

<b>Final Environmental Report</b>	<b>Period Ending:</b> 10 <sup>th</sup> June 2009
Compiled By: Siobhán Quinn & Catriona King	
Approved By: Aoife Reynolds	

## 1 Monitoring Data

### 1.1 Monitoring Equipment

Axonics	– Axonics plant operated as required during the reporting period.
PO <sub>4</sub>	– The PO <sub>4</sub> analyser was operational for the majority of the reporting period. – The composite sampler was in place to cover any shortfalls in the PO <sub>4</sub> analyser.
TSS	– The TSS analyser was operational during the reporting period.
Composite	– The composite sampler was operational during the reporting period. – Where there is loss of continuous monitoring data due to instrument faults or other issues composite sample data is provided on the graphs.
Noise	– There is a single noise monitoring location currently being used – N1.
Vibration	– There is a single vibration monitoring location currently being used – V1.
Sondes	– The results are displayed graphically. ○ Any unusual values are explained on the relevant graph. ○ D22 & D62 sondes were removed on the 9 <sup>th</sup> of June due to insufficient water flow in the drain.
Weather Station	– The data used for this reporting period was taken from the on-site meteorological station.
Weirs	– Weirs were operational during the reporting period. – Service of the weirs was undertaken on the 10 <sup>th</sup> of June.

### 1.2 Rainfall Data

28/05/2009	0.0	04/06/2009	0.0
29/05/2009	0.0	05/06/2009	0.0
30/05/2009	0.0	06/06/2009	3.2
31/05/2009	0.0	07/06/2009	3.0
01/06/2009	0.0	08/06/2009	0.0
02/06/2009	0.0	09/06/2009	0.0
03/06/2009	0.0	10/06/2009	0.0
Total Rainfall 6.2mm			

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### 1.3 Summary

Environment	Comments
Surface Water	There were no exceedances during the reporting period.
Groundwater	The groundwater data (Sonde) is within anticipated ranges.
Axonics	Elevated total aluminium result on the 9 <sup>th</sup> of June may have been caused by flock carry over. Improvements are ongoing in the plant. Discharge/recycle valve being changed.
Dust	Dust results are all within limits.
Weather	There was a total of 6.2mm of rainfall during the reporting period, with a temperature range of 4.0°C to 25.2°C.
Noise	All noise levels were within the set limits. Where values were affected by high wind speeds it is indicated on the table.
Vibration	No vibration exceedances were recorded during the reporting period, based on available results.

**Note:** All laboratory data generated on site should be considered indicative only.

## 2 Environmental Exceedances / Incidents / Complaints

No exceedances during the reporting period.

### Surface Water Monitoring Record Sheet: Accredited Laboratory Results

	Date	Cond.  µS/cm	Temp  °C	Turbidity  NTU	DO  % Sat	pH  pH units	TSS  mg l <sup>-1</sup>	Ortho-phosphate as P  µg l <sup>-1</sup>	Nitrate as N  mg l <sup>-1</sup>	Nitrate as NO <sub>3</sub>  mg l <sup>-1</sup>	Total Phosphorus as P  mg l <sup>-1</sup>	Ammonia as NH <sub>3</sub> -N  mg l <sup>-1</sup>	Nitrite as NO <sub>2</sub>  mg l <sup>-1</sup>	Aluminium (dissolved)  µg l <sup>-1</sup>	Aluminium (total)  µg l <sup>-1</sup>	Phosphate as PO <sub>4</sub> -P  mg l <sup>-1</sup>	TDS  mg l <sup>-1</sup>
<b>Action Limits</b>		<b>400</b>		<b>150</b>		<b>&lt;3.5 or &gt;7.5</b>	<b>25</b>	<b>40</b>	<b>1.5</b>	<b>4.0</b>		<b>0.2</b>	<b>0.025</b>	<b>100</b>	<b>135</b>		
<b>Target Limits</b>		<b>500</b>		<b>200</b>		<b>&lt;3 or &gt;8</b>	<b>35</b>	<b>70</b>	<b>2.6</b>	<b>6.0</b>		<b>0.5</b>	<b>0.05</b>	<b>150</b>	<b>200</b>		
<b>SP1</b>	03/06/2009	335		1.9		7.5	<2	<10		0.77	0.01	<0.005	<0.017	<20	47	<0.03	178
<b>SP3</b>	03/06/2009	320		1.2		6.9	<2	<10		<0.44	<0.01	<0.005	<0.017	<20	21	<0.03	171
<b>SP1</b>	09/06/2009	338		3.1		7.8	<2	<10		0.58	0.05	0.022	<0.017	<20	<20	<0.03	179
<b>SP3</b>	09/06/2009	351		3.3		6.9	<2	<10		<0.44	<0.03	0.006	<0.017	<20	<20	<0.03	185
<b>Additional Monitoring</b>																	
<b>D22</b>	09/06/2009	175		17.1		4.8	56	13		<0.44	0.03	0.018	<0.017	26	56	0.04	95
<b>D62</b>	09/06/2009	235		39.4		6.9	60	74		0.86	0.09	0.061	<0.017	42	83	0.23	123
<b>Axonics Monitoring</b>																	
<b>Pre Axonics</b>	03/06/2009	360		67.1		7.4	80	<10		1.28	0.02	<0.005	0.027	76	595	<0.03	192
<b>Post Axonics</b>	03/06/2009	377		2.2		6.6	5	<10		1.32	0.01	0.011	0.029	<20	25	<0.03	201
<b>Pre Axonics</b>	09/06/2009	357		57.4		7.8	89	<10		<0.44	<0.03	<0.005	<0.017	172	3471	<0.03	188
<b>Post Axonics</b>	09/06/2009	372		11.5		6.4	17	<10		<0.44	<0.03	<0.005	<0.017	<20	1306	<0.03	198
I.P. = In Progress < LOD = Below Limit of Detection > LOD = Above Limit of Detection On site laboratory results included in Appendix 1																	
Grey shaded areas denote parameters that cannot or were not analysed on-site or the lab.																	

Groundwater Monitoring Record Sheet																									
Location	Date	DO	Temp	Cond.	pH	TDS	BOD	TSS	Total Hardness	Nitrite as NO <sub>2</sub>	Nitrate as NO <sub>3</sub>	Phosphate as PO <sub>4</sub>	Arsenic	Mercury	Lead	Aluminium (total)	Zinc	Chromium	Copper	Cadmium	Iron	Tin	Ammonia	Aluminium, dissolved	Manganese, total
		% Sat	°C	uS/cm	pH Units	mg l <sup>-1</sup>	mg l <sup>-1</sup>	mg l <sup>-1</sup>	mg/l CaCO3	mg l <sup>-1</sup>	mg l <sup>-1</sup>	mg l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>	mg l <sup>-1</sup>	ug l <sup>-1</sup>	ug l <sup>-1</sup>
MP 1	03/06/2009	14.0	13.0	298	5.8	155	15	70	67	<0.017	<0.44	0.33	6.0	<0.05	0.9	49	5.0	<0.5	<1	<0.5	31080	11	2	<20	934
MP 2	03/06/2009	16.0	12.2	225	5.6	120	10	501	61	<0.017	<0.44	0.38	2.0	<0.05	5.0	342	25.0	3.0	16	<0.5	1882	8	2	138	345
MP 3	03/06/2009	30.0	13.1	323	5.7	171	8	492	69	<0.017	<0.44	1.71	4.0	<0.05	2.0	1836	8.0	2.0	4	<0.5	23290	8	2	28	331
MP 4	03/06/2009	25.0	12.1	406	5.9	217	12	159	75	<0.017	<0.44	<0.03	2.0	<0.05	3.0	542	6.0	3.0	6	<0.5	53060	6	0	<20	1491
MP 5	03/06/2009	22.0	13.5	310	5.9	167	8	98	114	<0.017	<0.44	0.28	1.0	<0.05	2.0	269	4.0	2.0	2	<0.5	5085	7	1	146	320
MP 6	03/06/2009	26.0	13.1	416	6.2	223	10	76	103	<0.017	<0.44	<0.03	10.0	<0.05	5.0	155	4.0	<0.5	3	0.6	51030	5	1	<20	1390
MP 7	03/06/2009	19.0	12.9	329	5.9	171	6	22	64	<0.017	<0.44	<0.03	<0.5	<0.05	<0.5	<20	<5	0.8	<1	<0.5	44170	26	2	<20	717
MP 10a	03/06/2009	25.0	12.7	351	5.7	186	5	98	127	<0.017	<0.44	<0.03	4.0	<0.05	<0.5	280	3.0	0.8	2	<0.5	13410	15	0	86	4172
MP 11	03/06/2009	20.0	12.6	189	5.5	103	5	70	32	0.018	<0.44	0.09	<0.5	<0.05	1.5	61	12.0	<0.5	1	<0.5	707	<0.5	0	<20	1289
Graphs provided for MP1, MP2,MP4, MP6 and MP7: Temperature, Conductivity, and pH.																									

