ONSITE WASTEWATER TREATMENT SYSTEM DESIGN

SITE DESIGN CONSIDERATIONS

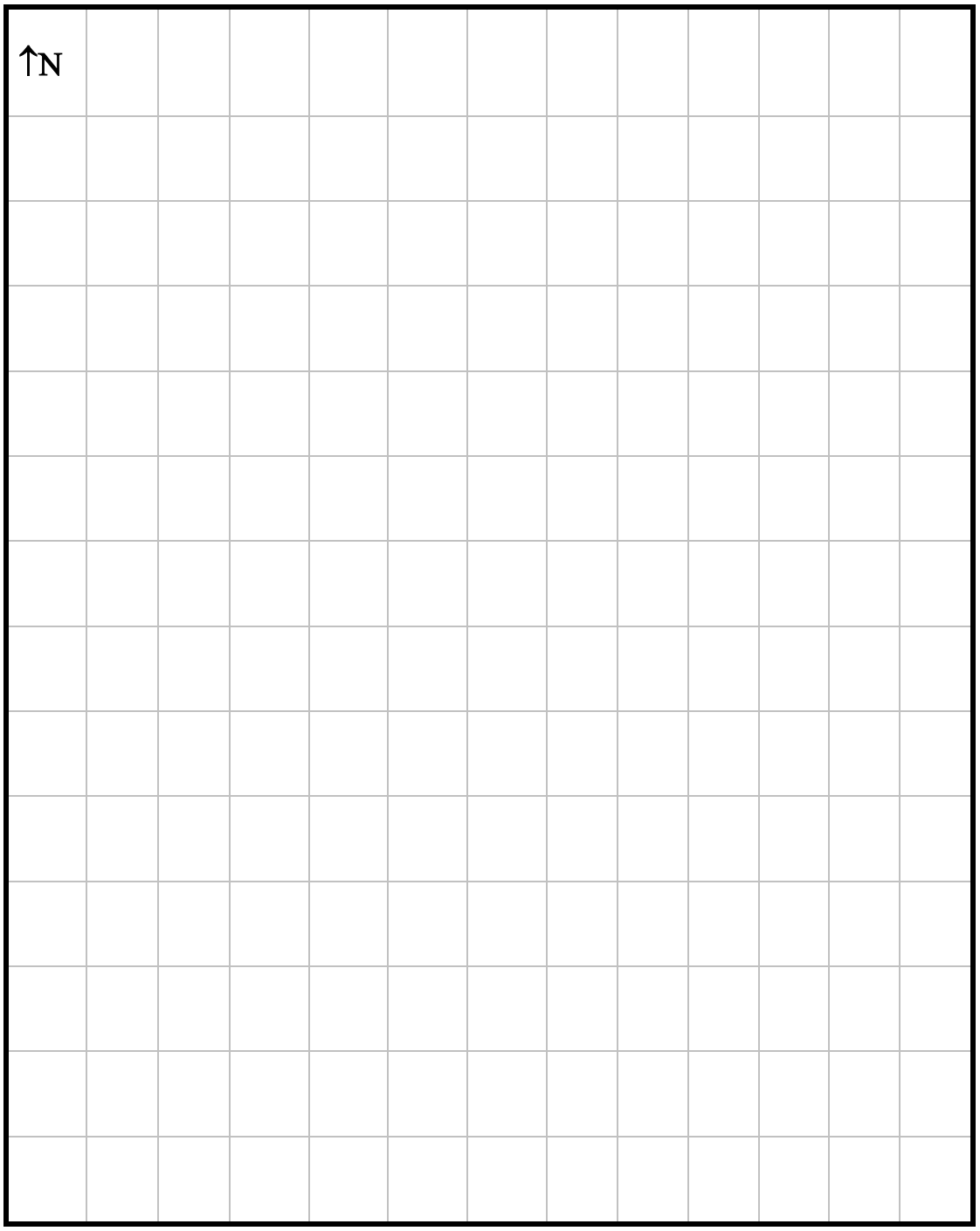
A detailed diagram of the site where the sewage system will be installed **must** be included.

The following information is to be shown on the diagram. This diagram does not need to be to scale, but must include all dimensions:

- Property size (in acres).
- All boundary lines, including the lengths in feet or meters.
- Buildings, roads, driveways and other property improvements - existing or proposed.
- Existing easements.
- Wells, cisterns or proposed water source locations on the property.
- Surface waters, rock outcrops and drainage features.
- Topography of the proposed treatment site.
- Soil test pits locations with surface elevations.
- Location of a permanent benchmark and its elevation.
- Outline of available treatment areas.

