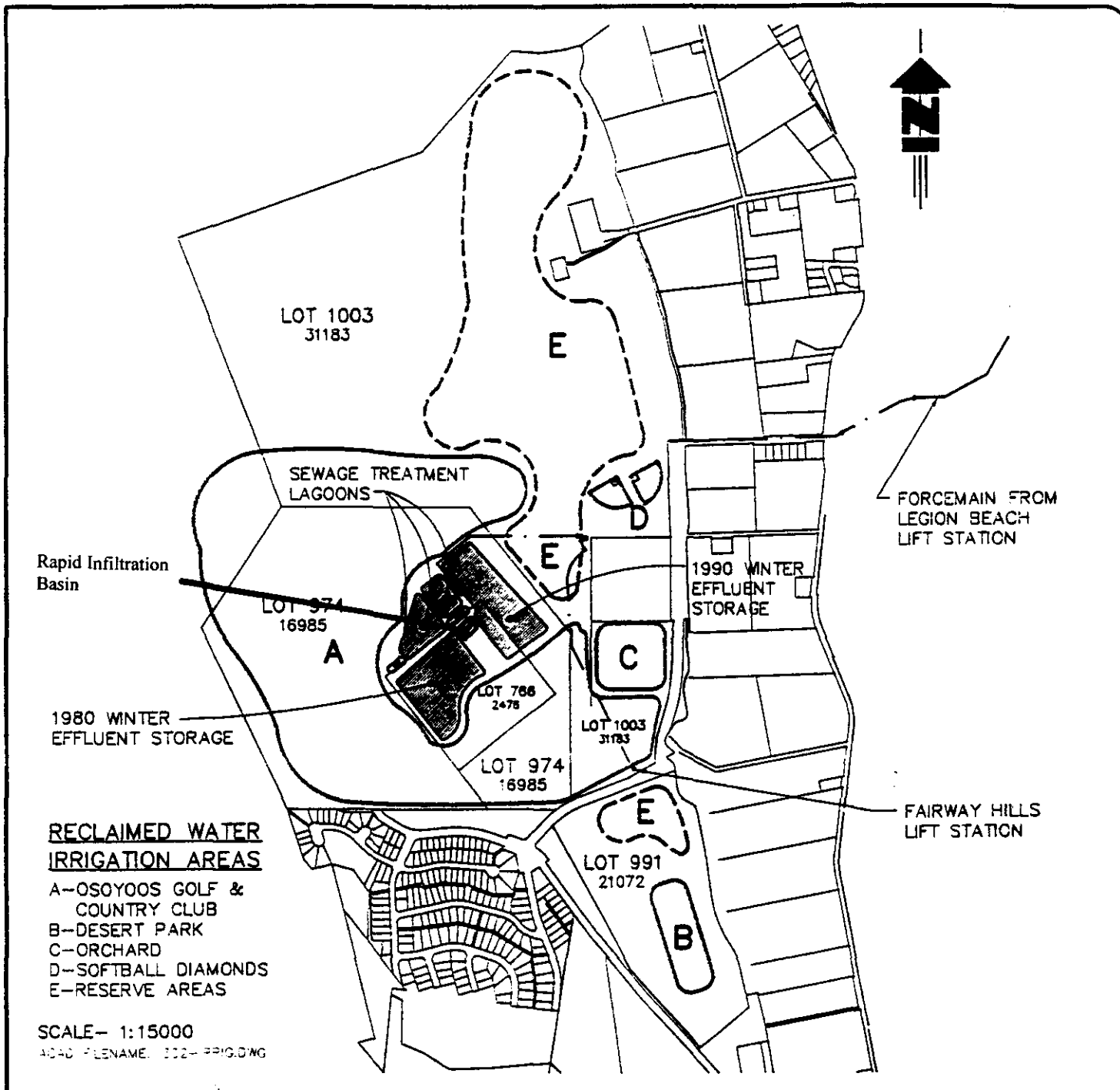
9.8.1. Irrigation on golf courses or cemeteries shall only be practised when the public are not present.

9.8.2. Golf score cards shall indicate that reclaimed water is used for irrigation on the golf course lands.

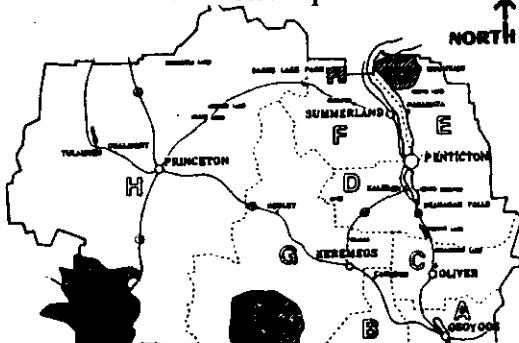


T.R. Forty, P.Eng.
Assistant Regional Waste Manager

SITE PLAN A



Location Map



Operational Certificate No.: ME-12214

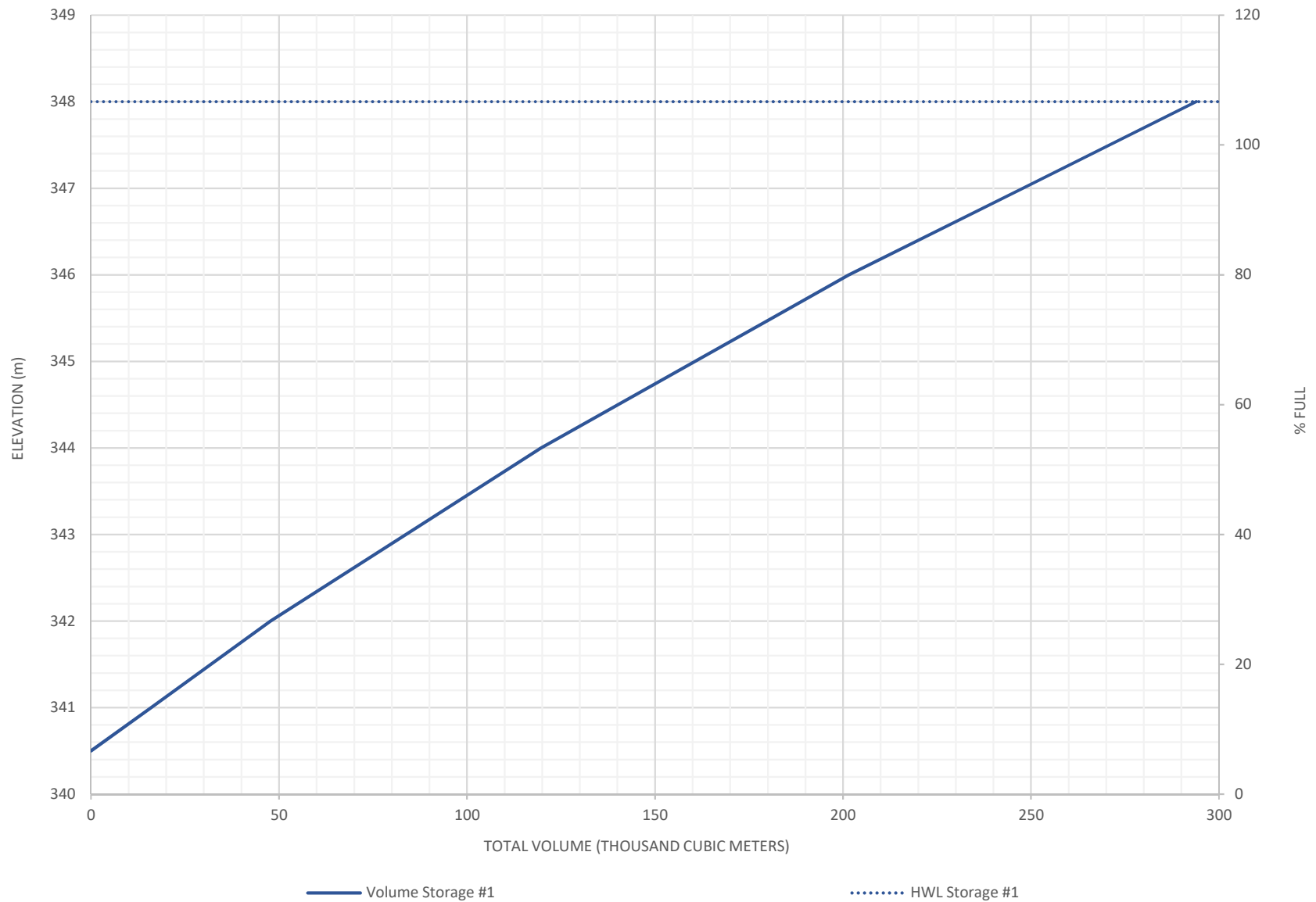
Date: December 18, 1998

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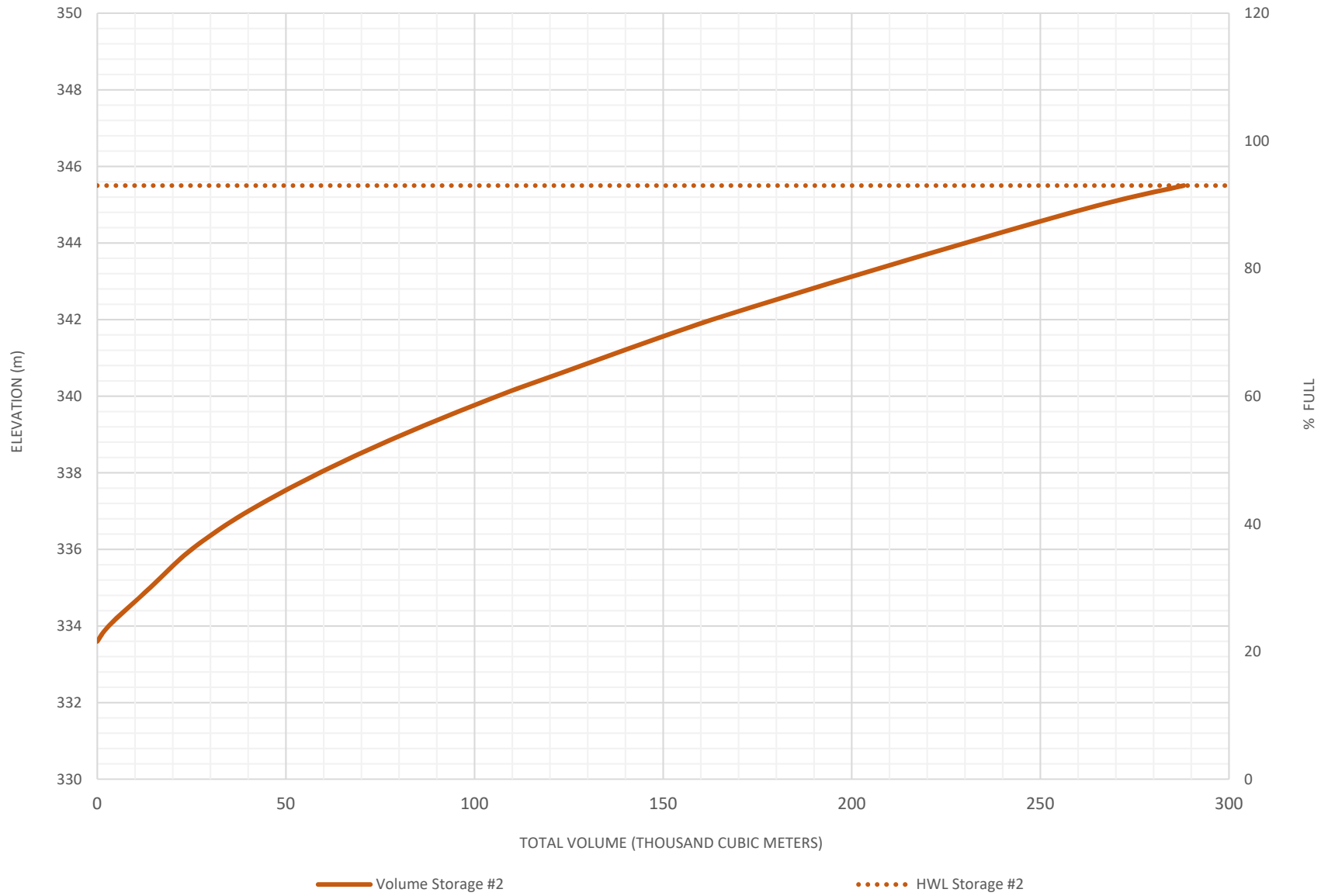
APPENDIX C

