

# Country Residential Sewage Handling

Priorities Committee presentation – April 17, 2018

UT11478645

# Outline of presentation

- Background information for Country Residential Policy Area – Planning and Development Services
- Private On-Site Sewage System – Planning and Development Services
- Municipal Piped STEP Sewage System – Utilities
- Summary – Planning and Development Services

# Background

At the June 6, 2017, Council Meeting a motion was approved for Administration to prepare a report regarding Country Residential sewage handling.

The following information is provided to the Priorities Committee in relation to the background on the requirement for piped municipal wastewater servicing systems in the Country Residential Policy Area, as well as information regarding private on-site sewage systems and the municipal piped STEP sewage system.

# Background (cont'd)

There has been a requirement in the County since 2003 that cluster country residential development requires a piped municipal wastewater servicing system.

This requirement was expanded in 2005 to include all new and existing subdivisions in the Country Residential Policy Area. In 2009, the requirement for existing subdivisions was cancelled.

Seven multi-lot country residential subdivisions have been developed in this time with piped municipal wastewater servicing: Ranchlands, Lorrelind Estates, Boag Lake Estates, Sherwood Hills Estates, The Estates at Crimson Leaf, The Grange and Meadow Hawk.

# Background (cont'd)

During the update of the Municipal Development Plan (MDP) in 2017, one of the items of focus was on servicing requirements in the Country Residential Policy Area. Regarding the two options of providing wastewater services to lots, the following were brought forth as points to consider for each type of system:

## **Individual (Private) On-Site Systems**

- Concerns the system will fail and be costly for a resident to replace, posing a risk to the environment.
- May encourage country residential development.
- Impact on road network, costs to County for road maintenance due to truck hauling.

## **Municipal Piped (STEP) System**

- Very costly to develop.
- Appears to discourage country residential development.
- If large servicing network is built-out, costs over time for maintenance and replacement may increase.

# Private on-site sewage system

## Typical Types of Systems in our Area/Soil Conditions

- Mound
- Field
- At Grade System

## Estimated Cost Range

- \$30,000 to \$60,000. Lot owner pays cost.
- Cost varies on type of system (at grade system typically being most expensive) but also depends on:
  - Type of soil.
  - Size of home – number of bedrooms (and fixture loads).

# Private on-site sewage system (cont'd)

## **Average lifespan of the different systems**

- All types last about 25-30 years (if maintained properly and typical usage).

## **Maintenance**

- At Grade – Maintained twice per year (filters), effluent out is extremely clean.
- Mound - Ensure no freezing occurs; tank to be pumped every 3 to 5 years depending on tank size/usage.
- Field – Tank to be pumped every 3 to 5 years depending on tank size/usage.

## **Minimum parcel size recommended**

- Subdivision requires a minimum of 1 acre of developable area, in part to ensure room for an on-site system. Lot sizes of two to four acres are typical for the traditional multi-parcel country residential subdivisions.

# Private on-site sewage system (cont'd)

## Other factors

- There are setback requirements from the field or mound system to buildings, wells and from property lines (vary between systems from 1.5m to 3.0m).
- The surface area where the field or mound is located is not useable, cannot recreate on them. As well, the rebuild of a field or mound cannot be placed on top of the old system. After its lifespan, a new system would be required in a new location on the lot. This is problematic if the lot is smaller and the location of the house, other buildings or the old system limits the space for a new system.
- There is no maximum number of these systems per quarter section/area. Each system should be designed to have minimal impact (if any) on the adjacent system, however over-saturation on the small lots can occur.

