



# **TOMAHAWK LAGOON UPGRADE**

**WHERE ARE WE NOW AND HOW DO WE PLAN FOR THE  
FUTURE?**

# INTENT OF THE PROJECT

Maintain  
OR  
Expand

```
graph TD; A[Maintain OR Expand] --- B[Lagoon Capacity]; A --- C[Treatment Quality]; A --- D[Physical Condition]; B --- B1[Population]; B --- B2[Sewage Generation]; C --- C1[BOD]; C --- C2[TSS]; D --- D1[Age]; D --- D2[Geotechnical]; D --- D3[Sludge];
```

Lagoon  
Capacity

Population  
Sewage Generation

Treatment  
Quality

BOD  
TSS

Physical  
Condition

Age  
Geotechnical  
Sludge

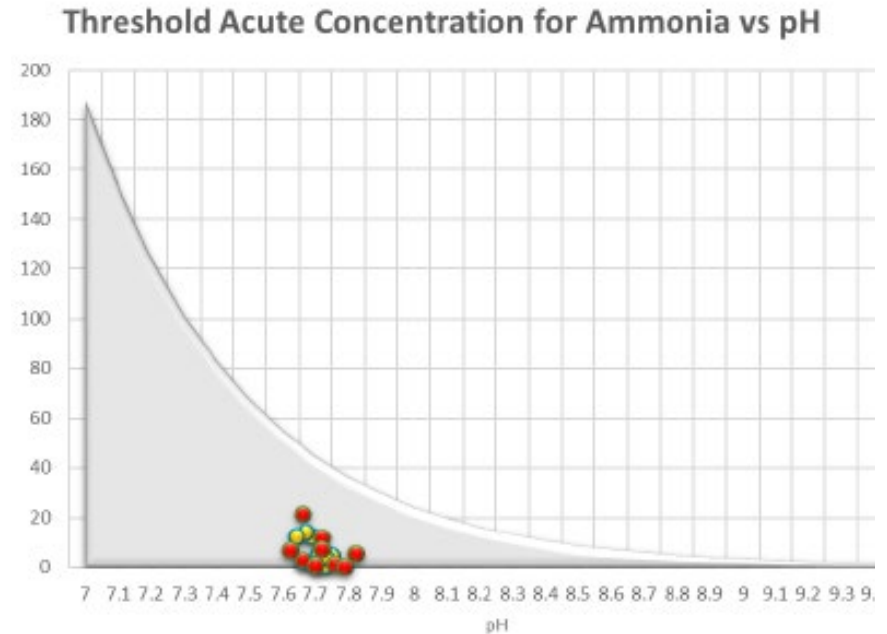
# LAGOON CAPACITY – SUFFICIENT FOR 15 YEARS

- We are granted up to two discharges per year. The existing 8,758m<sup>3</sup> cell size accommodates 6-months storage.
- Current average flows are approximately 21-23m<sup>3</sup>/day, the lagoon has capacity for 48m<sup>3</sup>/day .
- Estimating population growth at 1.5% and anticipating sewage generation of 325 L/person/day the lagoon capacity is sufficient for 15 years.



# TREATMENT QUALITY - ACCEPTABLE

Parameters	Limit (mg/L)
Carbonaceous Biochemical Oxygen Demand (CBOD5)	$\leq 25$
Total Suspended Solids (TSS)	$\leq 25$
Un-ionized Ammonia (NH <sub>3</sub> ) at 15°C	$\leq 1.25$



- We compare against National Standards to determine if there are any worsening trends that suggest performance issues.
- Review of the treated effluent quality from 2011 to 2019 indicate BOD and TSS are generally with the expectations of a bi-annual discharge lagoon.
- Ammonia is within safe levels to prevent acute toxicity in fish.



# PHYSICAL CONDITION – NEEDS REHABILITATION

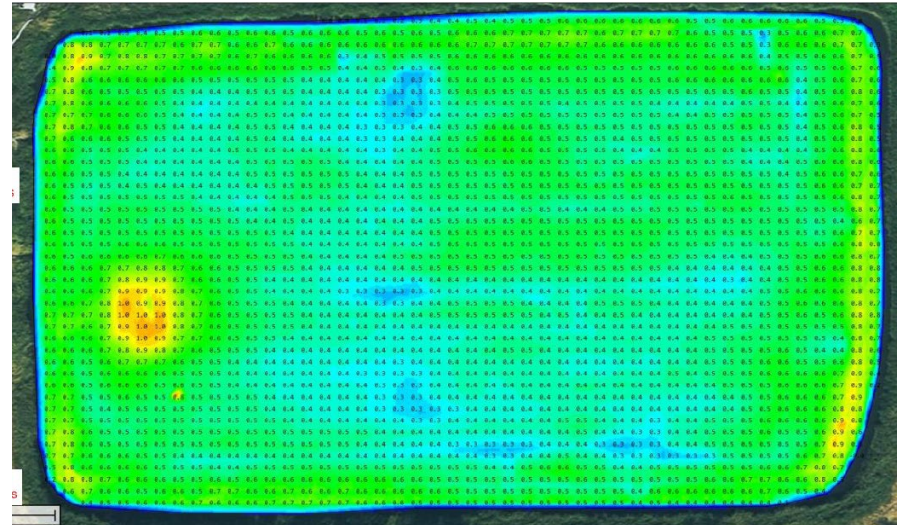
## GEOTECHNICAL/AGE

- The lagoon is 56 years old
- Geotechnical testing of the berm was conducted and it was recommended that the lagoon side slopes and clay liner be reconstructed, and groundwater monitoring wells be installed.



