

Final Environmental Report	Period Ending: 4 th March 2009
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 ₄	– The PO ₄ analyser was operational during the reporting period. – The composite sampler was in place to cover any shortfalls in the PO ₄ analyser.
TSS	– The TSS analyser was operational during the reporting period. – The composite sampler was in place to cover any shortfalls in the TSS analyser.
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. <ul style="list-style-type: none"> ○ Any unusual values are explained on the relevant graph. ○ Due to an internal power supply failure, data from MP6 is not available for the reporting period. The sonde has been sent back to the manufacturer for repair. ○ The turbidity probe on the SP1 malfunctioned during the reporting period. The problem has been rectified.
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.

1.2 Rainfall Data

19/02/2009	2.145	26/02/2009	8.190
20/02/2009	0.195	27/02/2009	2.535
21/02/2009	0.390	28/02/2009	2.535
22/02/2009	1.365	01/03/2009	5.850
23/02/2009	0.585	02/03/2009	3.510
24/02/2009	1.365	03/03/2009	12.285
25/02/2009	1.170	04/03/2009	9.360
Total Rainfall 51.480mm			

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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 51.48mm of rainfall during the reporting period, with a temperature range of -0.8°C to 11.4°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

Date and Time	19 th February 2009
Location	SP1
Nature of Incident	A value of 215µg/l was recorded for total aluminium at SP1 on the 19 th February 2009. This value is in exceedance of the site discharge limit for total aluminium of 200µg/l.
Actions Taken	<ul style="list-style-type: none"> On going surveillance and maintenance of site drainage outside the main footprint area. Close monitoring of total suspended solids will be carried out at SP1. Storage and pumping back to Axonic's of footprint waters. Using the northern settlement pond for increasing the water attenuating capacity thus improving water quality.
Category	Environmental Exceedance
Status	Closed

Surface Water Monitoring Record Sheet: Accredited Laboratory Results

[illegible]

Groundwater Monitoring Record Sheet																									
Location	Date	DO	Temp	Cond.	pH	TDS	BOD	TSS	Total Hardness	Nitrite as NO ₂	Nitrate as NO ₃	Phosphate as PO4	Arsenic	Mercury	Lead	Aluminium (total)	Zinc	Chromium	Copper	Cadmium	Iron	Tin	Ammonia	Aluminium, dissolved	Manganese total
		% Sat	°C	uS/cm	pH units	mg l ⁻¹	mg l ⁻¹	mg l ⁻¹	mg/l CaCO3	mg l ⁻¹	mg l ⁻¹	mg l ⁻¹	ug l ⁻¹	ug l ⁻¹	ug l ⁻¹	ug l ⁻¹	ug l ⁻¹	ug l ⁻¹	ug l ⁻¹	ug l ⁻¹	ug l ⁻¹	ug l ⁻¹	mg l ⁻¹	ug l ⁻¹	ug l ⁻¹
MP 1	04/03/2009	10	7.7	303	5.8	159	28	4	56.4	<0.017	<0.44	1.91	5.0	<0.05	<0.5	60	10	<0.5	<1.0	<0.5	21230	<0.5	2.25	<20	698
MP 2	04/03/2009	16	6.9	218	5.7	118	22	237	66.3	<0.017	<0.44	0.28	1.0	<0.05	4.0	1211	20	2.0	5.0	<0.5	5425	<0.5	2.59	64	193
MP 3	04/03/2009	13	8.0	334	5.7	176	15	169	62.2	<0.017	<0.44	1.82	3.0	<0.05	2.0	1027	14	2.0	2.0	<0.5	13760	<0.5	2.60	101	262
MP 4	04/03/2009	28	3.4	418	5.9	220	16	227	64.0	<0.017	<0.44	0.42	2.0	<0.05	3.0	1291	16	3.0	6.0	<0.5	58220	<0.5	0.14	<20	1702
MP 5	04/03/2009	17	6.5	246	5.6	130	16	95	64.8	<0.017	<0.44	0.43	1.0	<0.05	3.0	1204	15	3.0	4.0	<0.5	12730	<0.5	2.08	139	260
MP 6	04/03/2009	8	8.0	435	6.2	229	15	48	94.2	<0.017	<0.44	1.61	10.0	<0.05	1.0	65	14	<0.5	<1.0	<0.5	45840	0.7	0.32	<20	1231
MP 7	04/03/2009	14	7.3	337	5.8	173	22	8	54.7	<0.017	<0.44	0.75	<0.5	<0.05	<0.5	52	8	0.8	<1.0	<0.5	34670	0.7	2.93	<20	568
MP 10a	04/03/2009	14	8.6	402	5.6	210	4	246	159.0	<0.017	<0.44	0.08	1.0	<0.05	3.0	548	20	1.0	4.0	<0.5	6234	<0.5	0.42	<20	2896
MP 11	04/03/2009	15	8.2	192	5.2	98	4	7	33.4	<0.017	<0.44	0.04	<0.5	<0.05	1.0	25	10	<0.5	<1.0	<0.5	385	<0.5	0.02	<20	1045

