Alum Plant Update

June 2017

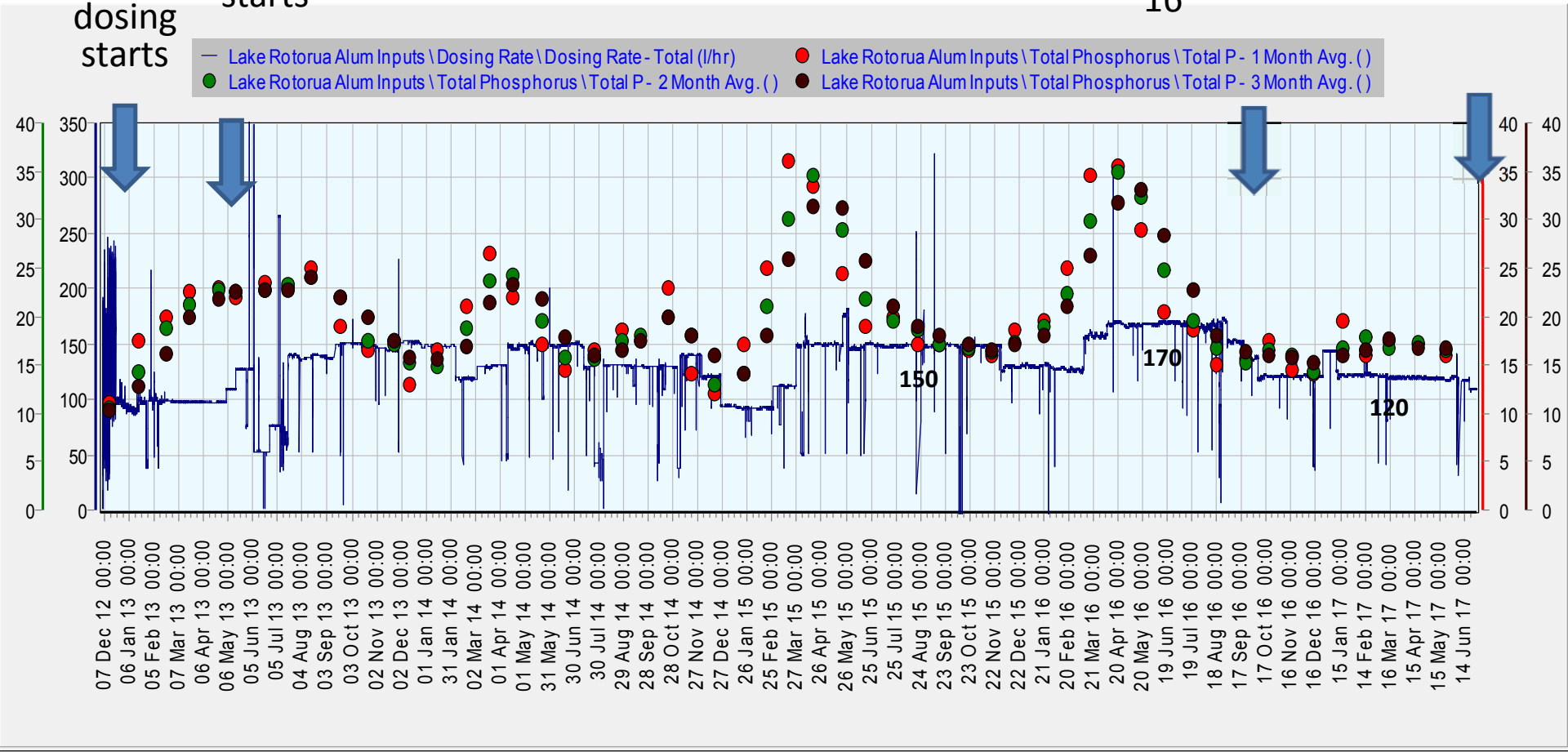
Dec 12 to current – dosing rate and TP concentrations Lake Rotorua

