

<b>Final Environmental Report</b>	<b>Period Ending: 13<sup>th</sup> May 2009</b>
Compiled By: Siobhán Quinn & Aoife Reynolds	
Approved By: Tony Doyle	

## 1 Monitoring Data

### 1.1 Monitoring Equipment

Axonics	– Axonics plant operated as required during the reporting period.
PO <sub>4</sub>	<ul style="list-style-type: none"> <li>– The PO<sub>4</sub> analyser was operational for the majority of the reporting period. However on the 10<sup>th</sup> of May the analyser mal-functioned and stopped operating. The technical error has been reconciled.</li> <li>– The composite sampler was in place to cover any shortfalls in the PO<sub>4</sub> analyser.</li> </ul>
TSS	– The TSS analyser was operational during the reporting period.
Composite	<ul style="list-style-type: none"> <li>– The composite sampler was operational during the reporting period.</li> <li>– Where there is loss of continuous monitoring data due to instrument faults or other issues composite sample data is provided on the graphs.</li> </ul>
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	<ul style="list-style-type: none"> <li>– The results are displayed graphically. <ul style="list-style-type: none"> <li>○ Any unusual values are explained on the relevant graph.</li> </ul> </li> </ul>
Weather Station	– The data used for this reporting period was taken from the on-site meteorological station.
Weirs	<ul style="list-style-type: none"> <li>– Weirs were operational during the reporting period.</li> <li>– Weirs re-set on 28<sup>th</sup> of April. Reading error may have been caused by an electrical surge.</li> </ul>

### 1.2 Rainfall Data

30/04/2009	0.0	07/05/2009	11.2
01/05/2009	15.8	08/05/2009	17.4
02/05/2009	3.2	09/05/2009	3.6
03/05/2009	1.4	10/05/2009	0.2
04/05/2009	6.4	11/05/2009	0.0
05/05/2009	11.2	12/05/2009	0.0
06/05/2009	14.0	13/05/2009	1.6
Total Rainfall 86.0mm			

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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.
Dust	Dust results are all within limits.
Weather	There was a total of 86.00mm of rainfall during the reporting period, with a temperature range of 1.9°C to 12.5 °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.



## 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 CaCO <sub>3</sub>	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	06/05/2009	14.0	13.0	298	5.7	155	22	2	77	<0.017	<0.44	1.68	6.0	<0.05	0.9	49	<5	<0.5	<1.0	<0.5	31080	8	2.33	138	345
MP 2	06/05/2009	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	3.0	16.0	<0.5	1882	11	1.56	<20	934
MP 3	06/05/2009	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	2.0	4.0	<0.5	23290	8	1.82	28	331
MP 4	06/05/2009	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	3.0	6.0	<0.5	53060	6	0.31	<20	1491
MP 5	06/05/2009	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	2.0	2.0	<0.5	5085	7	1.11	146	320
MP 6	06/05/2009	26.0	13.1	416	6.2	223	10	76	103	<0.017	<0.44	<0.03	10.0	<0.05	5.0	155	15	<0.5	3.0	<0.5	51030	5	1.36	<20	1390
MP 7	06/05/2009	19.0	12.9	329	5.9	171	6	22	64	<0.017	<0.44	<0.03	<0.5	<0.05	<0.5	80	<5	0.8	1.0	<0.5	44170	26	2.03	<20	717
MP 10a	06/05/2009	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	0.8	2.0	<0.5	13410	15	0.40	86	4172
MP 11	06/05/2009	20.0	12.6	189.3	5.5	103	5	70	32	<0.017	<0.44	0.09	<0.5	<0.05	1.5	61	12	<0.5	1.0	<0.5	707	<0.5	0.01	<20	1289

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

Determinant Results							
	Date Positioned	Date Removed	Ref. Number	Date Dispatched	Date Returned	Weight (mg/m <sup>2</sup> /day)	Comments
<b>Target (Consent) Limit: 350 mg m<sup>2</sup> d<sup>-1</sup> on as a 30 day average</b>							
D1	22/01/2009	20/02/2009	199883	20/02/2009	23/02/2009	106	
D2	22/01/2009	20/02/2009	199884	20/02/2009	23/02/2009	117	
D3	22/01/2009	20/02/2009	199885	20/02/2009	23/02/2009	109	
D4	22/01/2009	20/02/2009	199886	20/02/2009	23/02/2009	110	
D1	20/02/2009	20/03/2009	207133	20/03/2009	25/03/2009	169	
D2	20/02/2009	20/03/2009	207134	20/03/2009	25/03/2009	162	
D3	20/02/2009	20/03/2009	207135	20/03/2009	25/03/2009	174	
D4	20/02/2009	20/03/2009	207136	20/03/2009	25/03/2009	183	
D1	20/03/2009	20/04/2009	210632	20/04/2009	29/04/2009	146	
D2	20/03/2009	20/04/2009	210633	20/04/2009	29/04/2009	101	
D3	20/03/2009	20/04/2009	210635	20/04/2009	29/04/2009	117	
D4	20/03/2009	20/04/2009	210636	20/04/2009	29/04/2009	115	
D1	20/04/2009	20/05/2009	214041	20/05/2009	25/05/2009	101	
D2	20/04/2009	20/05/2009	214042	20/05/2009	25/05/2009	98	
D3	20/04/2009	20/05/2009	214043	20/05/2009	25/05/2009	88	
D4	20/04/2009	20/05/2009	214044	20/05/2009	25/05/2009	98	
NDP = No Determination Possible							
Monitoring Points are numbered clockwise through the Cardinal Marks (N, E, S, W)							
Monitoring Results will be presented monthly							

Monitoring Points are numbered clockwise through the Cardinal Marks (N, E, S, W)

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## 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	4.9	13.2	30/04/2009	08:00:00	14:00:00	2539533	3.2	259.7	Not Available			Technical error with instrument
N1	7.1	12.3	01/05/2009	08:00:00	14:00:00	2539533	6.3	216.2	52.6	81.5	38.6	Values impacted by high wind speeds
N1	5.8	12.7	02/05/2009	08:00:00	14:00:00	2539533	4.4	234.8	50.8	77.4	35.1	
N1	4.0	11.6	03/05/2009	08:00:00	14:00:00	2539533	4.0	269.7	46.7	76.6	32.7	
N1	8.7	11.6	04/05/2009	08:00:00	14:00:00	2539533	6.1	253.2	49.0	74.0	34.9	Values impacted by high wind speeds
N1	9.8	11.4	05/05/2009	08:00:00	14:00:00	2539533	6.5	243.6	52.7	78.2	42.6	Values impacted by high wind speeds
N1	6.8	11.4	06/05/2009	08:00:00	14:00:00	2539533	7.1	234.2	53.2	77.5	45.2	Values impacted by high wind speeds
N1	4.1	10.2	07/05/2009	08:00:00	14:00:00	2539533	8.0	228.7	58.3	84.9	42.2	Values impacted by high wind speeds
N1	5.3	11.3	08/05/2009	08:00:00	14:00:00	2539533	6.4	260.7	52.5	78.6	43.0	Values impacted by high wind speeds
N1	4.3	11.9	09/05/2009	08:00:00	14:00:00	2539533	3.8	247.1	47.0	69.2	40.1	
N1	2.5	13.2	10/05/2009	08:00:00	14:00:00	2539533	1.7	128.6	48.0	95.8	37.9	
N1	1.9	17.9	11/05/2009	08:00:00	14:00:00	2539533	3.1	124.5	50.3	73.4	37.9	
N1	4.8	16.8	12/05/2009	08:00:00	14:00:00	2539533	2.8	122.7	52.0	79.3	35.7	
N1	5.6	16.9	13/05/2009	08:00:00	14:00:00	2539533	3.3	125.0	51.5	75.0	36.3	

