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Septic Systems and Treatment Plants / Service and Maintenance  
Inspections and Assessments / Permits and Design

May 19, 2020

File #1926-19-20

Comox Valley Regional District  
Building Services  
600 Comox Road  
Courtenay, BC V9N 3P6

**RE: Letter of Assurance –CVRD Sewage Compliance for Building Permit  
Royston Elementary School, 3830 Warren Avenue, Royston, BC V0R 2V0**

I, Tobin Laughlin, assure that I have completed all required reviews and inspections for the assessment of the existing sewage disposal system.

This letter assures that these inspections and reports meet all the required assessments as per the SSSPM Ver. 3 under Section II-2.1.4 and III-2.1.4.

As it applies to the above noted property and its sewage disposal system: ***"The system is not malfunctioning and has been appropriately constructed and installed given the size and projected demands on the system to be placed by any building or improvements that are to be served by the system."***

Yours truly,  
ROCK CREEK ENVIRONMENTAL  
Tobin Laughlin  
BA, ROWP (BC)  
Reg. #OW0007



c.c. Ian Heselgrave  
Director of Operations  
School District 71 (Comox Valley)  
Phone: 250 334-5516  
E-mail: [ian.heselgrave@sd71.bc.ca](mailto:ian.heselgrave@sd71.bc.ca)



May 19, 2020

File #1926-19-20

Ian Heselgrave  
Director of Operations  
School District 71 (Comox Valley)  
Phone: 250 334-5516  
E-mail: [ian.heselgrave@sd71.bc.ca](mailto:ian.heselgrave@sd71.bc.ca)

**Compliance Inspection of the Onsite Sewage Treatment System serving Royston Elementary School, 3830 Warren Avenue, Royston, BC V0R 2V0**

**Type of Inspection**

At your request, I attended this property to carry out a compliance inspection of the onsite sewage treatment system serving the school with the aim of determining its location, condition, operation and suitability for your needs and to support a building permit for the addition of 2 modular classrooms. The intention of adding this portable is to create room for an increased enrollment of 50 students. The current student enrolment has 267 students and the additional students will increase the schools total student enrollment population to approximately 320.

The inspection will address the current system and review all available documentation provided by the school district, building contractors and VIHA. The inspection will include inspecting all the tanks, pumps and dispersal fields at site. This report will discuss the function, current condition any required setbacks/environmental impacts.

This inspection meets or exceeds the industry standard as set out in the Standard Practice Guidelines for the Inspection of Onsite Wastewater Systems published by the Applied Science Technologists and Technicians of BC (ASTTBC). As a Registered Onsite Wastewater Practitioner through ASTTBC, an Inspector is required to meet or exceed these requirements and undertake this work in the best interests of the client at all times.

There will be no increase in the daily design flows from the original permit to the existing system. The property is connected to municipal water.

**1.0 Objectives**

The purpose of my site reconnaissance was to conduct a Sewage System Compliance Report and analysis of system at site. This report will determine the new proposed daily design flows, its effect on the existing system, ensure proper setback distances and Sewage System function of all components. Specific objectives were as follows:

1. Advise on the probability of a health hazard resulting from the new classroom being connected to the existing system at site.
2. Ensure correct and allowable horizontal distance from components of the sewerage system to the Modular Classrooms.
3. Provide report that confirms the setback distances.
4. Provide report on system type, condition and its function of all existing components.
5. Provide report on the operations and on maintenance measures to reduce a health hazard.
6. Provide comment on impact of new total number of full time students affect on the Daily Design Flow original system.
7. Ensuring the system will not create a Public Health Hazard when operated and properly maintained.
8. Ensure the existing system conforms to the SSR and acceptable construction practices.

### **1.1 Limitations**

This report simply approves the proposed new daily design flow, both vertical and horizontal separations. Critical setback distances from the sewage system will also be addressed. Tobin Laughlin will not be responsible for any installation of materials or workmanship of any parts of the sewage system at site. The School District will be responsible for all planned operations and maintenance. The operations and maintenance should follow the current SSR and SPM3. The BC Sewerage System Regulation is to be adhered to, as such, he will be responsible for the report, setback drawings, specifications and field reviews of the building placement and sewage components.

This letter is subject to the attached Statement of General Conditions (Appendix 1).

### **1.2 System Records:**

To assist with assessing the system capabilities and performance requirements, either a copy of the following records were provided or we obtained them. See Appendix 3.

- Sewerage System Permit issued date: Jan 15, 1996, as a repair.
- Designed For: Total DDF of 22.5c/m. under the BC, SSR Reg 411/85 oc. "innovative Systems".
- The Permit to Construct dated: April 18/96, Condition of 300 students "while system is under Innovated Review".
- Authorization to Use: #387/94 May 30/96, Conditions as per service agreement & weekly logs.
- As-Built Drawings: Yes
- Operation & Maintenance Plan: Yes
- The site is served by municipal water System. There are no known potable wells within 30m.

NOTE: For all VIHA and system records see Appendix 3.

### **1.3 Type of Sewage System Present:**

This system type was installed under the Innovated Systems or "Code of Good Practices" of the Health Act's Sewerage System Regulation, REG 411/85, Section 3.0 and Schedule 6 (See Appendix 2).

This property has a single onsite sewage system, which consists of two 3000 ig septic tanks with an effluent pump in second chamber of second tank, a Hydroxyl Systems Inc HSI-20 treatment plant and a pressurized dispersal field of 8 laterals of approximately 18.2m each. A Total Of 122m

The dispersal field is a subsurface dispersal system using pressurized laterals covered by gravelless chambers at shallow depth.

There are 3 environmental monitoring wells (piezometer) for groundwater sampling.

The supplied Health Authority records show that the system was designed to serve a Total Daily Design Flow (DDF) of 22,500lpd or 4950igpd. The calculation for system design was used following the SSR 411/85 Schedule 2, Appendix 1 (Schedule 2, Section 14) [BC Reg 199/86, S.8.] See Appendix 3.

### **1.4 Evaluation of the System's Condition**

#### **Septic Tank:**

The first components of the sewage system are the septic tanks, located at the East (Livingston Road) side of the property. (See Drawing).

#### **Septic Tank #1**

- The top of the tank access lids are located at grade.
- The two chamber concrete tank has a capacity of 3000ig, which matches the sewerage system records.
- There is cleanout port lid located over the inlet pipe. From this point, all wastewater flows enter into the first tank's first chamber.
- The second chamber assists with settlement of the waste.
- The second chamber has an outlet inspection port and outlet pipe baffle.
- This tank flows by gravity into the tank #2.
- This tank and its chambers are as per the manufacturer's specifications.
- All lids are secure.

## Tank #2

- The top of the tank access lids are located at grade.
- The concrete tank has a capacity of 3000 ig, which matches the sewerage system records.
- There is cleanout port lid located over the inlet pipe. All wastewater flows from tank #1 (the collection tank) and enters into the chamber of tank #2 for additional settlement.
- The second chamber of tank #2 is the pump chamber that transfers the effluent from the first two tanks to the "Hydroxyl Sewage Treatment Unit" model# HSI-20 for final treatment.