Fixed rate dosing starts

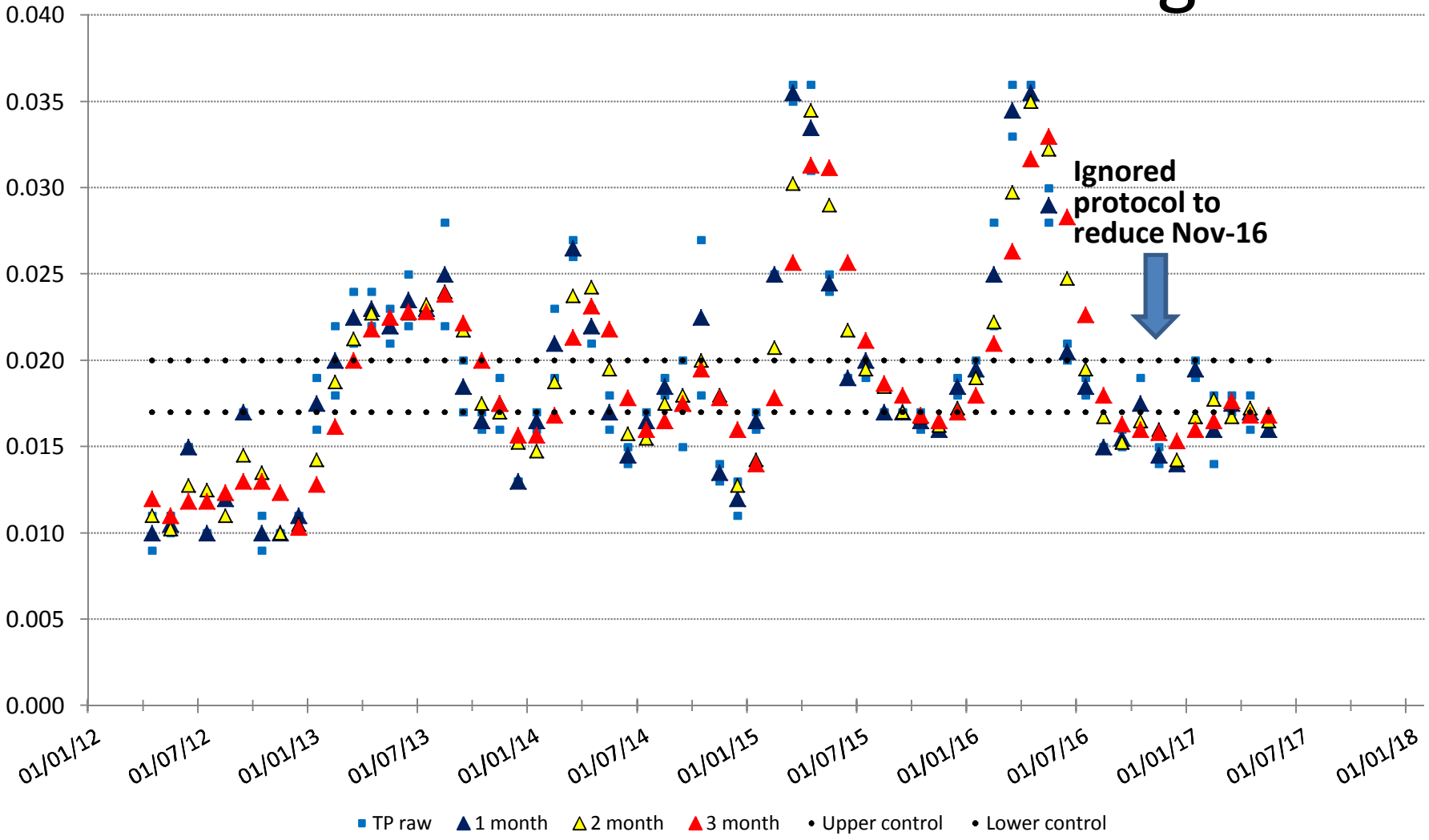
Protocol starts

Rate decrease (from 140 to 120l/h) in Oct 16

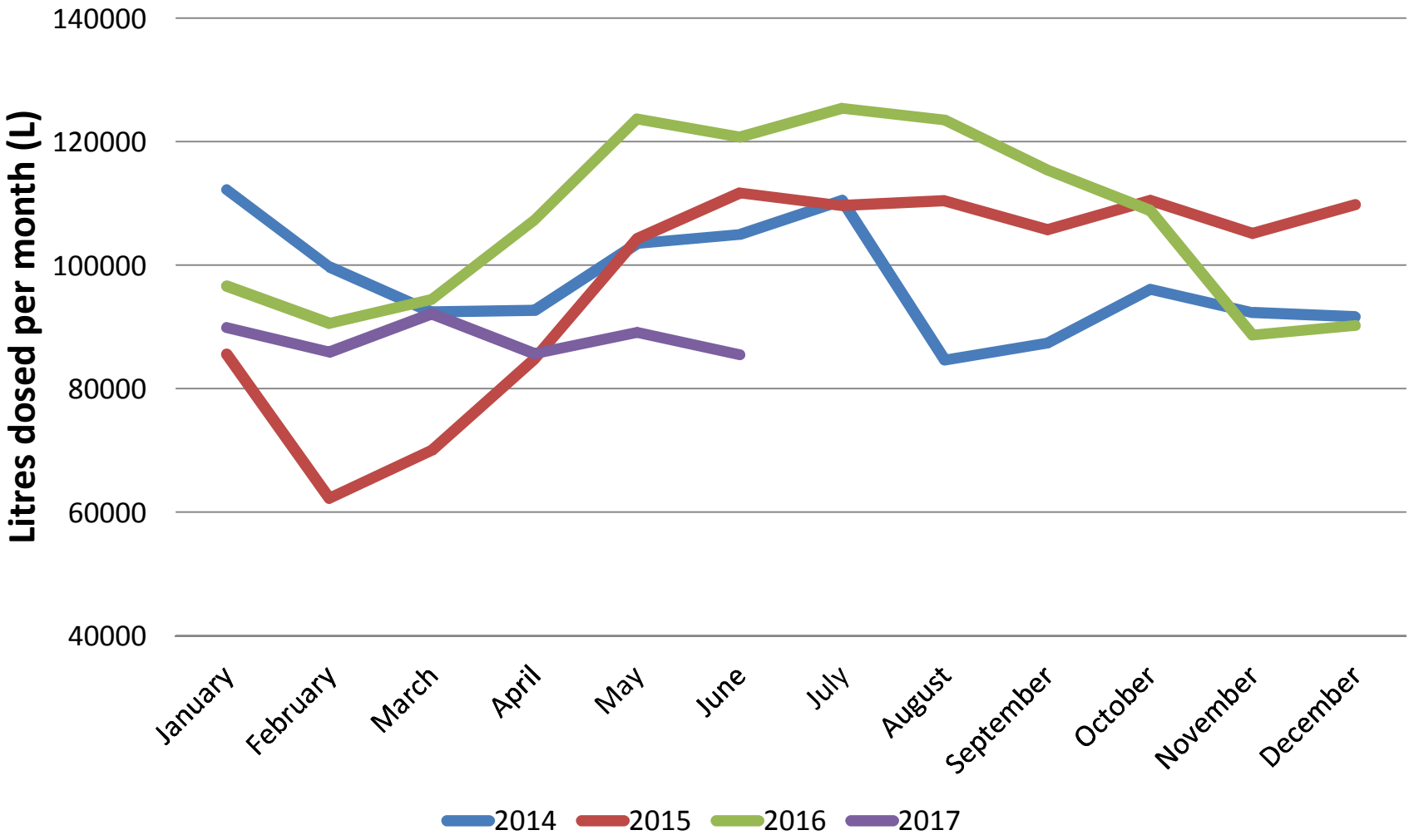
Rate decrease (120 to 110l/h) in June 17



April 12 to current- Rotorua P concentrations vs control target



Comparing Monthly Dose Rates



Comparing Monthly Dose Rates Cont.

Alum dose	L/hr	Increase/decrease
	100	
3/05/2013	112	12
14/05/2013	130	18
6/06/2013	50	-80
24/06/2013	70	20
16/07/2013	140	70
12/09/2013	150	10
5/02/2014	120	-30
3/03/2014	130	10
21/03/2014	130	0
9/04/2014	150	20
10/07/2014	130	-20
10/09/2014	130	0
1/12/2014	120	-10
24/12/2014	90	-30
26/02/2015	110	20
26/03/2015	150	40
30/11/2015	130	-20
9/03/2016	160	30
5/04/2016	170	10
30/08/2016	150	-20
20/09/2016	140	-10
6/10/2016	120	-20

- We also spent $41k less this summer than last year.
- In 2014/15 we spent $52k than previous year, due to lag time with the protocol as we reduced dose rate in December 2014 by 40l/h