\* 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

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	4.9	13.2	30/04/2009	22:00:00	10:00:00	2539533	3.2	259.7	Not Available			Technical error with instrument
N1	7.1	12.3	01/05/2009	22:00:00	10:00:00	2539533	6.3	216.2	44.3	69.0	34.8	Values impacted by high wind speeds
N1	5.8	12.7	02/05/2009	22:00:00	10:00:00	2539533	4.4	234.8	42.3	66.5	33.9	
N1	4.0	11.6	03/05/2009	22:00:00	10:00:00	2539533	4.0	269.7	48.1	75.3	35.7	
N1	8.7	11.6	04/05/2009	22:00:00	10:00:00	2539533	6.1	253.2	47.6	73.6	34.3	Values impacted by high wind speeds
N1	9.8	11.4	05/05/2009	22:00:00	10:00:00	2539533	6.5	243.6	49.1	72.3	41.1	Values impacted by high wind speeds
N1	6.8	11.4	06/05/2009	22:00:00	10:00:00	2539533	7.1	234.2	50.5	79.9	42.3	Values impacted by high wind speeds
N1	4.1	10.2	07/05/2009	22:00:00	10:00:00	2539533	8.0	228.7	51.1	81.1	41.7	Values impacted by high wind speeds
N1	5.3	11.3	08/05/2009	22:00:00	10:00:00	2539533	6.4	260.7	46.2	67.4	41.2	Values impacted by high wind speeds
N1	4.3	11.9	09/05/2009	22:00:00	10:00:00	2539533	3.8	247.1	44.5	63.6	39.3	
N1	2.5	13.2	10/05/2009	22:00:00	10:00:00	2539533	1.7	128.6	44.2	73.0	36.1	
N1	1.9	17.9	11/05/2009	22:00:00	10:00:00	2539533	3.1	124.5	44.7	68.6	37.4	
N1	4.8	16.8	12/05/2009	22:00:00	10:00:00	2539533	2.8	122.7	45.1	73.1	34.1	
N1	5.6	16.9	13/05/2009	22:00:00	10:00:00	2539533	3.3	125.0	44.8	76.9	34.9	

\* 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)
30/04/2009	36.16	0.44	17.11	6.03	1.89	4.14
01/05/2009	116.77	7.69	31.72	35.86	5.13	12.77
02/05/2009	13.98	9.66	11.71	9.55	7.73	9.02
03/05/2009	11.31	6.53	9.71	9.02	4.27	8.21
04/05/2009	12.70	9.31	11.02	9.28	6.26	7.59
05/05/2009	25.34	10.93	19.54	10.66	6.03	8.55
06/05/2009	70.70	24.11	40.00	27.41	10.66	16.12
07/05/2009	51.71	19.56	33.74	18.05	10.94	13.56
08/05/2009	75.42	23.81	47.51	25.51	12.38	18.36
09/05/2009	23.81	16.51	19.79	14.19	10.10	12.01
10/05/2009	16.27	10.56	13.17	10.66	7.47	9.14
11/05/2009	10.01	4.88	8.50	9.55	5.57	6.81
12/05/2009	8.81	0.93	4.99	7.47	1.16	4.28
13/05/2009	6.67	0.76	4.20	5.13	1.58	3.24