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 ² /day)	Comments
Target (Consent) Limit: 350 mg m² d⁻¹ on as a 30 day average							
D1	21/11/2008	22/12/2008	194862	22/12/2008	05/01/2009	172	
D2	21/11/2008	22/12/2008	194863	22/12/2008	05/01/2009	37	
D3	21/11/2008	22/12/2008	194864	22/12/2008	05/01/2009	144	
D4	21/11/2008	22/12/2008	194865	22/12/2008	05/01/2009	39	
D1	22/12/2009	22/01/2009	197095	22/01/2009	28/01/2009	295	
D2	22/12/2009	22/01/2009	197096	22/01/2009	28/01/2009	324	
D3	22/12/2009	22/01/2009	197097	22/01/2009	28/01/2009	261	
D4	22/12/2009	22/01/2009	197098	22/01/2009	28/01/2009	324	
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	
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)

Monitoring Results will be presented monthly

Day 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 _{Aeq}	L _{Amax}	L _{Amin}	
Action Limit									60			
Target Limit									65			
N1	2.0	10.8	19/02/2009	08:00:00	14:00:00	2539533	1.5	154.9	48.9	85.9	32.7	
N1	0.8	9.5	20/02/2009	08:00:00	14:00:00	2539533	3.1	36.3	50.0	70.0	31.6	
N1	7.9	11.4	21/02/2009	08:00:00	14:00:00	2539533	4.4	41.7	49.2	69.5	31.6	
N1	8.2	10.1	22/02/2009	08:00:00	14:00:00	2539533	3.0	92.2	44.7	78.0	30.0	
N1	7.8	10.8	23/02/2009	08:00:00	14:00:00	2539533	1.9	112.3	46.6	72.2	30.0	
N1	6.9	9.3	24/02/2009	08:00:00	14:00:00	2539533	2.9	50.1	49.5	74.5	30.0	
N1	5.5	10.5	25/02/2009	08:00:00	14:00:00	2539533	3.2	74.1	48.4	78.7	30.0	
N1	7.6	10.7	26/02/2009	08:00:00	14:00:00	2539533	4.2	51.3	51.2	73.2	32.6	
N1	8.2	10.1	27/02/2009	08:00:00	14:00:00	2539533	5.5	27.5	52.1	79.6	31.9	Values impacted by high wind speeds
N1	4.7	9.7	28/02/2009	08:00:00	14:00:00	2539533	4.0	42.8	49.4	82.4	31.5	
N1	4.2	9.5	01/03/2009	08:00:00	14:00:00	2539533	3.2	109.3	46.5	80.8	35.6	
N1	4.5	10.7	02/03/2009	08:00:00	14:00:00	2539533	4.2	62.2	52.6	83.8	35.2	
N1	-0.1	6.7	03/03/2009	08:00:00	14:00:00	2539533	3.8	80.6	64.3	101.5	33.8	Values impacted by high rainfall levels
N1	-0.8	4.3	04/03/2009	08:00:00	14:00:00	2539533	2.5	133.2	68.6	103.0	38.9	Values impacted by high rainfall levels
* Wind speeds in excess of 5 m/s negatively impact noise readings (as per EPA Guidance Note on Noise Measurement).												