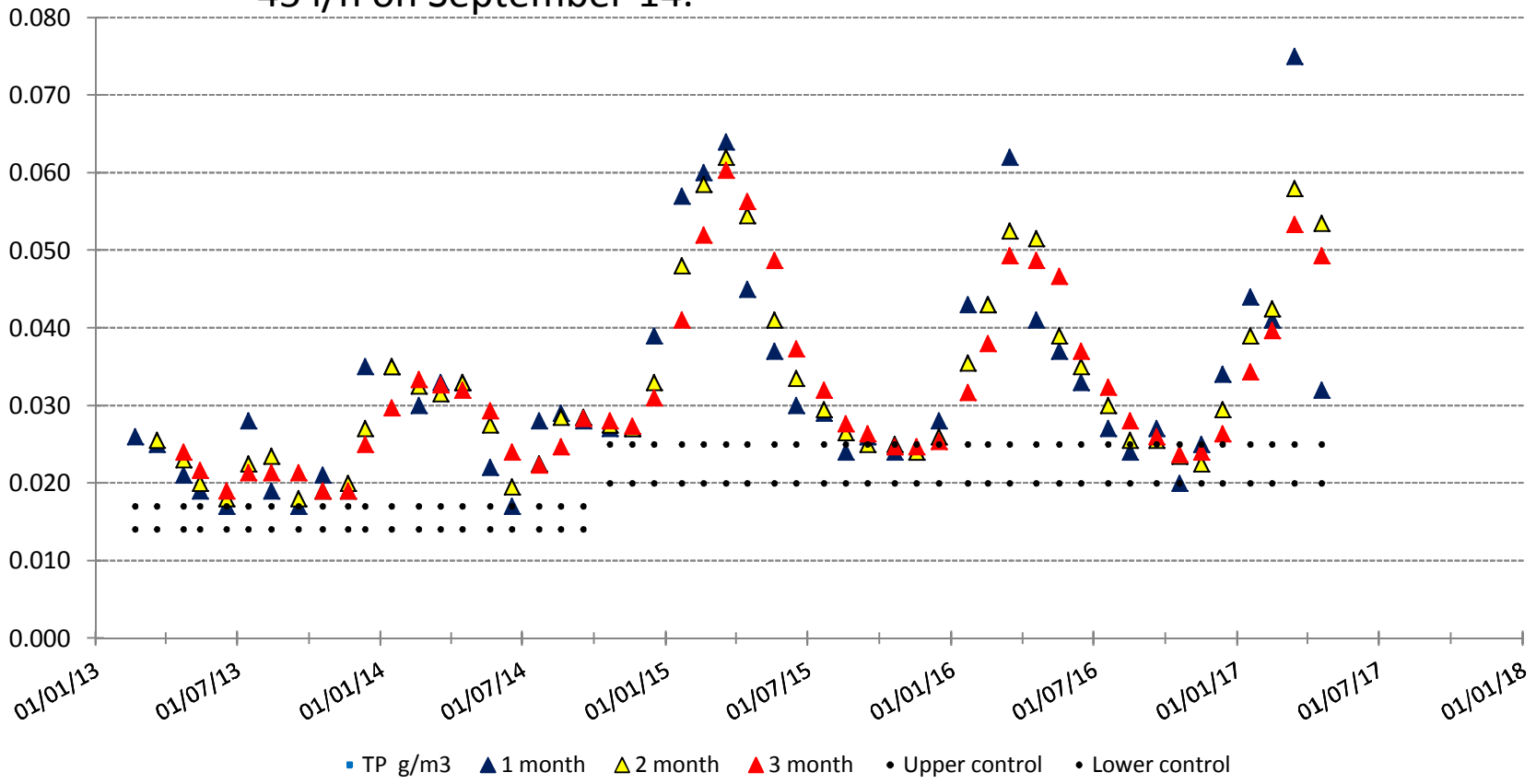
	2012/13	2013/14	2014/15	2015/16	2016/17
Total dosed Nov-April (L)	531977	600348	489914	614998	527734
Difference vs previous yr		68371	-110434	125083	-87264
Difference as %		12.85%	-18.39%	25.53%	-14.19%
Difference as $ value		$32,310	-$52,187	$59,109	-$41,237