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



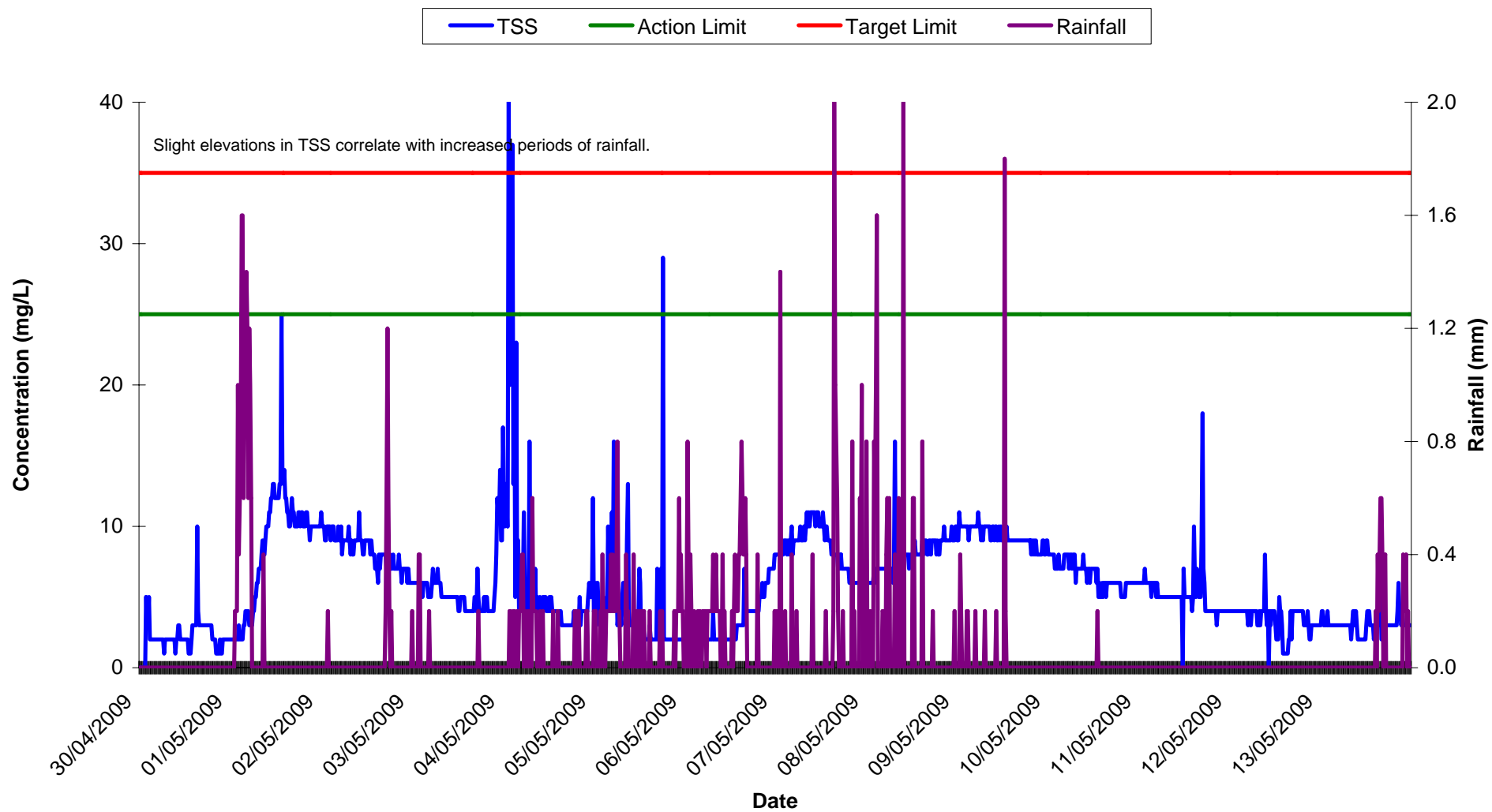
## Vibration Monitoring Record Sheet

Determinant Results	
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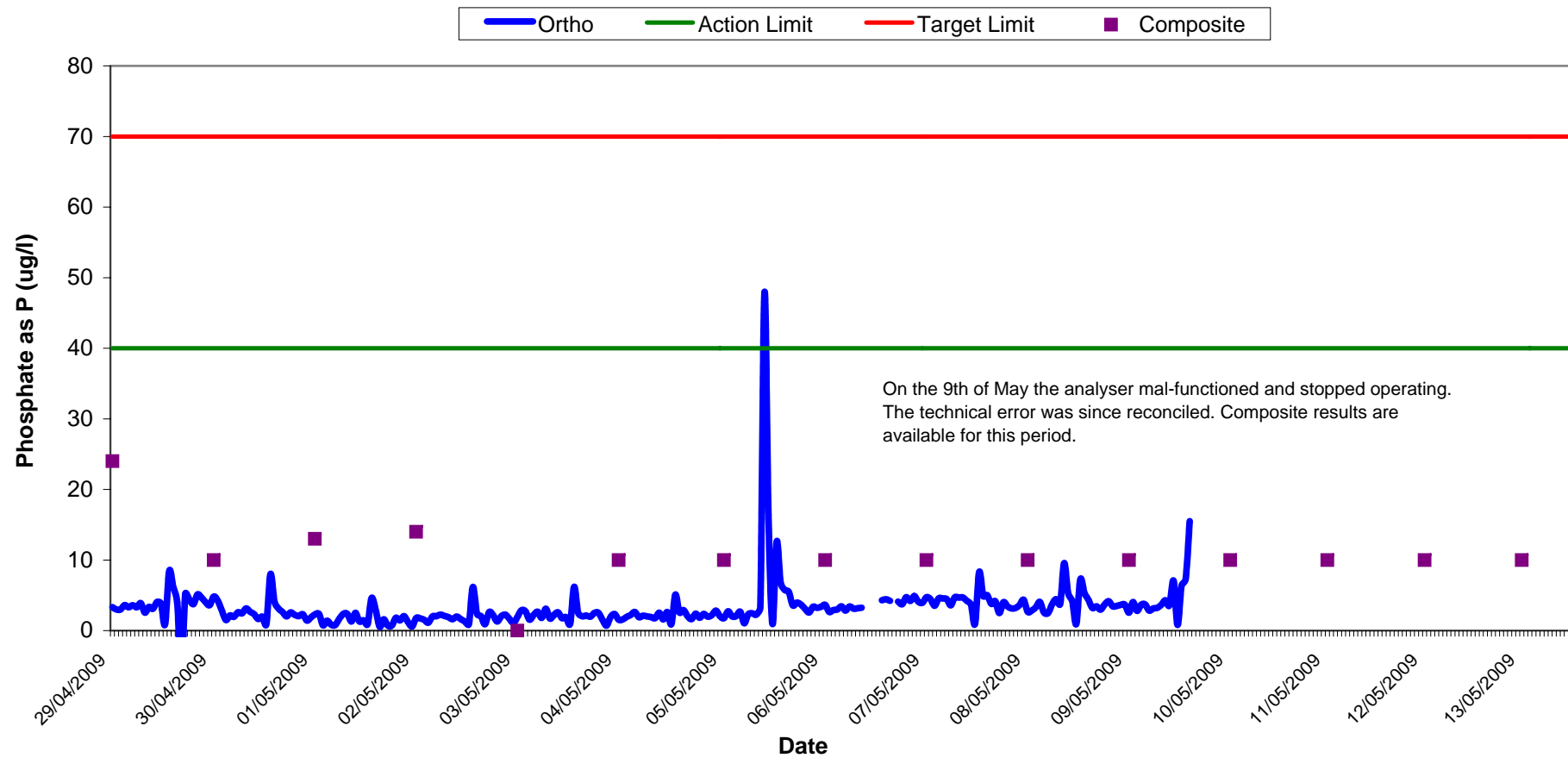
[illegible]

Vibration meter located at V1.

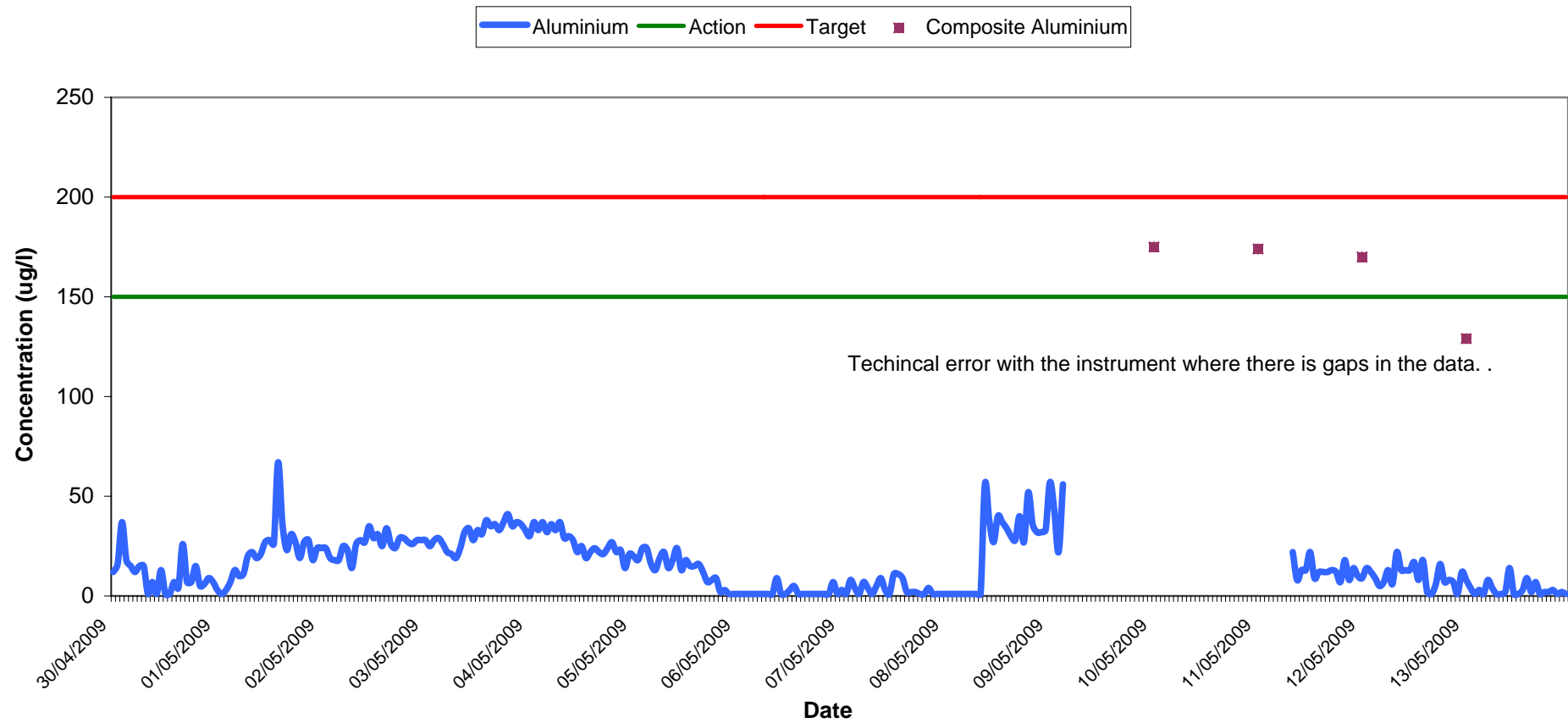
### Total Suspended Solids at SP1 Week 18-19