Winter Effluent Storage Lagoon Calibration Curves (OC 7.2.4.4)

EFFLUENT STORAGE CURVE
TOWN OF OSOYOOS
STORAGE #1

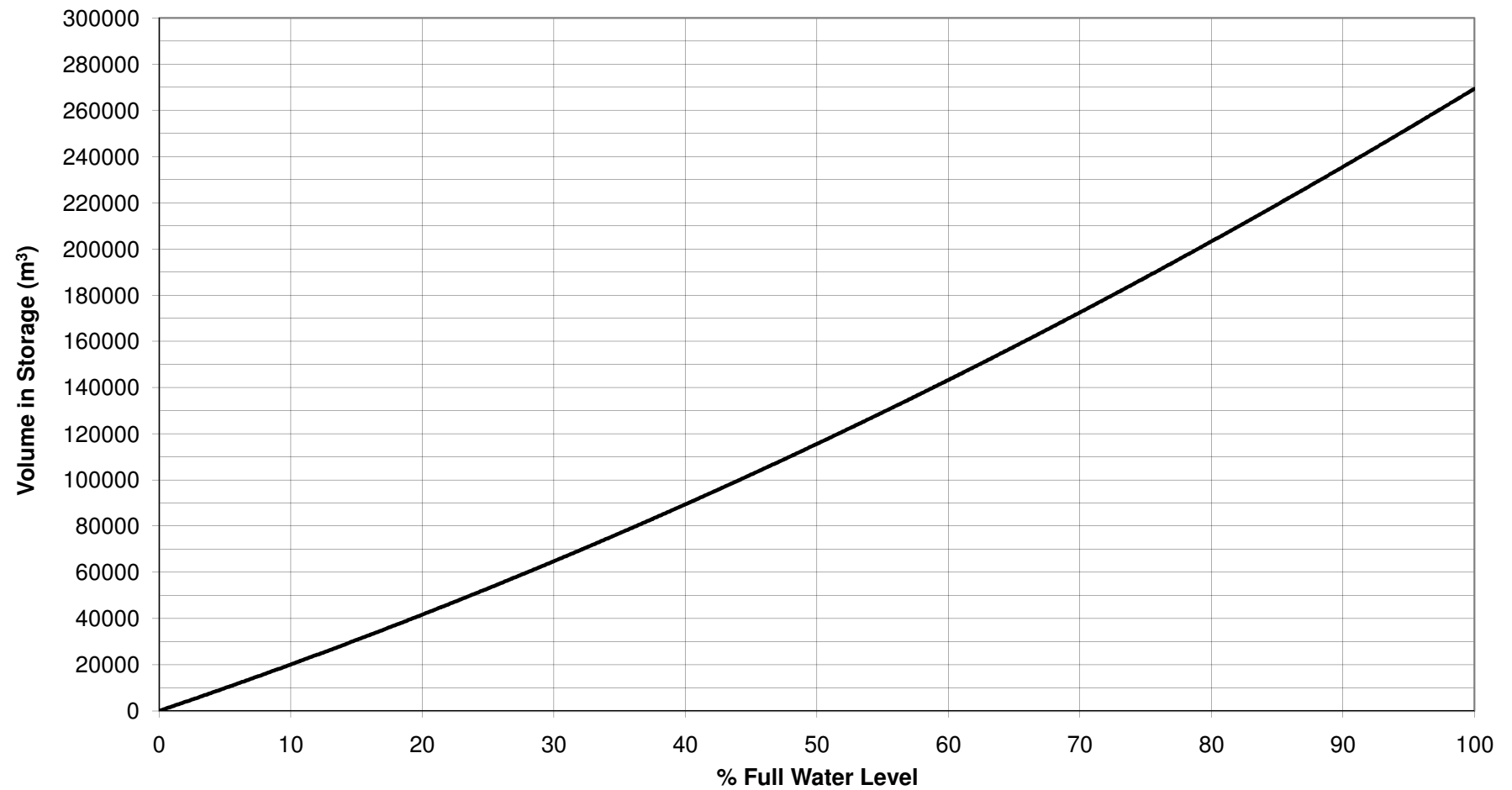


EFFLUENT STORAGE CURVE
TOWN OF OSOYOOS
STORAGE #2



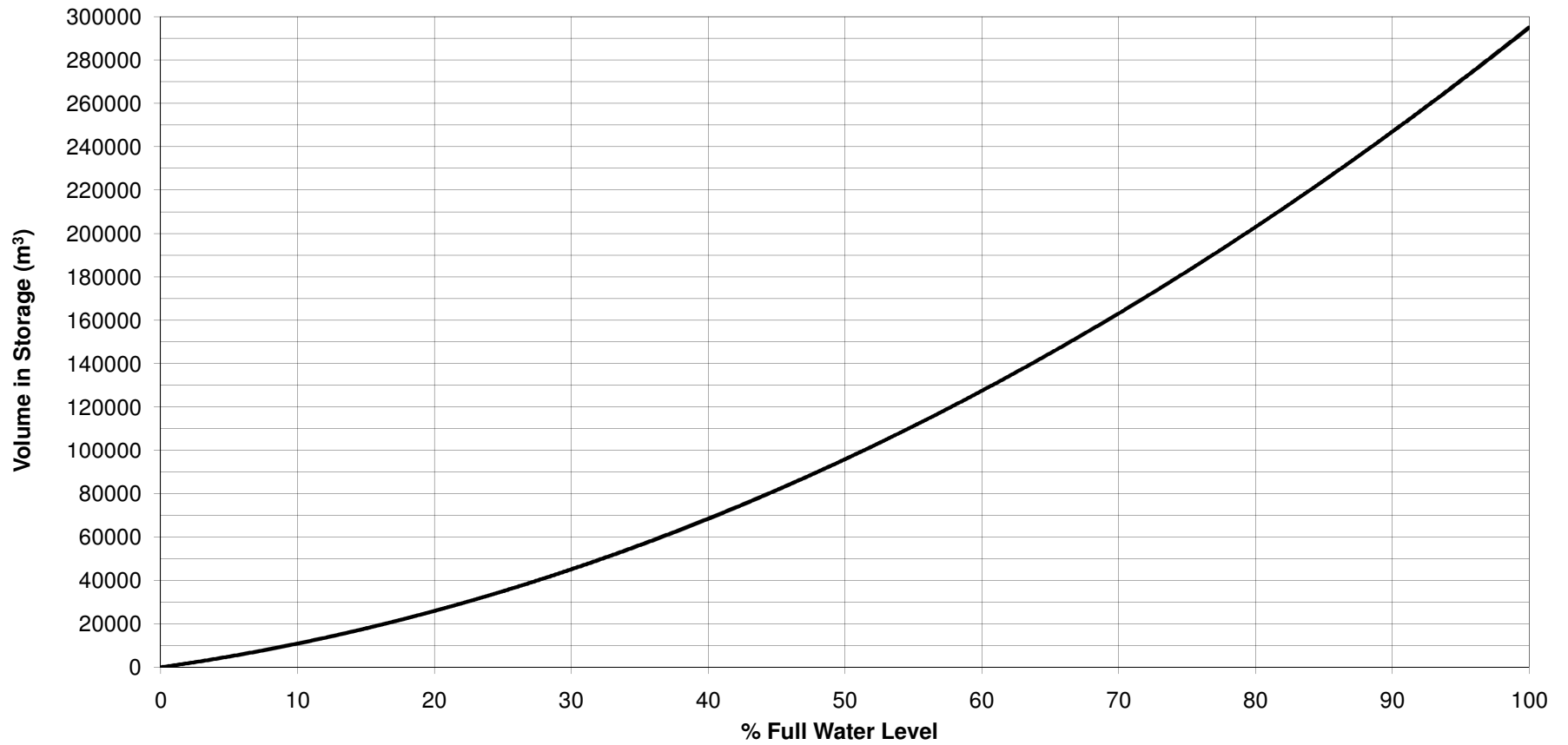
Winter Storage Lagoon #1 Calibration Curve

$$\text{vol} = 7.6499x^2 + 1928.6x$$



Winter Storage Lagoon # 2 Calibration Curve

$$\text{vol} = 20.646x^2 + 885.85x$$



APPENDIX D

Reclaimed Water Irrigation 2022 Total Flow Summary (OC 7.2.4.11)