**NOTE: All buildings, structures and utilities must remain great than 1.0m from all tanks.**

### Hydroxyl Systems Inc. HSI-20:

The Hydroxyl sewage treatment system process is primarily a fixed film wastewater treatment process that is designed for municipal, industrial and small flow wastewater treatment applications that need to meet NSF/ BNR discharge requirements.

The hydroxyl sewage treatment system has many treatment designs. The primary design process uses Media Retention Screen, using stainless steel wedge wire screens that then retain the cultivated biofilm/media in a process-designated reactor while allowing the treated wastewater and sloughed biofilm to grow through to the next treatment phase.

The system is basically a Single-Pass biological process. The technology employs thousands of polyethylene biofilm carriers or other suspended constructed media, operating in a mixed motion within an aerated wastewater treatment basin/tank. Each individual biocarrier increases productivity through providing and protecting the surface area of the suspended media/biocarriers by supporting the growth of heterotrophic and autotrophic bacteria within its media/cells. It is this high-density population of bacteria that is required to achieve the high-rate biodegradation within the system. This process is basically self-maintained with an optimum level of productive biofilm. The biofilm will attach to the mobile suspended media/biocarriers within the system automatically responding to load fluctuations. However, the process requires proper maintenance of the collection tanks and the raw sewage influent to hydraulic flow ratio to ensure proper function. The system's aeration cell/tank with the suspended media/biocarriers are the system's primary treatment functions. With influent loading or hydraulic flows surpassing the system design of the aeration cell of media/biocarrier surface area the system will stop producing the designed effluent qualities required.

### Dispersal Field:

The dispersal field is located at the rear of the property on the East property line.

- The field is a Constructed Bed of 8 laterals
- Each Lateral is 15.2m in length.
- Each lateral is constructed of 1" PVC pipe with 7/16 drill orifices
- Each lateral is covered in a gravelless "Infiltrator H-10 STD" chamber
- Each of the laterals has a ball valve and end cap clean-out.
- There is an up-slope interceptor drain as per design.
- The system appears to be constructed as per the Permit to Construct #387/94 May 30/96.

**NOTE: All buildings, structures must remain great than 3.0m and 7.5m if down slope, from dispersal field.**

**All utilities must remain greater than 1.0m from dispersal field.**

## 2.0 Soil Testing

Soils were reviewed on May 2, 2020 by Tobin Laughlin of Rock Creek Environmental. I reviewed four test pits on the same date just outside the existing dispersal field area. Four 80cm deep test pits were hand dug on site (See Figure 1). Soil characteristics have been confirmed to be a few inches of topsoil and turf, over a layer of tan loamy fine sand and sandy loams and compacted till of low permeability.

### 2.1. Summary of Site Evaluation

On May 2, 2020 Mr. Laughlin tested evaluated site and soil conditions. Following site visits were included for well locations. The following table is a summary of the site evaluation.

**Table 3: Site Evaluation Summary**

Land Slope:	5-7% average.	
# of soil test sites:	4	
<b>Typical soil at infiltration surface where Tested</b>		
Texture:	Sandy Loams	
Structure:	Single-grain moderate grade slight graininess	
Consistence:	Firm	
<b>Typical soil profile</b>		
A:	Brown/tan Sandy loam SG-0 to GR-2, loose.	
B:	Olive sand.	
C:	Till, modled	
<b>Typical depths in the selected dispersal area</b>		
Roots:	46cm- 62cm	
Mottling:	few distinct mottles at 50cm	
Seasonal Water Table:	> 65cm (note upslope drainage).	
Reference:	WL measured by TL	
<b>Soil Permeability</b>		
# of CHBP:	4	constant head borehole permeameter
<b>Shallow Soils</b>		
Measured K(fs):	mm/d median value, shallow soil depth of 20 to 30 cm	
-or, in mm/d	>4400mm/d design value based on median	
<b>Deeper Soils</b>		
Measured k(fs):	2460mm/d	median value, soil depth of 45 to 50cm
<b>Interpretation</b>		
FRH:	>80cm Flow Restrictive Horizon	
SHWT:	>50m Seasonal High Water Table	

**2.2 Soil Permeability**

Permeability tests were conducted within the locations shown near the test pits (see Fig 1). The permeabilities KFS ranged between 4800mm/day-3800mm/day amongst the areas tested.

# of CHBP tests: 4 constant head borehole permeameter

**SHALLOW SOILS**

Measured K(fs): cm/d median value, shallow soil depth of 20 to 30 cm.  
-or,inmm/d: 440 cm/d Design value based on median

NOTE: following SPM3 Table II-22, the maximum allowable Hydraulic Loading Rate (HLR) for this type of soil classification is 70L/D/m<sup>2</sup>. When using the maximum allowable HLR based on permeability the HLR would be 80L/D/m<sup>2</sup>.

**2.3 Groundwater**

High groundwater conditions were not a concern during the initial test pit reviews. Checking the groundwater level on May 2, 20120 confirmed groundwater levels to be low. The upslope drain appears to be working correctly reducing ground water

**3.0 Regarding the Proposed Construction:**

The proposed location of the two new modular classroom will not impact either the sewage treatment facility or its discharge and dispersal field.

The additional new modular classrooms are required for an additional 50 students. The modular classroom will be located with a setback distance of greater than 1.0m of the collection tanks and greater than 3m from the dispersal field (See Fig 1). This proposed placement meets the current Sewage System Standards Practices Manual Ver.3 for building setback to a septic tank or

holding tank. It is also understood that no structures are to be placed on or near the dispersal field and or its components within 7.5m.

The additional students being added to the daily design flow will increase, the sewage system's components (collection tanks, sewage treatment plant and the dispersal field) have all been designed to handle the current daily sewage flows from existing students in the existing school building and its newly proposed modular classroom. (See Architect's Drawings)

### **3.1 Potable water:**

The school potable water is provided by the Royston Water Service. The water service is metered and recorded every two months. The school's service and consumption records from 2016 to 2019 have been obtained. (See Appendix # 4) These records provide actual daily usage and average flow per student. The average consumption rate of a student using the greatest metered usage is 13.8L per student. That's following the highest (fall/winter) metered usage of the school in between 2016-2019. The late spring and summer months were not used as the school's playing fields are irrigated for community use.

### **4.0 Summary of System Performance:**

**The compliance inspection found all components of the existing and temporary systems to be in good working condition, and wastewater flows traveled through the system in a normal manner. Based on these observations, this system is operating in a normal and safe manner.**

The current operations appear to be within the design parameters of the original construction drawings and existing system on the property. There are currently 267 student using approximately 15 lpd. The actual water meter records show a lower usage of only 13.8 lpd. Following SPM3 Table III-11 shows a daily average of 15 lpd to 30 lpd per student.

The current system has an VIHA Authorization of 22,500 lpd system design of the innovative protocol. The sewage disposal system that the school is currently using was designed for 300 students at 68 lpd under SSR Reg 411/86 for a total daily design flow (DDF) of 20,400 lpd. The 68 lpd per student was the design flow used under the regulation of the day. The total Daily Design Flow using the SPM3 and actual water consumption will be 4800 lpd: 320 students @ 15 lpd each totals 4800 lpd.