Graphs provided for MP1, MP2,MP4, MP6 and MP7: Temperature, Conductivity, and pH.



## Day Time Noise Monitoring Record Sheet

Determinant Results
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Location	Air Temp. (Min)	Air Temp. (Max)	Start Date	Time	Duration	Serial No.	Wind		Results dB			*Comments
							Speed (m/s)*	Direction (Degrees)	L <sub>Aeq</sub>	L <sub>Amax</sub>	L <sub>Amin</sub>	
<b>Action Limit</b>									<b>60</b>			
<b>Target Limit</b>									<b>65</b>			
N1	11.3	13.8	28/05/2009	08:00:00	14:00:00	2539533	5.5	204.5	51.1	80.7	31.0	
N1	9.8	22.3	29/05/2009	08:00:00	14:00:00	2539533	4.5	156.3	52.7	72.8	30.0	
N1	11.4	18.6	30/05/2009	08:00:00	14:00:00	2539533	4.0	184.0	44.6	71.4	30.0	
N1	11.0	23.6	31/05/2009	08:00:00	14:00:00	2539533	1.8	185.6	41.5	66.8	30.0	
N1	8.7	22.8	01/06/2009	08:00:00	14:00:00	2539533	1.9	211.8	41.3	72.2	30.0	
N1	10.3	25.3	02/06/2009	08:00:00	14:00:00	2539533	1.6	248.7	46.0	73.3	30.0	
N1	8.8	16.4	03/06/2009	08:00:00	14:00:00	2539533	2.9	101.2	49.5	79.9	30.0	
N1	8.3	14.5	04/06/2009	08:00:00	14:00:00	2539533	2.8	36.7	50.2	85.8	30.0	
N1	8.7	13.0	05/06/2009	08:00:00	14:00:00	2539533	4.2	37.1	52.1	75.3	35.4	
N1	7.0	13.1	06/06/2009	08:00:00	14:00:00	2539533	4.6	64.7	51.8	76.9	34.1	
N1	8.0	14.3	07/06/2009	08:00:00	14:00:00	2539533	3.0	61.4	44.4	75.9	30.0	
N1	5.5	16.3	08/06/2009	08:00:00	14:00:00	2539533	2.4	56.2	50.0	72.1	30.0	
N1	4.0	14.8	09/06/2009	08:00:00	14:00:00	2539533	2.3	109.2	49.7	75.0	30.0	
N1	6.4	14.6	10/06/2009	08:00:00	14:00:00	2539533	2.6	212.4	47.1	83.9	30.0	

\* Wind speeds in excess of 5 m/s negatively impact noise readings (as per EPA Guidance Note on Noise Measurement).

# Night Time Noise Monitoring Record Sheet

## Determinant Results

Determinant Results												
Location	Air Temp. (Min)	Air Temp. (Max)	Start Date	Time	Duration	Serial No.	Wind		Results dB			*Comments
							Speed (m/s)*	Direction (Degrees)	L <sub>Aeq</sub>	L <sub>Amax</sub>	L <sub>Amin</sub>	
Action Limit									50			
Target Limit									55			
N1	11.3	13.8	28/05/2009	22:00:00	10:00:00	2539533	5.5	204.5	43.3	69.8	30.0	
N1	9.8	22.3	29/05/2009	22:00:00	10:00:00	2539533	4.5	156.3	47.4	81.4	30.0	
N1	11.4	18.6	30/05/2009	22:00:00	10:00:00	2539533	4.0	184.0	40.2	66.8	30.0	
N1	11.0	23.6	31/05/2009	22:00:00	10:00:00	2539533	1.8	185.6	41.3	67.4	30.0	
N1	8.7	22.8	01/06/2009	22:00:00	10:00:00	2539533	1.9	211.8	42.4	63.9	30.0	
N1	10.3	25.3	02/06/2009	22:00:00	10:00:00	2539533	1.6	248.7	43.3	80.3	30.0	
N1	8.8	16.4	03/06/2009	22:00:00	10:00:00	2539533	2.9	101.2	42.6	72.3	30.0	
N1	8.3	14.5	04/06/2009	22:00:00	10:00:00	2539533	2.8	36.7	42.1	69.7	30.0	
N1	8.7	13.0	05/06/2009	22:00:00	10:00:00	2539533	4.2	37.1	44.3	70.7	34.2	
N1	7.0	13.1	06/06/2009	22:00:00	10:00:00	2539533	4.6	64.7	40.1	72.3	30.0	
N1	8.0	14.3	07/06/2009	22:00:00	10:00:00	2539533	3.0	61.4	41.9	69.3	30.0	
N1	5.5	16.3	08/06/2009	22:00:00	10:00:00	2539533	2.4	56.2	41.2	68.8	30.0	
N1	4.0	14.8	09/06/2009	22:00:00	10:00:00	2539533	2.3	109.2	42.7	83.9	30.0	
N1	6.4	14.6	10/06/2009	22:00:00	10:00:00	2539533	2.6	212.4	41.1	69.2	30.0	

\* Wind speeds in excess of 5 m/s negatively impact noise readings (as per EPA Guidance Note on Noise Measurement).

**Flow Weir Record Sheet****Determinant Results**

Date	SP1			SP3		
	Max (l/s)	Min (l/s)	Avg (l/s)	Max (l/s)	Min (l/s)	Avg (l/s)
28/05/2009	4.88	0.62	2.58	3.47	-0.13	0.67
29/05/2009	1.65	0.23	0.75	1.16	-0.18	0.04
30/05/2009	3.23	0.73	1.71	1.89	-0.18	0.47
31/05/2009	2.96	0.84	1.88	1.44	-0.18	0.50
01/06/2009	0.84	0.52	0.66	-0.18	-0.28	-0.27
02/06/2009	0.59	0.16	0.30	1.16	-0.28	-0.08
03/06/2009	0.20	0.12	0.15	3.47	-0.33	0.33
04/06/2009	0.14	0.10	0.12	3.10	-0.38	0.13
05/06/2009	7.69	0.10	1.49	5.80	-0.23	3.28
06/06/2009	8.81	0.52	4.41	6.03	-0.43	2.72
07/06/2009	0.80	0.36	0.50	-0.43	-0.58	-0.52
08/06/2009	0.38	0.12	0.21	2.05	-0.68	-0.03
09/06/2009	0.15	0.12	0.13	3.10	-0.68	0.04
10/06/2009	0.15	0.00	0.10	2.05	-1.08	-0.29

