



LAMBOURNE ENVIRONMENTAL Ltd.

51 Belich Crescent, Red Deer County, AB T4S 2K5

** SENT VIA EMAIL wleigh@nakusp.com **

April 25, 2017

Village of Nakusp
1325 Hot Springs Road
Nakusp, BC
V0G 1R0
Attn: Warren Leigh, Director of Operations

Re: Nakusp, BC – Lagoon Survey report

Dear Warren,

Please find the following lagoon survey results for the Nakusp lagoon site. Our survey process and methodology was as per our discussion, which was as follows.

Project Methodology

To carry out the survey, we marked the perimeter of the cell with a GPS unit that is accurate to <1cm, and then created a grid pattern of the cell.

From a boat our crew used a metered pole to probe for the bottom of the cell to determine total depth of the lagoon.

We also used a photosensitive instrument that detects sludge at 1% TS or greater. It was lowered into the cell at the various locations (as shown by the red crosses on the accompanying map) and it gives off an audible tone when the top of the sludge blanket was located. The wire leading to the meter has been marked with measurements so that the distance between the top of water level at the time of the survey and the top of the sludge can be recorded.

The data points collected were then processed using Carlson software to calculate volumes and drawings of the lagoons.

The table below indicates a summary of our findings from the sludge survey:

Table 1: Survey Data

Cell	Total Volume (m ³)	Sludge Volume (m ³)	Total Depth (m)	Max Sludge Depth (m)	Average Sludge Depth (m)	Berm Slope Used
Cell 1	1,700	90	3.20	0.81	0.30	3:1
Cell 2	9,500	3,500	3.40	2.80	1.24	See site overview drawing

As well, we collected three sludge samples from cell 2 to assist in estimating the dry tonne equivalency of the biosolids. The results are as follows:

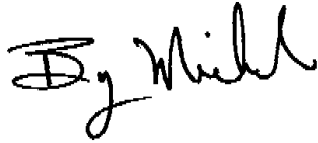
Sample	Percent solids
1	6.49
2	6.52
3	6.46

Based upon these results we would estimate that there is approximately 230 dry tonnes of biosolids in cell #2.

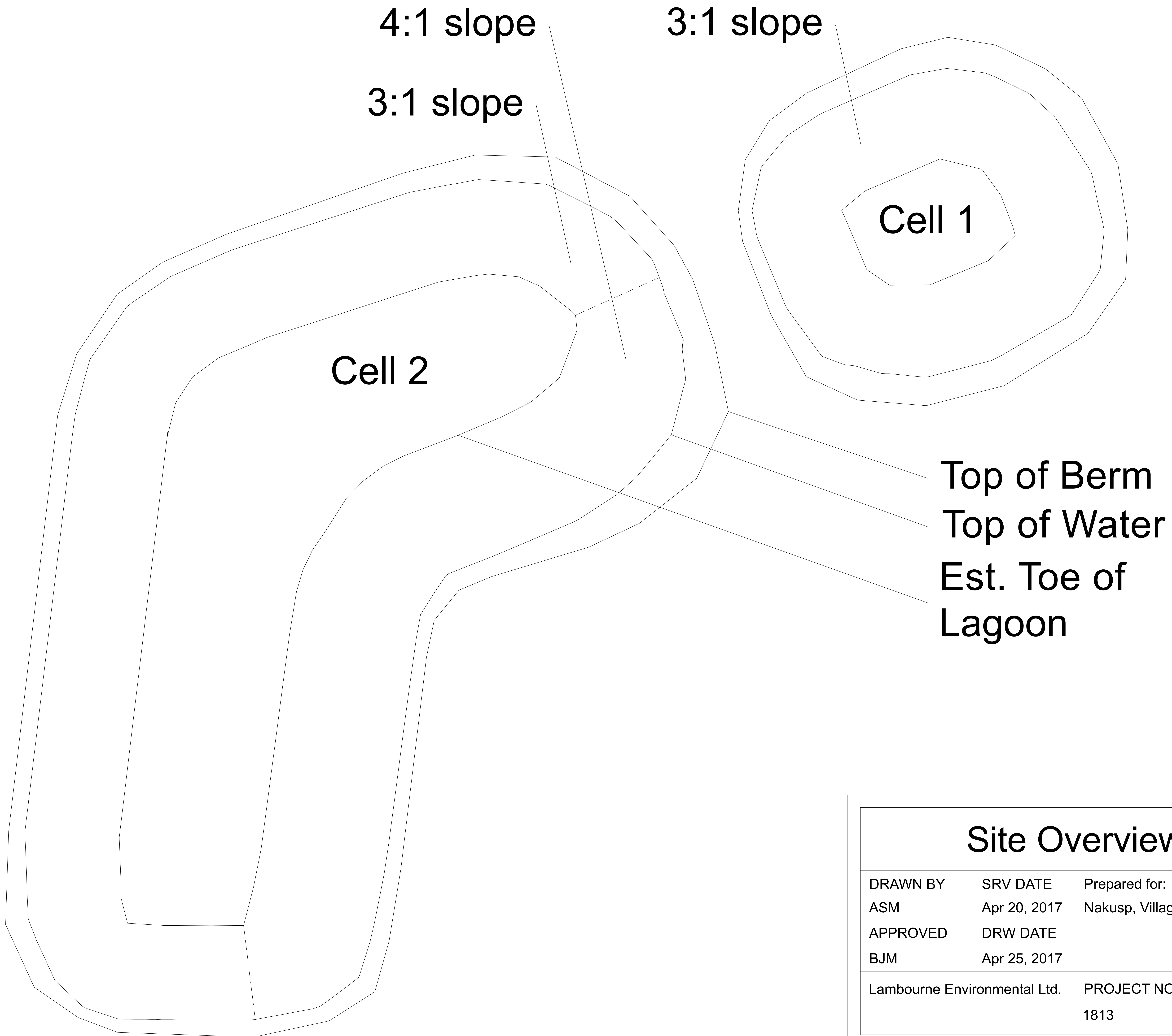
We would recommend that cell 1 does not require desludging and that cell 2 should be desludged as there was considerable buildup at the south end of the cell.