Note: Site weather data not available from the 27/11/2008 to 01/12/2008. Belmullet data used where available.

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 _{Aeq}	L _{Amax}	L _{Amin}	
Action Limit									50			
Target Limit									55			
N1	2.0	10.8	19/02/2009	22:00:00	10:00:00	2539533	1.5	154.9	43.6	67.0	32.3	
N1	0.8	9.5	20/02/2009	22:00:00	10:00:00	2539533	3.1	36.3	44.2	66.9	33.1	
N1	7.9	11.4	21/02/2009	22:00:00	10:00:00	2539533	4.4	41.7	46.2	72.2	30.0	
N1	8.2	10.1	22/02/2009	22:00:00	10:00:00	2539533	3.0	92.2	42.4	77.7	30.0	
N1	7.8	10.8	23/02/2009	22:00:00	10:00:00	2539533	1.9	112.3	41.0	67.3	30.0	
N1	6.9	9.3	24/02/2009	22:00:00	10:00:00	2539533	2.9	50.1	43.6	73.0	30.0	
N1	5.5	10.5	25/02/2009	22:00:00	10:00:00	2539533	3.2	74.1	44.7	77.4	31.0	
N1	7.6	10.7	26/02/2009	22:00:00	10:00:00	2539533	4.2	51.3	46.7	72.8	31.9	
N1	8.2	10.1	27/02/2009	22:00:00	10:00:00	2539533	5.5	27.5	44.5	67.3	31.8	Values impacted by high wind speeds
N1	4.7	9.7	28/02/2009	22:00:00	10:00:00	2539533	4.0	42.8	49.1	82.4	31.5	
N1	4.2	9.5	01/03/2009	22:00:00	10:00:00	2539533	3.2	109.3	44.2	72.3	33.3	
N1	4.5	10.7	02/03/2009	22:00:00	10:00:00	2539533	4.2	62.2	47.9	76.6	35.9	
N1	-0.1	6.7	03/03/2009	22:00:00	10:00:00	2539533	3.8	80.6	44.5	89.7	36.0	
N1	-0.8	4.3	04/03/2009	22:00:00	10:00:00	2539533	2.5	133.2	47.1	72.7	40.6	

* 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)
19/02/2009	8.00	3.23	6.73	3.10	0.02	2.18
20/02/2009	7.54	0.88	6.06	3.67	0.07	2.24
21/02/2009	7.85	3.05	4.89	3.87	0.02	1.33
22/02/2009	6.26	4.10	5.75	2.38	0.67	1.93
23/02/2009	5.99	1.77	4.44	1.89	-0.73	0.87
24/02/2009	6.67	0.52	3.25	2.05	-0.78	0.07
25/02/2009	6.26	0.29	3.48	2.05	-0.53	0.64
26/02/2009	3.32	-0.05	0.87	0.02	-0.73	-0.36
27/02/2009	4.99	1.31	2.49	0.78	-0.83	-0.36
28/02/2009	6.12	4.00	5.11	1.03	0.02	0.69
01/03/2009	19.29	5.60	12.47	4.27	0.78	2.52
02/03/2009	11.12	8.48	9.73	3.47	1.89	2.60
03/03/2009	61.82	4.43	15.08	15.44	3.28	5.86
04/03/2009	40.97	17.24	25.20	6.50	3.47	4.97

Note: Negative values indicate low flow conditions.