Following Table II-22 SPM3, the soil Hydraulic loading rate for sandy loams is 80l/p/m<sup>2</sup> Type 3 (L/Day/M<sup>2</sup>). Following section II-6.6 of SPM3, the existing system has a total of 122m of dispersal field length. Following the Standards of SPM3, the system's dispersal field is large enough to both safely and adequately disperse the treated effluent. The proposed DDF (4800 lpd) and existing approved system design only requires a total dispersal field length of 100m.

When using the SPM3 design criteria and the site soils conditions, it appears the original system can treat the new daily sewage flows of the proposed 320 students.

The new additional DDF of 750 lpd added to the current 4000 lpd the total system design flow of approximately 4800 lpd, is well under the sewage treatment plant's intended treatment design of 22,500 lpd. To ensure the system and its dispersal field function correctly, a conservative operation should follow the SPM3 system design criteria. When applying the SPM3 design criteria with proper operations and maintenance, the system will service the needs of the school's sewage demand.

The additional students will not contribute to a health hazard with the system being well maintained. Based on the as-built drawings, the components inspected at site, the system appears to be operating correctly and is not causing a health hazard. The intended use and function appears to be in compliance and meets the intent of the SSR.

The attached drawing shows the confirmed location of the system in relation to the existing and proposed unit and its design flow schematic.

It is understood that School District 71 pumps the septic tanks and pump chamber annually. It would be good operation standards to have the entire system inspected annually to ensure the system's function continues to operate with in the Sewage System Regulations. As there are no records on file with VIHA, the system's design and correct operation are unknown. Annual inspection would ensure correct operation and protect public health.

Should you have any other questions, please contact our office at any time.



Tobin Laughlin  
BA, ROWP (BC)  
Reg. #OW0007

FIGURE 1: Location of septic system components and proposed moduls

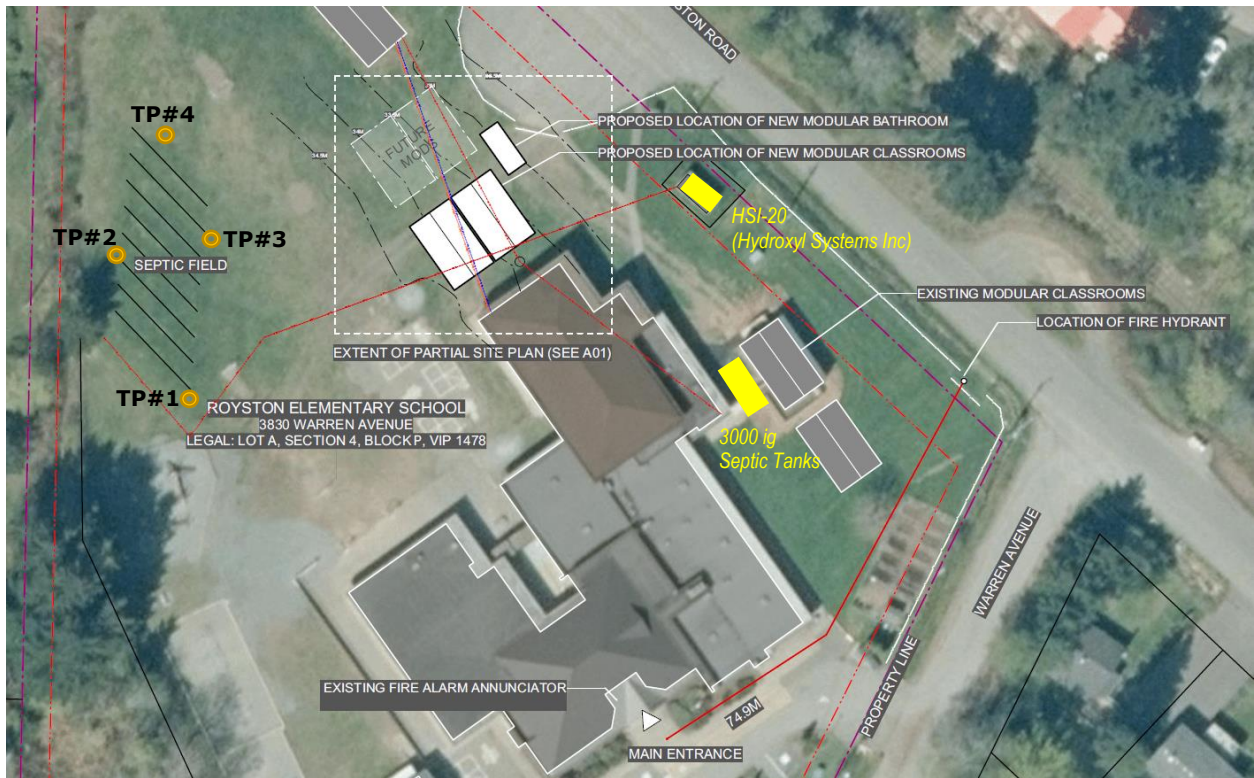


FIGURE 2:





*FOR COMPLIANCE INSPECTION ONLY*

**Appendix 1: Statement of General Conditions**

**Scope of this Report**

This review report satisfies only those objectives stated in the introduction. Tobin Laughlin (ROWP) has not conducted a *Site Investigation, Vertical Separation analysis, soils Assessment, or Effluent sampling or testing.*

**Use of this Report**

This Rock Creek Environmental (RCE) report pertains only to a specific project. If the project is modified, then our client will allow us to confirm that the report is still valid. We prepared this report only for the benefit of our Client and those agencies authorized by law to regulate our Client's activities.

No others may use any part of this report without our written consent. To understand the content of this report, the reader must refer to the entire, signed report. We cannot be responsible for the consequences of anyone using only a part of the report, or referring only to a draft report. This report reflects our best judgment based on information available at the time.

Any use of this report, or reliance on this report, by a third party is the responsibility of that third party. We accept no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions taken based on this report.

**Reliance on Provided Information**

RCE has relied on the accuracy and completeness of information provided by its client and by other professionals. We are not responsible for any deficiency in this document that results from a deficiency in this information.

**Site, Record Documents and Sewage Equipment Interpretations**

Site and the sewage system equipment conditions always vary across a site and vary with time. Monitoring wells, inspection ports and the sewage system equipment maintenance logs show conditions only at the locations that can be inspected. The precision with which compliance reports show subsurface field and treatment equipment conditions depends on the recorded documents, access, maintenance records/logs, frequency and methods of sampling and testing, and the uniformity of subsurface conditions.

RCE based these descriptions on observations at the time of the study. Unless otherwise noted, we based the report's conclusions and recommendations on these observed conditions.

**Changed Conditions**

Conditions encountered by others at this site may differ significantly from what we encountered, either due to natural variability of equipment conditions, or as a result of other(s) activities. Our client will inform us about any such changes, and will give us an opportunity to review our recommendations. Recognizing changed soil, Design Flows and equipment conditions, requires experience. Therefore, during any construction or remediation, a qualified person should be employed to visit the site with sufficient frequency to observe whether conditions or system performance have changed significantly.