I trust this provides you with the information you require. If you have any questions regarding this report please do not hesitate to contact me.

Yours truly,
Lambourne Environmental Ltd.

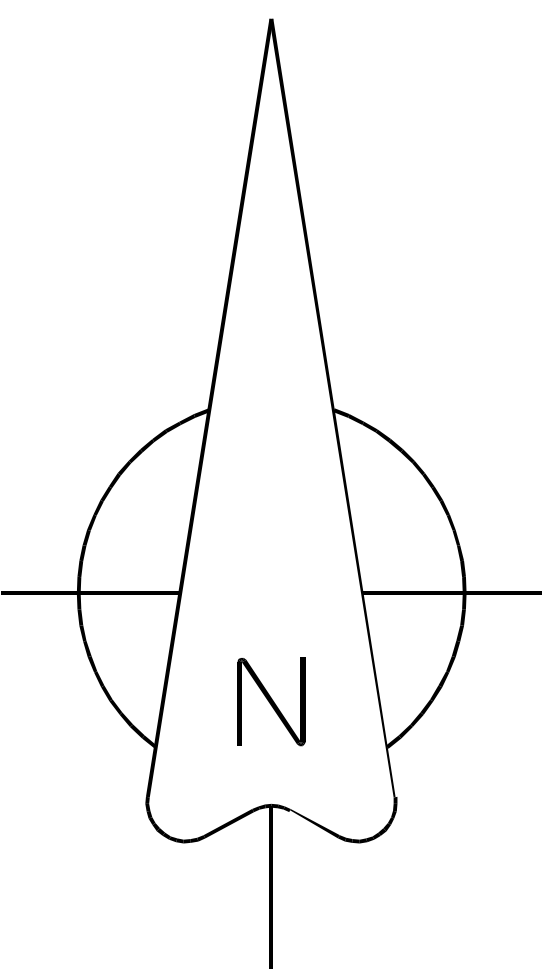
A handwritten signature in black ink, appearing to read "By Mickelson". The signature is written in a cursive, flowing style.

Byron Mickelson, CPA, CMA
President



Site Overview

DRAWN BY ASM	SRV DATE Apr 20, 2017	Prepared for: Nakusp, Village of
APPROVED BJM	DRW DATE Apr 25, 2017	
Lambourne Environmental Ltd.		PROJECT NO. 1813