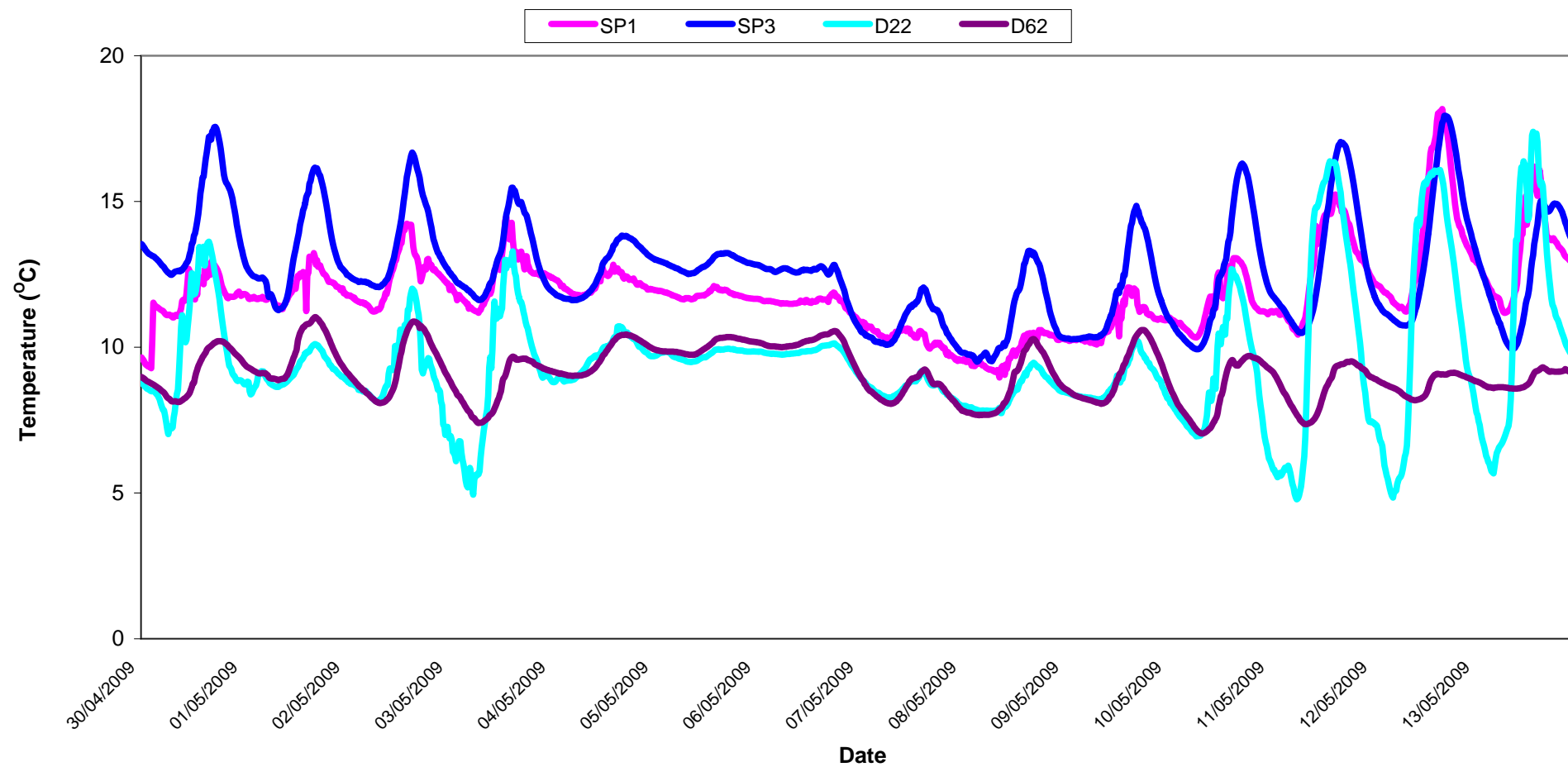
# Orthophosphate Results at SP1 Wk 18-19



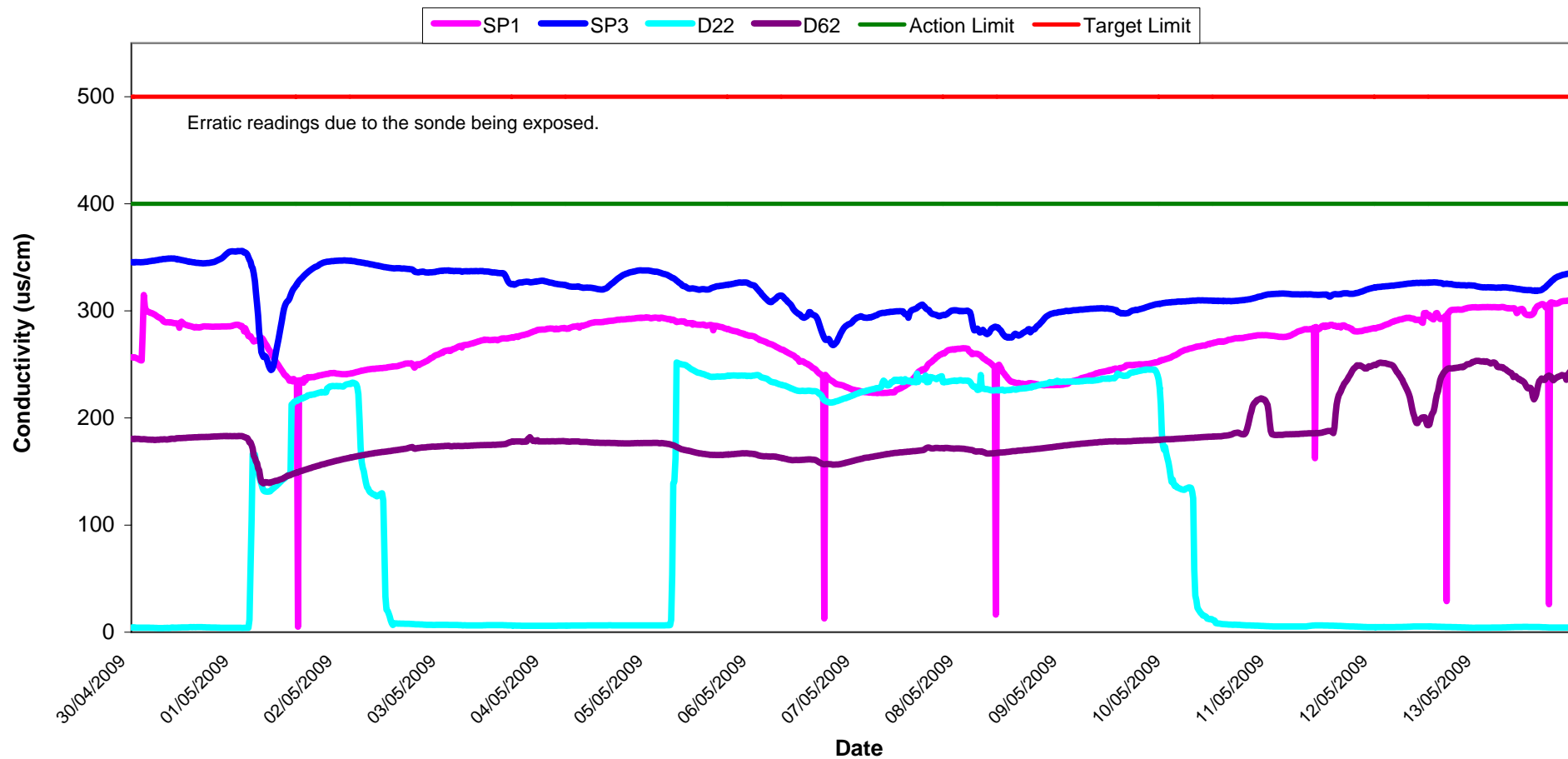
# Aluminium Concentration at SP1 Wk 18-19