**Risks and Liability**

We recommend that our client engage RCE to review all design drawings and constructed works that are based on our conclusions and recommendations.

**Standard of Care**

We exercise a standard of care consistent with that level of skill and care ordinarily exercised by Authorized Persons & Professionals currently practicing under similar conditions.

**APPENDIX 2**

Sewerage System Standard Practice Manual Version 3

Volume II

Table II- 19. Minimum required horizontal separation distances

MINIMUM HORIZONTAL DISTANCE TO	FROM DISPERSAL SYSTEM	FROM WATERTIGHT TREATMENT OR PUMP TANK
	METRES	METRES
<b>Water sources and wells</b>		
Surface source of drinking water	30	15
Domestic water supply well <sup>1</sup>	30	30
Domestic water supply well, high pumping rate <sup>2</sup>	60	30
Domestic water supply well, high pumping rate, in unconfined aquifer <sup>2</sup>	90	30
Irrigation well or open loop geothermal well	15	7.5
Deep monitoring well or closed loop geothermal well <sup>3</sup>	6	6
Shallow monitoring well <sup>4</sup>	3	0
<b>Drinking water lines and cisterns</b>		
Drinking water suction line	30	15
Drinking water suction line, sleeved <sup>5</sup>	7.5	3
Drinking water line, under pressure	3	3
Drinking water line, under pressure, sleeved <sup>5</sup>	1	1
Drinking water supply cistern, below ground	15	3
<b>Water bodies and surface breakout</b>		
Permanent fresh water body <sup>6</sup>	30	10
Intermittent fresh water body <sup>7</sup>	15	10
Marine water body <sup>8</sup>	15	7.5
Break-out point or downslope drain <sup>9</sup>	7.5	0

Notes:

<sup>1</sup> For drinking water well, see the SSR s3.1 and Section II- 2.1.2.2 of this Manual for special considerations. Domestic water supply wells include excavated or dug wells.

<sup>2</sup> For definitions of "high pumping rate well" and "unconfined aquifer" see the glossary.

<sup>3</sup> The horizontal separation to a deep monitoring well or to a closed loop geothermal well is based on a well with an annular seal that complies with the Ground Water Protection Regulation (GWPR). If the well does not comply with the GWPR, follow horizontal separation standards for drinking water wells.

<sup>4</sup> The horizontal separation to a shallow monitoring well is based on a well which is shallower than 4.6 m and constructed with an annular seal that complies with the GWPR.

<sup>5</sup> Sleeved water lines (suction or pressure) use continuous pipe sleeving within the normal standard HS to allow reduced HS, see Volume III for details.

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**III- 5.4.6 HORIZONTAL SEPARATIONS TO REDUCE RISK OF DAMAGE OR ENCROACHMENT**

Horizontal separation is useful to reduce the risk of accidental system damage or encroachment on a neighboring property, and Table III- 16 provides guidance for these situations.

**Table III- 16. Guidelines for minimum horizontal separation distances**

DISTANCE TO	FROM DISPERSAL SYSTEM (METRES)	FROM LAGOON (METRES)	FROM WATERTIGHT SUBSURFACE TREATMENT TANK (METRES)
Property lines	3	*	1
Building or structure (where there is not a perimeter drain)	1	*	1
Dispersal system (including other dispersal system)	6	6	3
Buried utility services	1	1	1
Drinking water supply cistern, at or above ground	1	*	1

Notes:



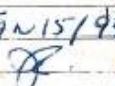
- \* For lagoon separations in these cases see Volume II, Table II- 20 (Page II-33)
- For swimming pools or lined ponds with no external subsurface drainage, use the horizontal setbacks for a building or structure for all systems except for BC zero discharge lagoons. Always provide access for maintenance work.
- If these guidelines are departed from, the AP should include in their rationale steps taken to mitigate risk of system damage or encroachment.
- Buried utility services include sewer, stormwater, electricity, gas, cable and telephone. For any work near buried services follow guidelines published by the utility.

In freezing conditions it is important to consider setback to roads, driveways and other similar areas where:

- Soil may be compacted.
- Snow cover may be disturbed, compacted or removed.


A separation of 3 m to these areas from system components may reduce risk of system freezing.

### APPENDIX 3

 Province of British Columbia Ministry of Health and Ministry of Responsible Government		RESUBMISSION 387/94 APPLICATION FOR PERMIT TO CONSTRUCT OR REPAIR A SEWAGE DISPOSAL SYSTEM	
FOLIO NUMBER: 771-09169.100 DATE OF APPLICATION (Y/M/D): 96 01 12		<input type="checkbox"/> New Construction <input checked="" type="checkbox"/> Repair <input type="checkbox"/> Alteration	
OWNER INFORMATION Correspondence to be sent to owner	NAME OF OWNER: SCHOOL DISTRICT 71 (COURTENAY)		TELEPHONE NUMBER: 334-5500
	MAILING ADDRESS: 607 CUMBERLAND ROAD	City: COURTENAY	Postal Code: V9N 7G5
APPLICANT INFORMATION Correspondence to be sent to applicant	NAME OF APPLICANT:		TELEPHONE NUMBER: 334-5500
	MAILING ADDRESS:	City:	Postal Code:
LOT INFORMATION	LEGAL DESCRIPTION OF WHERE DISPOSAL SYSTEM IS TO BE CONSTRUCTED: LOT 13 PLAN 1478 SEC 4 DL 34 NELSON LD (BLOCK P)		
	STREET ADDRESS / GENERAL LOCATION: 3830 WARREN AVE. ROYSTON		
PREMISE INFORMATION	SEWAGE DISPOSAL SYSTEM WILL SERVE: <input type="checkbox"/> SINGLE FAMILY DWELLING <input type="checkbox"/> DUPLEX <input checked="" type="checkbox"/> OTHER (specify): ELEM. SCHOOL	NUMBER OF BEDROOMS: N/A	FINISHED BASEMENT: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	ESTIMATED DAILY SEWAGE FLOW: $\leq$ 5000 L/GPD	TOTAL LIVING AREA: 2556 M <sup>2</sup>	DO YOU INTEND TO ADD A BASEMENT SUITE OR MORE BEDROOMS IN THE FUTURE? <input type="checkbox"/> Yes N/A <input type="checkbox"/> No LOT SIZE: 5.4 AC
SYSTEM INFORMATION	TYPE OF SEWAGE DISPOSAL SYSTEM: <input type="checkbox"/> CONVENTIONAL <input checked="" type="checkbox"/> ALTERNATE (E.G. <input type="checkbox"/> PRIVY <input type="checkbox"/> LAGOON, <input type="checkbox"/> RAISED MOUNDS, <input type="checkbox"/> SEEPAGE BED) <input type="checkbox"/> DEEP TRENCH <input checked="" type="checkbox"/> OTHER (specify): INNOVATIVE SYSTEM		SEPTIC TANK MANUFACTURER: HYDROXYL SYSTEMS INC.
	TOTAL LENGTH OF DRAINAGE PIPE: 400' (8x50' LATERALS)		MATERIAL OF SEPTIC TANK:
	TYPE OF DRAINAGE PIPE: <input type="checkbox"/> PVC <input checked="" type="checkbox"/> OTHER (specify): INFILTRATOR H-10 STD		LIQUID VOLUME OF TANK:
	IF PACKAGE TREATMENT PLANT IS PROPOSED GIVE: MAKE: HYDROXYL SYSTEMS INC. MODEL: H51-23		TREATMENT CAPACITY: 4950 L/GPD / 23500 L/PD
ALTERNATE INFORMATION	PRESSURE DISTRIBUTION PROPOSED: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	LAGOON SIZE:	DEPTH OF CLAY SOIL:
	GARBURATOR: <input type="checkbox"/> YES <input type="checkbox"/> NO		FIELD DOSE VOLUME PUMPED PER CYCLE: AS PER PLANT DISCHARGE SPECS
SOIL INFORMATION	SOIL DESCRIPTION: DEPTH OF SOIL: <input type="checkbox"/> over 1.2 m (4 ft.) <input checked="" type="checkbox"/> under 1.2 m (4 ft.) if under 1.2m (4 ft.), due to <input type="checkbox"/> rock or <input type="checkbox"/> clay at ~1.8 ft. from surface.		
	DEPTH TO WATER TABLE: <input type="checkbox"/> over 1.2 m (4 ft.) <input checked="" type="checkbox"/> under 1.2 m (4 ft.) if under 1.2m (4 ft.) the depth is 1.5 FT		
	PERC TESTS: SLOWEST RATE FROM test hole #1 24 min./2.5 cm (1 inch)    test hole #2 28 min./2.5 cm (1 inch) AVERAGE OF SLOWEST RATE FROM EACH TEST HOLE 26 min./2.5 cm (1 inch)		
	WATER INFORMATION: SOURCES OF DOMESTIC WATER: ROYSTON IMPROVEMENT DISTRICT DISTANCES OF PROPOSED DISPOSAL FIELD FROM: +100' source of domestic water    +50' breakout point N/A own well    N/A neighbouring wells    N/A stream or lake    +10' water lines		
RESTRICTIVE COVENANTS	ARE THERE ANY RESTRICTIVE COVENANTS / EASEMENTS WHICH WILL AFFECT THE DESIGN OR LOCATION OF THE SEWAGE DISPOSAL SYSTEM? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, explain		
APPLICANT SIGNATURE	The information on this application is accurate and true to the best of my knowledge: <input type="checkbox"/> Owner or <input checked="" type="checkbox"/> Agent Signature:  ISLAND ONSITE SYSTEMS    96 01 12		ENVIRONMENTAL HEALTH OFFICE RECEIVED PAID:    DATE: JAN 15 / 1996 INITIALS: 