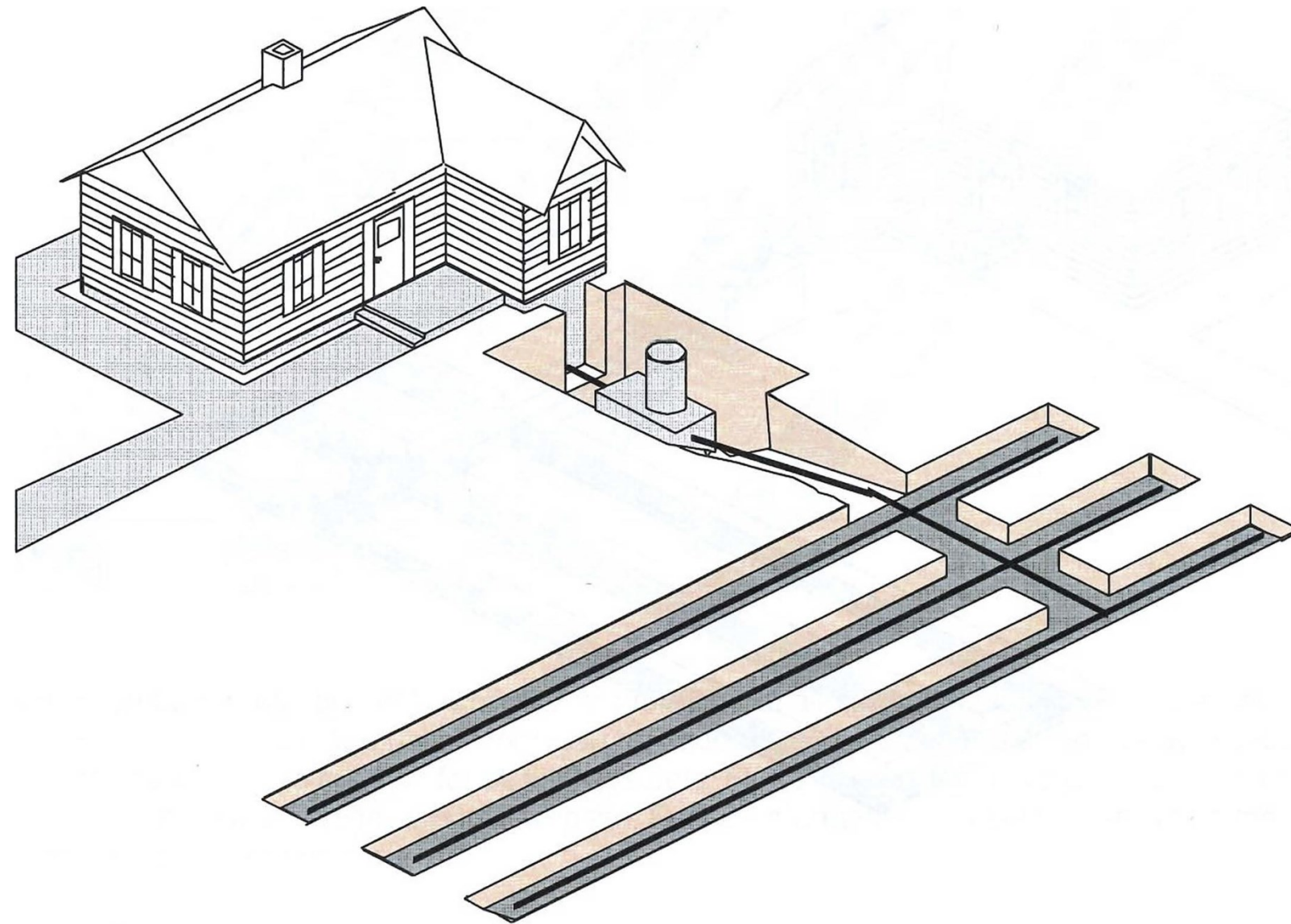


# Private on-site sewage system (cont'd)

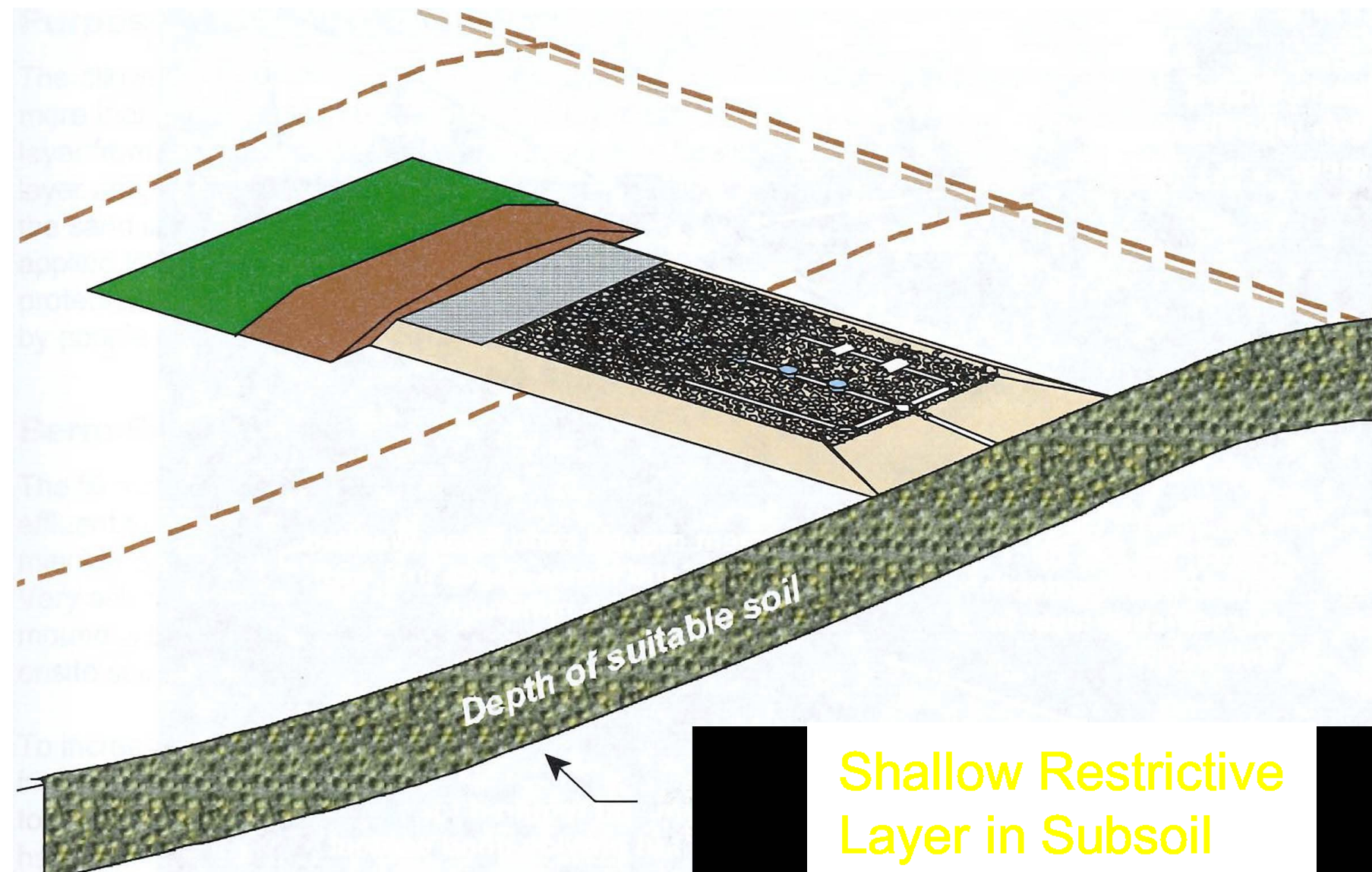
## Important considerations

- The systems today are better if soil conditions accommodate (much of our area still require mounds). The review process is more stringent however, homes are getting larger. Systems exceeding 1,250 gallons (4,732 litres) of wastewater per day must be engineered.
- Fields take up a large amount of space on the lot.
- Mounds are prone to freezing especially if not maintained or operated during vacation (freeze when not in use).
- Although At Grade Systems take up very little room, they need wooded areas.

# Field sewage system diagram



# Treatment Mound Sewage System Diagram



# Municipal Piped STEP Sewage System

## **Type of Municipal System Provided in the Country Residential (CR) Policy Area**

- Septic Tank Effluent Pumping (STEP).

## **Estimated Cost Range for Two Development Scenario Examples**

- Cost estimates include:
  - Offsite (Municipal) Infrastructure – developer pays up front:
    - Wastewater transmission main (2 km or 10 km scenarios).
    - Wastewater collection main.
  - Onsite (Private) infrastructure – lot owner pays:
    - Onsite service lines from property line to private tank.
    - Septic tank and pump.