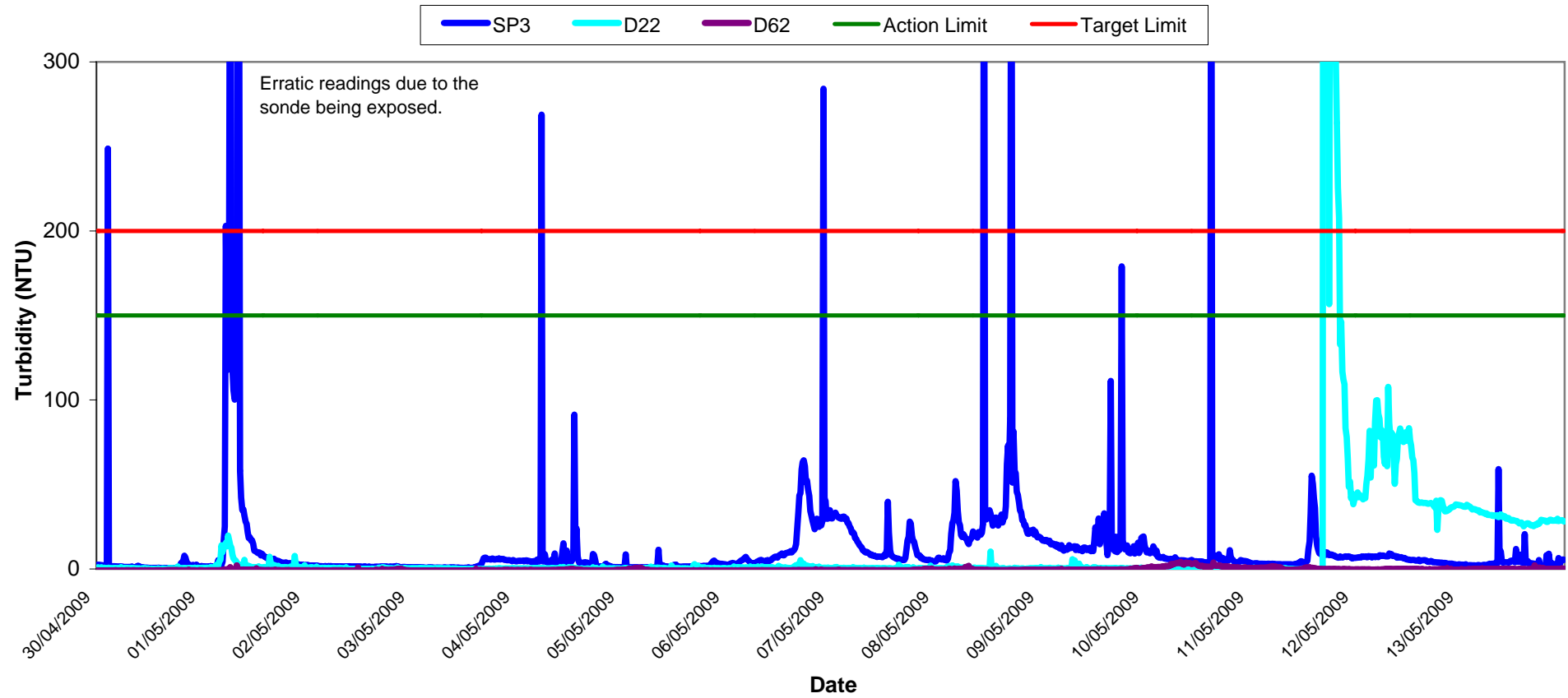
Temperature - Surface Waters  
Wk 18-19



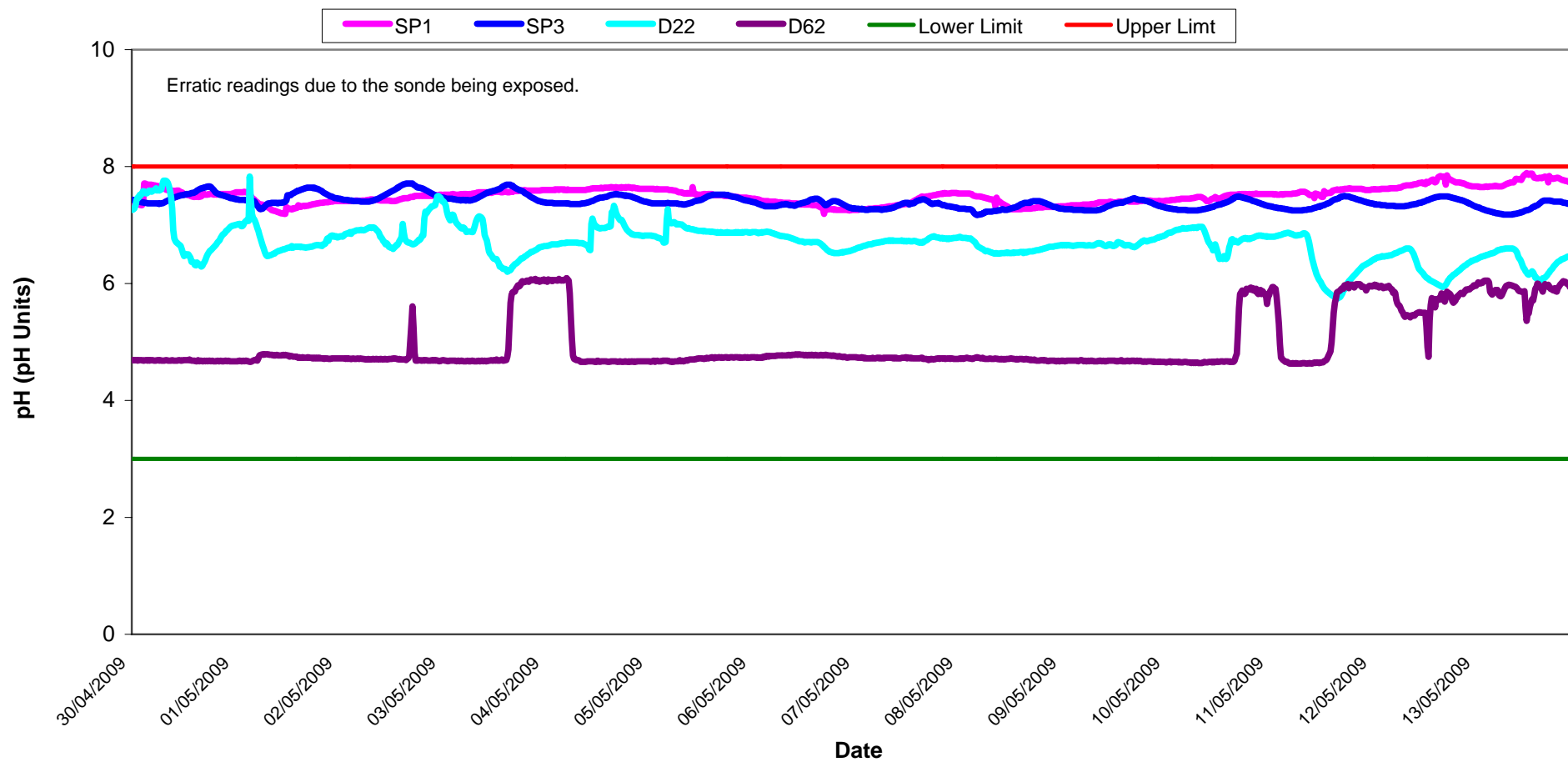
# Conductivity - Surface Waters, Wk 18-19