5 Nov. 84/12

A plot plan must be submitted with this application (refer to on-site page)



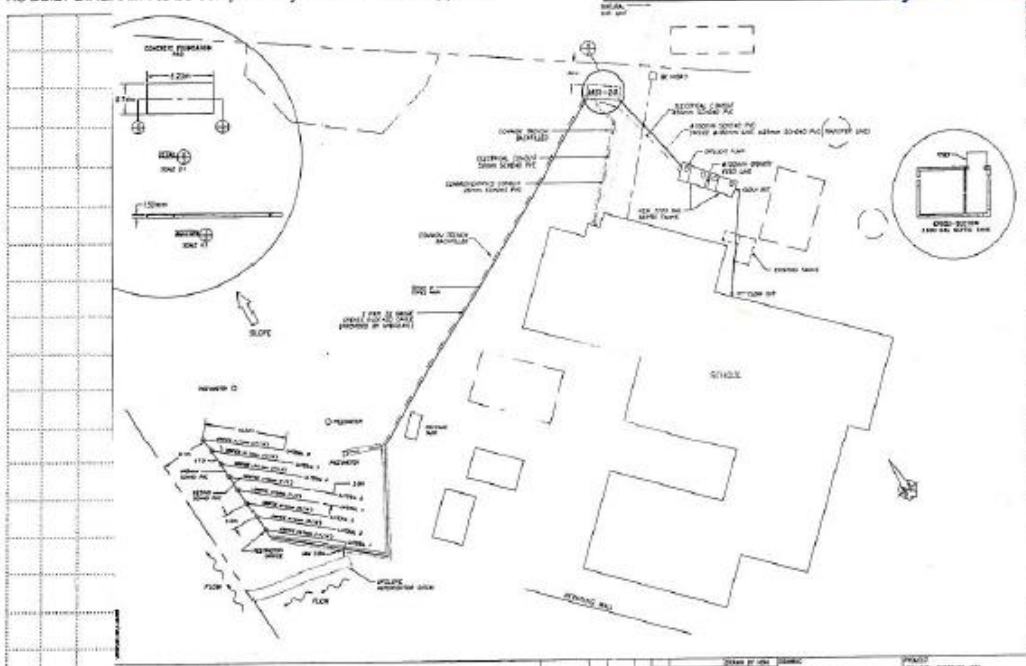
Province of British Columbia  
Ministry of Health and Ministry Responsible for Seniors

#387/94

### AUTHORIZATION TO OPERATE A SEWAGE DISPOSAL SYSTEM

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FOLIO NUMBER <b>771-09169.100</b>	DATE OF APPLICATION (Y/M/D) <b>96/01/12</b>	NAME OF OWNER <b>School District 71 (Cowtown)</b>	NAME OF CONTRACTOR <b>Hydroxyl Systems Inc.</b>
LEGAL DESCRIPTION OF LOT <b>Lot 13 Plan 1478 Sec 4 DL ST Nelson LD (Block P)</b>		STREET ADDRESS / GENERAL LOCATION <b>3830 Warren Ave, Royston, BC</b>	
AS BUILT DIAGRAM : to be completed by the contractor or applicant		INSTALLED AS PER REGULATIONS <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
		SIGNATURE OF OWNER / APPLICANT <i>[Signature]</i>	



Scale 1 Box = [unintelligible]

ENVIRONMENTAL HEALTH  
RECEIVED  
JUN 07 1996

**Hydroxyl Systems Inc.**  
 207 10th St. Unit 100, Royston, BC V0R 2V0  
 TEL: 250-835-1234 FAX: 250-835-1234  
 HYDROXYL SYSTEMS INC. IS A REGISTERED SERVICE PROVIDER IN BRITISH COLUMBIA