High School Booster Pump Station

Inspection				Total Volume m3					Jockey Pump				Pump 1				Pump 2				Station							
Month	Date	Time	Operator	Total	MAIN METER	JOCKEY METER	Demand	LPS	Total Hours	Run Time	Ampls	Hz	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	Heater	Fan	Insulation	Clean	Antenna	Pressure Tanks	Security	Temp
March	4	13:40	KF																		Working		Winterized	Yes	Good	Not Leaking	Secure	16
March	8	1:25	DG																		Working		Winterized	Yes	Good	Not Leaking	Secure	14
March	15	8:35	KF																		Working		Winterized	Yes	Good	Not Leaking	Secure	15
March	29	9:40	DS	119092	119,092			5.3	2099	9.6	4	60	5846	0	0	0	3868	0	0	0	Working		Winterized	Yes	Good	Not Leaking	Secure	16
March	31	9:50	KF	119092	119,092			5.3	2147	9.8	4	60	5846	0	0	0	3868	0	0	0	Working		Winterized	Yes	Good	Not Leaking	Secure	16
April	1				119,092	0																						
April	5	9:30	KF	119092	119,092			5.3	2267	9.5	4	60	5846	0	0	0	3868	0	0	0	Working		Winterized	Yes	Good	Not Leaking	Secure	16
April	7	9:45	KF	119092	119,092			5.3	2315	9.7	4	60	5846	0	0	0	3868	0	0	0	Working		Winterized	Yes	Good	Not Leaking	Secure	16
May	1				119,092	0																						
May	4	13:39	DS	119092	119,092			0	2968	13.6	4	60	5846	0	0	0	3868	0	0	0	Working		Winterized	Yes	Good	Not Leaking	Secure	20
May	17	15:15	KF	119092	119,092			5.3	3282	15.1	4	69	5846				3868				Working		Winterized	Yes	Good	Not Leaking	Secure	19
May	31	1:40PM	DS	119092	119,092			5.3	3617	13.8	4.1	60	5846	0			3868	0			Working		Winterized	Yes	Good	Not Leaking	Secure	23
June	1				119,092	0																						
June	12	14:25	FZ	119092	119,092			5.2	3906	24	4	60	5846	0			3868	0						Yes	Good	Not Leaking	Secure	25
June	14	9:30	FZ	44454+119092	119,092	44,454		5.2	3949	24	4	60	5846	0			3868	0						Yes	Good	Not Leaking	Secure	23
June	30				127,832																							
July	1				128,378	46,403																						
July	2	12:00	KF	46518+128924	128,924	46,518		5.8	4096	0	0	0	6134	12	14	40	3868	0						Yes	Good	Not Leaking	Secure	31
July	5	9:05	KF	46518+131229	131,229	46,518		5.8	4096	0	0	0	6203	9	14	40	3868	0						Yes	Good	Not Leaking	Secure	28
July	12	10:45	FZ	46518+134369	134,369	46,518		5.9	4096	0			6373		14	40	3868	0						Yes	Good	Not Leaking	Secure	26
July	26	3:00PM	DS	141405	141,405			8.1	4096	0	0	0	6714	14	14	40	3868	0						Yes	Good	Not Leaking	Secure	33
August	1				149,446	46,519																						
August	2	1:10	DG	150786	150,786			10.3	4096	0	0	0	6880	13.1	15	40	3868	0	0	0		Working		No	Good	Not Leaking	Secure	31
August	9	10:55	KF	46520+160128	160,128	46,520		17.2	4096	0	0	0	7046	24	14	43	3868	0	0	0		Working		No	Good	Not Leaking	Secure	27
August	16	9:50	DS	15135	15,135			2.5	4131	5.4	2.6	44	7106	3.3	0	0	3898	0	0	0		Working		No	Good	Not Leaking	Secure	26
August	30	11:30	FZ	164226	164,226			5	4175	0	4.1	60	7149	0	0	0	3940	0	0	9		Working	Summerized	Yes	Good	Not Leaking	Secure	25
August	31	8:50AM	DS	47451+164226	164,226	47,451		0	4178	0	0	0	7149	0	0	0	3940	0	0	0		Working	Summerized	Yes	Good	Not Leaking	Secure	24
September	1				164,254	47,479																						
September	6	11:15	FZ	164424	164,424			0	4197	0	0	0	7160	0	0	0	3946	0	0	0		Working	Summerized	Yes	Good	Not Leaking	Secure	23
September	13	1:45	DS	47849+164733	164,733	47,849		0	4216	0	0	0	7178	0	0	0	3950	0	0	0		Working	Summerized	Yes	Good	Not Leaking	Secure	21
September	20	9:40	KF	47877+164767	164,747	47,877		0	4219	0	0	0	7181	0	0	0	3951	0	0	0		Working	Summerized	No	Good	Not Leaking	Secure	18
October	1				164,780	48,003																						
October	4	11:45AM	DS	48053+165205	165,205	48,053		0	4235	0	0	0	7182	0	0	0	3980	0	0	0		Working	Summerized	Yes	Good	Not Leaking	Secure	19
November	1	9:20AM	DS	48053+165205	165,205	48,053	0	0	4235	0	0	0	7182	0	0	0	3980	0	0	0				Yes	Good	Not Leaking	Secure	17
November	8	3:15	DG	48053+165205	165,205	48,053	0	0	4235	0	0	0	7182	0	0	0	3980	0	0	0	Working		Winterized	Yes	Good	Not Leaking	Secure	16
November	21	9:40	KF	48053+165205	165,205	48,053	0	0													Working		Winterized	Yes	Good	Not Leaking	Secure	17
November	29	11:10	KF	48053+165205	165,205	48,053	0	0													Working		Winterized	Yes	Good	Not Leaking	Secure	16
December	1				165,205	48,053																						
December	6	9:30	DS																		Working		Winterized	Yes	Good	Not Leaking	Secure	16
December	20	15:10	KF																		Working		Summerized	Yes	Good	Not Leaking	Secure	14

WWTF - Lagoons

Inspection						Storage			Discharge Total Volume m3						Inspection				Pump #1				Pump #2				Pump #3				Discharge		Air
Month	Date	Time	Op	Security	Temp	Pond 1 %	Pond 2 %	Contact Tank %	Desert Total	Demand	Meadow Total	Demand	Combined Total	Total Demand	Date	Time	Op	Security	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	PSI	GPM	Temp
January	18	1:35	DG	G		21	80.3	75.3	7.5	639820	0	568617	0	1208437	0				2116	0	Na	Na	1060	0	Na	Na	1118	0	Na	Na			
January	19	745	DG	G		22	88.3	75.5	7.5	639820	0	568617	0	1208437	0				2116				1060				1118						
January	21	11:20	DG	G		20	80.4	76.7	3 /		0 /		0 /	0					/		0		/		0		/		0				
January	24	10:35	FZ	G		18	80.4	78.1	2.3	639820	0	568617	0	1208437	0				/		0		/		0		/		0				
January	25	11:00	FZ	G		18	80.4	78.5	3.9	1	1.2	0	0	1	0				0	0			0	0			0	0					
January	26	10:40	FZ	G		20	80.4	79	4.3	1	0	0	0	1	0				0	0			0	0			0	0					
January	27	11:40	DG	G		17	80.4	79.4	4.3	1	0	0	0	1	0				0	0			0	0	0	0	0	0	0	0	0	0	
January	28	12:50	DS	G		15	80.3	80	2.2	1	0	0	0	1	0				0	0	/	/	0	0	/	/	0	0	/	/			
January	31	13:20	KF	G		19	80.3	81.3	5.6	1	0	0	0	1	0				0	0	/	/	0	0	/	/	0	0	/	/			

WWTF - Lagoons

[illegible]

WWTF - Lagoons

Inspection					Storage			Discharge Total Volume m3						Pump #1				Pump #2				Pump #3				Discharge		Air	
Month	Date	Time	Op	Security	Pond 1 %	Pond 2 %	Contact Tank %	Desert M3	Demand	Meadow M3	Demand	Combined M3	Total M3	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	PSI	GPM	Temp	
March	1	9:40	FZ	Secure	80.3	93.3	0.6	1	0	0	0	0	1	0	0	33	60	0	0	34	60	0	0	35	60	29			
March	2	13:20	FZ	Secure	80.3	93.8	0.4	1	0	0	0	0	1	0	0.06			0	0.06			0	0.07						
March	4	12:55	KF	Secure	81	94.2	74.2	76	74.4	0	0	74.4	76	2	1.29			0				0	0.04						
March	7	11:20	FZ	Secure	82.6	92.9	40.8	205	0	0	0	0	205	2	0			0	0			0	0						
March	8	11:35	DG	Secure	83.1	93.5	83.6	626	421	0	0	421	626	3	1			1	1			0	0			23			
March	9	10:45	KF	Secure	83.6	93.3	82.2	1019	406.4	0	0	406.4	1019	4	1			1	0			0	0			27			
March	10	7:40	DS	Secure	84	93.2	81	1371	406.3	1	0.7	407	1372	5	0.86			1	0			0	0			23		-6	
March	11	11:05	DS	Secure	84.6	92.9	84.9	1846	407.9	4	1.9	409.8	1850	6	0.7			1	0			0	0			20		5	
March	14	13:45	KF	Secure	86.4	92.9	81.8	3104	412.3	12	2.4	414.7	3116	8	0.71			1	0			0	0			17		13	
March	15	8:15	KF	Secure	86.9	92.1	87.5	3422	412.9	13	1.6	414.5	3435	9	0.85			1	0			0	0			27		7	
March	16	10:45	FZ	Secure	87.6	92.8	84.8	3883	414.4	14	1.1	415.5	3897	10	0.85			1	0			0	0			17		8	
March	17	10:45	FZ	Secure	88.2	92.4	82.3	4345	439.9	14	0.5	440.4	4359	11	0.86			1	0			0	0						
March	18	9:00	FZ	Secure	88.7	92.2	83.4	332	187.7	0	0	187.7	187.7	0	0.21			0	0.01			0	0			17		4	
March	21	2:30	DG	Secure	89.6	92.7	85.3	2203	464.3	0	0	464.3	464.3	4	0.99			0	0			0	0						
March	22	2:15	DG	Secure	89.3	93	80.4	3141	1142.6	0	0	1142.6	3142	7	2.49			0	0			0	0			24		19	
March	24	1:40	DG	Secure	73.5	95	86.3	6744	1873	155	5.4	1878.4	6899	15	4.16			0	0			0	0						
March	25	11:00	DS	Secure	86.9	92.7	77.2	9280	2640	161	6	2646	9441	20	5.81			0	0			0	0			25		10	
March	28	10:55	DS	Secure	88.6	92	78.4	13543	1688	2356	274	1962	15899	34	4.5			0	0			0	0			25		13	
March	29	8:40	DS	Secure	89.1	91.9	81.2	14370	1611	2613	334	1945	16983	37	4.4			0	0			0	0			18		8	
March	30	9:20	DG	Secure	87.4	91.8	79.3	17033	2065	4560	1080	3145	21593	46	9			0	0			0	0						
March	31	11:30	KF	Secure	86.9	93.6	78.2	17953	1314	4887	1091	2405	22840	49	3	32	60	0	0			0	0			29		12	

WWTF - Lagoons

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WWTF - Lagoons

[illegible]