# Turbidity - Surface Waters Wk 18-19

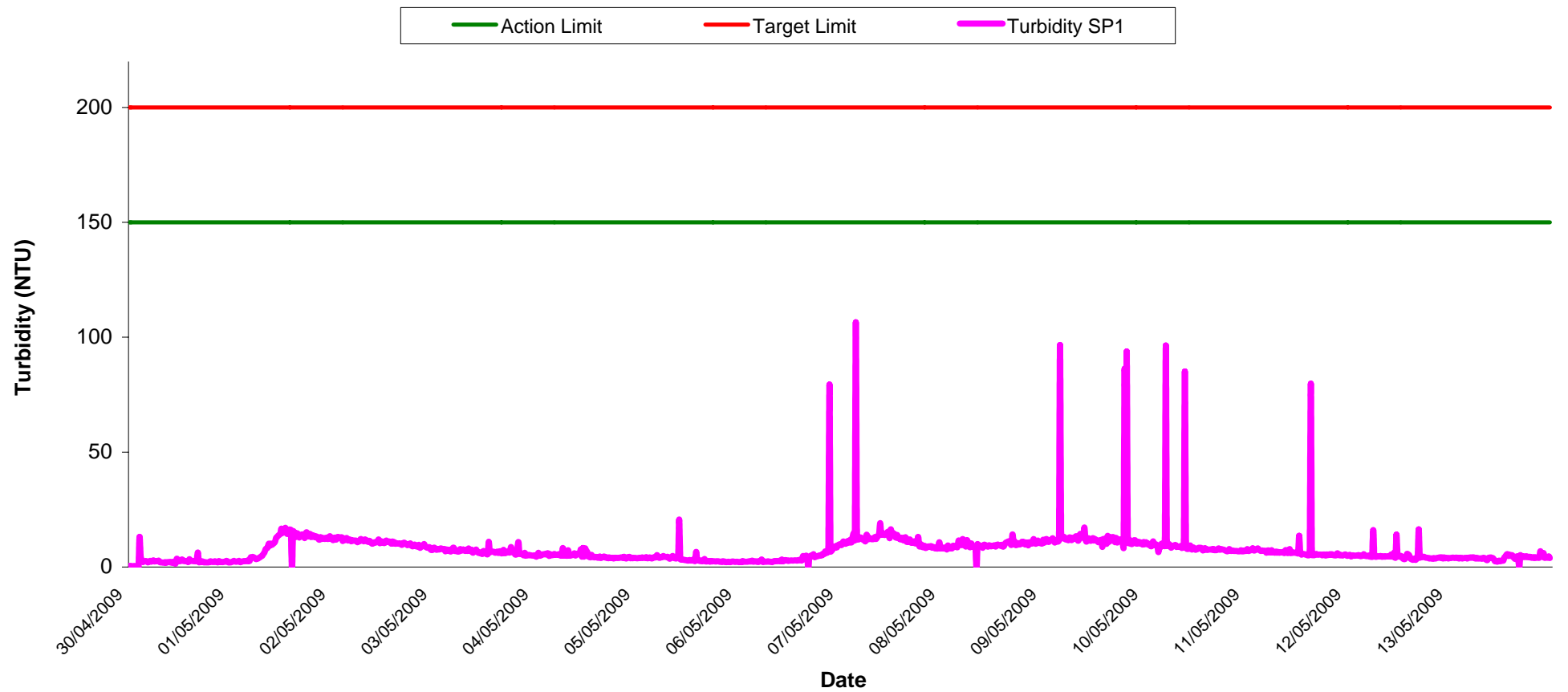


# pH - Surface Waters Wk 18-19

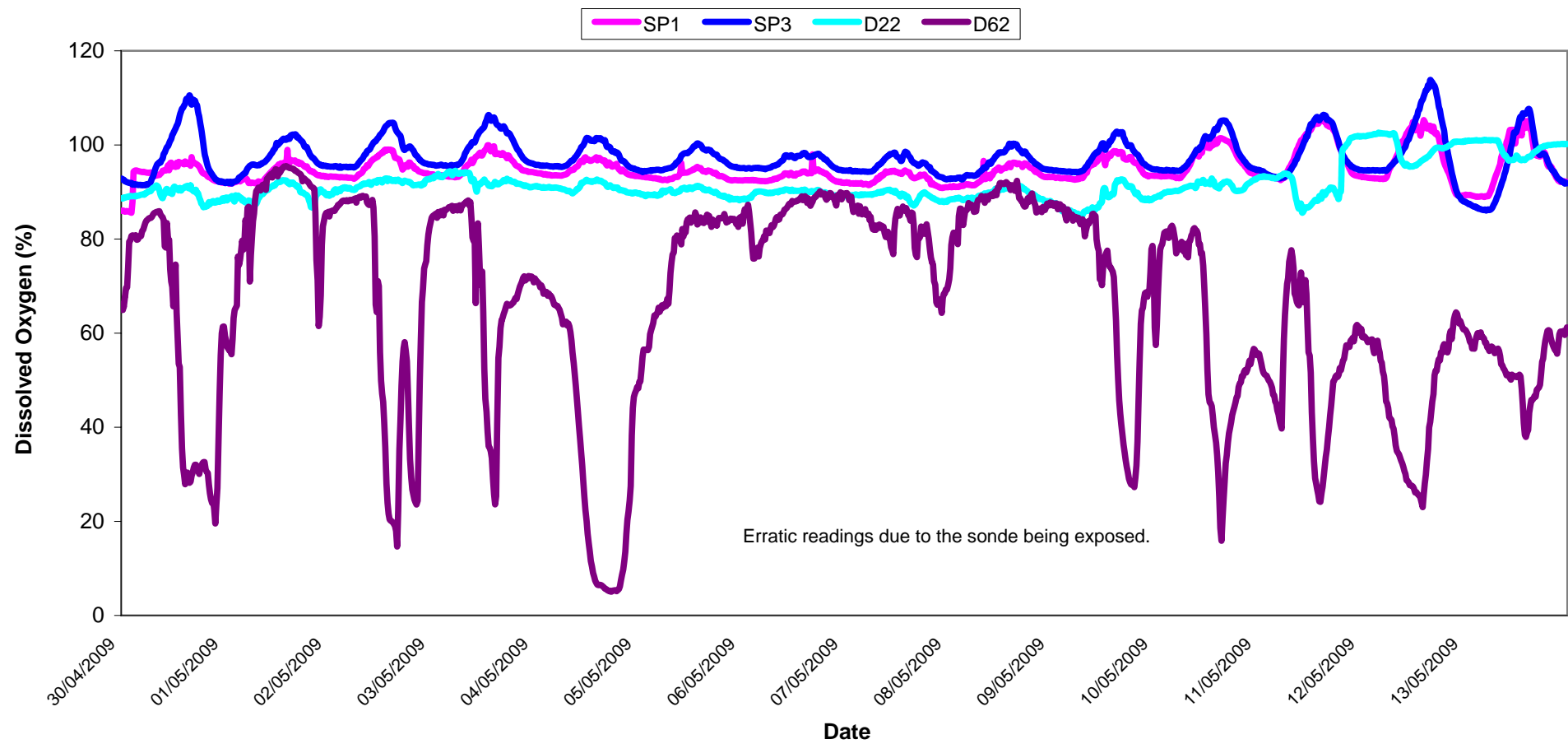