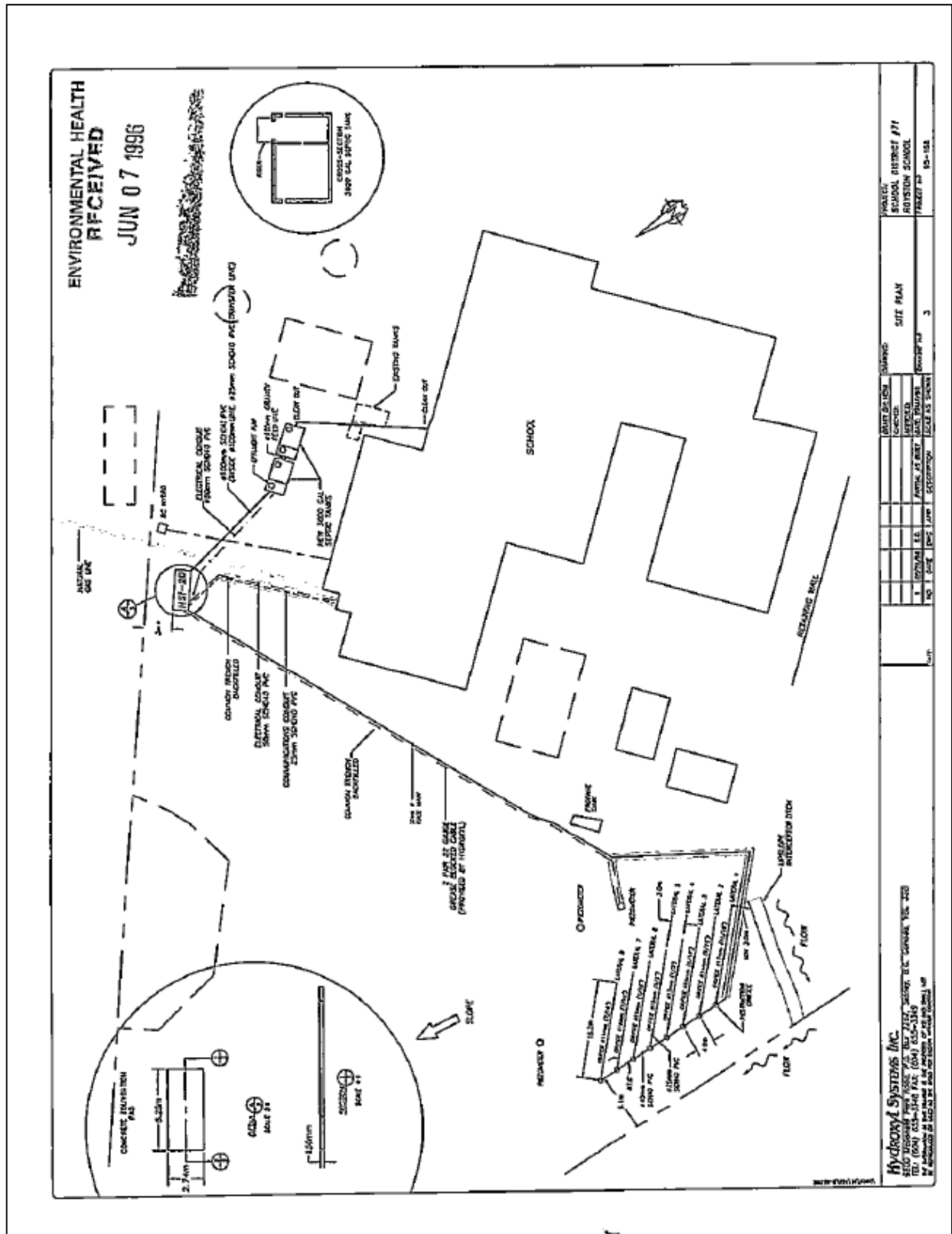
DATE OF JOB	JOB NO.	JOB NAME	JOB TYPE
01/12/96	387/94	SCHOOL DISTRICT #71 ROYSTON SCHOOL	SEWERAGE


The Ministry of Health does not guarantee the useable life of the sewage disposal system. The life of the system is affected by the use and maintenance it receives. Pump out the septic tank every 2-3 years. For servicing of package treatment plants, consult your local service agent. For service guarantees, consult your local sewage disposal contractor. If the system needs repair or modification, a new permit is required. If the system is not authorized for backfilling and if corrections are required, a re-inspection fee of \$100 must be paid for each time the Public Health Inspector checks to see that the faults have been corrected.

DATE BACKFILL / USE AUTHORIZED <b>May 30/96</b>	SUBJECT TO THE FOLLOWING CONDITIONS: <i>The conditions listed in the service contract must be completed. <del>Plus</del> Weekly logs of piezometer reading must be maintained and available on request.</i>
SIGNATURE PUBLIC HEALTH INSPECTOR / EHO: <i>[Signature]</i>	

	APPROVED	REJECTED	NOT APPLICABLE		APPROVED	REJECTED	NOT APPLICABLE
septic tank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	curtain drain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
package treatment plant	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	interceptor drains	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other (e.g. lagoon, holding tank)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pump	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
field laterals	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	drain rock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
distribution box	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	set back distances	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
siphon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	fill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HLTH 136 Rev. 94/09
WHITE COPY - FILE
YELLOW COPY - TO OWNER
PINK COPY - TO BUILDING AUTHORITY