Private Sewage System Site Evaluation Diagram

Legal Description: _____



Show the proposed location of the onsite sewage system and indicate the distances from the following:

- trees
- floodplains/swamps
- wells
- waste sources
- bedrock
- vegetable gardens
- buildings
- property lines
- easement lines
- ditches or interceptors
- banks or steep slopes
- fills
- driveways
- existing sewage systems
- underground utilities
- parking areas
- rock outcroppings
- soil test pits

drainage course	slope direction (% of slope)	Test Pit 1 ☐	Test Pit 2 ☐

Note: Additional information is required to be submitted separately for the system design detail.

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SUMMARY DESIGN REPORT

Project: Onsite Wastewater Treatment System Design

Owner's Name: _____

Site Address: Lot:_____ Block:_____ Plan:_____ Subdivision: _____

Address: _____

Designer's Name: _____

(if different from applicant or contractor)

Mailing Address:_____

Phone (Work): _____ **(Cell):**_____

DESIGN OVERVIEW

Based on the site evaluation and soil assessment the type of system being installed will be a:

- ◯ Septic Tank
- ◯ Packaged Sewage Treatment Plant
- ◯ Sand Filter
- ◯ Septic Field
- ◯ Open/surface Discharge
- ◯ Subsurface Drip Dispersal
- ◯ At Grade Treatment System
- ◯ Septic Treatment Mound

and used in this design, because soil conditions exist to maintain a **vertical separation of** _____ feet.

DEVELOPMENT CONSIDERATION & WASTEWATER CHARACTERISTICS

◯ **Residential System - from Table 2.2.2.2.A.**

The development being served is a _____ **bedroom** single family home.

The expected peak daily flow volume is _____ **Imperial gallons per day.**

The expected fixture units in this dwelling are _____**fixture units.**

Total number of fixture units over 25 for 2 or 3 bedrooms, 28 for 4 bedrooms, 31 for 5 bed rooms, 33 for 6 bedroom, will be ____**FU X 11 Imp. gal/day =**_____**Imp. gal. Plus daily peak flow** _____, = **Total Peak Daily Flow of** _____**Imp. gal./day.**

Characteristics of the home were considered in regards to impact on sewage strength.

Garbage grinder: ◯ Yes, ◯ No Water saving fixtures: ◯ Yes, ◯ No.

Projected wastewater strength for this design is: BOD_____mg/L, TSS _____ mg/L

◯ **Commercial System. From Table 2.2.2.2.B.**

The development being served is:

☐ Commercial ☐ Restaurant, ☐ Institutional
☐ Campground ☐ Assembly ☐ Hotel/Motel
☐ Other (Describe) _____

This facility will produce a peak daily wastewater volume of _____Imperial gallons per day, based on Table 2.2.2.2.B, of the 2015 Standard of Practice, to which an additional tank capacity for sludge and scum accumulation rate has been added as per Table A.6.A., for a total tank capacity of _____Imperial Gallons.

Projected wastewater strength for this design is: BOD _____ mg/L, TSS _____ mg/L.

This project and use are expected to generate wastewater flow ◯**With**, ◯**Without,** substantial variation during the day or from day to day. As a result flow variation management, ◯**Will**, ◯**Will Not**, be required.

SITE DESIGN CONSIDERATIONS

This lot size is_____ **acres** with dimensions noted on site plan.

There ◯**is**, ◯**is not** a **well or buried cistern** on this site. Land-use of neighboring property in this area is ☐ **Country Residential**, ☐ **Farmland**, ☐ **Urban Residential**, or ☐ **Country Forested**

There ◯**are**, ◯**are not**, any utility right-of-way's or easements on this property and, as such, will be noted on the site plan.

There ◯**are**, ◯**are not**, any discernible watercourses on this property.

Describe: _____

A setback distance of _____**feet** will be maintained from this watercourse.

Topography at site is: ◯**Rolling Hills**, ◯**Generally Level**, ◯**Sloping**

Topography at system installation is: ◯**Generally Level**, ◯**Sloping % of Slope**_____

SOILS ASSESSMENT

The site evaluation identified a suitable area on this property which was investigated, to assess the suitability this of site to the system design. A total of _____ **test pits** were excavated to a depth of _____**feet,** and described in the attached soil profile logs. Soil horizons where measured from ground surface to the top and bottom of each soil horizon only and logged on the Soil Profile Log Form, along with soil Color, Texture, Structure, Grade, and Consistence for each horizon. A laboratory analysis was conducted of the most limiting layer above a restricting layer for each pit. A total of _____ **laboratory soil analyses** were conducted and the resulting **laboratory soils analysis reports have been attached**.