**Note:** Negative values indicate low flow conditions.



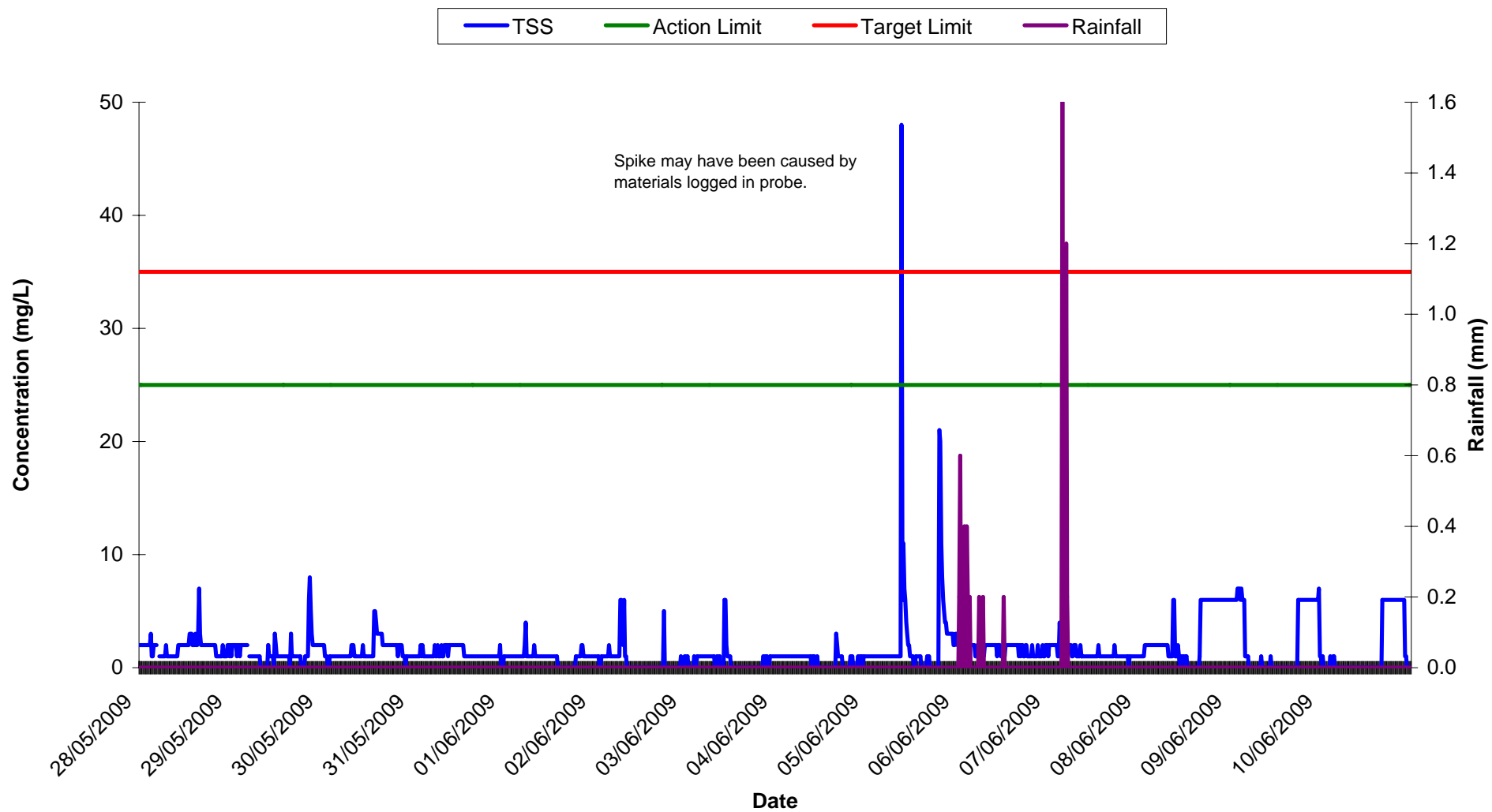
## Vibration Monitoring Record Sheet

Determinant Results	
1	1
2	2
3	3
4	4
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10	10
11	11
12	12
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99	99
100	100

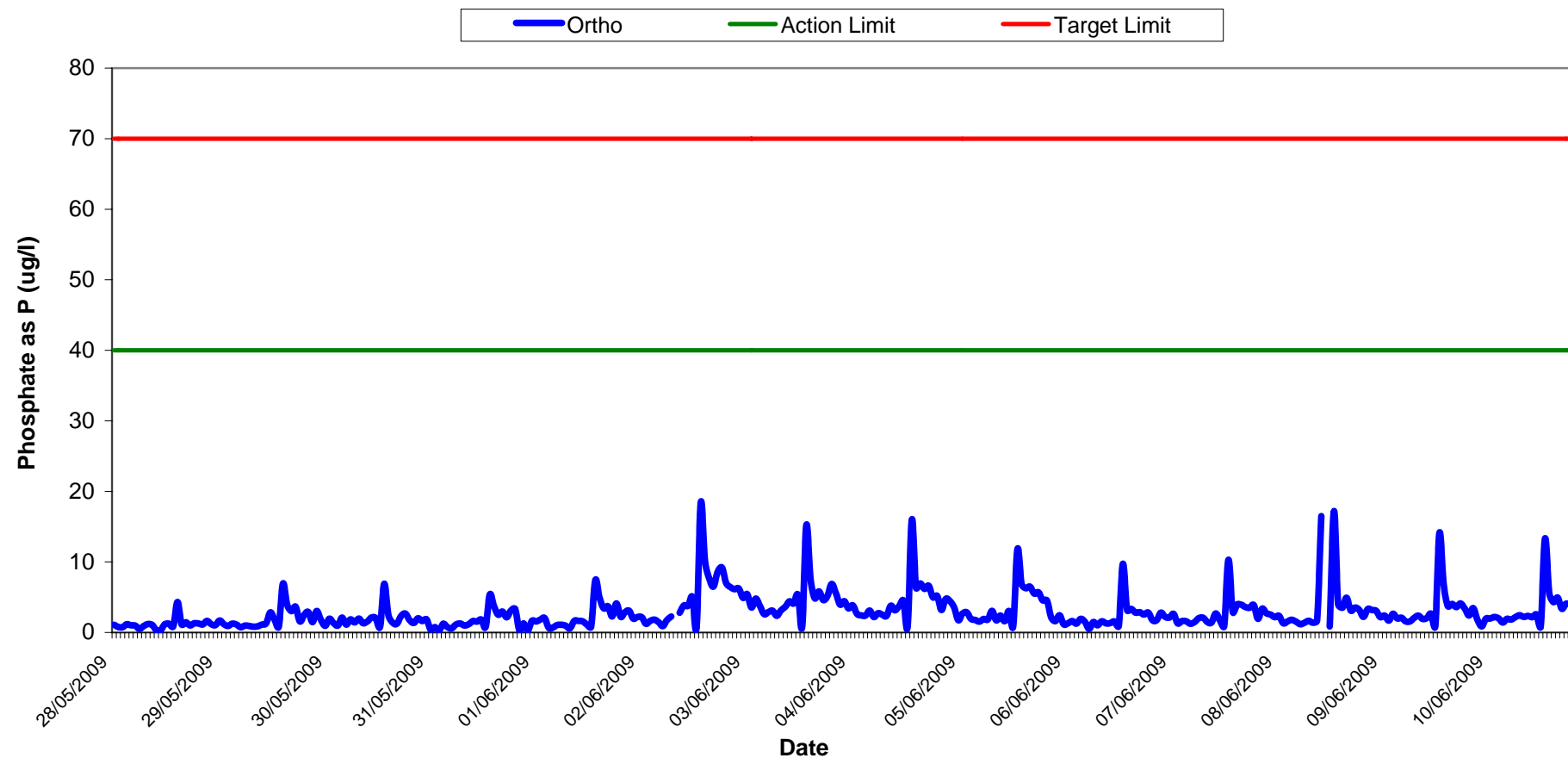
[illegible]

Vibration meter located at V1.