WWTF - Lagoons

Inspection					Storage			Discharge Total Volume m3						Pump #1				Pump #2				Pump #3				Discharge		Air
Month	Date	Time	Op	Security	Pond 1 %	Pond 2 %	Contact Tank %	Desert M3	Demand	Meadow M3	Demand	Combined M3	Total M3	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	PSI	GPM	Temp
June	1	11:30AM	DS	Secure	74.7	87.6	86	108820	230	71505	300	530	180325	23	0.61	0	0	122	0	0	0	11	1.17	0	0	23	0	22
June	2	11:15	KF	Secure	73.1	84.8	79	111095	1863	73657	1349	3212	184752	25	0.22			122				17	6.03					22
June	3	8:45	FZ	Secure	71.7	84.3	81	113469	2234	75602	2092	4326	189071	33	7.3	0	0	122	0	0	0	17	1.05	0	0	19	0	17
June	6	9:00	DG	Secure	71.2	88.6	78.5	113919	48	75712	107			36	1.02	0	0	122	0	0	0	17	0	0	0			
June	7	9:00	FZ	Secure	70.8	90.1	87.8	114179	221	75724	15	236	189903	38	1.25	0	0	122	0	0	0	17	0	0	0	0	0	17
June	9	13:35	KF	Secure	68.5	89.3	80.3	116835	1468	79102	1848	3316	195937	50	6.37			123	0.6			17	0					
June	10	14:30	FZ	Secure	68.2	92.4	78.9	117327	492	79102	0	492	196429	52	5.77			123	0			17	0			0	21	
June	12	13:50	FZ	Secure	65.7	93.3	82.9	120546	3219	82195	3093	6312	202741	63	5.75			125	1.18			17	0			23	0	25
June	13	8:15	FZ	Secure	64.1	91	83.1	122658	2112	84691	2496	4608	207349	72	5.92			126	0.46			17	0			0	13	
June	14	8:40	FZ	Secure	64.9	91.3	81.6	122662	713	84691	1023	1736	207353	73	3.83			126	0			17	0			18	0	13
June	15	9:00	DS	Secure	65.6	91.9	80.9	122662	7	84691	14	21	207353	73	0.8			126	0			17	0			23	0	15
June	16	8:00	DS	Secure	66.3	86.7	76.6	124897	1409	87093	1332	2741	211990	82	5.68			126	0			17	0			22	270	14
June	17	11:00	KF	Secure	67.2	89.8	84.3	125164	949.6	87227	1201.4	2151	212391	84	4.65			126	0			17	0			23	0	16
June	18	10:30AM	DS	Secure	68.9	89.6	83	125164	0	87233	12.5	12.5	212397	84	0			126	0			19	0.78			22	0	14
June	20	8:40	DG	Secure	69.7	89.9	87	125164	0	87233	114.6	114.6	212397	84	0			126	0			20	0.98			19	0	
June	21	2:30	DG	Secure	70.7	91.2	8.8	125268	2	87393	154.2	156.2		84	0			126	0			22	1.29					
June	22	15:30	KF	Secure	71.5	92.2	86.8	125759	414.1	87673	349.2	763.3	213432	84	0			126	0			25	2.64					
June	23	10:40	DG	Secure	72.1	84.5	76.5	128457	1781.9	9098	1788.7			84	0			128	1.84			35	6.64					
June	24	9:15	DG	Secure	72.8	82.5	87.9	1315598	2922	93857	3274			84	0			131	2.43			46	10.93			24	0	25
June	26	2:00	DG	Secure	74.3	85.1	84	136242	2786	98949	2726			90	2.93			150	10.2			46	0					
June	27	1:00PM	DS	Secure	75	82.9	83.9	138656	2082	101907	2398	4480	240563	92	1.35			160	8.72			46	0			23	0	31
June	28	11:20PM	DS	Secure	75.8	77.1	83.1	141117	2705	105035	3341	6046	246152	95	3.22			170	10.99			46	0			0	24	
June	29	10:45AM	DS	Secure	76.5	79	87.7	142888	2049	105060	1250	3299	247948	95	0.53			175	7.24			46	0			17	0	21
June	30	1:00	DG	Secure	77.2	77	77.9	146182	2450	107705	1499	3949	253887	99	2.87			186	7.7			46	0			22	0	27

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Inspection					Storage			Discharge Total Volume m3						Pump #1				Pump #2				Pump #3				Discharge		Air
Month	Date	Time	Op	Security	Pond 1 %	Pond 2 %	Contact Tank %	Desert M3	Demand	Meadow M3	Demand	Combined M3	Total M3	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	PSI	GPM	Temp
July	2	11:30	KF	Secure	78.9	73.5	81	151549	2818.5	113051	2658	5476.5	264600	107	4.46	0	0	206	10			46	0			23		21
July	4	11:25	DS	Secure	80.8	69.8	78	155595	2102.8	117303	2116.4	4219.2	272898	113	2.52	0	0	223	8.44			46	0			23		21
July	5	8:25	KF	Secure	81.9	70.7	79	155907	849	117303	629.5	1478.5	273210	113	0	0	0	226	4.21			46	0			21		16
July	6	11:30	FZ	Secure	83	71.4	85.4	156219	667.7	117557	22.8	690.5	273776	113	0	0	0	229	2.72			46	0					18
July	7	10:45	FZ	Secure	83.8	70.2	79.5	156998	778.7	118652	1052.7	1831.4	275650	113	0			234	4.64			46	0			15		23
July	8	9:25	FZ	Secure	84.8	69.7	80.1	157906	922.2	118653	464.2	1386.4	276559	113	0			238	4.14			46	0			21		21
July	10	11:15	FZ	Secure	86.6	70.7	83.9	158555	658.9	118841	197.6	856.5	277396	113	0			244	3.1			46	0					26
July	11	11:30	FZ	Secure	87.4	68	80.7	159145	769.9	121598	1518.8	2288.7	280743	113	0			253	5.8			46	0			18		27
July	12	8:35	FZ	Secure	88.1	60.7	76.5	161933	2210.1	124817	2811.5	5021.6	286750	120	3.92			263	9.68			46	0			18		23
July	13	13:30	FZ	Secure	88.9	65.8	81.3	165164	3022	126814	3202.5	6224.5	291978	124	6.8			275	11.3			46						31
July	14	10:50AM	DS	Secure	89.6	59.8	76.4	168132	3325	129364	1849.1	5174.1	297496	129	3.68			286	10.58			46	0					25
July	15	11:30	DG	Secure	77	59.9	866	171159	3144	131967	2670	5814	303126	135	5.21			297	11.15			46	0					
July	18	1:20PM	DS	Secure	84.1	63.3	81	179054	2928	140136	2858	5786	319190	139	0.95			327	10.63			46	0			24		28
July	19	10:55AM	DS	Secure	82.6	64.1	78.2	181224	2816	142196	2971	5787	323420	141	1.94			335	10.2			46	0			24		26
July	20	1:25PM	DS	Secure	80.8	67.3	85.7	183513	2323.5	144072	2059	4382.5	327585	142	1.28			343	8.25			46	0					33
July	21	8:15	FZ	Secure	78.7	62.9	80.8	186471	2314.5	147278	2682	5023.5	333749	144	1.28			353	7.89			46	0					21
July	23	10:30	KF	Secure	74.5	65.9	88.3	191741	2399.2	152542	2401	4800.2	344283	148	2.01			374	8.69			46	0					27
July	24	10:35	KF	Secure	72.6	66.7	78.7	194460	3091	154870	2838	5929	349330	149	1.55			383	10.75			46	0			21		27
July	25	8:20AM	DS	Secure	70.7	66.4	86.4	196894	2706	157146	2421	5127	354040	150	0.95			393	9.92			46	0			22		25
July	26	2:40PM	DS	Secure	68.2	70.9	79.7	199947	2737	159933	2582	5319	359880	152	1.87			405	10.06			46	0			22		37
July	27	13:15	KF	Secure	66.1	71.5	76.7	202704	3167	162166	2763	5930	364870	155	2.31			414	11.06			46	0					36
July	28	9:20	FZ	Secure	64	70	88.2	205689	2846.8	164319	2281.4	5128.2	370008	157	2.1			424	9.8			46	0					29
July	29	11:30	DS	Secure	61.9	71.5	76.7	208440	3122.6	166747	2263.6	5386.2	375187	159	2.59			434	10.23			46	0			22		33
July	31	11:00AM	DS	Secure	57.3	72.5	84.6	213834	2752.9	172098	2711.9	5464.8	385932	164	3.08			455	10.02			46	0			22		32
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Inspection					Storage			Discharge Total Volume m3						Pump #1				Pump #2				Pump #3				Discharge		Air
Month	Date	Time	Op	Security	Pond 1 %	Pond 2 %	Contact Tank %	Desert M3	Demand	Meadow M3	Demand	Combined M3	Total M3	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	PSI	GPM	Temp
August	2	87	DG	Secure	53	74.6	84.9	218776	2683	176738	2418	5101	395514	169	2.77			475	10.37			46	0			21		32
August	3	0.4583	FZ	Secure	50.6	75.3	87	221454	2685.8	179223	2333.4	5019.2	400677	171	2.87			486	9.92			46	0					29
August	5	8:30	DG	Secure	52.3	72.3	71.6	226504	2335.1	184223	2646.3	4981.4	410727	176	2.22			506	10.21			46	0			21		26
August	7	9:10	FZ	Secure	54.1	69.2	84.8	231317	2335.4	188233	2173.6	4509	419550	179	1.65			526	10.13			46	0					22
August	8	10:30	KF	Secure	55.1	67.8	79.5	233043	2089	190627	2199.3	4288.3	423670	181	0.93			536	9.9			46	0					26
August	9	9:15	KF	Secure	56	65.7	84.4	236084	2031	193659	2450.3	4481.3	429743	187	3.95			548	9.63			46	0			26		24
August	10	11:25	DG	Secure	57	64	76	239213	3045	195617	3097	6142	434830	190	6.06			559	12.11			46	0					
August	12	8:00	DG	Secure	58.7	55.9	84.2	242837	2113	201313	2925	5038	444150	195	2.88			577	9.62			46	0					
August	15	9:25AM	DS	Secure	61.3	56.9	88.7	3179	1732	2980	1631	3363	6159	2	1.21			13	7.16			0	0			19		23
August	16	9:20	DS	Secure	62.2	55.1	81.8	5915	3058	5753	2964	6022	11668	8	4.12			23	11.89			0	0			17		25
August	17	1:15PM	DS	Secure	63.1	53.2	87.4	8885	2870	8531	2779	5649	14180	13	5.9			34	10.23			0	0			17	10.23	34
August	18	9:00AM	DS	Secure	63.8	51.6	89.4	11222	2825	11119	2759	5584	22341	17	4.56			43	10.11	35	60	0	0			29	0	26
August	19	13:45	KF	Secure	64.9	49.9	87.9	13654	2396	13371	2617	5013	27025	23	5.13			52	9.24			0	0					33
August	20	9:30	KF	Secure	65.7	49	82.1	15750	2399	15438	2178	4577	31188	28	5.67			59	8.54			0	0					23
August	21	9:40	KF	Secure	66.6	48.2	84.8	16165	672	15580	624	1296	31745	28	1			61	3.26			0	0					24
August	22	10:45	DS	Secure	64.4	49.3	86.8	18458	1644	18237	1610	3254	36695	28	0			70	6.3			0	0			24		26
August	25	11:00	DS	Secure	60.3	51.8	86.9	24465	3027	23202	2653	5680	47667	31	0.96			90	9.79			0	0			23	0	27
August	26	9:00AM	DS	Secure	58.9	52.5	82.2	26406	2834	25001	2228	5062	51407	32	1.87			97	8.91			0	0			23	0	23
August	28	11:55	FZ	Secure	56.3	54.2	89.1	29825	1769	27905	1554	3323	57730	34	1.12			109	5.87			0	0					23
August	29	9:15	DZ	Secure	55.3	54.9	90.2	31992	2785	27984	1444	4229	59976	34	1.01			113	7.96			0	0			22	0	19
August	30	9:20	FZ	Secure	54.1	55.7	86.3	32747	1235	30782	1690	2925	63529	34	0			120	5.61			0	0			0	0	21
August	31	7:45AM	DS	Secure	52.2	56.4	82.6	35551	1997	33205	2610	4607	68756	36	0.88			129	8.02			0	0			24	0	20