## SLUDGE

- Estimated sludge volume of 3,807m<sup>3</sup> or 43% occupied by sludge! It is recommended to de-sludge to regain capacity and improve treatment quality.
- Tests show that it meets requirements for the application to land.

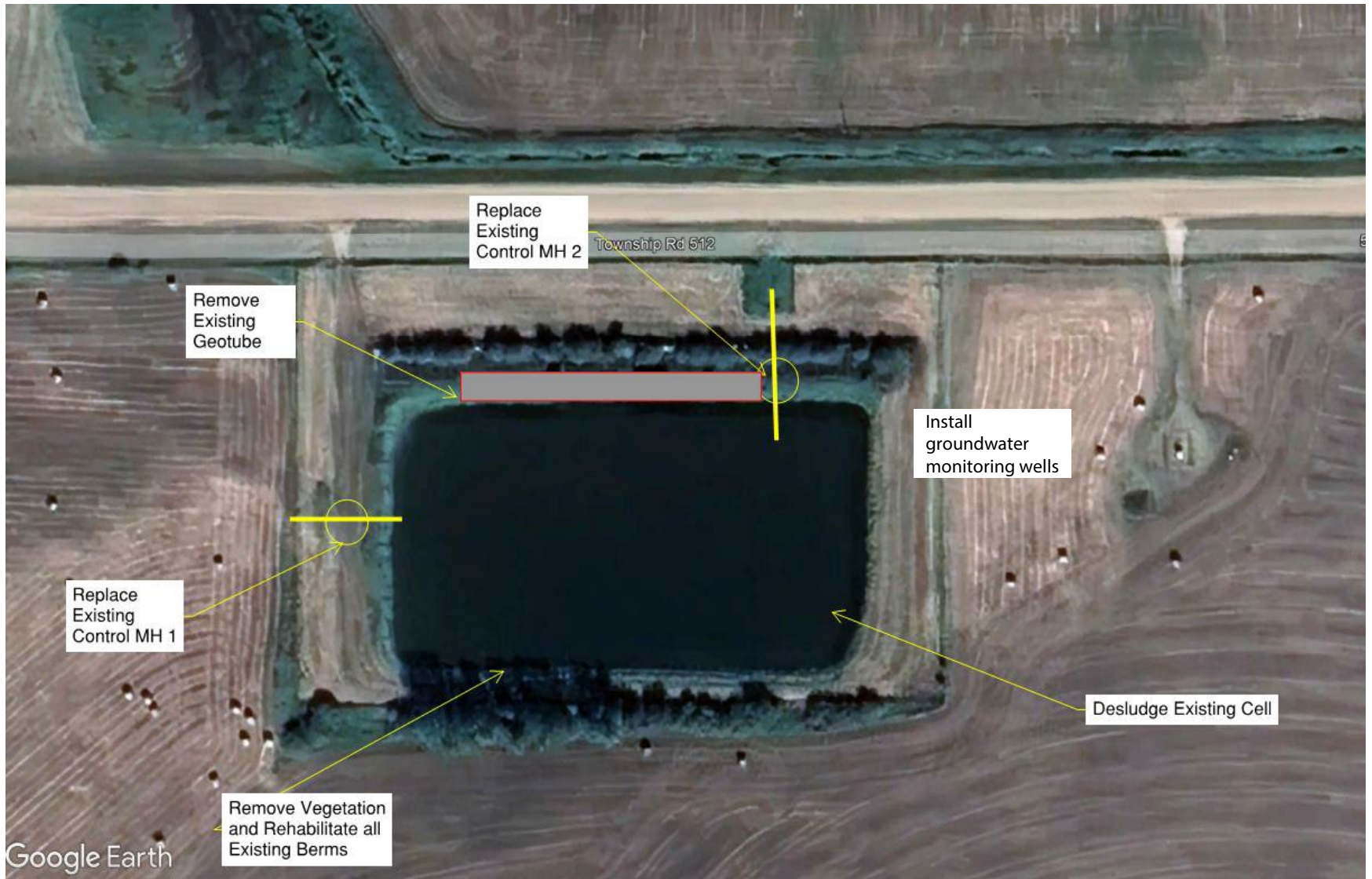




**RECOMMENDATION**



# RECOMMENDATION - MAINTAIN AND REHABILITATE



# ALBERTA ENVIRONMENT DISCUSSIONS

- Maintaining the existing lagoon involves continuing to operate under the grandfathered Alberta Environment Approval #1230-01-00, maintaining a one-cell operation, 6-month storage and bi-annual discharge.
- Keep following annual reporting; disclosing discharge dates, volumes and effluent analysis. Data is reviewed yearly by Alberta Environment to ensure the lagoon is operating satisfactorily.