# Municipal Piped STEP Sewage System (cont'd)

## Assumptions

- Costs based on existing County contracted values and existing country residential subdivision documented costs.
- Wastewater mains are in road right-of-ways (no land requirements).
- Construction method is directional drilling.
- Contingency of 30% added to the cost estimates.
- Private service line lengths taken as an average (approximately 25m).
- Development density of 50 lots per quarter.

# Municipal Piped STEP Sewage System (cont'd)

## **Scenario 1 – Country Residential lot, 2 km from Existing STEP Transmission Infrastructure**

- Offsite (Municipal) Infrastructure: \$12,000 per lot
- Onsite (Private) Infrastructure: \$31,000 per lot
- **Total: \$43,000 per lot**

## **Scenario 2 – Country Residential lot, 10 km from Existing STEP Transmission Infrastructure**

- Offsite (Municipal) Infrastructure: \$39,000 per lot
- Onsite (Private) Infrastructure: \$31,000 per lot
- **Total: \$70,000 per lot**

# Municipal Piped STEP Sewage System (cont'd)

## **Additional costs for either scenario:**

### **Contribution in Aide of Construction** (Non-refundable):

- Country Residential Minimum Transmission: \$3,500 per lot
- Storage: \$3,378 per lot

**TOTAL ESTIMATED COST: \$50,000 - \$77,000 per lot** (2 km – 10 km from existing STEP transmission infrastructure)

# Municipal Piped STEP Sewage System (cont'd)

## Municipal Monthly Rate

- Treatment - Monthly Fixed Charge: \$22.46
- Operation & Maintenance – Monthly Fixed Charge: \$21.90
- **Total Wastewater Rate: \$44.38 per month**

## Average Lifespan of Infrastructure

- Offsite (Municipal) Infrastructure: Wastewater Mains - 90 years
- Onsite (Private) Infrastructure: Tanks and Pumps – 25 - 30 years (if maintained properly).