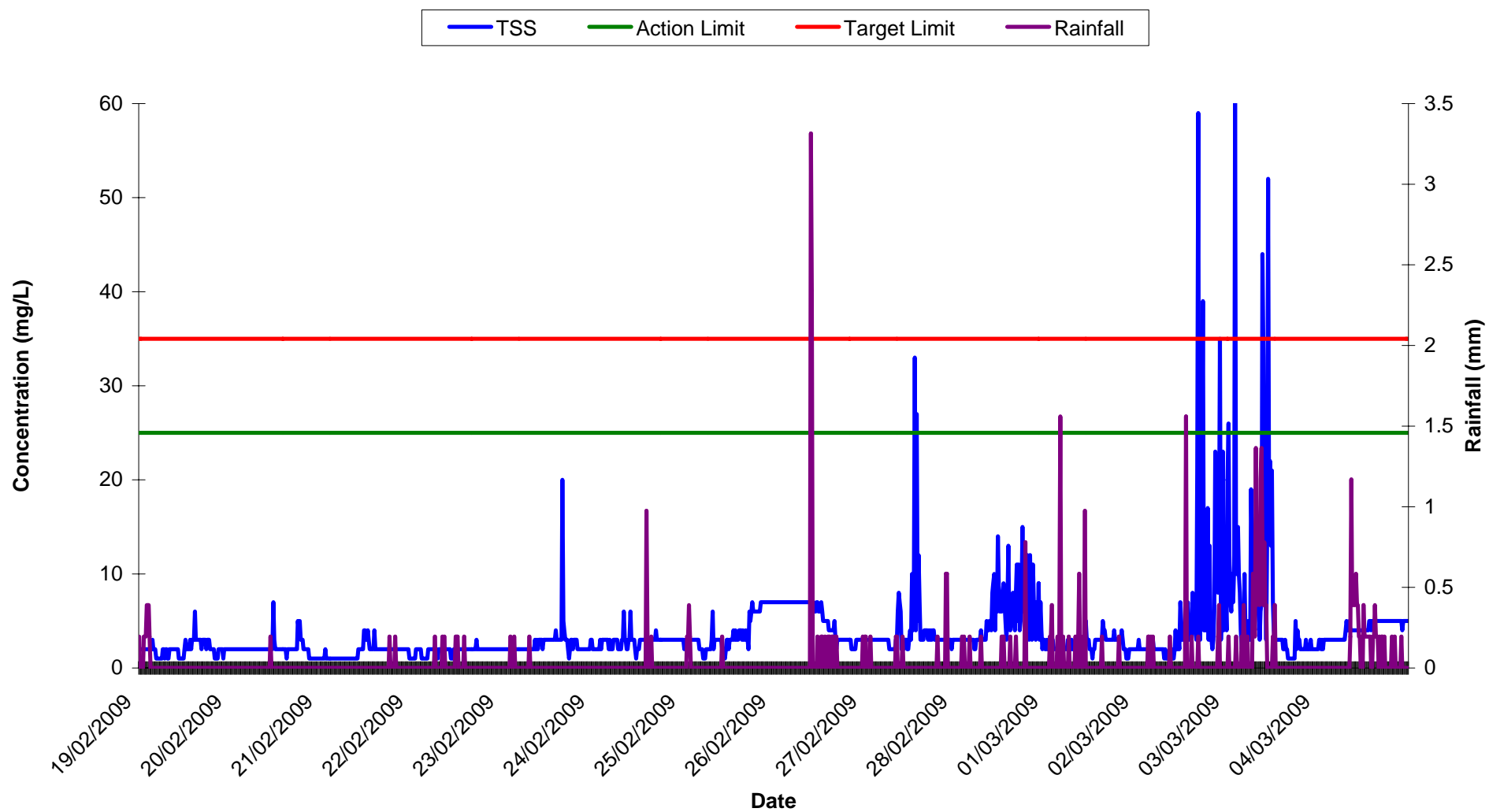
Vibration Monitoring Record Sheet

Determinant Results	
1	1
2	2
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4	4
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10	10
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100	100