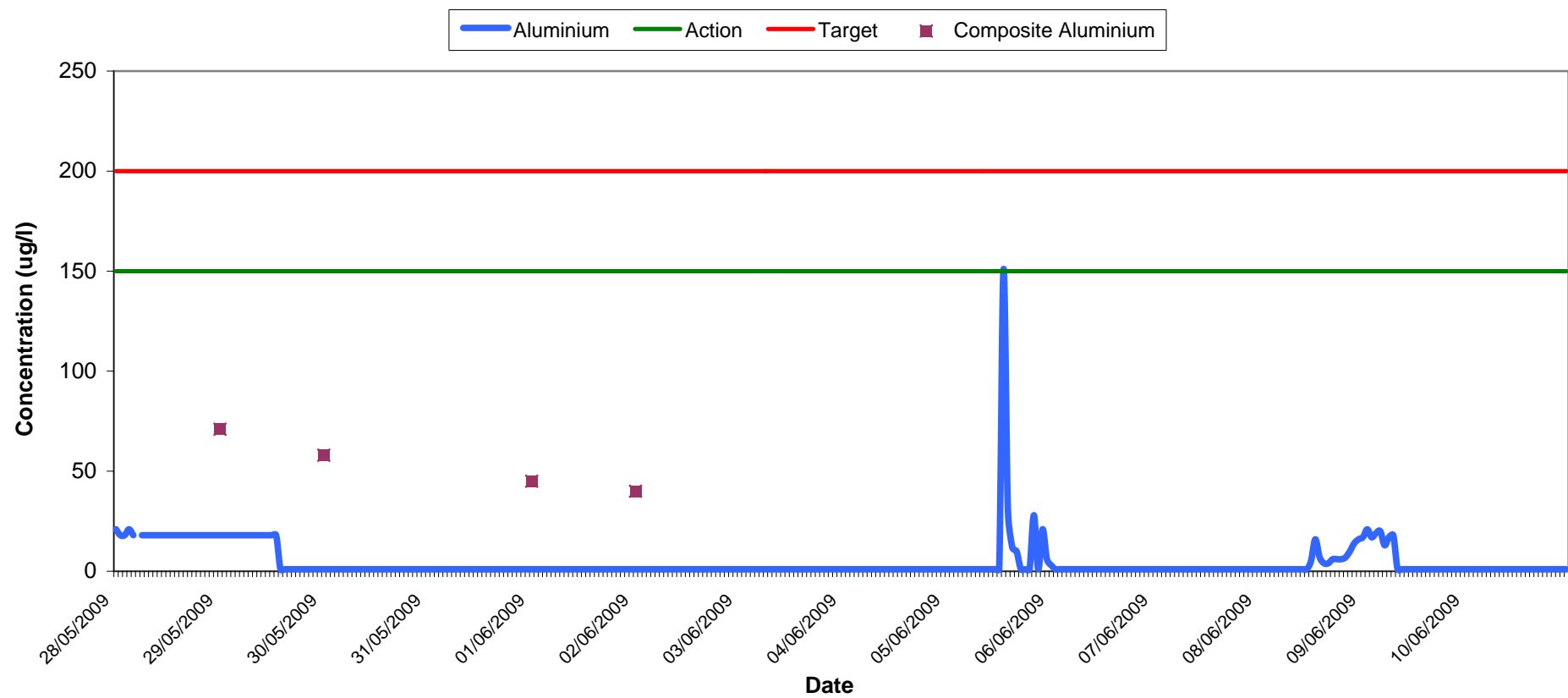
### Total Suspended Solids at SP1 Week 22-23



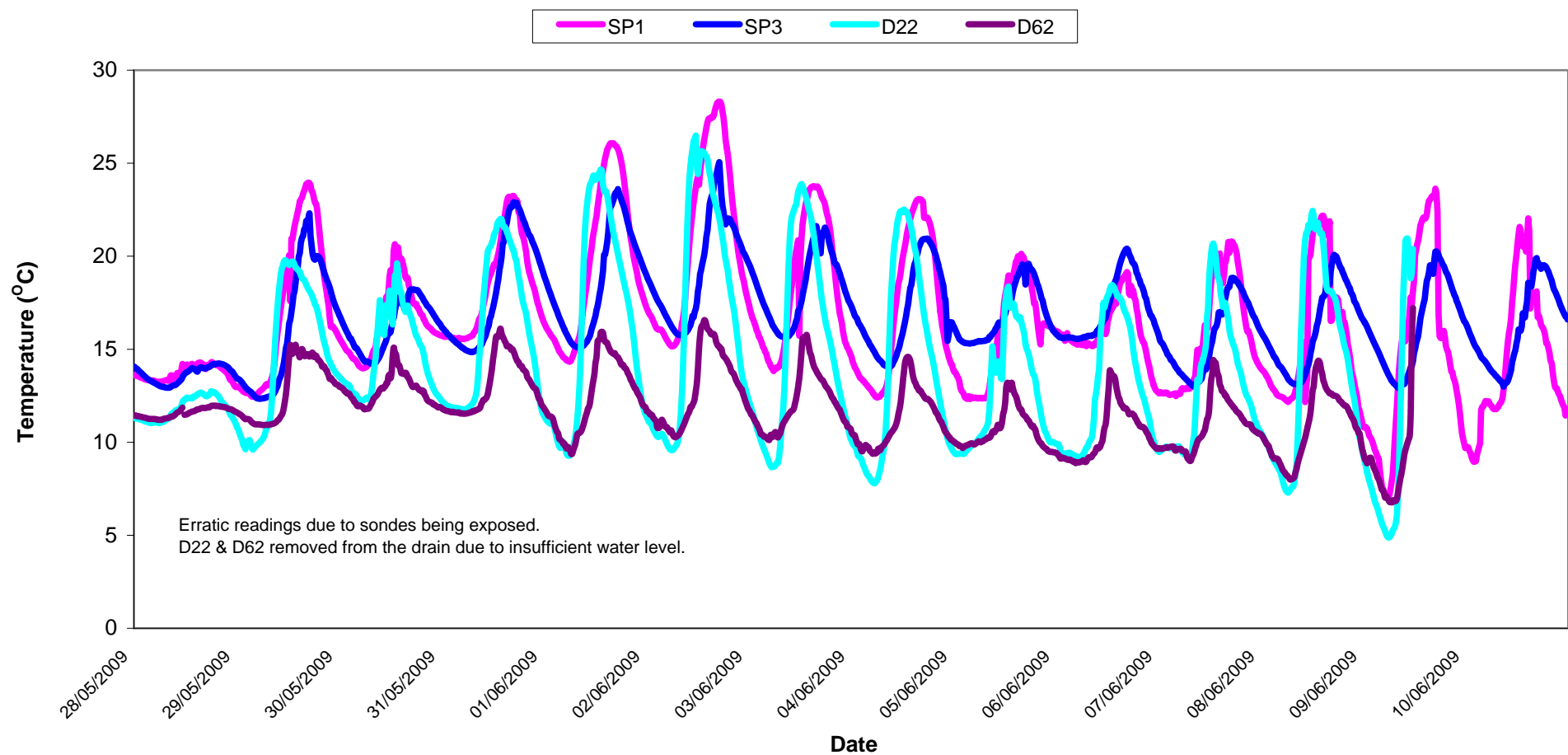
**Orthophosphate Results at SP1  
Wk 22-23**



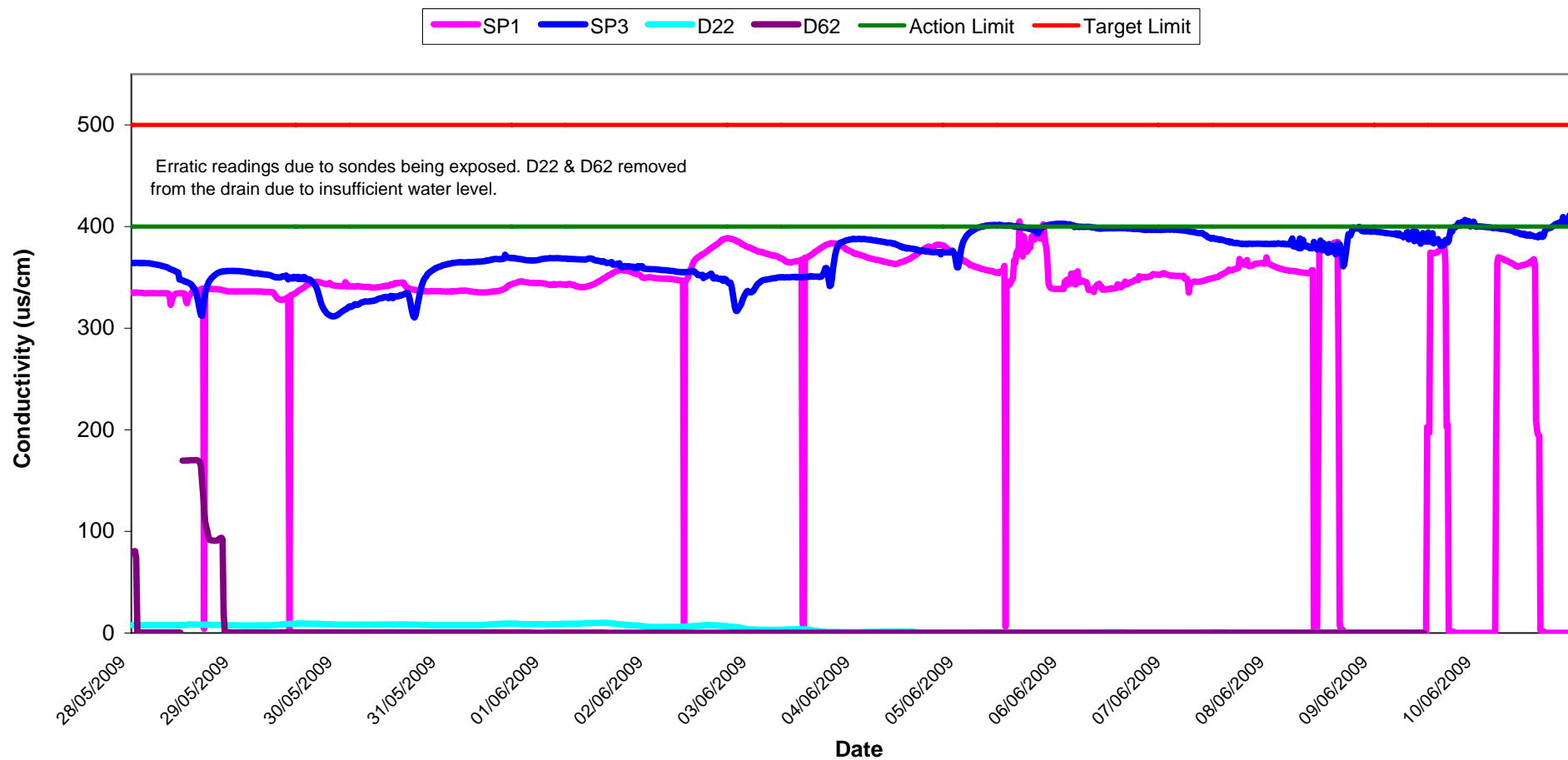
# Aluminium Concentration at SP1 Wk 22-23