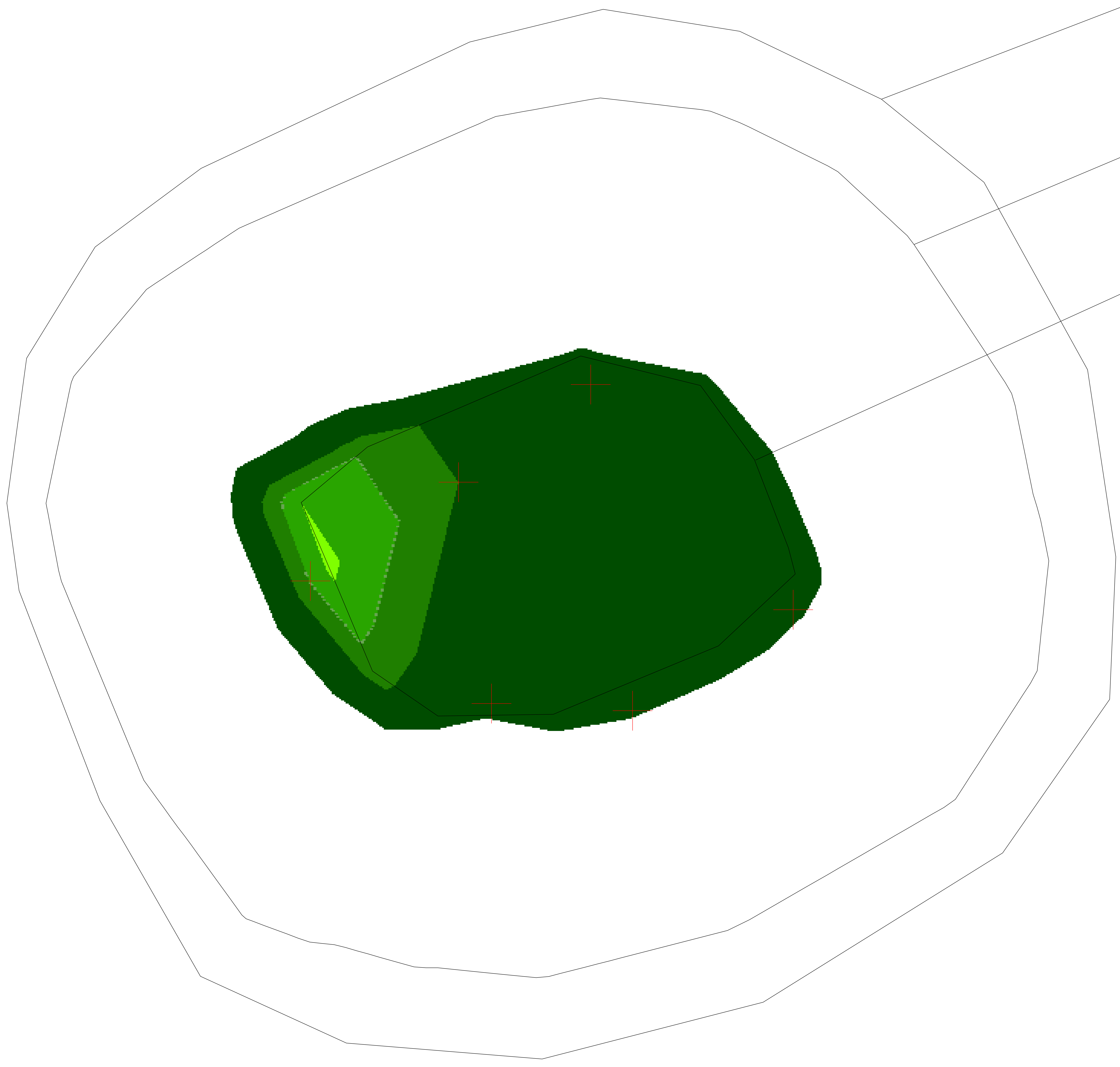


Top of Berm

Top of Water

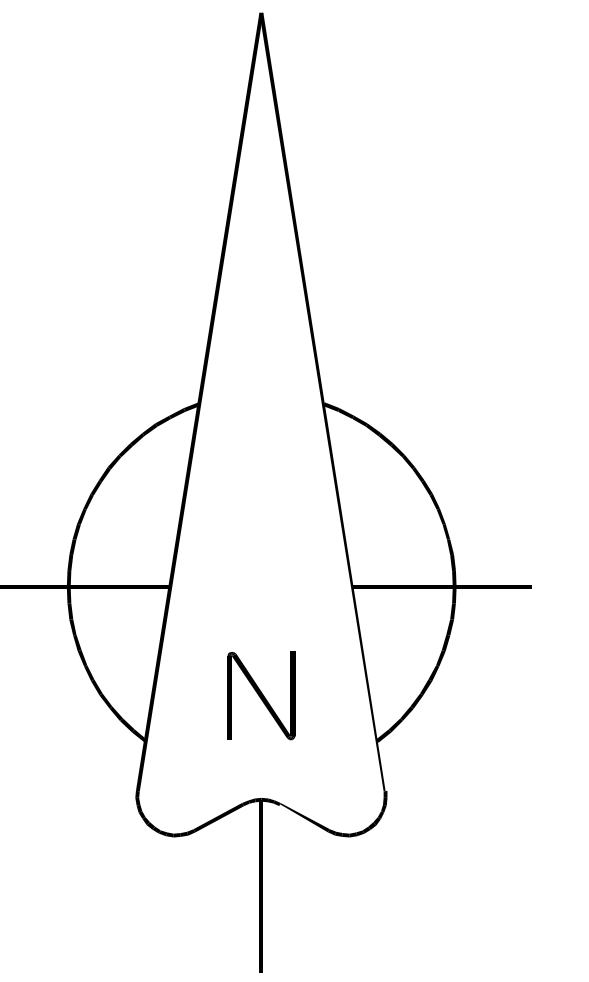
Est. Toe of Lagoon

Sludge Thickness (m)