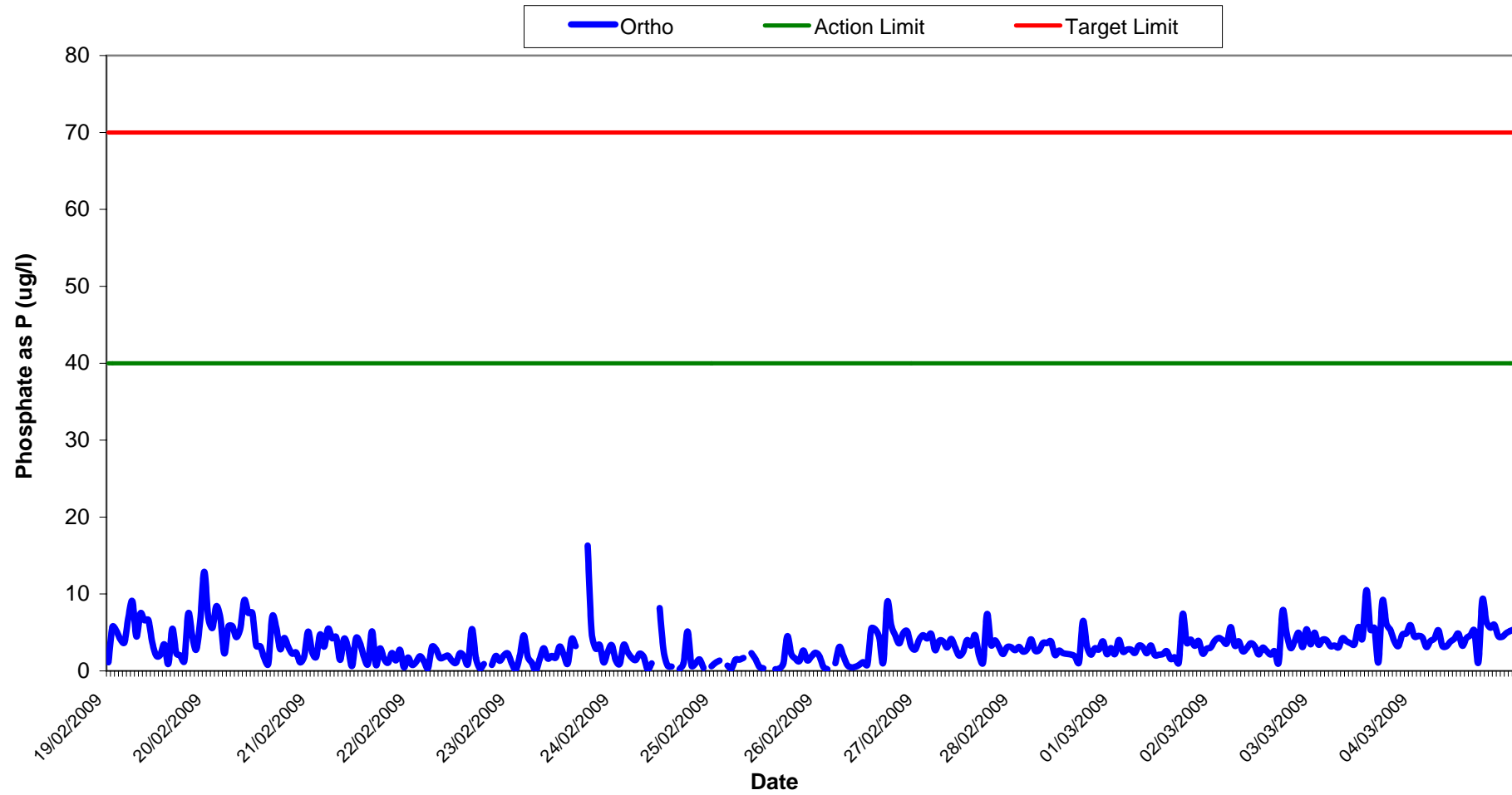
Location	Date Positioned	Date Removed	Event Date	Event Time	Peak Vector Sum	Tran PPV	Vert PPV	Long PPV	Comments
V1	19-Feb-09			14:35					Monitor Started
			19-Feb-09	14:44	4.94	2.29	4.44	1.52	Sensor Check
		02-Mar-09		10:40					Monitor Stopped
	02-Mar-09			10:49					Monitor Started
			02-Mar-09	10:54	1.49	1.4	0.762	0.508	Sensor Check
		02-Mar-09		11:54					Monitor Stopped
	02-Mar-09			13:04					Monitor Started
			04-Mar-09	12:49	156.0	69.0	89.7	136.0	Sensor Check
	05-Mar-09			14:57					Monitor Stopped

Vibration meter located at V1.