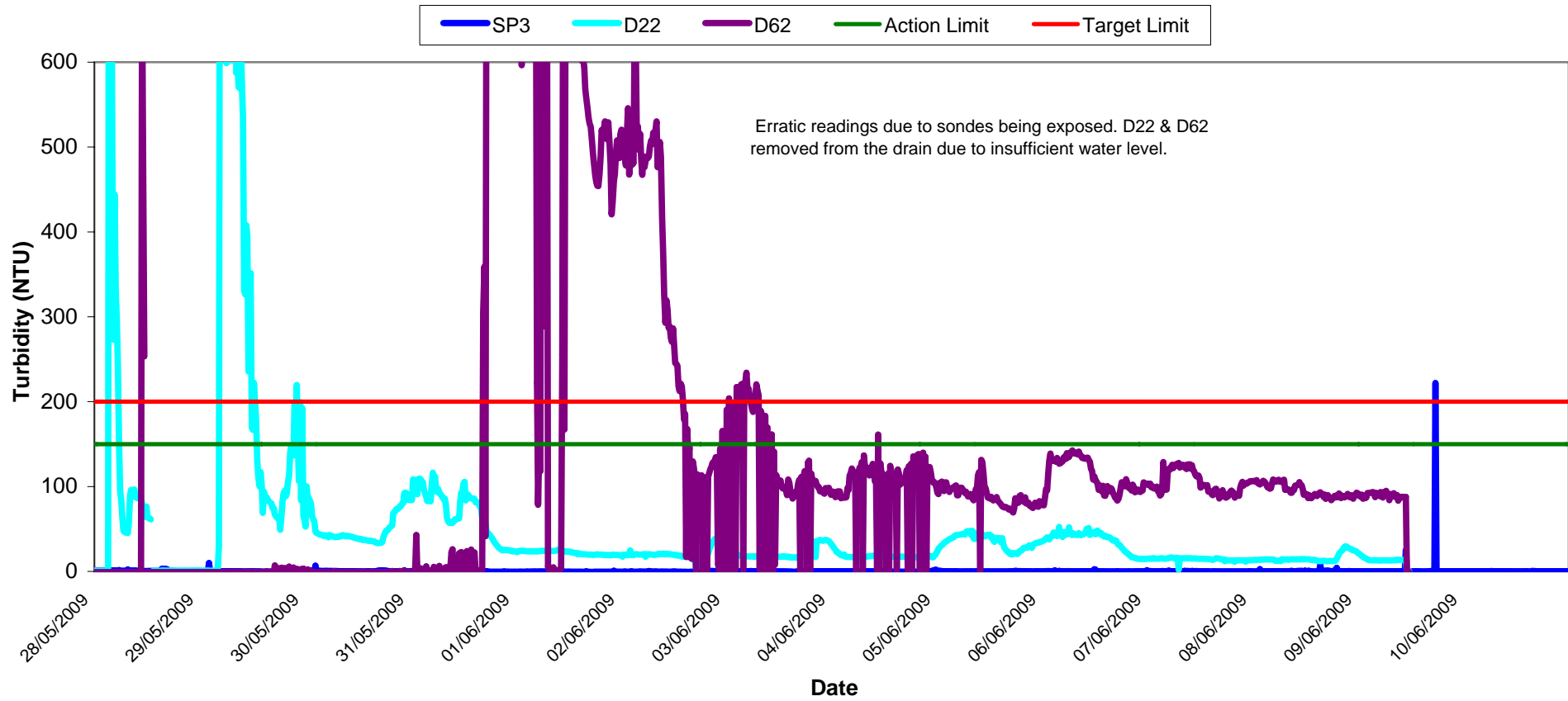
# Temperature - Surface Waters Wk 22-23



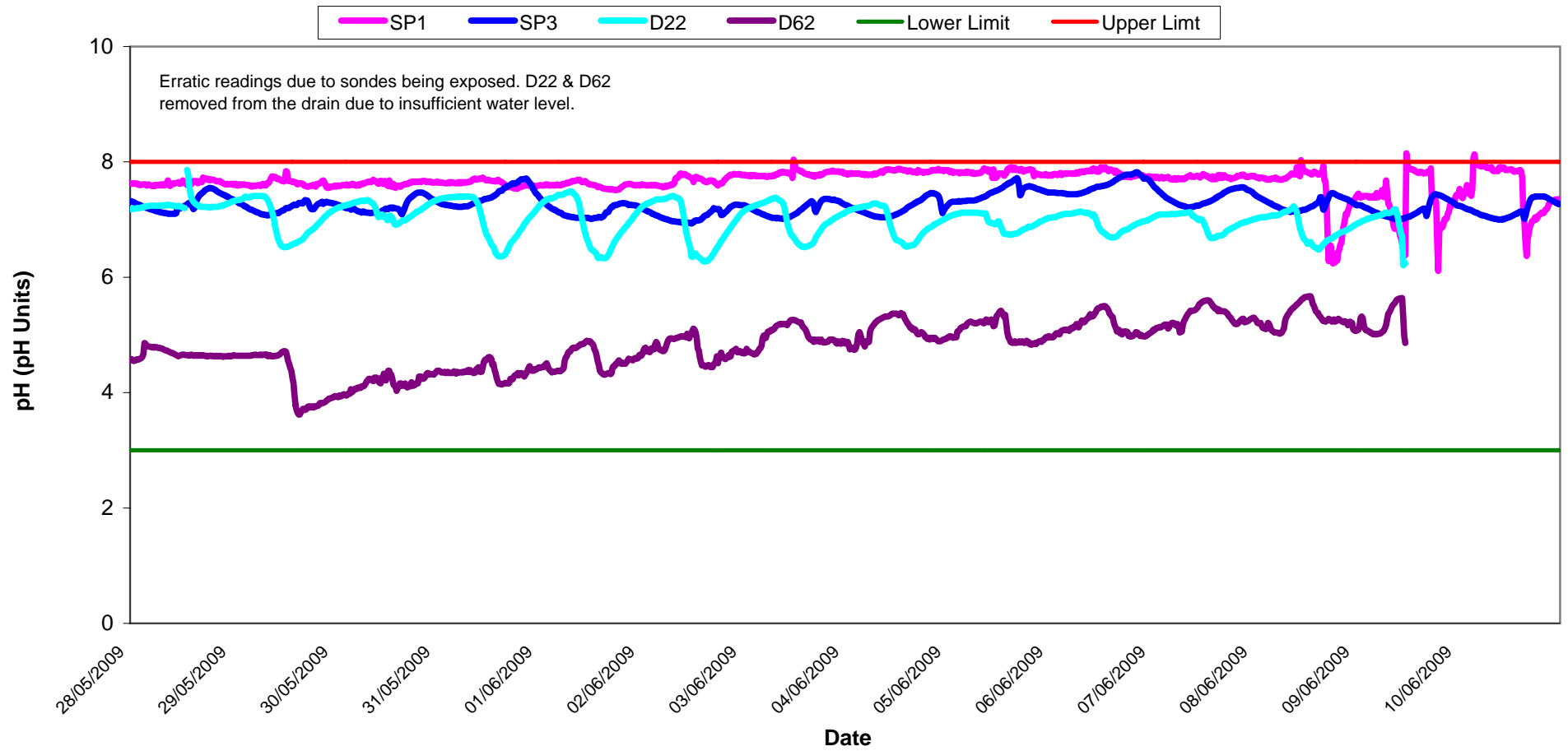
## Conductivity - Surface Waters, Wk 22-23