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Inspection					Storage			Discharge Total Volume m3					Pump #1				Pump #2				Pump #3				Discharge		Air	
Month	Date	Time	Op	Security	Pond 1 %	Pond 2 %	Contact Tank %	Desert M3	Demand	Meadow M3	Demand	Combined M3	Total M3	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	PSI	GPM	Temp
September	1	11:25AM	DS	Secure	51.6	57.2	81.9	36110	1470	34463	2031	3501	70573	36	0.8			132	6.2	0	0	0	0	0	0	24	0	29
September	4	8:00	DG	Secure	47.2	59.2	83.4	41794	5684	39982	5519	144042	81776	40	0.9	0	0	152	3.77	0	0	0	0	0	0			
September	6	8:40	FZ	Secure	44.8	60.7	87.5	44584	1141	43008	1513	2654	87592	41	0.79	0	0	163	4.83	0	0	0	0	0	0	21	0	17
September	7	2:30	DS	Secure	42.5	61.5	86.5	47785	1827	46024	1569	3396	93809	43	1.05	0	0	174	6.04	0	0	0	0	0	0	21	0	26
September	8	9:20	DS	Secure	42.2	62.1	90	48082	1814	46042	1483	3297	94124	43	1.1	0	0	175	5.88	0	0	0	0	0	0	20	0	19
September	9	9:10AM	DS	Secure	40	62.6	85	50925	1726	49076	1567	3293	100001	45	1.38	0	0	185	5.88	0	0	0	0	0	0	20	0	19
September	11	11:35AM	DS	Secure	41.8	60.7	83.3	53997	1746	52386	1648	3394	106383	50	2.63	0	0	196	5.98	0	0	0	0	0	0	20	0	17
September	12	11:45	KF	Secure	42.6	60.6	80.4	53997	1139	52387	1447	2586	106384	50	1.61	0	0	196	4.8	0	0	0	0	0	0			18
September	13	12:55	DS	Secure	43.5	60.5	84.3	54348	197	52406	41	238	106754	50	0	0	0	198	0.85	0	0	0	0	0	0	21	0	22
September	14	14:30	FZ	Secure	44.4	60.3	83.6	54974	487	52488	95	582	107462	50	0	0	0	199	1.41	0	0	0	0	0	0			23
September	15	15:15	FZ	Secure	45.2	60	81.3	55669	562	52688	18	580	108357	50	0	0	0	201	1.43	0	0	0	0	0	0			24
September	16	9:10	DS	Secure	45.8	59.7	89.9	56250	750	52741	196	946	108991	50	0	0	0	203	2.28	0	0	0	0	0	0	18	0	17
September	18	9:40	KF	Secure	47.3	56.1	90.1	62060	2754	58605	2692	5446	120665	59	4.21	0	0	224	9.62	0	0	0	0	0	0			16
September	20	9:15	KF	Secure	48.7	54.1	85.1	65190	2069	61240	1517	3586	126430	64	3.45	0	0	234	6.14	0	0	0	0	0	0	16	0	14
September	21	8:10	KF	Secure	49.4	53.8	90	65922	1369	61242	1132	2501	127164	64	1.99	0	0	236	4.61	0	0	0	0	0	0			10
September	22	11:45	KF	Secure	50.2	51.8	82	69433	2206	64189	1530	3736	133622	71	4	0	0	247	6.77	0	0	0	0	0	0			18
September	23	11:45	KF	Secure	50.9	50.2	82.9	71841	3286	66517	3017	6303	138358	76	7.25	0	0	256	10.98	0	0	0	0	0	0			18
September	25	9:45	FZ	Secure	52.3	49.6	83	73617	754	66517	10	764	140134	76	0	0	0	259	1.92	0	0	0	0	0	0			17
September	26	10:50AM	DS	Secure	53.1	47.5	82.1	76948	1976	69744	1556	3532	146692	83	4.12	0	0	271	6.7	0	0	0	0	0	0	20		18
September	27	13:45	KF	Secure	53.9	46.7	85.7	77938	1905	70906	2614	4519	148844	83	3.1	0	0	276	8.71	0	0	0	0	0	0	20		25
September	28	14:55	FZ	Secure	54.7	46	81.7	79840	1619	71038	279	1898	150878	83	0	0	0	280	5.1	0	0	0	0	0	0			24
September	29	13:45	KF	Secure	55.4	45.4	90	80527	675	71980	1023	1698	152507	83	0	0	0	284	3.79	0	0	0	0	0	0			22
September	30	10:35AM	DS	Secure	56	44.9	84.8	82077	1337	71991	58	1395	154068	83	0	0	0	288	3.58	0	0	0	0	0	0	20		18
October	2	8:45AM	DS	Secure	57.4	42.6	81.2	86003	1576	74850	1380	2956	160853	90	3.33	0	0	300	5.68	0	0	0	0	0	0	20		12

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Inspection					Storage			Discharge Total Volume m3						Pump #1				Pump #2				Pump #3				Discharge		Air
Month	Date	Time	Op	Security	Pond 1 %	Pond 2 %	Contact Tank %	Desert M3	Demand	Meadow M3	Demand	Combined M3	Total M3	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	Total Hours	Run Time	Amps	Hz	PSI	GPM	Temp
October	3	8:55AM	DS	Secure	58.1	40.3	90	89133	1950	77940	1515	3465	167073	98	4.42	0	0	311	6.48	0	0	0	0	0	0			12
October	4	9:15AM	DS	Secure	58	40.9	89.2	90015	1743	78058	1704	3447	168073	98	2.95	0	0	313	6.53	0	0	0	0	0	0			12
October	5	9:30AM	DS	Secure	57.7	41.6	86.7	90895	692	78176	7	699	169071	98	0	0	0	314	1.59	0	0	0	0	0	0			14
October	6	1:00	DG	Secure	57.4	42.4	89.3	91670	522	78188	141	663	169858	98	0	0	0	316	1.17	0	0	0	0	0	0			
October	7	11:15	KF	Secure	55.2	43	90.2	95033	2055	81359	1579	3634	176392	100	1.14	0	0	326	6.22	0	0	0	0	0	0			18
October	10	10:10	DG	Secure	54.1	45.1	86.9	97441	511	82685	346	857	180126	100	0	0	0	332	1.53	0	0	0	0	0	0			
October	11	2:40PM	DS	Secure	51.8	46	80.9	100993	2076	85549	1588	3664	186542	102	1.32	0	0	343	6.4	0	0	0	0	0	0	24		22
October	12	9:15AM	DS	Secure	51.5	46.5	83.1	101713	1890	85557	1477	3367	187270	102	0.93	0	0	344	6.05	0	0	0	0	0	0	24		13
October	13	7:55	DG	Secure	49.2	47.9	85.3	105172	192	88775	1556	1748	193947	102	0	0	0	356	5.46	0	0	0	0	0	0			
October	16	8:40	KF	Secure	46.5	49.2	87.1	109052	2225	92560	1858	4083	201612	105	1.99	0	0	369	6.9	0	0	0	0	0	0			7
October	17	11:10AM	DS	Secure	44.3	49.9	84.6	112011	2506	95803	3803	6309	207814	105	1.34	0	0	380	11.09	0	0	0	0	0	0	24		13
October	18	14:55	DG	Secure	43.9	50.7	89.3	112977	1432	95825	1385	2817	208802	107	0.64	0	0	380	4.39	0	0	0	0.16	0	0			
October	19	10:45	DG	Secure	43.7	51.3	90	113738	669	95825	10	669	209563	108	1.6	0	0	380	0	0	0	0	0	0	0			
October	20	8:45AM	DS	Secure	43.4	51.9	84.3	114580	681	95825	18.5	699.5	210405	110	1.29	0	0	380	0	0	0	0	0	0	0	21		9
October	21	11:20	DG	Secure	43.1	52.5	81.1	115516	712	95834	23	735	211350	110	0.63	0	0	380	0	0	0	2	0.79	0	0			
October	22	13:00	FZ	Secure	42.8	53.2	83.1	116427	669	95834	34.8	703.8	212261	110	0	0	0	380	0	0	0	3	1.51	0	0			13
October	24	11:50	KF	Secure	41.7	54.3	87.2	119065	1735	95916	15.2	1750.2	214981	110	0	0	0	380	0	0	0	8	3.43	0	0			11
October	25	14:50	KF	Secure		54.9	90	119833	524	95916	89.5	613.5	215749	110	0	0	0	380	0	0	0	9	1.22	0	0			13
October	28	10:55AM	DS	Secure	41	56.6	83.5	121755	448	95916	0	448	217671	110	0	0	0	380	0	0	0	12	0.89	0	0	25		11
October	31	9:10AM	DS	Secure	40.4	58.2	86.3	123734	449	95916	0	449	219650	110	0	0	0	380	0	0	0	14	0.91	0	0	25		10

[illegible]

WWTF - Lagoons

[illegible]

WWTF - Lagoons

[illegible]

APPENDIX E

Seasonal Precipitation Summary: 2009 - 2022
for Osoyoos, BC (Station: Osoyoos CS, OC 7.2.4.12)

Seasonal Precipitation Summary: 2009 - 2022
Total Monthly Precipitation (mm) for Osoyoos CS