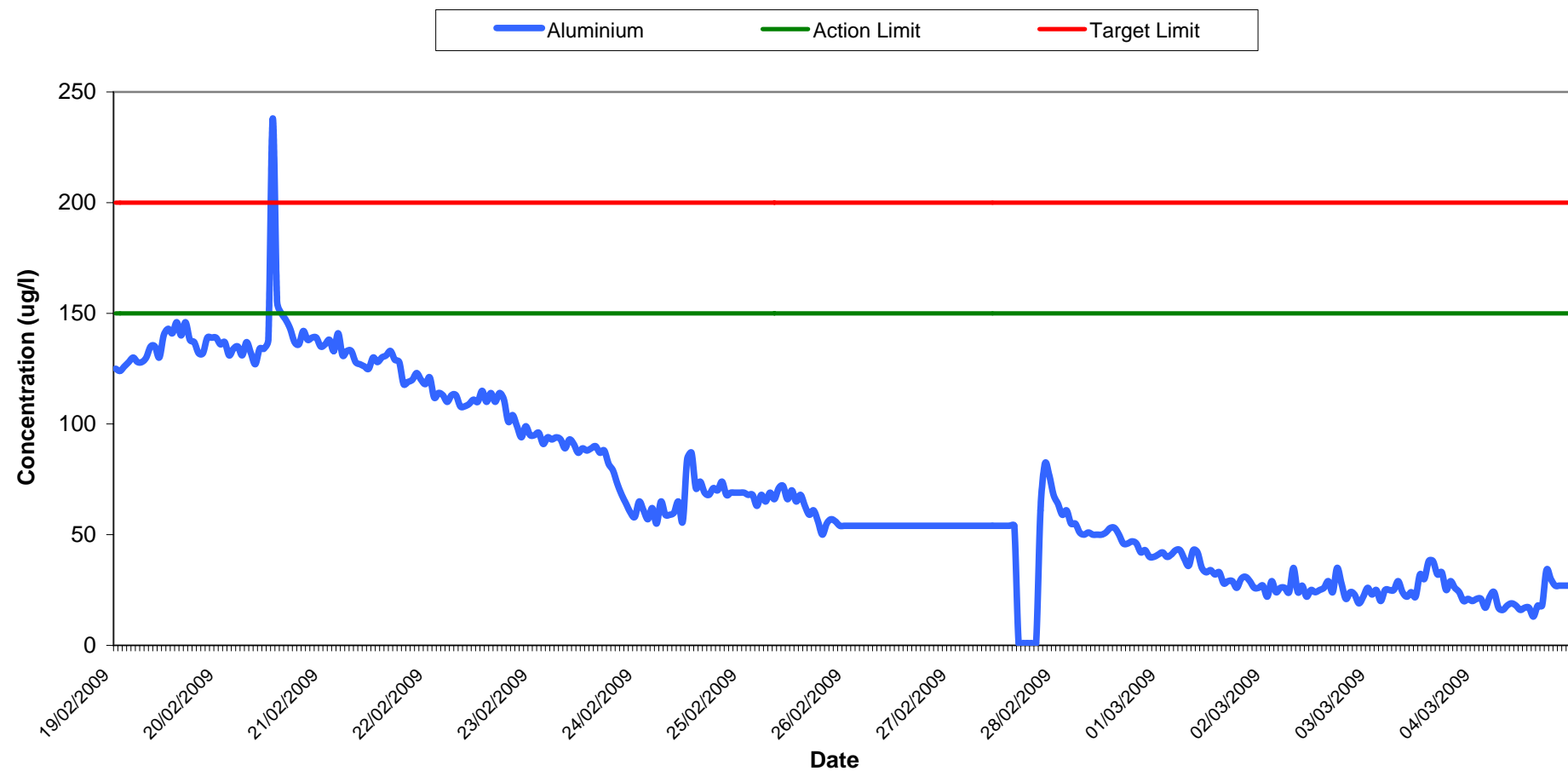
Total Suspended Solids at SP1 Week 08-09