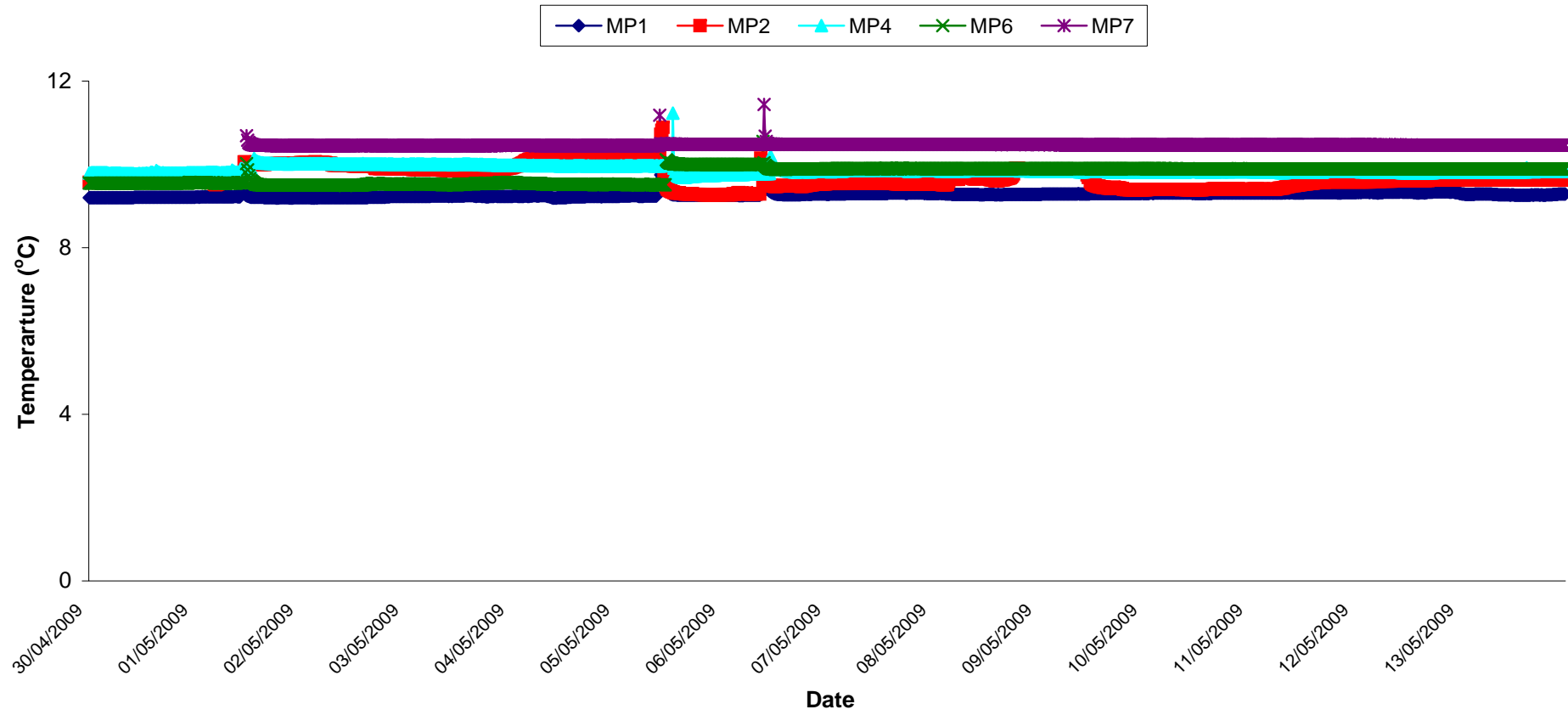
# Turbidity - Surface Waters @ SP1, Wk 18-19



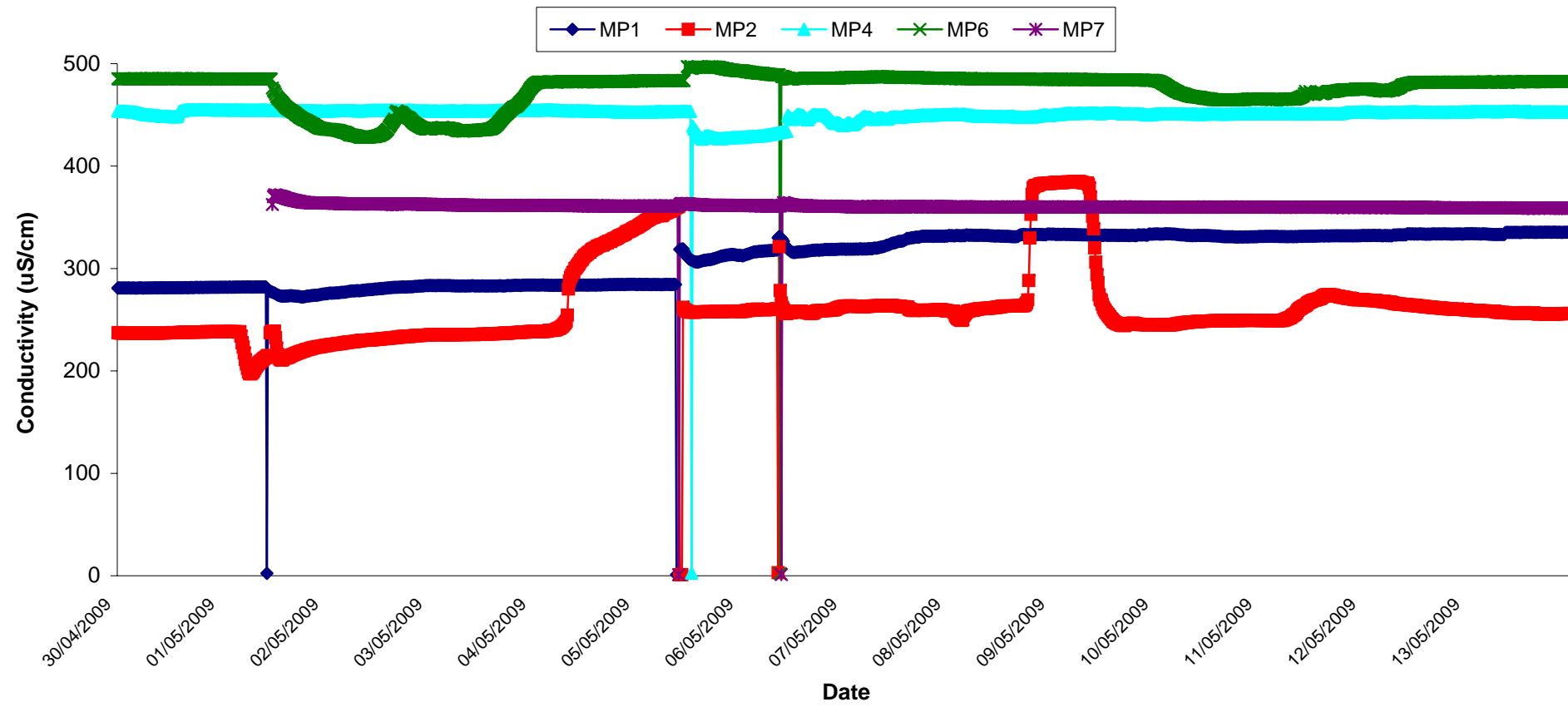
# Dissolved Oxygen - Surface Waters, Wk 18-19