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total for Season
Climate Normals 1971-2000	27.8	25.5	22.5	23.5	37.4	35.9	24.3	21.2	16.1	17.1	32.1	34.2	175.5
2009	-	-	-	13.8	35.8	47.0	63.4	61.0	34.2	27.2*	11.8	-	282.4
2010	-	-	12.2	22.6	90.2	61.4	19.0*	5.4*	28.2*	16.8	13.6	-	243.6
2011	-	-	51.4	13.4	65.6	6.2*	19.2*	2.6*	5.0*	18.6	18.8	-	130.6
2012	-	-	54.2*	34.0	17.6	79.8*	49.5*	2.1*	0.7*	35.4*	58.7	61.5	219.0
2013	18.9	5.3	12.6	15.6	19.5	41.5	4.0	15.9	50.7	7.0	20.7	13.3*	154.2
2014	12.3	31.6	9.1	19.4	15.4	23.7*	24.9	9.8	7.6	28.2	51.5	28.9	129.0
2015	23.7	10.1	14.5	4.8	36.6	33.9	8.2	7.5	0.6	15.2	27.4	74.6*	106.8
2016	34.3*	21.7	42.0	9.3	12.8	32.3	25.0	20.3	7.0	59.7	36.3	15.0	166.4
2017	25.4	19.8	31.2	71.7	52.2	8.2	0.0	0.6	0.9	6.2	48.4	28.9	139.8
2018	65.6	18.0	58.7	39.1	35.9*	35.5	4.5	0.0	5.7	17.8	16.1	33.0	138.5*
2019	22.9	15.9	16.7	10.5	0.4*	M	M	M	M	M	M	M	10.9*
2020	M	M	M	M	M	43.3	5.1	5.7	2.2	30.4	31.8	32.0	150.5*
2021	45.3	22.9	2.3	14.3*	0.0	33.5	2.7	7.5	7.4	53.8	25.6	31.5	246.8*
2022	36.1	9.6	15.4	11.5	16.3	47.1	21.6	0.5	3.7	3.7	37.1	45.2	104.4

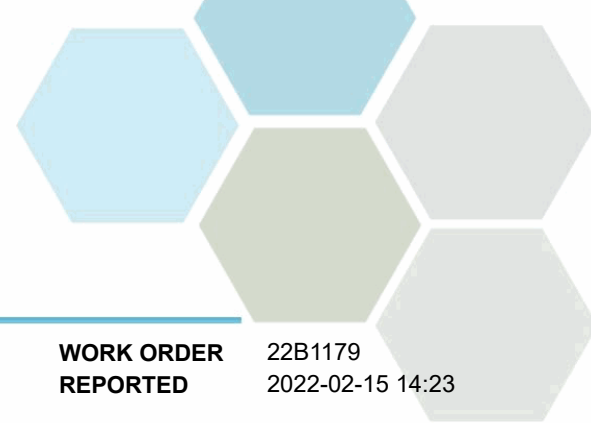
**The value displayed is based on incomplete data*

M = Missing Data

Data compiled from Environment Canada

APPENDIX F

Analytical Reports (OC 5.2.2, 5.3.2, 5.5.3, 5.6.2)

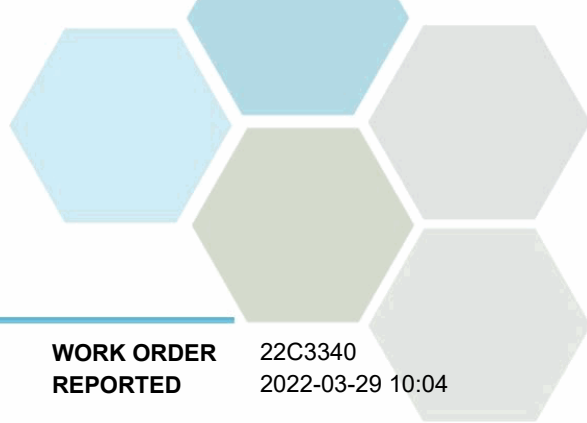


TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22B1179
2022-02-15 14:23

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E105001 (22B1179-01) Matrix: Water Sampled: 2022-02-08 11:20					
<i>General Parameters</i>					
BOD, 5-day Carbonaceous	14.6	2.0	mg/L	2022-02-15	
Solids, Total Suspended	16.5	2.0	mg/L	2022-02-13	



TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22C3340
2022-03-29 10:04

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E207444 (22C3340-01) Matrix: Water Sampled: 2022-03-23 10:05					
<i>Microbiological Parameters</i>					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2022-03-24	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2022-03-24	

TEST RESULTS

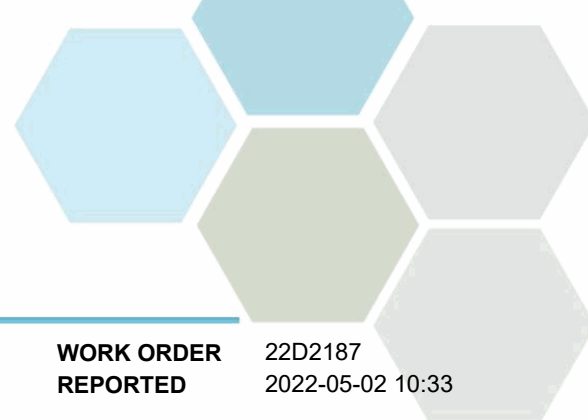
REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22C4033
2022-04-05 16:17

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E207444 (22C4033-01) Matrix: Water Sampled: 2022-03-29 08:10					
Anions					
Nitrate (as N)	6.12	0.010	mg/L	2022-03-31	
Nitrite (as N)	0.050	0.010	mg/L	2022-03-31	
Calculated Parameters					
Nitrate+Nitrite (as N)	6.17	0.0100	mg/L	N/A	
Nitrogen, Total	27.1	0.500	mg/L	N/A	
General Parameters					
Nitrogen, Total Kjeldahl	20.9	0.050	mg/L	2022-04-05	
Phosphorus, Total (as P)	4.75	0.0050	mg/L	2022-04-04	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2022-03-30	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2022-03-30	

Sewer Site E105001 (22C4033-02) | Matrix: Water | Sampled: 2022-03-29 08:35

General Parameters					
BOD, 5-day Carbonaceous	14.9	2.0	mg/L	2022-04-04	
Solids, Total Suspended	12.7	2.0	mg/L	2022-04-01	



TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22D2187
2022-05-02 10:33

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E207444 (22D2187-01) Matrix: Water Sampled: 2022-04-19 09:10					
Anions					
Nitrate (as N)	7.65	0.010	mg/L	2022-04-22	
Nitrite (as N)	0.092	0.010	mg/L	2022-04-22	
Calculated Parameters					
Nitrate+Nitrite (as N)	7.74	0.0100	mg/L	N/A	
Nitrogen, Total	19.7	0.500	mg/L	N/A	
General Parameters					
Nitrogen, Total Kjeldahl	11.9	0.050	mg/L	2022-04-30	
Phosphorus, Total (as P)	5.79	0.0050	mg/L	2022-04-27	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2022-04-20	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2022-04-20	

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22D2270
2022-05-02 11:17

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E105001 (22D2270-01) Matrix: Water Sampled: 2022-04-19 08:50					FILT, PRES
Anions					
Nitrate (as N)	1.87	0.010	mg/L	2022-04-23	HT1
Nitrite (as N)	1.28	0.010	mg/L	2022-04-23	HT1
Phosphate (as P)	4.20	0.0050	mg/L	2022-04-23	HT1
Calculated Parameters					
Nitrate+Nitrite (as N)	3.14	0.0100	mg/L	N/A	
Nitrogen, Total	37.3	1.25	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	31.8	0.050	mg/L	2022-04-25	
BOD, 5-day Carbonaceous	13.0	2.0	mg/L	2022-04-26	
Nitrogen, Total Kjeldahl	34.2	0.050	mg/L	2022-04-30	
Phosphorus, Total (as P)	5.52	0.0050	mg/L	2022-04-27	
Phosphorus, Total Dissolved	5.25	0.0050	mg/L	2022-04-27	
Solids, Total Suspended	10.3	2.0	mg/L	2022-04-24	

Sample Qualifiers:

FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.

HT1 The sample was prepared and/or analyzed past the recommended holding time.

PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22E4132
2022-06-07 15:57

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E207444 (22E4132-01) Matrix: Water Sampled: 2022-05-31 08:30					
<i>Microbiological Parameters</i>					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2022-06-01	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2022-06-01	
Sewer Site E105001 (22E4132-02) Matrix: Water Sampled: 2022-05-31 08:15					
<i>Anions</i>					
Nitrate (as N)	0.677	0.010	mg/L	2022-06-02	
Nitrite (as N)	0.024	0.010	mg/L	2022-06-02	
<i>Calculated Parameters</i>					
Nitrate+Nitrite (as N)	0.700	0.0100	mg/L	N/A	
Nitrogen, Total	61.2	1.00	mg/L	N/A	
<i>General Parameters</i>					
BOD, 5-day	18.4	2.0	mg/L	2022-06-06	
Nitrogen, Total Kjeldahl	60.5	0.050	mg/L	2022-06-07	
Phosphorus, Total (as P)	8.14	0.0050	mg/L	2022-06-06	
Solids, Total Suspended	33.0	2.0	mg/L	2022-06-03	

TEST RESULTS

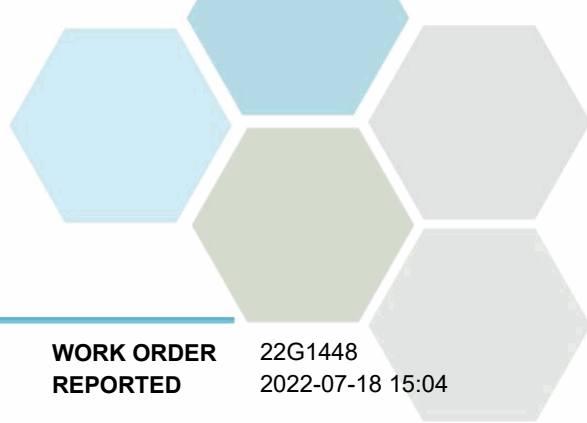
REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22F2466
2022-06-22 15:47

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E207444 (22F2466-01) Matrix: Water Sampled: 2022-06-15 08:40					
Anions					
Nitrate (as N)	5.69	0.010	mg/L	2022-06-17	
Nitrite (as N)	0.348	0.010	mg/L	2022-06-17	
Calculated Parameters					
Nitrate+Nitrite (as N)	6.04	0.0100	mg/L	N/A	
Nitrogen, Total	21.6	0.500	mg/L	N/A	
General Parameters					
Nitrogen, Total Kjeldahl	15.6	0.050	mg/L	2022-06-22	
Phosphorus, Total (as P)	5.46	0.0050	mg/L	2022-06-21	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2022-06-16	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2022-06-16	