Cell 1

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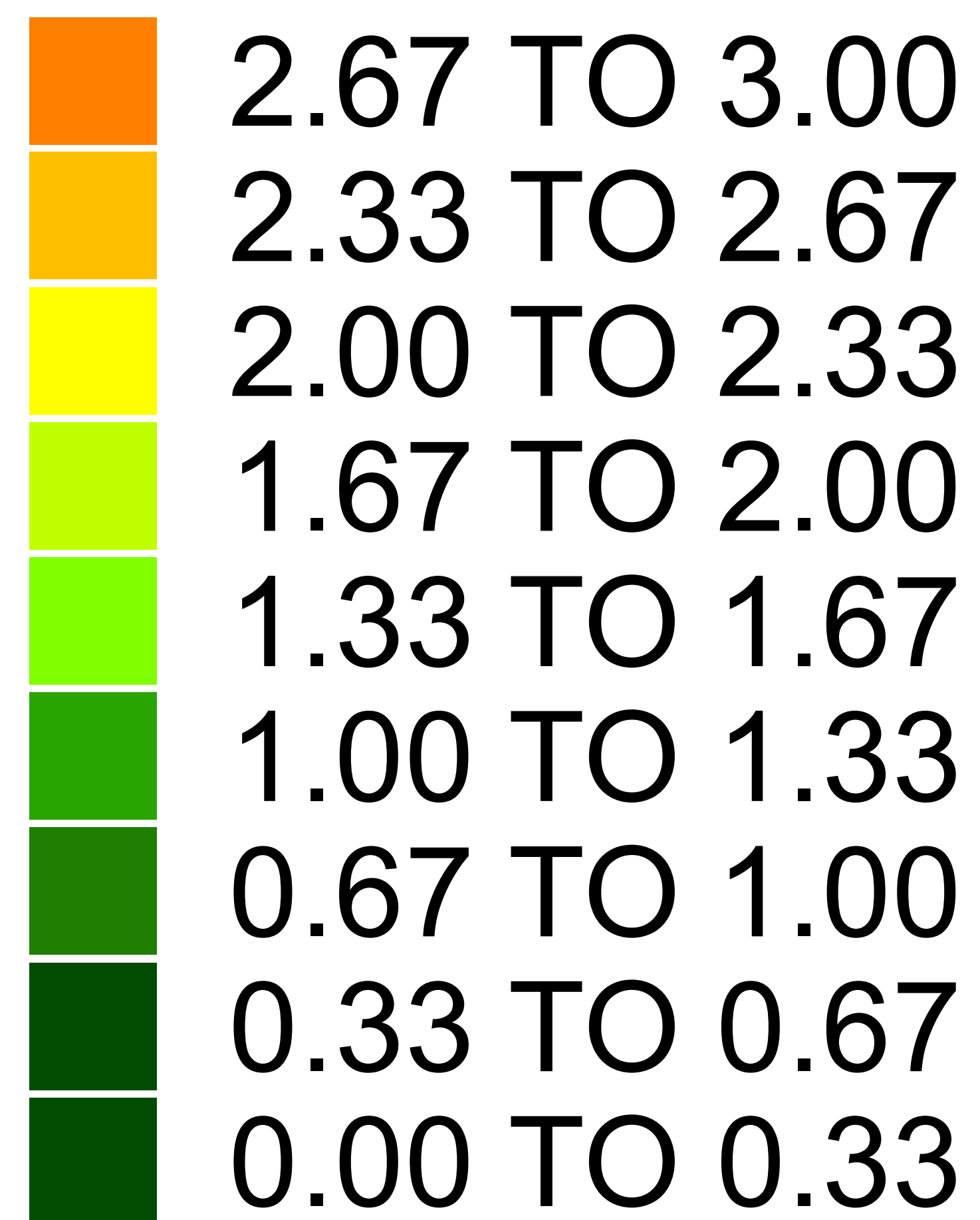


Top of Berm

Top of Water

Est. Toe of Lagoon

Sludge Thickness (m)



Cell 2

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