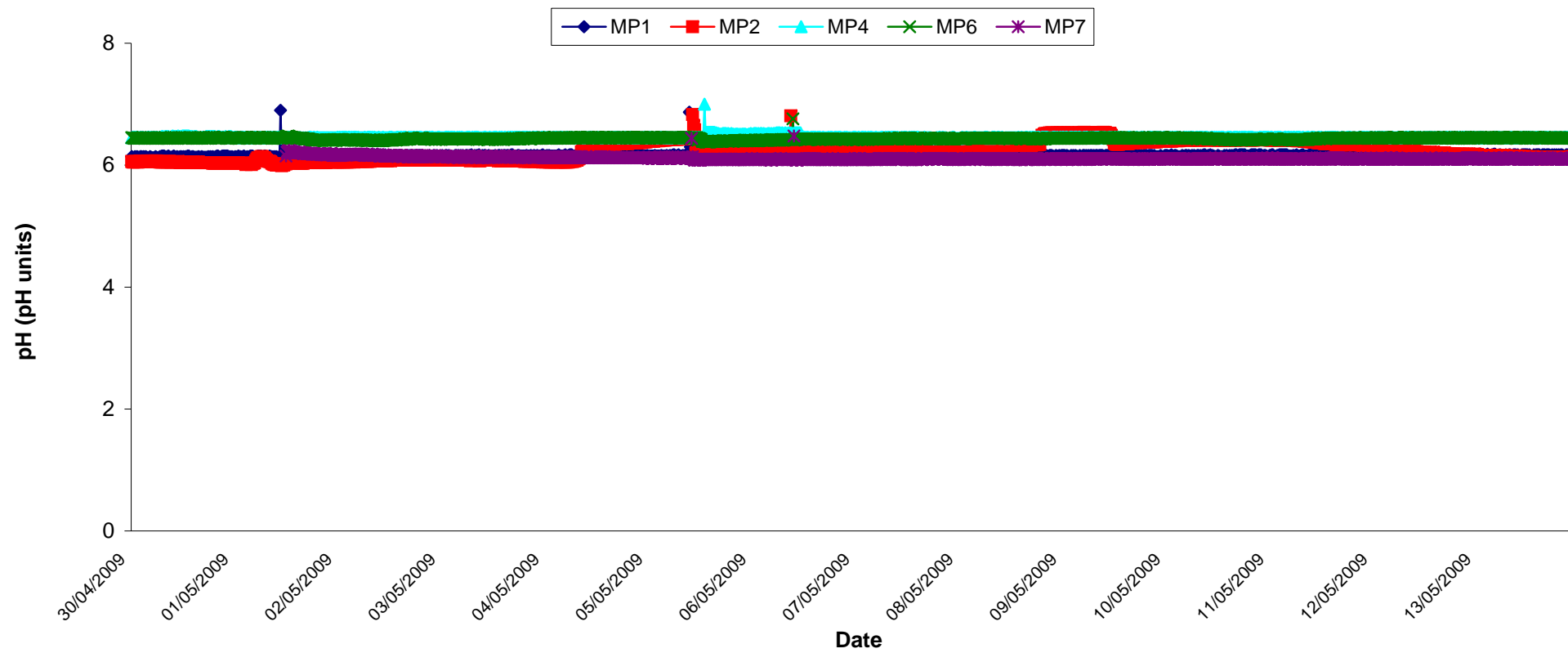
# Temperature - Groundwaters Wk 18-19



# Conductivity - Groundwaters Wk 18-19



# pH - Groundwaters Wk 18-19



# **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	30/04/2009	288	12.8	12.7	89.0	6.4			<LOD			<LOD		<LOD	45	1.25	213
SP1	01/05/2009	254	12.1	16.6	89.7	6.7			<LOD			<LOD		29	93	1.00	181
SP1	05/05/2009	286	12.1	11.2	90.9	6.4			<LOD			0.06		<LOD	129	>LOD	200
SP1	06/05/2009	255	11.7	8.0	91.1	6.4			0.1			<LOD		<LOD	112	1.18	179
SP1	07/05/2009	220	11.5	30.5	91.0	6.5			<LOD			<LOD		35	162	1.01	125
SP1	08/05/2009	234	10.4	23.7	90.4	6.5			<LOD			<LOD		32	95	1.13	129
SP1	11/05/2009	278	11.3	14.5	92.3	7.1			<LOD			0.03		27	174	0.25	205
SP1	12/05/2009	300	13.1	10.1	88.1	6.7			<LOD			0.12		38	316	0.21	200
SP1	13/05/2009	288	13.1	9.7	100.5	7.1			<LOD			0.58		22	117	0.04	198
SP3	30/04/2009	346	16.4	3.9	104.7	6.8			<LOD			<LOD		38		0.03	244
SP3	01/05/2009	254	11.6	65.4	93.0	6.9			<LOD			0.03		71		0.03	180
SP3	05/05/2009	304	12.8	4.6	95.3	6.6			0.2			<LOD		<LOD		<LOD	222
SP3	06/05/2009	292	12.6	12.0	95.1	6.3			0.3			0.01		22		0.01	210
SP3	07/05/2009	303	11.3	12.4	96.4	6.9			<LOD			0.04		30		0.04	216
SP3	08/05/2009	274	10.6	31.7	93.9	6.6			0.1			<LOD		31		0.02	203
SP3	11/05/2009	320	12.1	8.4	91.9	7.1			0.5			0.02		<LOD		<LOD	224
SP3	12/05/2009	333	10.7	11.3	95.7	6.7			0.5			0.18		31		0.05	222
SP3	13/05/2009	325	11.3	8.5	98.5	7.3			<LOD			0.04		30		0.01	214
Additional Monitoring																	
D22	01/05/2009	206	10.1	7.1	87.7	6.9			0.1			0.16		22		0.05	151
D62	01/05/2009	163	10.7	3.4	90.7	5.8			0.5			<LOD		<LOD		0.03	80
D22	12/05/2009	268	6.2	2.7	102.1	6.7			<LOD			>LOD		27		0.07	178
D62	12/05/2009	210	8.3	0.9	89.9	6.0			0.1			0.47		35		0.06	122
Axonics Monitoring																	
Pre	30/04/2009	350		107.0		6.9			<LOD			0.12		317		0.04	244
Post	30/04/2009	361		5.6		6.7			0.4			<LOD		21	277	0.02	251
Pre	01/05/2009	348		425.0		6.9			<LOD			0.15		936		0.04	239
Post	01/05/2009	360		21.7		6.8			0.2			<LOD		36	274	0.01	246
Pre	05/05/2009	331		130.0		6.8			<LOD			0.38		>LOD		0.02	228
Post	05/05/2009	345		5.0		6.8			0.3			<LOD		<LOD	185	<LOD	235
Pre	06/05/2009	320		669.0		6.5			<LOD			1.52		>LOD		0.14	225
Post	06/05/2009	338		6.3		6.5			0.6			0.02		<LOD	230	0.02	235
Pre	07/05/2009	309		>LOD		7.0			<LOD			0.45		>LOD		0.04	220
Post	07/05/2009	328		6.4		6.9			0.7			0.02		<LOD	238	<LOD	231
Pre	08/05/2009	312		>LOD		6.8			<LOD			0.86		>LOD		0.21	223
Post	08/05/2009	331		11.5		6.7			0.2			<LOD		40	272	0.04	233
Pre	11/05/2009	328		167.0		6.9			<LOD			0.61		459		0.02	230
Post	11/05/2009	338		8.9		6.8			0.3			<LOD		42	286	0.03	235
Pre	12/05/2009	336		61.9		6.7			<LOD			0.07		>LOD		0.02	223
Post	12/05/2009	346		3.9		6.7			0.7			0.29		<LOD	381	<LOD	230
Pre	13/05/2009	349		935.0		7.2			<LOD			1.63		>LOD		0.09	230
Post	13/05/2009	361		5.8		6.5			0.3			0.42		<LOD	334	<LOD	237
Pre	13/05/2009	349		935.0		7.2			<LOD			1.63		>LOD		0.09	230
Post	13/05/2009	361		5.8		6.5			0.3			0.42		<LOD	334	<LOD	237
Grey shaded areas denote parameters that cannot or were not analysed on-site.																	
= Indicative Only																	
= Below Limit of Detection																	
= Above Limit of Detection																	