Sewer Site E105001 (22F2466-02) | Matrix: Water | Sampled: 2022-06-15

General Parameters					
BOD, 5-day	65.3	2.0	mg/L	2022-06-22	
Solids, Total Suspended	16.5	2.0	mg/L	2022-06-21	



TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22G1448
2022-07-18 15:04

Analyte	Result	RL	Units	Analyzed	Qualifier
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Sewer Site E207444 (22G1448-01) | Matrix: Water | Sampled: 2022-07-12 09:50

Microbiological Parameters

Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2022-07-13	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2022-07-13	

Sewer Site E105001 (22G1448-02) | Matrix: Water | Sampled: 2022-07-12 11:00

General Parameters

BOD, 5-day	15.8	2.0	mg/L	2022-07-18	
Solids, Total Suspended	22.4	2.0	mg/L	2022-07-15	

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22G1494
2022-07-20 15:01

Analyte	Result	RL	Units	Analyzed	Qualifier
Main Lift (22G1494-01) Matrix: Water Sampled: 2022-07-12 09:25					
<i>General Parameters</i>					
BOD, 5-day Carbonaceous	309	2.0	mg/L	2022-07-18	
Oil & Grease, Mineral	3.1	2.0	mg/L	2022-07-19	
pH	7.71	0.10	pH units	2022-07-13	HT2
Solids, Total Suspended	264	2.0	mg/L	2022-07-15	

Golf Course Lift (22G1494-02) | Matrix: Water | Sampled: 2022-07-12 10:40

<i>General Parameters</i>					
BOD, 5-day Carbonaceous	234	2.0	mg/L	2022-07-18	
Oil & Grease, Mineral	2.4	2.0	mg/L	2022-07-19	
pH	7.68	0.10	pH units	2022-07-13	HT2
Solids, Total Suspended	226	2.0	mg/L	2022-07-15	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22G2658
2022-07-27 14:53

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E207444 (22G2658-01) Matrix: Water Sampled: 2022-07-19 10:50					
Anions					
Nitrate (as N)	16.5	0.010	mg/L	2022-07-22	
Nitrite (as N)	1.55	0.010	mg/L	2022-07-22	
Calculated Parameters					
Nitrate+Nitrite (as N)	18.0	0.100	mg/L	N/A	
Nitrogen, Total	28.1	0.500	mg/L	N/A	
General Parameters					
Nitrogen, Total Kjeldahl	10.1	0.050	mg/L	2022-07-25	
Phosphorus, Total (as P)	5.06	0.0050	mg/L	2022-07-25	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2022-07-20	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2022-07-20	

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22H1491
2022-08-17 13:34

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E105001 (22H1491-01) Matrix: Water Sampled: 2022-08-09 09:30					
General Parameters					
BOD, 5-day	35.8	2.0	mg/L	2022-08-16	
Solids, Total Suspended	58.3	2.0	mg/L	2022-08-13	
Sewer Site E207444 (22H1491-02) Matrix: Water Sampled: 2022-08-09 09:45					
Anions					
Nitrate (as N)	11.0	0.010	mg/L	2022-08-12	
Nitrite (as N)	1.31	0.010	mg/L	2022-08-12	
Calculated Parameters					
Nitrate+Nitrite (as N)	12.3	0.100	mg/L	N/A	
Nitrogen, Total	26.7	0.400	mg/L	N/A	
General Parameters					
Nitrogen, Total Kjeldahl	14.4	0.050	mg/L	2022-08-17	
Phosphorus, Total (as P)	4.64	0.0050	mg/L	2022-08-12	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	24	1	MPN/100 mL	2022-08-10	HT1
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2022-08-10	HT1

Sample Qualifiers:

HT1 The sample was prepared and/or analyzed past the recommended holding time.

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 2210768
2022-09-14 12:22

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E207444 (2210768-01) Matrix: Water Sampled: 2022-09-06					
Anions					
Nitrate+Nitrite (as N)	17.9	0.0050	mg/L	2022-09-09	
Calculated Parameters					
Nitrate (as N)	17.9	0.500	mg/L	N/A	
Nitrogen, Total	25.3	0.500	mg/L	N/A	
General Parameters					
Nitrogen, Total Kjeldahl	7.41	0.050	mg/L	2022-09-12	
Phosphorus, Total (as P)	4.92	0.0050	mg/L	2022-09-09	
Microbiological Parameters					
Coliforms, Total (Q-Tray)	2	1	MPN/100 mL	2022-09-07	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2022-09-07	

Sewer Site E105001 (2210768-02) | Matrix: Water | Sampled: 2022-09-06

FILT,
PRES

Anions					
Nitrate (as N)	19.7	0.010	mg/L	2022-09-09	
Nitrite (as N)	0.019	0.010	mg/L	2022-09-09	
Phosphate (as P)	< 0.0500	0.0050	mg/L	2022-09-09	RA1
Calculated Parameters					
Nitrate+Nitrite (as N)	19.7	0.100	mg/L	N/A	
Nitrogen, Total	26.9	1.00	mg/L	N/A	
General Parameters					
Ammonia, Total (as N)	3.37	0.050	mg/L	2022-09-08	
BOD, 5-day Carbonaceous	7.8	2.0	mg/L	2022-09-14	
Nitrogen, Total Kjeldahl	7.14	0.050	mg/L	2022-09-12	
Phosphorus, Total (as P)	6.61	0.0050	mg/L	2022-09-09	
Phosphorus, Total Dissolved	6.19	0.0050	mg/L	2022-09-09	
Solids, Total Suspended	48.4	2.0	mg/L	2022-09-09	

Sample Qualifiers:

FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.
PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.
RA1 The Reporting Limit has been raised due to matrix interference.

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22J0671
2022-10-13 15:09

Analyte	Result	RL	Units	Analyzed	Qualifier
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Sewer Site E105001 (22J0671-01) | Matrix: Water | Sampled: 2022-10-05 08:55

General Parameters

BOD, 5-day	7.1	2.0	mg/L	2022-10-12	
Solids, Total Suspended	9.2	2.0	mg/L	2022-10-12	

Sewer Site E207444 (22J0671-02) | Matrix: Water | Sampled: 2022-10-05 09:20

Anions

Nitrate+Nitrite (as N)	13.9	0.0050	mg/L	2022-10-07	
Nitrite (as N)	0.0974	0.0050	mg/L	2022-10-07	

Calculated Parameters

Nitrate (as N)	13.8	0.500	mg/L	N/A	
Nitrogen, Total	21.3	0.500	mg/L	N/A	

General Parameters

Nitrogen, Total Kjeldahl	7.41	0.050	mg/L	2022-10-13	
Phosphorus, Total (as P)	7.00	0.0050	mg/L	2022-10-12	

Microbiological Parameters

Coliforms, Total (Q-Tray)	< 1	1	MPN/100 mL	2022-10-06	
Coliforms, Fecal (Q-Tray)	< 1	1	MPN/100 mL	2022-10-06	

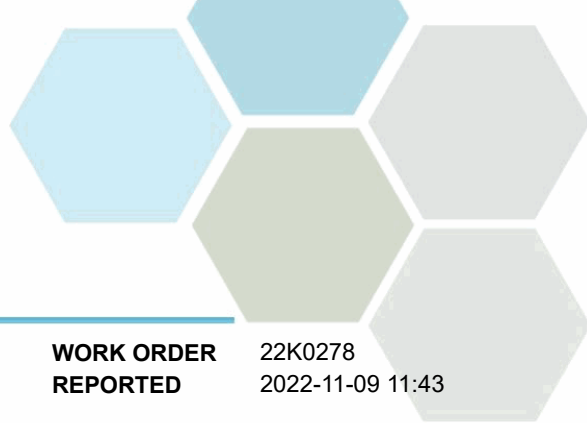
Main Lift (E230277) (22J0671-03) | Matrix: Water | Sampled: 2022-10-05 10:45

General Parameters

BOD, 5-day Carbonaceous	228	2.0	mg/L	2022-10-11	
Oil & Grease, Total	31.7	2.0	mg/L	2022-10-13	
Oil & Grease, Mineral	< 2.0	2.0	mg/L	2022-10-13	
pH	7.54	0.10	pH units	2022-10-10	HT2
Solids, Total Suspended	220	2.0	mg/L	2022-10-12	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22K0278
2022-11-09 11:43

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E105001 (22K0278-01) Matrix: Water Sampled: 2022-11-01 08:45					
<i>General Parameters</i>					
BOD, 5-day Carbonaceous	11.0	2.0	mg/L	2022-11-09	
Solids, Total Suspended	8.4	2.0	mg/L	2022-11-07	

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22K3553
2022-12-06 11:21

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E105001 (22K3553-01) Matrix: Water Sampled: 2022-11-29 09:45					
<i>General Parameters</i>					
BOD, 5-day Carbonaceous	< 6.9	2.0	mg/L	2022-12-06	
Solids, Total Suspended	8.7	2.0	mg/L	2022-12-03	

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
Wastewater- PE12214

WORK ORDER REPORTED 22L2240
2022-12-27 15:01

Analyte	Result	RL	Units	Analyzed	Qualifier
Sewer Site E105001 (22L2240-01) Matrix: Water Sampled: 2022-12-20 11:45					
<i>General Parameters</i>					
BOD, 5-day Carbonaceous	14.3	2.0	mg/L	2022-12-27	
Solids, Total Suspended	14.0	2.0	mg/L	2022-12-22	

APPENDIX G

Groundwater Monitoring Well Analytical Reports and
Depth Sampling (OC 7.2.4.9)

GROUND MONITORING WELLS

GOLF COURSE AREA 2022

For the Month of JANUARY

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	9.06	7.21	5	FZ	10:55
MW-2-01	10.3 m	Snowed	W	5	FZ	10:30
MW-5-10	14.82 m	8.76	6.06	5	FZ	11:25
MW-6-10	8.93 m	DRY	DRY	5	FZ	11:15
MW-7-10	16.1 m	12.5	3.6	5	FZ	11:05
MW-8-10	10.5 m	Snowed	W	5	FZ	10:15
MW-9-10	25.3 m	14.46	10.84	5	FZ	10:45

For the Month of FEBRUARY

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	9.1	7.17	1	FZ	8:50
MW-2-01	10.3 m	7.95	2.35	1	FZ	8:30
MW-5-10	14.82 m	8.81	6.01	1	FZ	9:20
MW-6-10	8.93 m	DRY	DRY	1	FZ	9:10
MW-7-10	16.1 m	12.53	3.57	1	FZ	9:00
MW-8-10	10.5 m	7.31	3.19	1	FZ	8:20
MW-9-10	25.3 m	14.57	10.73	1	FZ	8:40