Key Soil Characteristics Applied to This Design

An evaluation of the soil characteristics at this site was conducted by:

The soils evaluation is considered complete and sufficient for the design of this system meets the requirements set out in Section 7 of the SOP as applicable to this site and system design. A summary of profiles identifies:

INITIAL TREATMENT COMPONENT DESIGN DETAILS

Detailed considerations and specifications for the initial treatment components described in this section have been attached if additional information is required on the system design.

Tank Components

After consideration of the design requirements as set out in section 4.2 and 5.2 of the 2015 Standard of Practice, a **Model:**_____

☐ **Tank /** ☐ **Packaged Treatment Plant** with at working capacity of _____**Imp. gal.** was chosen.

Dose Tank

This system design◯**Will,**◯**Will Not**, require the use of a separate dosing tank to regulate flow.

A **Model** _____Tank was chosen.

HIGH LIQUID LEVEL ALARM

A high liquid level alarm will be utilized in this system design.

Manufacturer _____ Model Number _____

EFFLUENT FILTER

An effluent filter: Manufacturer _____ Model #_____

This filter will be installed in: _____

This filter is rated for a flow rate of _____Imp. gal./min. and will be readily accessible for service.

SOIL TREATMENT COMPONENT DESIGN DETAILS

The system selected for this design is: (**ie.** Tank and mound)_____

_____

Selection of this system type has considered soil stratigraphy effects on effluent treatment and infiltration, potential for groundwater or effluent mounding in the subsurface, achieving vertical separation distances within the soil, seven day retention treatment requirements for effluent and the potential impact on human health and the environment for this system dispersal option.

SIZING

Based on the expected peak daily flow volume of _____**Imp. gal/day,** from Section 1 of this report and a soil loading rate of **0.** _____ **Imp. gal/day,** for the design soil horizon in Section 2 of this report, this requires a soil infiltration surface area of _____**sq. ft.**

Linear loading was considered and ◯ **will,** ◯ **will not,** be required for this design.

The linear loading rate required for this design will be _____ **gal/day/foot,** based on information provided from soils horizon logs, lab results, and **Table A.1.E.1** of the SOP. This design has considered various sizing requirements outlined in Section 8.1 of the SOP. The design calculations have been completed on worksheets, which have been ◯ **included,** ◯ **not included**, but will be made available upon request.

PUMP SELECTION

Size of line from tank to treatment site will be ____**inches**.

Design Head Height at Orifice will be 5 feet or more and adjusted to 5 feet.

Pump selected for this design will be a **Make:**_____

Model Number:_____. Delivering_____**Imp. gal/min.** at a pressure head of _____ft. Dose volume selected for this system will be _____ **gal./dose**.

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EFFLUENT DISTRIBUTION DESIGN DETAIL

Open Discharge

◯ **Bell and Syphon**, or ◯ **Pump**

Length of discharge line: _____ **feet** tank to discharge.

Distance to nearest building: _____ **feet**;

Distance to nearest water source:_____ **feet;**

Distance to nearest water course:_____ **feet**;

Distance to nearest property line:_____ **feet**.

Septic Fields

This system will utilize: ◯ **Gravity Distribution** ◯ **Pressure Distribution**

Number of laterals within system **will be:**_____

Length of each lateral within system **will be**:_____

Orifice Size: _____ **Total Number of Orifices:**_____

◯ **Pipe and Gravel** or ◯ **Chambers** **Chamber Width:** ◯ **36 in.** ◯ **24 in.**

Pressure distribution piping will be elevated at least 4 inches above trench bottom.

Pressurized Septic Treatment Mounds

Number of laterals within system **will be:**_____

Length of each lateral within system **will be**:_____

Orifice Size: _____ **Total Number of Orifices:**_____

◯ **Pipe and Gravel** or ◯ **Chambers** **Chamber Width:** ◯ **36 in.** ◯ **24 in.**

Width of Sand Layer: _____ **ft.**

Length of Sand layer _____**ft.**

Base infiltration area _____**sq. ft.**

Area of Sand layer _____**feet**

Pressurized At-Grade Dispersal System

Number of laterals within system **will be:**_____

Length of each lateral within system **will be**:_____

Orifice Size: _____ **Total Number of Orifices:**_____

Chambers will be utilized in this type of system. **Chamber width** ◯ **36 in.** ◯ **24 in.**

Service intervals for this systems treatment plant must be once every _____**months.**

Pressure distribution piping will be elevated at least 4 inches above ground surface within chambers.