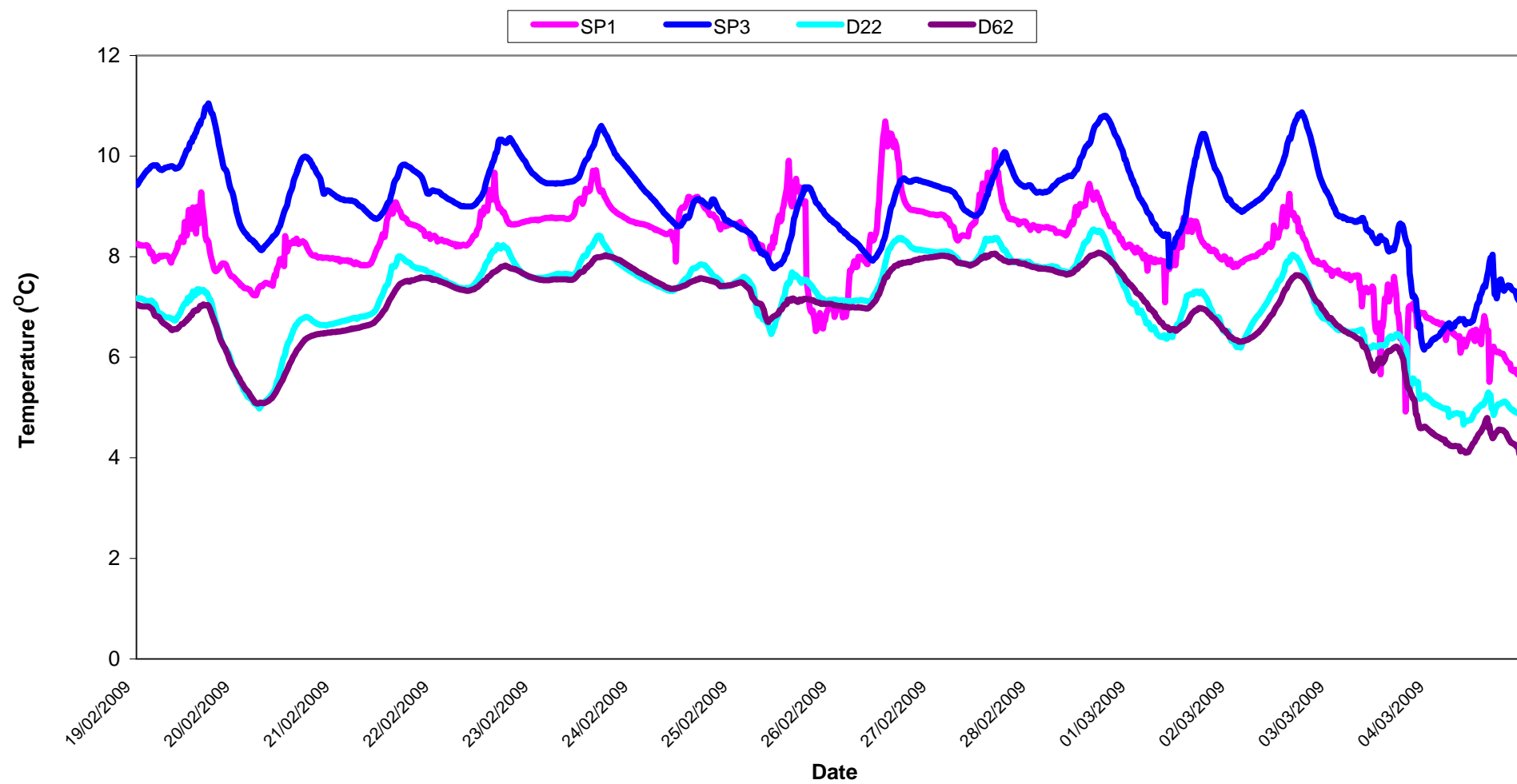
Orthophosphate Results at SP1
Wk 08-09