## Turbidity - Surface Waters Wk 22-23

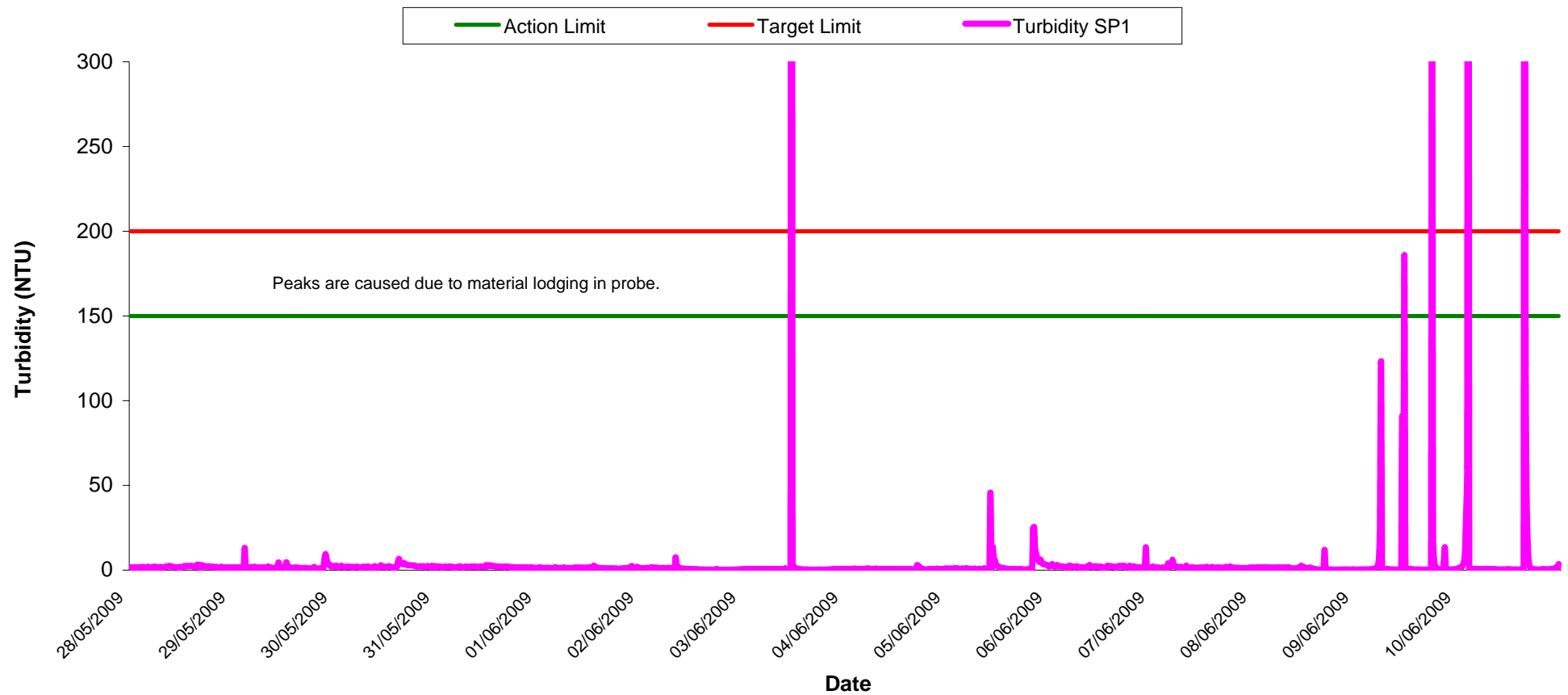


# pH - Surface Waters Wk 22-23

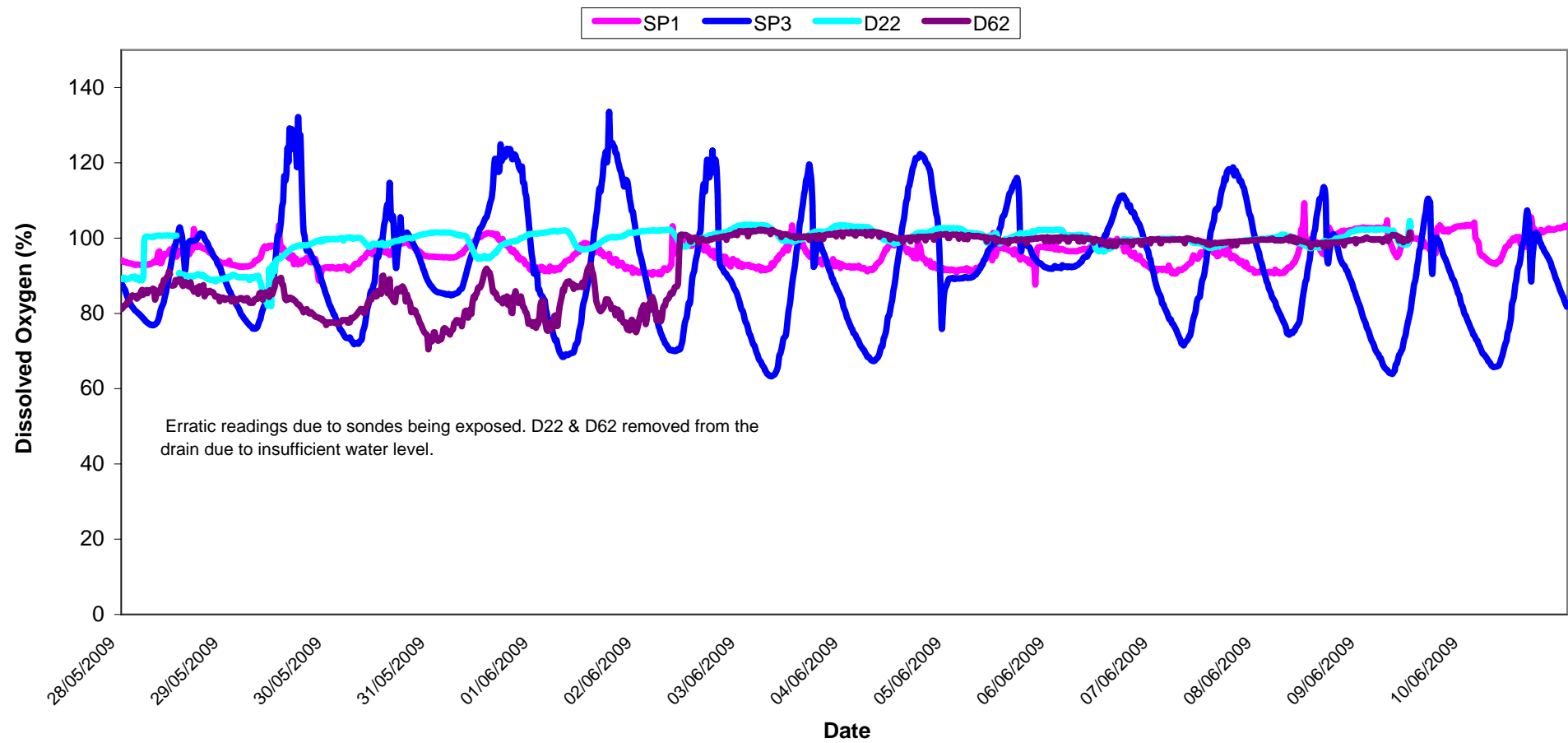