OPERATIONAL MONITORING COMPONENTS

A detailed Operations and Maintenance (O&M) Manual will be provided to the owner/occupant upon completion of the installation and should be referenced for details on maintenance intervals and the procedure for such activities, including pump sizing for replacement.

MONITORING PORTS

Four (4) inch monitoring ports will be installed within 15 feet of each end of each lateral of the soil treatment component to inspect the ponding depth of effluent on the soil infiltration area.

LATERAL CLEANOUTS

Cleanouts have been installed at the end of each pressure distribution lateral to facilitate the flushing of laterals of any initial construction debris and any particulate matter that has entered the piping with the effluent. The laterals should be flushed to prevent the piping from clogging up with foreign materials.

SAMPLING EFFLUENT QUALITY

Sampling to assess the performance of the septic tank/treatment plant to reduce such parameters as BOD, TSS, etc. can be accomplished through the manhole access to the effluent chamber.

INITIAL OPERATIONAL SET UP PARAMETERS

The following activities should be conducted in order to commission this system and ensure the design requirements have been achieved:

- Clean the septic tank of any debris from system construction and flushed the laterals to ensure any debris that resulted from drilling orifices have been removed to prevent laterals from becoming logged.
- Conduct a squirt test (with safety codes officer present, if possible) to assess that residual head pressure required by the design (5 feet) has been achieved by the pump selected.
- Confirm the float levels that deliver the expected dose volume are set corrected by measuring volume at orifices and ensuring that volumes are even across the entire soil infiltration area.
- Confirm the float level on alarm are set correctly to sound alarm with enough head room to allow time for service (recommended minimum 300 gallons head room).

INSPECTIONS

Ensure that final inspection has been conducted by safety codes officer and rectify any deficiencies noted.

The information requested in this document must be submitted in full with the permit application as required by the Private Sewage Systems Standard of Practice 2015.

SOIL PROFILE REPORTING

The characteristics of each soil profile investigated shall be described using the Canadian System of Soil Classification nomenclature and include the following in the soil profile description:

- Soil Horizons – the distance from the ground surface to the top and bottom of each soil horizon observed shall be measured and distinctness and topography of the horizon boundaries described.
- Soil Color for each soil lies and identified, the matrix color and quantity, size, contrast, and color of any redoximorphic features present shall be described.
- Texture for each horizon identified, the soil texture classification including any appropriate texture modifier shall be reflected in this evaluation report and a soil sample of the most restricting layer affecting the design shall be collected and analyzed at a laboratory using a recognized grain or particle size analysis method to determine the texture of the same.

NOTE: Other than sandy clay, any texture that uses the word SAND in its description must include sand particle size.

- **Soil Structure** and grade of structure identified for each horizon.
- A statement regarding the treatment capability and dispersal capacity of the available site(s).
- Where the soil profile includes features that will require the lateral movement of water through the soil away from the dispersal system, identified constraints on the system design and allowable effluent hydraulic loading rates, as it relates to linear loading rates.
- A summary of the significant limiting conditions of soil profile and site.
- A justification of the locations and number of the soil profiles investigated.
- A description of the development being served including:
    - Characteristics affecting the determination of peak and average wastewater flows to be used in the design,
    - The peak daily wastewater flow volume to be used for the system design, and
    - Anticipated influent wastewater strength.
- Copies of laboratory soils analysis reports have been attached.
- Number of soil profiles investigated; a minimum of two (2) test pit excavations shall be investigated at the proposed location for the soil-based treatment component to classify and assess the treatment capacity of the soil.
- Minimum depth of soil investigation (choose appropriate depth as per YOUR design). The soil profiles shall be investigated to a minimum depth below ground surface of:
    - 4 feet for Treatment Mounds.
    - 6 feet below trench bottom for Treatment Fields receiving primary treated effluent (septic tank effluent).
    - 6.5 feet for Treatment Fields receiving secondary treated effluent (treatment plant, sand filter effluent).
    - 6 feet for Open Discharge systems.

NOTE: When the site evaluation report is complete the information from the report is to be used to produce your Systems Summary Design Report. This includes any features that would require peak flow to be increased.