  
ENVIRONMENTAL PROTECTION

---

**APPROVAL**  
PROVINCE OF ALBERTA  
ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT  
S.A. 1992, c.E-13.3 and as amended from time to time.

APPROVAL NO. .... 1230-01-00 .....

APPLICATION NO. .... 001-1230 .....

EFFECTIVE DATE .... April 21, 1997 .....


EXPIRY DATE .... April 1, 2007 .....

APPROVAL HOLDER..... Reeve  
..... Parkland County .....

Pursuant to Part 2, Division 2 of the Environmental Protection and Enhancement Act, S.A. 1992, c.E-13.3, as amended from time to time, approval is granted to the approval holder subject to the attached terms and conditions for the following activity:

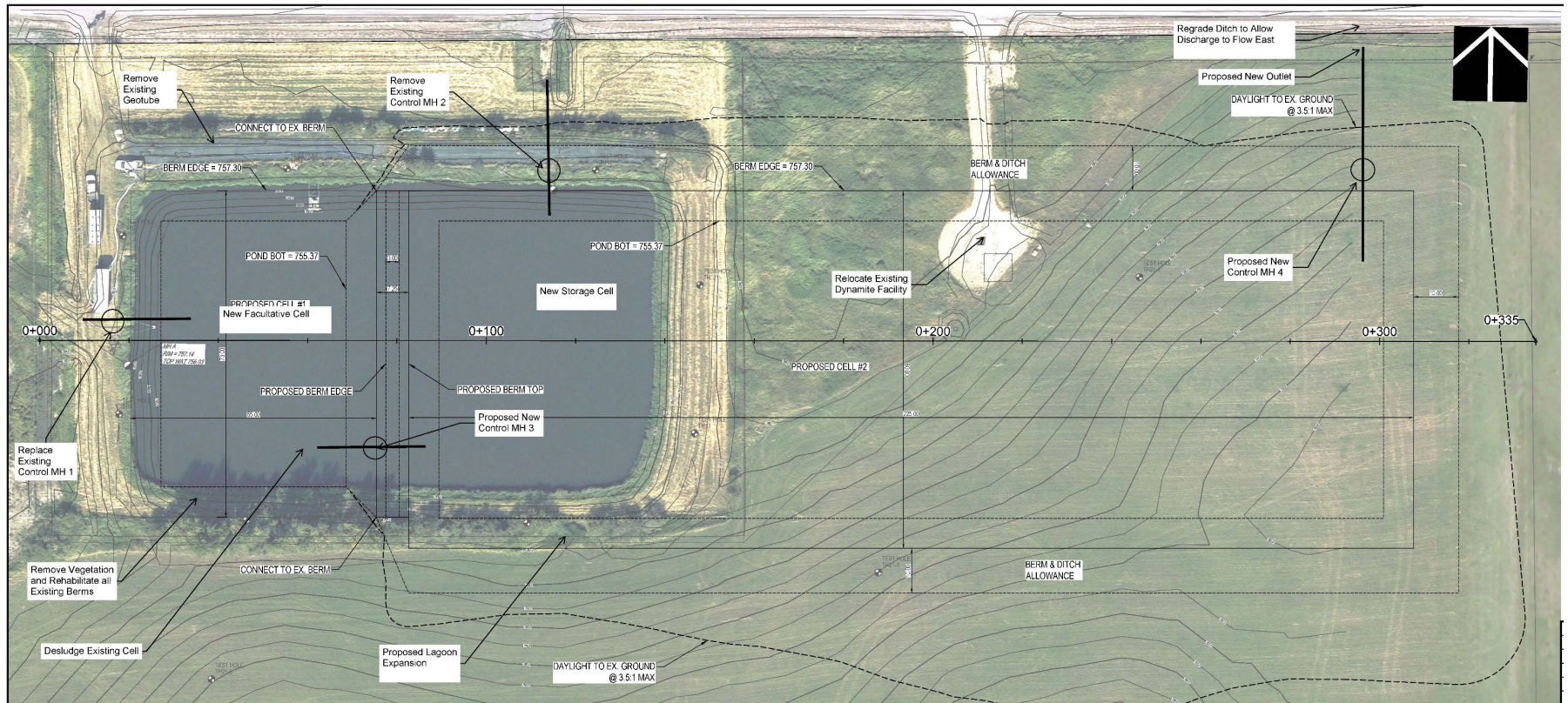
Operation of a Class I wastewater treatment plant (wastewater stabilization ponds) and a Class I wastewater collection system for the Hamlet of Tomahawk.

Date Signed ..... April 21, 1997 .....

Regional Director's Signature .....  .....



# EXPANSION OPTION TO ACCOMMODATE FUTURE GROWTH



- Once we approach lagoon capacity, that is total sewage generation of  $\sim 48\text{m}^3/\text{day}$ , anticipated in 15 years, the lagoon will have to be expanded. This shows the preliminary layout when it comes time to expand the lagoon.
- Working on acquiring  $\sim 3.6\text{Ha}$  of land for the future expansion option.



# QUESTIONS?