PROPOSED

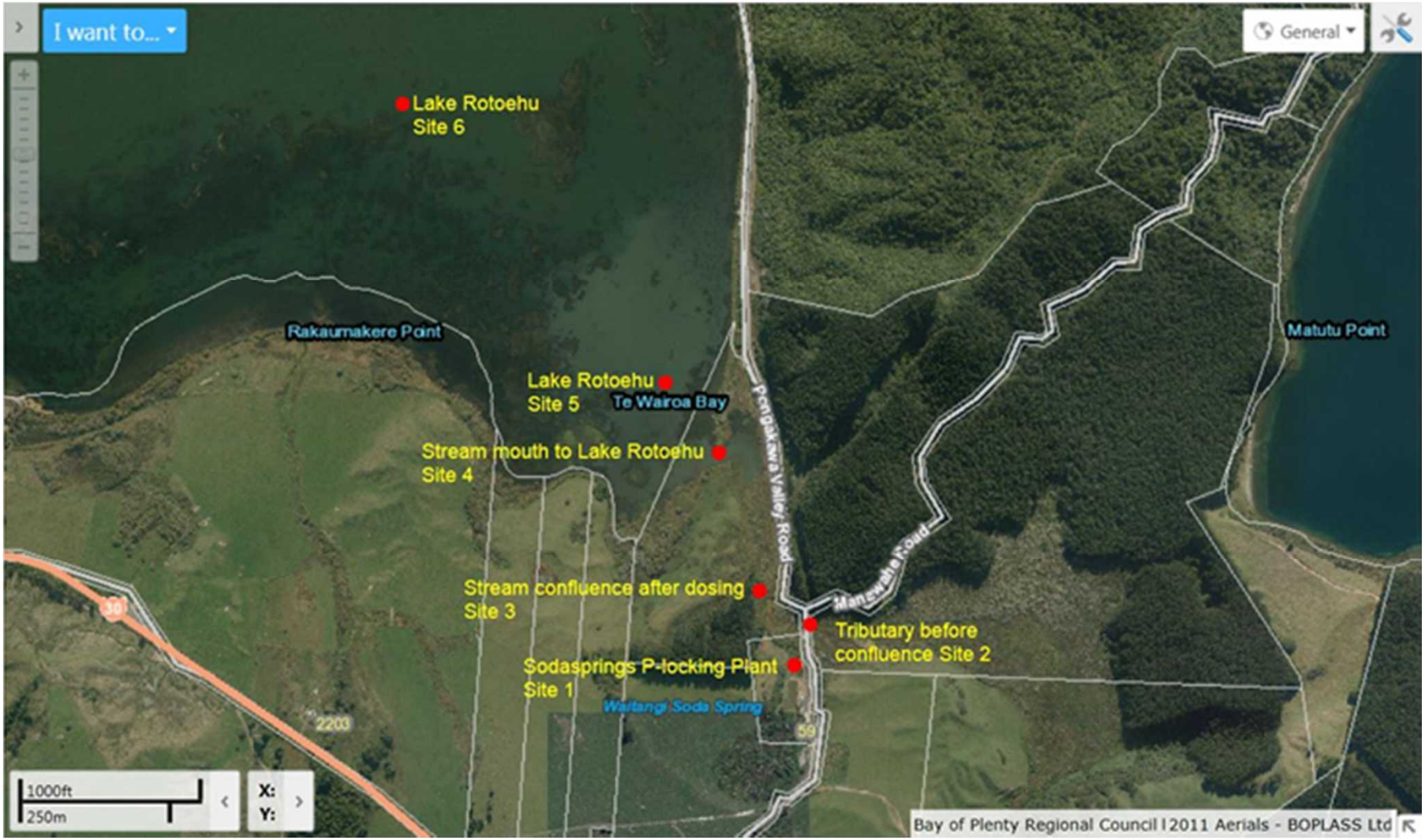
- Prevent dose rate decrease between Nov-April, however still allowing increase.
- Seek agreement from QWTAG to add this to the dose protocol.

Feb 13 to current- Rotoehu P concentrations vs control target

Dosing rate has increased from 20 l/h to 35 l/h in March 14 and then to 40 l/h in April 14 to the current maximum dose rate of 45 l/h on September 14.