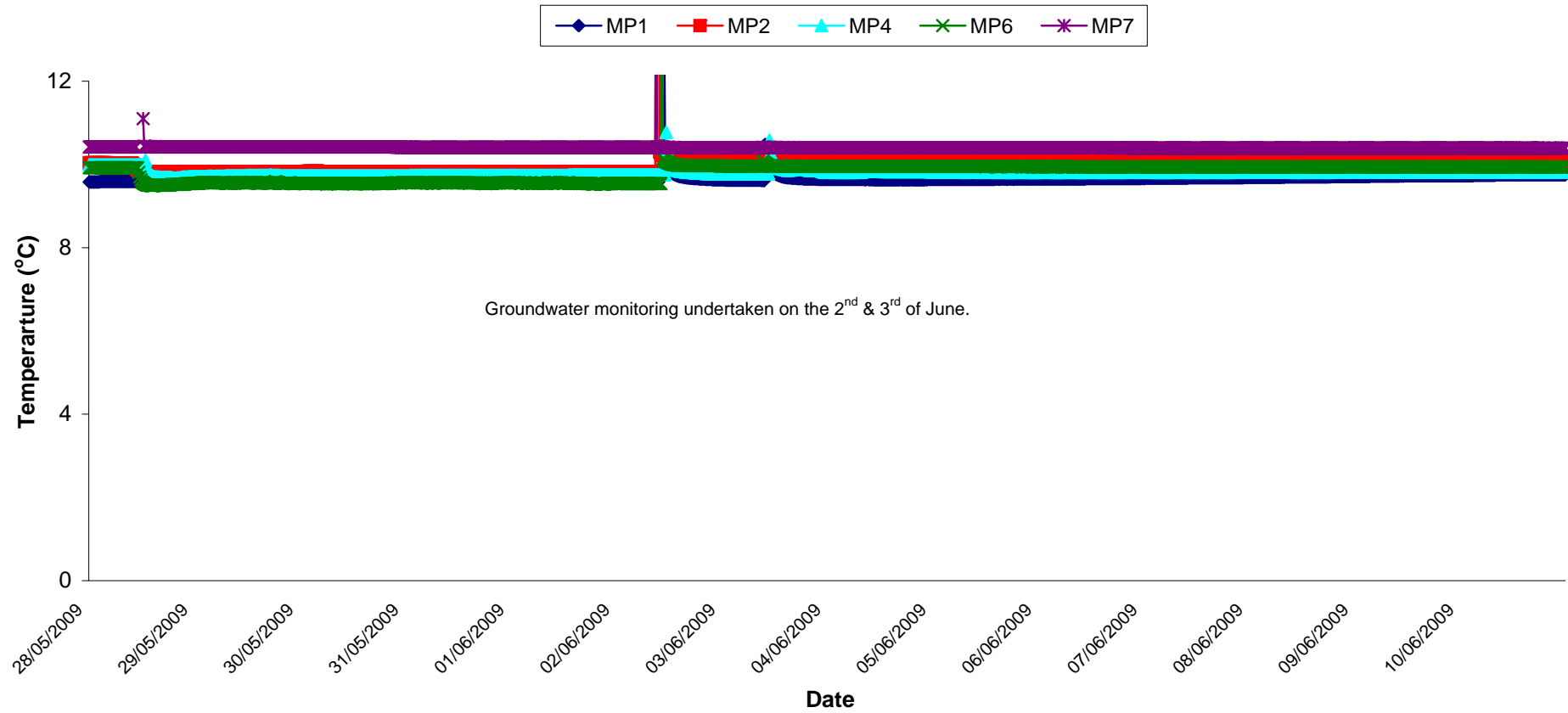
# Turbidity - Surface Waters @ SP1, Wk 22-23



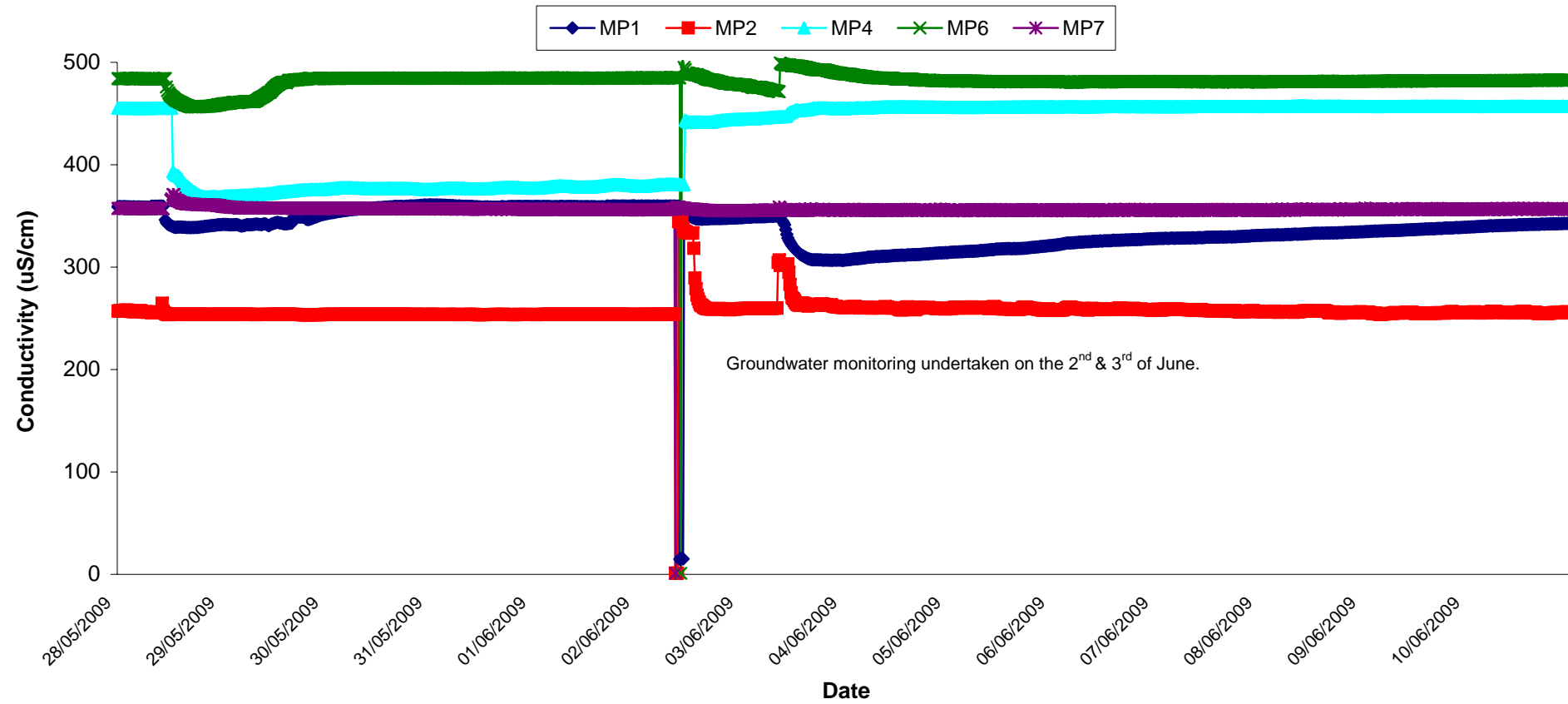
# Dissolved Oxygen - Surface Waters, Wk 22-23