For the Month of MARCH

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	9.14	7.13	Mar.3	DS	8:45
MW-2-01	10.3 m	8.31	1.99	Mar.3	DS	8:25
MW-5-10	14.82 m	8.85	5.97	Mar.3	DS	9:15
MW-6-10	8.93 m	DRY	DRY	Mar.3	DS	9:05
MW-7-10	16.1 m	12.56	3.54	Mar.3	DS	8:55
MW-8-10	10.5 m	7.57	2.93	Mar.3	DS	8:10
MW-9-10	25.3 m	14.35	10.95	Mar.3	DS	8:35

GROUND MONITORING WELLS

GOLF COURSE AREA 2022

For the Month of APRIL

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	9.05	7.22	4	FZ	8:30
MW-2-01	10.3 m	8.69	1.61	4	FZ	8:15
MW-5-10	14.82 m	8.88	5.94	4	FZ	8:45
MW-6-10	8.93 m	DRY	DRY	4	FZ	8:35
MW-7-10	16.1 m	12.57	3.53	4	FZ	8:30
MW-8-10	10.5 m	7.35	3.15	4	FZ	8:05
MW-9-10	25.3 m	14.72	10.58	4	FZ	8:25

For the Month of MAY

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	8.96	7.31	31	FZ	8:30
MW-2-01	10.3 m	7.66	2.64	31	FZ	8:15
MW-5-10	14.82 m	9.0	5.82	31	FZ	9:00
MW-6-10	8.93 m	DRY	DRY	31	FZ	8:45
MW-7-10	16.1 m	12.51	3.59	31	FZ	8:35
MW-8-10	10.5 m	6.16	4.34	31	FZ	8:05
MW-9-10	25.3 m	14.68	10.62	31	FZ	8:25

For the Month of JUNE

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	9.2	7.07	20	KF	8:10am
MW-2-01	10.3 m	7.85	2.45	20	KF	7:55am
MW-5-10	14.82 m	9.04	5.78	20	KF	8:30am
MW-6-10	8.93 m	Dry	Dry	20	KF	8:20am
MW-7-10	16.1 m	12.49	3.61	20	KF	8:15am
MW-8-10	10.5 m	5.53	4.97	20	KF	7:40am
MW-9-10	25.3 m	14.53	10.77	20	KF	8:05am

GROUND MONITORING WELLS GOLF COURSE AREA 2022

For the Month of JULY

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	10.22	6.05	29	DS	10:55
MW-2-01	10.3 m	8.48	1.82	29	DS	10:40
MW-5-10	14.82 m	9.02	5.8	29	DS	9:50
MW-6-10	8.93 m	Dry	Dry	29	DS	11:05
MW-7-10	16.1 m	12.60	3.5	29	DS	11:00
MW-8-10	10.5 m	5.46	5.04	29	DS	10:26
MW-9-10	25.3 m	14.55	10.75	29	DS	10:50

For the Month of AUGUST

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	10.28	5.99	16	KF	13:05
MW-2-01	10.3 m	8.31	1.99	16	KF	11:45
MW-5-10	14.82 m	8.97	5.85	16	KF	12:50
MW-6-10	8.93 m	Dry	Dry	16	KF	13:15
MW-7-10	16.1 m	12.7	3.4	16	KF	13:10
MW-8-10	10.5 m	5.8	4.7	16	KF	11:55
MW-9-10	25.3 m	14.55	10.75	16	KF	11:55

For the Month of SEPTEMBER

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m					
MW-2-01	10.3 m					
MW-5-10	14.82 m					
MW-6-10	8.93 m					
MW-7-10	16.1 m					
MW-8-10	10.5 m					
MW-9-10	25.3 m					

GROUND MONITORING WELLS

GOLF COURSE AREA 2022

For the Month of OCTOBER

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	9.65	6.62	31	KF	1345
MW-2-01	10.3 m	8.6	1.7	31	KF	1315
MW-5-10	14.82 m	8.72	6.1	31	KF	1430
MW-6-10	8.93 m	Dry	Dry	31	KF	1355
MW-7-10	16.1 m	12.65	3.45	31	KF	1330
MW-8-10	10.5 m	6.26	4.24	31	KF	1300
MW-9-10	25.3 m	14.64	10.66	31	KF	1340

For the Month of NOVEMBER

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	9.3	6.97	29	DS	2:50
MW-2-01	10.3 m	7.9	2.4	29	DS	2:40
MW-5-10	14.82 m	8.75	6.07	29	DS	11:40
MW-6-10	8.93 m	None	None	29	DS	3:05
MW-7-10	16.1 m 16	12.58	3.42	29	DS	2:55
MW-8-10	10.5 m 10.45	6.6	3.85	29	DS	1:30
MW-9-10	25.3 m 24.92	14.73	10.19	29	DS	1:50

For the Month of DECEMBER

WELL ID	WELL DEPTH	WATER LEVEL	WATER DEPTH	DATE	OPT	TIME
MW-1-01	16.27 m	9.33	6.94	15	KF	900
MW-2-01	10.3 m	7.81	2.49	15	KF	840
MW-5-10	14.82 m	8.78	6.04	15	KF	915
MW-6-10	8.93 m	None	None	15	KF	910
MW-7-10	16.1 m 16	12.58	3.42	15	KF	905
MW-8-10	10.5 m 10.45	6.81	3.64	15	KF	830
MW-9-10	25.3 m 24.92	14.79	10.13	15	KF	850

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
WB Groundwater (Comp)

WORK ORDER REPORTED 22D3472
2022-05-02 14:51

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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MW-8-10 (22D3472-01) | Matrix: Water | Sampled: 2022-04-27 09:20

Anions

Chloride	34.2	AO ≤ 250	0.10	mg/L	2022-04-28	
Nitrate (as N)	3.07	MAC = 10	0.010	mg/L	2022-04-28	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-04-28	

Calculated Parameters

Hardness, Total (as CaCO ₃)	1910	None Required	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	3.07	N/A	0.0200	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2022-04-29	
Phosphorus, Total Dissolved	0.0166	N/A	0.0050	mg/L	2022-05-02	
Solids, Total Suspended	4750	N/A	2.0	mg/L	2022-05-01	

Total Metals

Calcium, total	619	None Required	0.20	mg/L	2022-04-29	
Magnesium, total	87.7	None Required	0.010	mg/L	2022-04-29	
Sodium, total	50.5	AO ≤ 200	0.10	mg/L	2022-04-29	

MW-9-10 (22D3472-02) | Matrix: Water | Sampled: 2022-04-27 09:40

Anions

Chloride	2.36	AO ≤ 250	0.10	mg/L	2022-04-28	
Nitrate (as N)	0.174	MAC = 10	0.010	mg/L	2022-04-28	
Nitrite (as N)	0.020	MAC = 1	0.010	mg/L	2022-04-28	

Calculated Parameters

Hardness, Total (as CaCO ₃)	165	None Required	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	0.194	N/A	0.0200	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	0.119	None Required	0.050	mg/L	2022-04-29	
Phosphorus, Total Dissolved	0.0412	N/A	0.0050	mg/L	2022-05-02	
Solids, Total Suspended	9770	N/A	2.0	mg/L	2022-05-01	RA10

Total Metals

Calcium, total	48.0	None Required	0.20	mg/L	2022-04-29	
Magnesium, total	10.9	None Required	0.010	mg/L	2022-04-29	
Sodium, total	16.8	AO ≤ 200	0.10	mg/L	2022-04-29	

MW-1-01 (22D3472-03) | Matrix: Water | Sampled: 2022-04-27 10:40

Anions

Chloride	15.6	AO ≤ 250	0.10	mg/L	2022-04-28	
Nitrate (as N)	0.014	MAC = 10	0.010	mg/L	2022-04-28	

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
WB Groundwater (Comp)

WORK ORDER REPORTED 22D3472
2022-05-02 14:51

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
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MW-1-01 (22D3472-03) | Matrix: Water | Sampled: 2022-04-27 10:40, Continued

Anions, Continued

Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-04-28	
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Calculated Parameters

Hardness, Total (as CaCO ₃)	530	None Required	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	< 0.0200	N/A	0.0200	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2022-04-29	
Phosphorus, Total Dissolved	0.0133	N/A	0.0050	mg/L	2022-05-02	
Solids, Total Suspended	414	N/A	2.0	mg/L	2022-05-01	

Total Metals

Calcium, total	121	None Required	0.20	mg/L	2022-04-29	
Magnesium, total	55.0	None Required	0.010	mg/L	2022-04-29	
Sodium, total	38.2	AO ≤ 200	0.10	mg/L	2022-04-29	

MW-7-10 (22D3472-04) | Matrix: Water | Sampled: 2022-04-27 11:00

Anions

Chloride	4.37	AO ≤ 250	0.10	mg/L	2022-04-28	
Nitrate (as N)	0.056	MAC = 10	0.010	mg/L	2022-04-28	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-04-28	

Calculated Parameters

Hardness, Total (as CaCO ₃)	433	None Required	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	0.0565	N/A	0.0200	mg/L	N/A	

General Parameters

Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2022-04-29	
Phosphorus, Total Dissolved	0.0200	N/A	0.0050	mg/L	2022-05-02	
Solids, Total Suspended	6590	N/A	2.0	mg/L	2022-05-01	

Total Metals

Calcium, total	116	None Required	0.20	mg/L	2022-04-29	
Magnesium, total	34.9	None Required	0.010	mg/L	2022-04-29	
Sodium, total	13.2	AO ≤ 200	0.10	mg/L	2022-04-29	

MW-5-10 (22D3472-05) | Matrix: Water | Sampled: 2022-04-27 11:25

Anions

Chloride	203	AO ≤ 250	0.10	mg/L	2022-04-28	
Nitrate (as N)	7.83	MAC = 10	0.010	mg/L	2022-04-28	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-04-28	

Calculated Parameters

TEST RESULTS

REPORTED TO PROJECT Osoyoos, Town of
WB Groundwater (Comp)

WORK ORDER REPORTED 22D3472
2022-05-02 14:51

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
MW-5-10 (22D3472-05) Matrix: Water Sampled: 2022-04-27 11:25, Continued						
Calculated Parameters, Continued						
Hardness, Total (as CaCO ₃)	508	None Required	0.500	mg/L	N/A	
Nitrate+Nitrite (as N)	7.83	N/A	0.0200	mg/L	N/A	
General Parameters						
Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2022-04-29	
Phosphorus, Total Dissolved	0.0170	N/A	0.0050	mg/L	2022-05-02	
Solids, Total Suspended	181	N/A	2.0	mg/L	2022-05-01	
Total Metals						
Calcium, total	133	None Required	0.20	mg/L	2022-04-29	
Magnesium, total	42.4	None Required	0.010	mg/L	2022-04-29	
Sodium, total	99.9	AO ≤ 200	0.10	mg/L	2022-04-29	

Sample Qualifiers:

RA10 This is an estimated value. The result was over the calibration range and further dilution was not performed at this time.