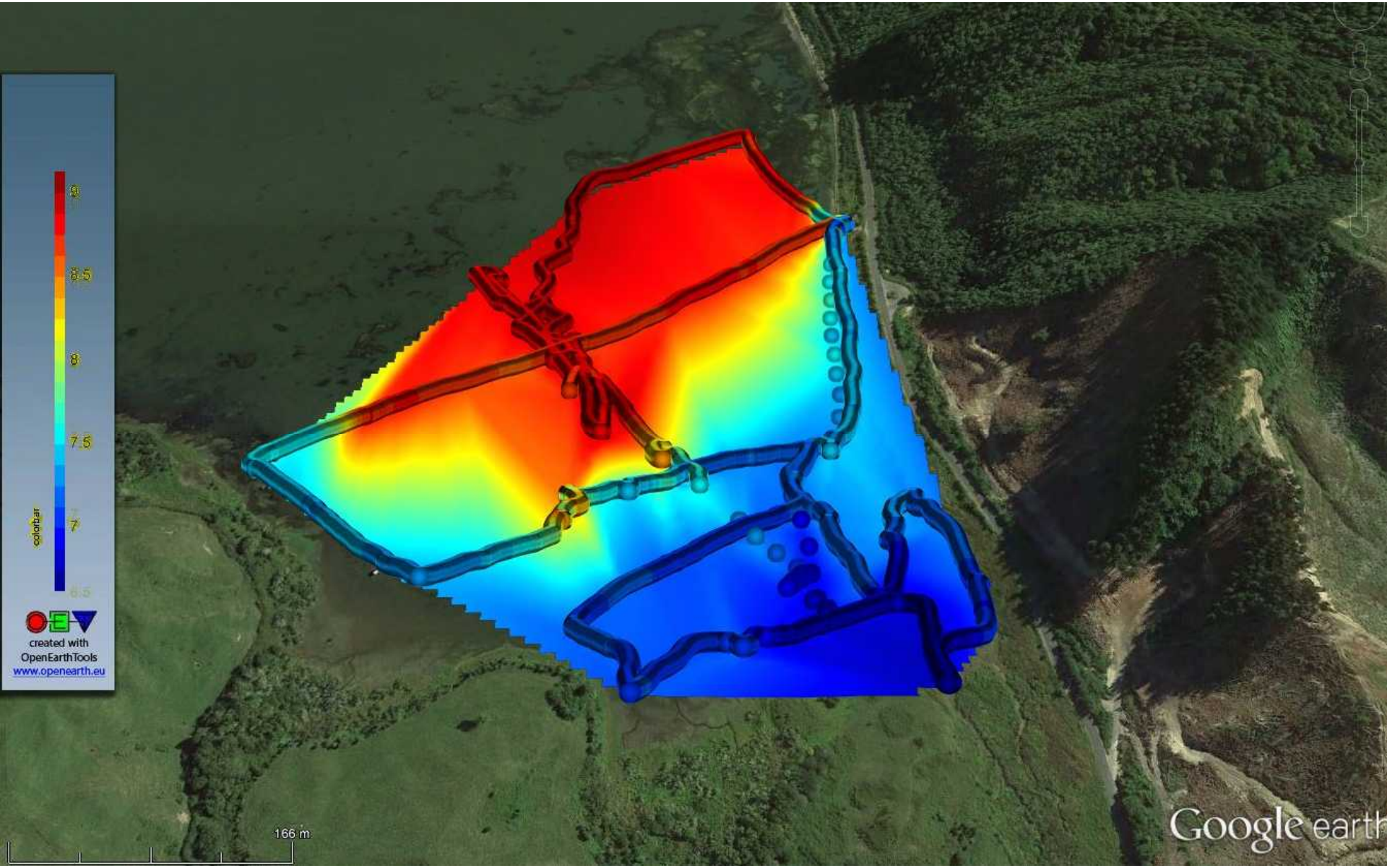


Understanding pH Driver and Complexities



- Week of a week of continuous monitoring of pH at site 4 Lake Rotoehu (2-8th Feb 17) (Paul Scholes)
- Area shallow 0.7m with thick unconsolidated sediment (0.8m).
- At end of monitoring equipment had hornwort and Iron oxide covering it.
- pH ranged from 9.1 to 12.7 with a mean of 11.5 over the week of installation.

- Chris Eager (UoW Masters Student) is approaching completion of his study regarding the alum dispersal in this area.
- Using DGT moorings and CTD logging using Kayak.
- Generally site 4 values were around pH 6 – 7
- Into April weed beds very mobile dependent on wind speed and direction.
- To shallow to harvest, turbidity makes Diquat ineffective for spraying.



Credit: Chris Eager

- Preferred to dose outside the weed bed
- Current dose point pH6 preferred for binding, although ionic binding competition??
- Outside weed bed pH 7-8 reduced P binding effectiveness,
- Chris is due to finish reporting in August,
- Report back after.