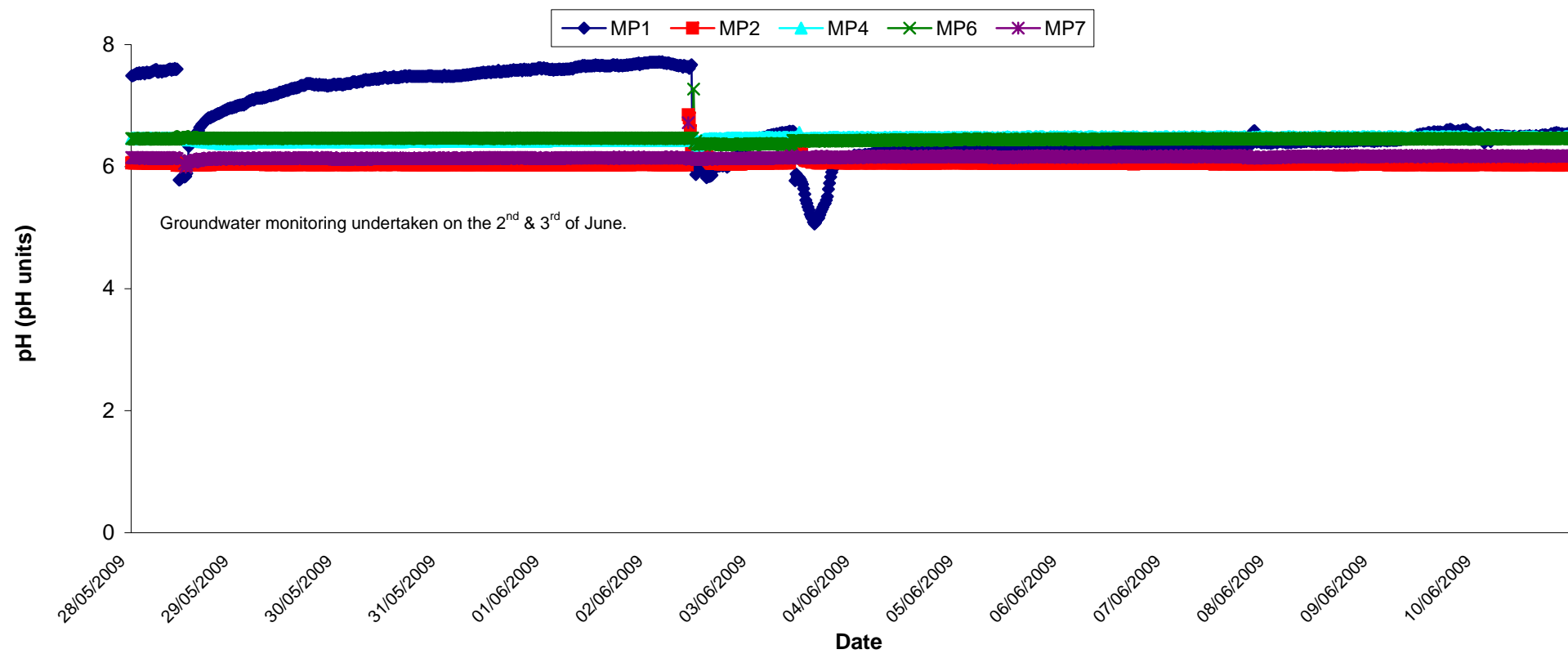
# Temperature - Groundwaters Wk 22-23



# Conductivity - Groundwaters Wk 22-23



# pH - Groundwaters Wk 22-23



# **Appendix 1**

## Appendix 1: Surface Water Monitoring Record Sheet- Onsite Monitoring

	Date	Cond. µS/cm	Temp °C	Turbidity NTU	DO % Sat	pH	TSS mg l <sup>-1</sup>	Ortho-phosphate as P µg l <sup>-1</sup>	Nitrate as N mg l <sup>-1</sup>	Nitrate as NO <sub>3</sub> mg l <sup>-1</sup>	Total Phosphorus as P mg l <sup>-1</sup>	Ammonia as NH <sub>3</sub> -N mg l <sup>-1</sup>	Nitrite as NO <sub>2</sub> mg/l	Aluminium (dissolved) ug/l	Aluminium (total) ug/l	Phosphate as PO <sub>4</sub> mg/l	Total dissolved solids mg/l
Settlement Pond Monitoring																	
SP1	28/05/2009	341	14.0	4.6	93.4	6.9			0.4			0.09		<LOD	70	0.67	225
SP1	29/05/2009	341	15.0	6.3	89.2	6.5			0.3			0.18		<LOD	41	>LOD	220
SP1	02/06/2009	354	18.8	6.9	86.5	6.6			0.5			0.05		<LOD	25	1.50	238
SP1	03/06/2009	371	16.4	3.7	92.0	6.7			0.3			0.17		<LOD	26	1.31	252
SP1	04/06/2009	371	15.0	3.3	92.4	7.8			0.3			0.46		<LOD	50	0.48	251
SP1	05/06/2009	361	15.5	14.3	92.0	6.6			0.5			0.05		29	105	0.87	242
SP1	08/06/2009	351	14.8	4.4	94.1	7.4			0.5			0.03		<LOD	69	0.61	236
SP1	09/06/2009	370	11.9	5.6	86.9	7.5			0.3			0.36		<LOD	<LOD	0.17	247
SP1	10/06/2009	378	13.5	5.0	80.2	7.6			0.6			0.50		<LOD	48	0.51	250
SP3	28/05/2009	355	13.5	4.3	90.0	6.7			0.2			0.63		<LOD		0.04	236
SP3	29/05/2009	354	13.3	4.8	78.9	6.1			0.4			0.13		<LOD		<LOD	241
SP3	02/06/2009	354	17.4	3.0	73.0	6.7			<LOD			0.21		<LOD		0.06	240
SP3	03/06/2009	350	15.9	2.8	88.3	6.7			0.1			0.37		<LOD		0.06	238
SP3	04/06/2009	383	14.5	3.1	76.5	7.4			<LOD			0.79		<LOD		<LOD	259
SP3	05/06/2009	407	16.4	2.1	100.0	6.5			0.9			0.08		<LOD		0.05	273
SP3	08/06/2009	377	14.3	3.1	85.8	7.0			<LOD			1.09		<LOD		<LOD	377
SP3	09/06/2009	384	16.0	3.5	91.3	7.5			0.2			0.31		<LOD		<LOD	256
SP3	10/06/2009	400	13.2	4.7	72.8	6.2			<LOD			0.10		<LOD		0.01	266
Additional Monitoring																	
D22	04/06/2009	255	13.6	8.1	87.6	6.5			0.3			2.75		32		0.15	175
D22	09/06/2009	263	12.2	11.2	69.3	6.7			0.2			0.51		29		0.11	175
D62	04/06/2009	211	12.6	6.4	61.0	5.4			<LOD			0.55		48		0.12	123
D62	09/06/2009	195	14.9	24.6	92.3	4.7			<LOD			0.33		38		<LOD	126
Axonics Monitoring																	
Pre	28/05/2009	379		>LOD		6.5			<LOD			0.68		>LOD		0.02	248
Post	28/05/2009	398		6.3		6.6			0.3			0.34		<LOD	286	<LOD	263
Pre	29/05/2009	370		>LOD		6.1			<LOD			0.58		>LOD		<LOD	251
Post	29/05/2009	391		6.3		6.2			0.2			0.39		33	120	0.02	266
Pre	02/06/2009	400		>LOD		6.9			<LOD			0.37		>LOD		0.01	271
Post	02/06/2009	415		>LOD		6.7			0.1			0.12		79	>LOD	0.01	281
Pre	03/06/2009	399		>LOD		6.6			<LOD			>LOD		362		0.01	270
Post	03/06/2009	422		5.5		6.6			0.4			1.35		<LOD	<LOD	0.02	284
Pre	04/06/2009	390		>LOD		7.3			<LOD			1.20		473		0.13	265
Post	04/06/2009	413		3.8		6.3			0.3			0.73		<LOD	142	1.43	279
Pre	05/06/2009	397		182.0		6.7			<LOD			0.43		>LOD		0.04	264
Post	05/06/2009	414		9.5		6.6			0.4			0.09		29	328	0.06	279
Pre	08/06/2009	388		102.0		7.6			<LOD			0.46		>LOD		0.18	388
Post	08/06/2009	415		3.7		7.2			<LOD			0.03		<LOD	166	0.01	415
Pre	09/06/2009	395		38.0		7.6			0.1			0.50		298		<LOD	263
Post	09/06/2009	418		18.3		7.4			<LOD			0.33		54	>LOD	0.70	278
Pre	10/06/2009	395		112.0		7.2			<LOD			0.08		375		0.14	263
Post	10/06/2009	420		6.4		7.0			0.2			0.18		128	369	0.02	279
	Grey shaded areas denote parameters that cannot or were not analysed on-site.																
	= Indicative Only																
< LOD	= Below Limit of Detection																
> LOD	= Above Limit of Detection																