<p style="text-align: center;"><b>Ministry of HEALTH</b></p> <p style="text-align: center;">Environmental Health Upper Island Health Unit 941B England Avenue Courtenay, B.C. V9N 2N7 Phone: 334-1172 Fax: 334-1439</p>	<p style="text-align: center;"><b>Building Department REFERRAL</b></p> <p style="text-align: center;">Building Inspections Regional District of Comox-Strathcona 4795 Headquarters Road P.O. Box 3370 Courtenay, B.C. V9N 5N5 Phone: 334-8000</p> <p style="text-align: right;">ENVIRONMENTAL HEALTH <b>RECEIVED</b> APR 25 1997</p>																											
<p><input type="checkbox"/> EXPECTED OCCUPANCY INCREASE    <input type="checkbox"/> BUILDING EXTENSION    <input type="checkbox"/> CHANGE IN USE    <input type="checkbox"/> OTHER</p>																												
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>LEGAL DESCRIPTION (as applicable)</th> <th>PCL</th> <th>LOT</th> <th>D.L.</th> <th>BLK</th> <th>SEC.</th> <th>TWP.</th> <th>LAND DISTRICT</th> <th>PLAN NO.</th> </tr> <tr> <td></td> <td></td> <td>A</td> <td></td> <td>P</td> <td>4</td> <td></td> <td>NELSON</td> <td>1478</td> </tr> <tr> <td>HOUSE NUMBER: 3830</td> <td colspan="6">STREET: WARREN AVENUE</td> <td>DISTRICT: DO. OF 14687</td> <td>MUNICIPALITY: ROYSTON R/D</td> </tr> </table>		LEGAL DESCRIPTION (as applicable)	PCL	LOT	D.L.	BLK	SEC.	TWP.	LAND DISTRICT	PLAN NO.			A		P	4		NELSON	1478	HOUSE NUMBER: 3830	STREET: WARREN AVENUE						DISTRICT: DO. OF 14687	MUNICIPALITY: ROYSTON R/D
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HOUSE NUMBER: 3830	STREET: WARREN AVENUE						DISTRICT: DO. OF 14687	MUNICIPALITY: ROYSTON R/D																				
<p>LOT DIMENSIONS: 205.2 X 192 X 112 X 121.4    LOT AREA: 5.4 ACRES</p> <p>RESTRICTIVE COVENANTS AFFECTING THE PROPOSAL: YES, INCLUDE COPY <input type="checkbox"/> NO <input checked="" type="checkbox"/></p> <p>ASSESSMENT ROLL OR FOLIO NUMBER: 771-9169 100</p> <p>EXISTING DWELLING DETAILS: Total Floor Area: _____ Year Constructed: _____ Total Bedrooms: _____ Year Renovated: _____</p> <p>EXISTING SEWAGE DISPOSAL SYSTEM: Year Installed: _____ <input type="checkbox"/> Permitted    <input type="checkbox"/> Copy Attached Date of Last Alteration or Repair: _____ Nature of Work: _____</p>																												
<p>OWNER'S NAME: _____ ADDRESS: _____ MUNICIPALITY: _____ POSTAL CODE: _____ PHONE: _____</p> <p>AGENT'S NAME: _____ ADDRESS: _____ MUNICIPALITY: _____ POSTAL CODE: _____ PHONE: _____</p>																												
<p><b>PROPOSAL</b> (nature and extent of building modifications): Total Bedrooms _____ Finished Floor Area 960 SQ FT</p> <p>INSTALL ONE NEW CLASSROOM (PERMANENT) NO PLUMBING (DAY TYPE) Number of students _____</p>																												
<p><b>PLOT PLAN:</b> (the following information must be transferred on a copy of the survey certificate plan or representative scale diagram):</p> <p><input type="checkbox"/> Lot Dimensions    <input type="checkbox"/> Existing and proposed water-serviced buildings.  <input type="checkbox"/> North Arrow    <input type="checkbox"/> Proposed area of building expansion (show dotted lines)  <input type="checkbox"/> Roads/intersections    <input type="checkbox"/> Existing and proposed drinking water sources and waterlines.  <input type="checkbox"/> Access from road    <input type="checkbox"/> Size and configuration of existing sewage disposal system(s).  <input type="checkbox"/> Accessory Buildings    <input type="checkbox"/> All surface water bodies and drainage courses.  <input type="checkbox"/> Setback distances between all the above existing and proposed site features.</p>																												
<p><b>AGREEMENT:</b> I, the undersigned, being the owner/agent of the above described property hereby certify that the information provided is correct.</p> <p>DATE: JAN 14/97    SIGNATURE OF: <input checked="" type="checkbox"/> OWNER <input checked="" type="checkbox"/> AGENT</p>																												
<p style="text-align: center;"><b>MINISTRY OF HEALTH USE:</b></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>DATE(S)</th> <th>EHO</th> <th>OBSERVATIONS:</th> </tr> </thead> <tbody> <tr> <td>Apr 29/97</td> <td>DL</td> <td>No Malfunction seen</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		DATE(S)	EHO	OBSERVATIONS:	Apr 29/97	DL	No Malfunction seen																					
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Apr 29/97	DL	No Malfunction seen																										
<p><b>PROPOSAL</b>    <input checked="" type="checkbox"/> Approved    <input checked="" type="checkbox"/> Subject to the following (complete <input checked="" type="checkbox"/> )    <input type="checkbox"/> Denied</p> <p><input type="checkbox"/> Demonstrate the adequacy of the existing Sewage Disposal System (complete <input checked="" type="checkbox"/> )  <input type="checkbox"/> Pump out septic tank and verify capacity and state of repair.    <input type="checkbox"/> Expose the distribution box and header pipes.  <input type="checkbox"/> Expose the fall trench profile of both outside laterals and report total pipe length.  <input type="checkbox"/> Excavate two 4 foot test holes and conduct two percolation soil tests adjacent to the area of the existing disposal field and report the results.  <input checked="" type="checkbox"/> Other: <u>Maximum Number of students 300</u></p> <p><input type="checkbox"/> Sewage Disposal Permit required for system    <input type="checkbox"/> Alteration    <input type="checkbox"/> Replacement</p> <p><input checked="" type="checkbox"/> Conditions    <input checked="" type="checkbox"/> Building extension not to encroach within 10 feet of existing sewage disposal system and 3 feet from tank.  <input type="checkbox"/> Building occupancy not to exceed the approved sewage disposal design capacity of _____ bedrooms in total.  <input type="checkbox"/> Other _____</p>																												
<p style="text-align: center;"> Environmental Health Officer <u>April 29/97</u> Date</p>	<p><b>RESPONSE:</b>    FAX    MAIL    PHONE    PICKUP    DATE COMPLETED</p> <p>Building Dept.    <input checked="" type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/>    <u>April 30/97</u>  Applicant    <input type="checkbox"/>    <input checked="" type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/>    <u>April 30/97</u>  Other    <input type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/>    <input type="checkbox"/>    _____</p>																											

## *Hydroxyl SYSTEMS INC.*

### **SERVICE CONTRACT and RECORDED AGREEMENT**

This Contract is made between School District #71 (the "owner") of Courtenay, British Columbia and *Hydroxyl SYSTEMS INC.* of Sidney, B.C. in respect of a planned sewage disposal system installation. The innovative system is a *Hydroxyl SYSTEMS INC.* 22,500 L treatment plant based on the "*Hydroxyl PROCESS*" ("the System") to be constructed at Royston Elementary School, 3830 Warren Avenue, Royston, British Columbia. (Legal: Lot 13, Block P, Section 4, Plan 1478, DL 34, Nelson District) (the "Property").

The "Approving Agency" is the Upper Island Health Unit, B.C. Ministry of Health. ✓  
A "Current System" is one normally approved by the Approving Agency.

#### **SECTION A - EVALUATION AND SERVICE AND MAINTENANCE PERIODS**

The Evaluation Period of the project shall be one (1) year from the date of commissioning or for such a reasonable period of time as the Approving Agency deems necessary for the evaluation of the system.

Under this Service contract the following is provided:

1. Bi-annual (twice per year) inspection of all mechanical systems and components and all necessary adjustments, including clearing of screens (as necessary).
2. Sampling and analysis services to fulfil the requirements of the Approving Agency, as per the following schedule (first year only): This period may be altered as described above.
3. *Hydroxyl SYSTEMS INC.* will provide response to and resolution of any operating malfunctions that may arise within the system; all labour and associated materials required for servicing repairs to the system until acceptance of the system.



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**System of 22,500 Litres or Less**

<b>Time from Startup</b>	<b>Parameters</b>	<b>by</b>
1 month	Field: Visual Inspection	<i>Hydroxyl SYSTEMS INC.</i>
2 months	Effluent: BOD5, TSS, Fecal Coliform Field: Visual Inspection	Testing Lab <i>Hydroxyl SYSTEMS INC.</i>
3 months	Field: Visual Inspection	<i>Hydroxyl SYSTEMS INC.</i>
4 months	Effluent: BOD5, TSS, Fecal Coliform Field: Visual Inspection	Testing Lab <i>Hydroxyl SYSTEMS INC.</i>
5 months	Field: Visual Inspection	<i>Hydroxyl SYSTEMS INC.</i>
6 months	Effluent: BOD5, TSS, Fecal Coliform Field: Visual Inspection	Testing Lab <i>Hydroxyl SYSTEMS INC.</i>
8 months	Effluent: BOD5, TSS, Fecal Coliform Field: Visual Inspection	Testing Lab <i>Hydroxyl SYSTEMS INC.</i>
10 months	Field: Visual Inspection	<i>Hydroxyl SYSTEMS INC.</i>
12 months	Effluent: BOD5, TSS, Fecal Coliform Field: Visual Inspection	Testing Lab <i>Hydroxyl SYSTEMS INC.</i>

At least once per winter, the drainfield will be checked after a major rainfall event.