# Municipal Piped STEP Sewage System (cont'd)

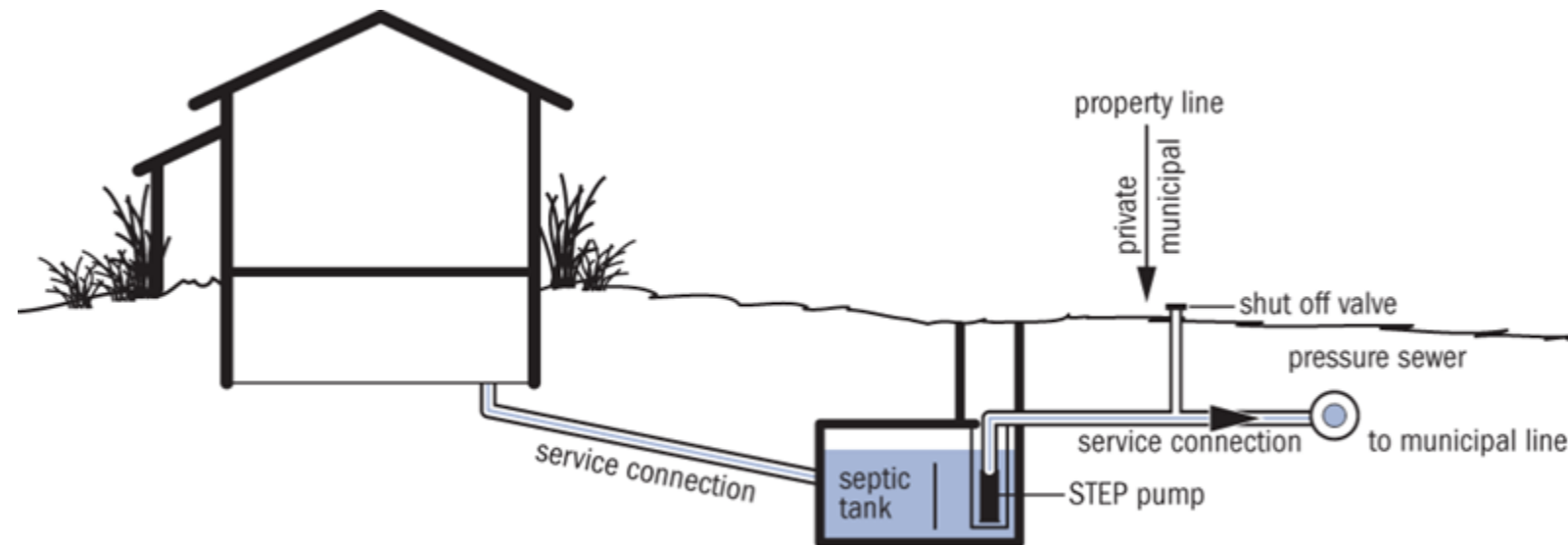
## **Maintenance**

- Offsite (Municipal) Infrastructure: Continuous Odor/Corrosion Protection; Periodic Line Flushing
- Onsite (Private) Infrastructure: Tank to be pumped every 3 to 5 years depending on tank size/usage

## **Minimum Parcel Size Recommended**

- There is no minimum parcel size or maximum number per quarter/area in relation to waste water servicing; however density impacts the waste water main sizing.

# STEP Sewage System Diagram



# Summary of Systems

	Private On-Site System	Municipal Piped System
<b>Cost</b>	<p>Installation: \$30,000 - \$60,000 per lot depending on type</p> <p>Lot owner pays entire cost</p>	<p>Installation: \$50,000 to \$77,000 total per lot depending on distance from transmission infrastructure</p> <p>Developer pays a high up front cost for off-site municipal portion of system</p> <p>Lot owner pays cost of on-site portion of system</p> <p>Monthly Utility Rate: ~ \$45 month</p>
<b>Lifespan</b>	25-30 years depending on type	<p>On-site portion: 25-30 years</p> <p>Off-site portion: 90 years</p>
<b>Lot Size Requirements</b>	At least 1 developable acre	No minimum size
<b>Environmental Concerns</b>	If tank or treatment area not maintained or operated properly	If tank not maintained or operated properly
<b>Maintenance</b>	<p>Tanks to be pumped approximately every 3 – 5 years</p> <p>Maintenance for at grade filters twice per year</p>	<p>Tanks to be pumped approximately every 3 – 5 years</p> <p>Continuous odor/corrosion protection and periodic line flushing</p>

# Vision for the Area

What is the desired look and feel in the Country Residential Policy Area going forward? The servicing falls out of the vision. In this regard, there are 3 options that could be considered:

- Small lot with STEP system (e.g. The Grange, Meadow Hawk)
  - Status quo
- Large lot with STEP system (e.g. Estates at Crimson Leaf, Ranchlands)
  - Small change from current policy (lot sizes of 2 – 4 acres while current policy results in lot sizes of 1/3 - 2 acres)
- Large lot with private on-site system (e.g. Deer Mountain, Four Ridges)
  - Significant change from current policy

# Small lot with STEP system



- Typical of more recent developments
- May limit growth due to off-site costs
- A more estate or urban form of development (lots less than 1 acre in size, can be as small as 1/3 acre)
- Typically less road infrastructure due to smaller lots
- Less environmental concerns due to STEP system
- Environmental obligation shared between land owner and municipality



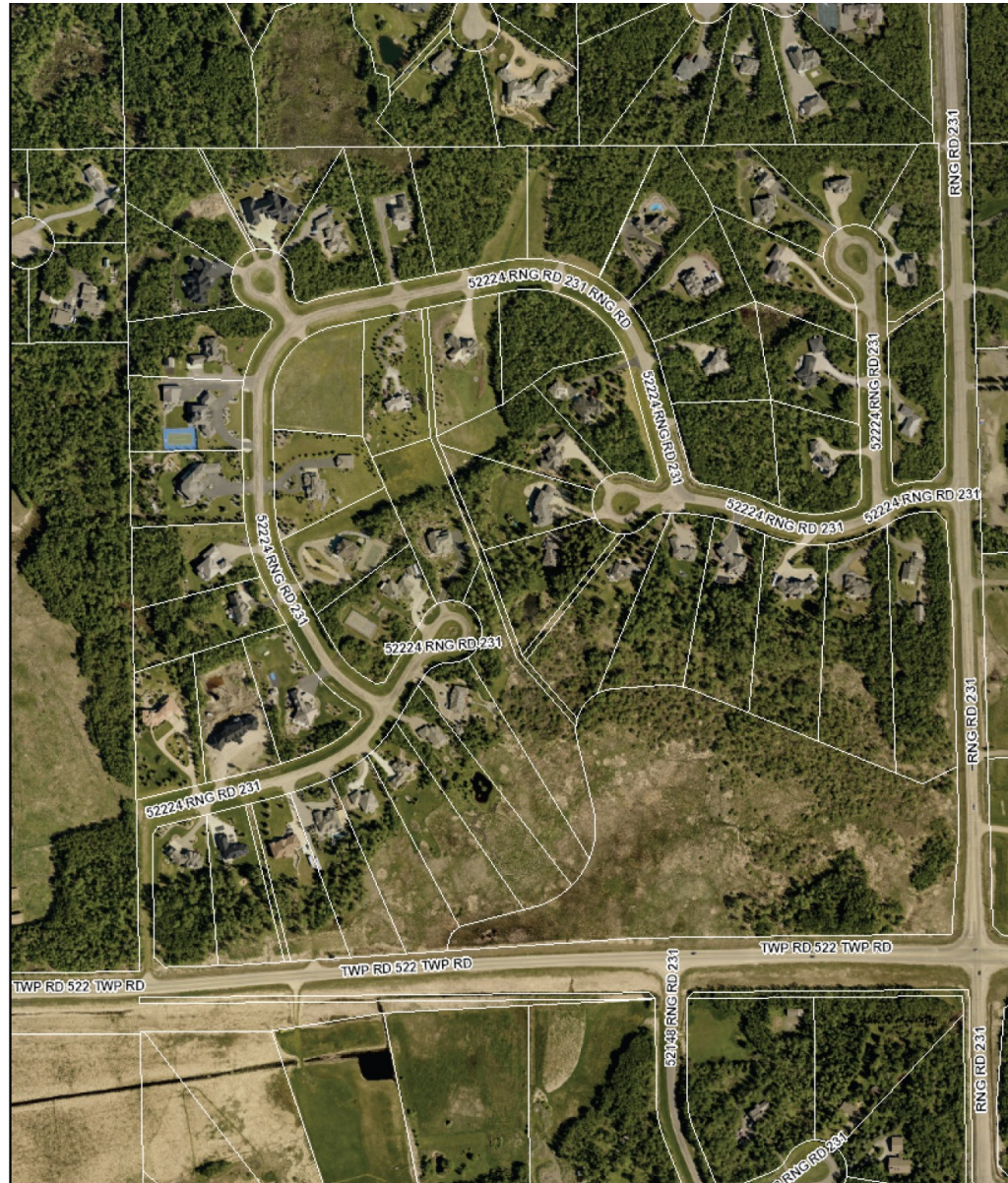
# Large lot with STEP system



- Typical of development form from about 12 – 15 years ago
- May limit growth due to off-site costs
- A more traditional form of country residential development (approximately 2 - 4 acre lots)
- Typically more road infrastructure due to larger lots
- Less environmental concerns due to STEP system
- Environmental obligation shared between land owner and municipality



# Large lot with private on-site system



- Typical of development form from more than 15 years ago
- May see more growth due to no off-site costs
- A more traditional form of country residential development (approximately 2 - 4 acre lots)
- Typically more road infrastructure due to larger lots
- Potentially more environmental concerns
- Environmental obligation carried by land owner

# Edmonton Metropolitan Regional Board (EMRB)

- Any proposed change to serving in the Country Residential area would require amendments to the County's Municipal Development Plan (MDP) and Country Residential Area Concept Plan (ACP)
- Direction in the EMRB Growth Plan allows for a maximum of 50 lots per quarter section and private on-site sewage systems
- If changes to how the area is serviced were to be considered, discussions with EMRB administration would be required in order to determine alignment with the Growth Plan



# Questions