To guarantee impartiality, all laboratory testing of effluent samples will be accomplished by an independent test laboratory. Results will be forwarded to both the Approving Agency and HSI.

**SECTION B - OWNER RESPONSIBILITIES**

The Owner agrees to:

1. allow access to the Property by the Service Agent and the Approving Agency for the purposes of routine inspection, sampling, monitoring or necessary repair or enforcement action;
2. not remove or damage the System, place any materials on the System, fail to supply electrical energy to the System or take any other action which hinders the operation of the system;
3. notify prospective purchasers or other parties of this agreement before sale or transfer of ownership.

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### **SECTION C - SERVICE AGENT RESPONSIBILITIES**

In return for the Owner's payment of the Service and Monitoring Fee, the Service Agent agrees to provide servicing (the Service) for as long as the system is used in waste water disposal.

Two Service Options are available for the system for the period following acceptance by the Approving Agency:

#### **Option A: Routine Service and Maintenance.**

Under this Service Contract, the following is provided:

Bi-annual (twice per year) inspection of all mechanical and system components and all necessary adjustments, including clearing of screens (as necessary).

#### **Option B: Comprehensive Service, Maintenance and Repair**

In addition to the services provided under Option A, *Hydroxyl SYSTEMS INC.* will provide:

1. response to, and resolution of, any operating malfunctions that may arise with the system;
2. all labour and associated materials required for servicing and repairs to the system.

#### **General**

The above servicing and monitoring program is intended to verify performance and comply with the requirements of the Approving Agency. Additional sampling and analysis for research purposes may be conducted by the Service Agent with the permission of the Owner.

*Hydroxyl SYSTEMS INC.* commits that the performance of the System under normal use conditions will meet the following standards for effluent quality: not more than 10mg/L 5-day Biochemical Oxygen Demand (BOD5); not more than 5mg/L Total Suspended Solids (TSS), not more than 100 MPN fecal coliforms per 100 ml and not more than 25mg/L nitrate nitrogen. It is understood that occasional exceedences of these targets can occur.

*Hydroxyl SYSTEMS INC.*'s obligation to guarantee performance under this contract are deemed to be suspended if:

1. the Owner fails to observe good rules of practice in the disposal of water and substances to the System, as set out in the Owner's Manual to be provided to the Owner by the Service Agent;

APPENDIX 4 ROYSTON WATER CONSUMPTION HISTORY

Site Description	Reading Start	Reading End	Consumption	Cost
3830 Warren Ave, Comox, BC	July 1, 2016	July 31, 2016	1,220.00	\$1,522.10
3830 Warren Ave, Comox, BC	August 1, 2016	August 31, 2016	1,200.00	\$1,497.30
3830 Warren Ave, Co mox, BC	September 1, 2016	September 30, 2016	690.00	\$864.90
3830 Warren Ave, Comox, BC	October 1, 2016	October 31, 2016	75.00	\$102.30
3830 Warren Ave, Comox, BC	November 1, 2016	November 30, 2016	50.00	\$71.30
3830 Warren Ave, Comox, BC	December 1, 2016	December 31, 2016	20.00	\$41.40
3830 Warren Ave, Comox, BC	January 1, 2017	January 31, 2017	80.00	\$108.50
3830 Warren Ave, Comox, BC	February 1, 2017	February 28, 2017	120.00	\$158.10
3830 Warren Ave, Comox, BC	March 1, 2017	March 31, 2017	120.00	\$158.10
3830 Warren Ave, Comox, BC	April 1, 2017	April 30, 2017	110.00	\$145.70
3830 Warren Ave, Comox, BC	May 1, 2017	May 31, 2017	575.00	\$722.30
3830 Warren Ave, Comox, BC	June 1, 2017	June 30, 2017	1,910.00	\$2,377.70
3830 Warren Ave, Comox, BC	July 1, 2017	July 31, 2017	1,265.00	\$1,577.90
3830 Warren Ave, Comox, BC	August 1, 2017	August 31, 2017	2,065.00	\$2,569.90
3830 Warren Ave, Comox, BC	September 1, 2017	September 30, 2017	265.00	\$337.90
3830 Warren Ave, Comox, BC	October 1, 2017	October 31, 2017	70.00	\$96.10
3830 Warren Ave, Comox, BC	November 1, 2017	November 30, 2017	50.00	\$71.30
3830 Warren Ave, Comox, BC	December 1, 2017	December 31, 2017	50.00	\$71.30
3830 Warren Ave, Comox, BC	January 1, 2018	January 31, 2018	75.00	\$102.30
3830 Warren Ave, Comox, BC	February 1, 2018	February 28, 2018	55.00	\$77.50
3830 Warren Ave, Comox, BC	March 1, 2018	March 31, 2018	80.00	\$108.50
3830 Warren Ave, Comox, BC	April 1, 2018	April 30, 2018	105.00	\$139.50
3830 Warren Ave, Comox, BC	May 1, 2018	May 31, 2018	1,205.00	\$1,503.50
3830 Warren Ave, Comox, BC	June 1, 2018	June 30, 2018	1,740.00	\$2,166.90
3830 Warren Ave, Comox, BC	July 1, 2018	July 31, 2018	1,125.00	\$1,404.30
3830 Warren Ave, Comox, BC	August 1, 2018	August 31, 2018	695.00	\$871.10
3830 Warren Ave, Comox, BC	September 1, 2018	September 30, 2018	350.00	\$443.30
3830 Warren Ave, Comox, BC	October 1, 2018	October 31, 2018	40.00	\$61.00
3830 Warren Ave, Comox, BC	November 1, 2018	November 30, 2018	40.00	\$61.00
3830 Warren Ave, Comox, BC	December 1, 2018	December 31, 2018	70.00	\$96.10
3830 Warren Ave, Comox, BC	January 1, 2019	January 31, 2019	40.00	\$61.00
3830 Warren Ave, Comox, BC	February 1, 2019	February 28, 2019	50.00	\$71.30
3830 Warren Ave, Comox, BC	March 1, 2019	March 31, 2019	40.00	\$61.00
3830 Warren Ave, Comox, BC	April 1, 2019	April 30, 2019	40.00	\$61.00
3830 Warren Ave, Comox, BC	May 1, 2019	May 31, 2019	980.00	\$1,224.50
3830 Warren Ave, Comox, BC	June 1, 2019	June 30, 2019	890.00	\$1,112.90
3830 Warren Ave, Comox, BC	July 1, 2019	July 31, 2019	800.00	\$1,001.30
3830 Warren Ave, Comox, BC	August 1, 2019	August 31, 2019	150.00	\$195.30
3830 Warren Ave, Comox, BC	September 1, 2019	October 31, 2019	105.00	\$139.50
3830 Warren Ave, Comox, BC	November 1, 2019	November 30, 2019	35.00	\$55.85
3830 Warren Ave, Comox, BC	December 1, 2019	December 31, 2019	40.00	\$116.84
3830 Warren Ave, Comox, BC	January 1, 2020	February 29, 2020	265.00	\$398.90

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