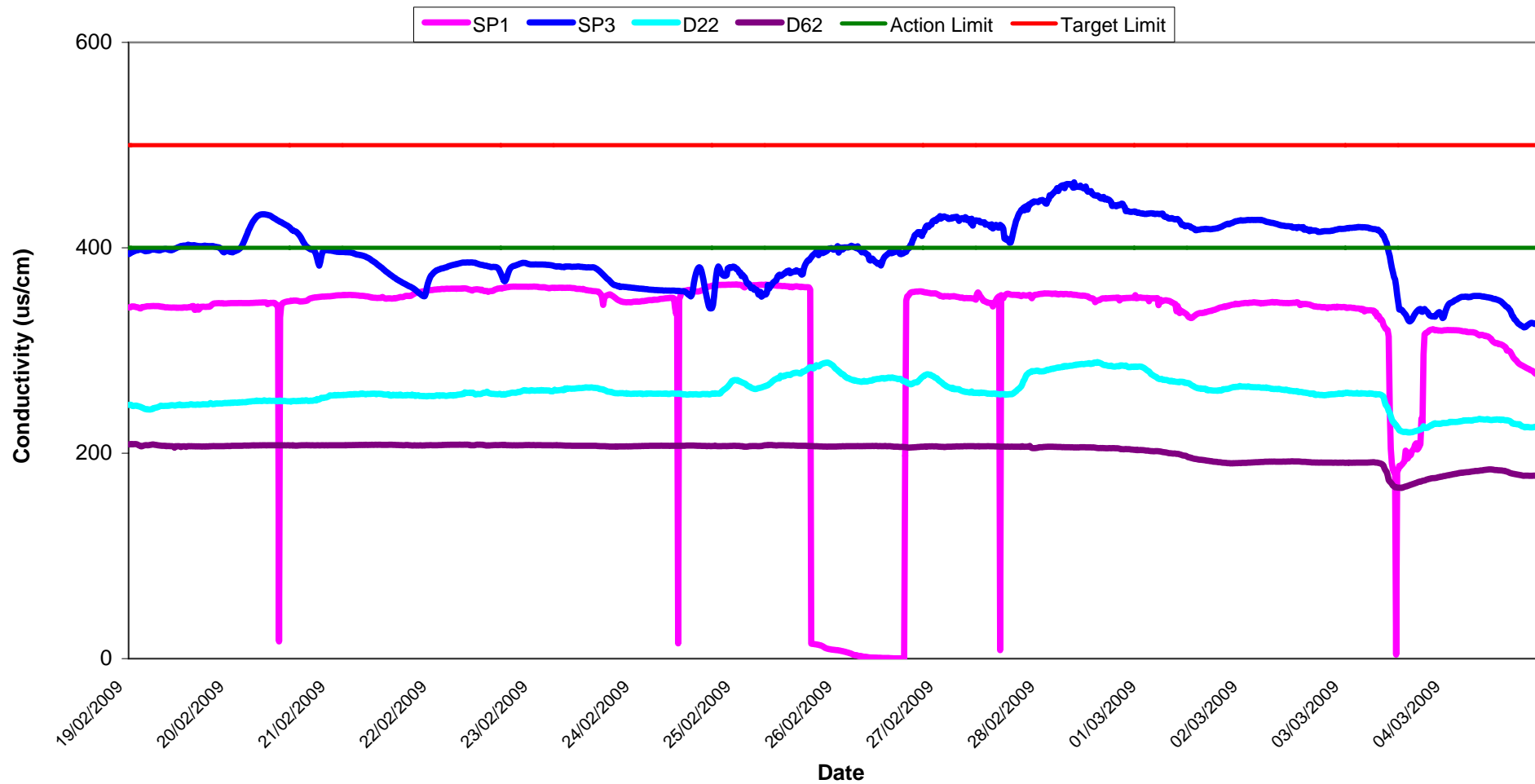
Aluminium Concentration at SP1 Wk 08-09



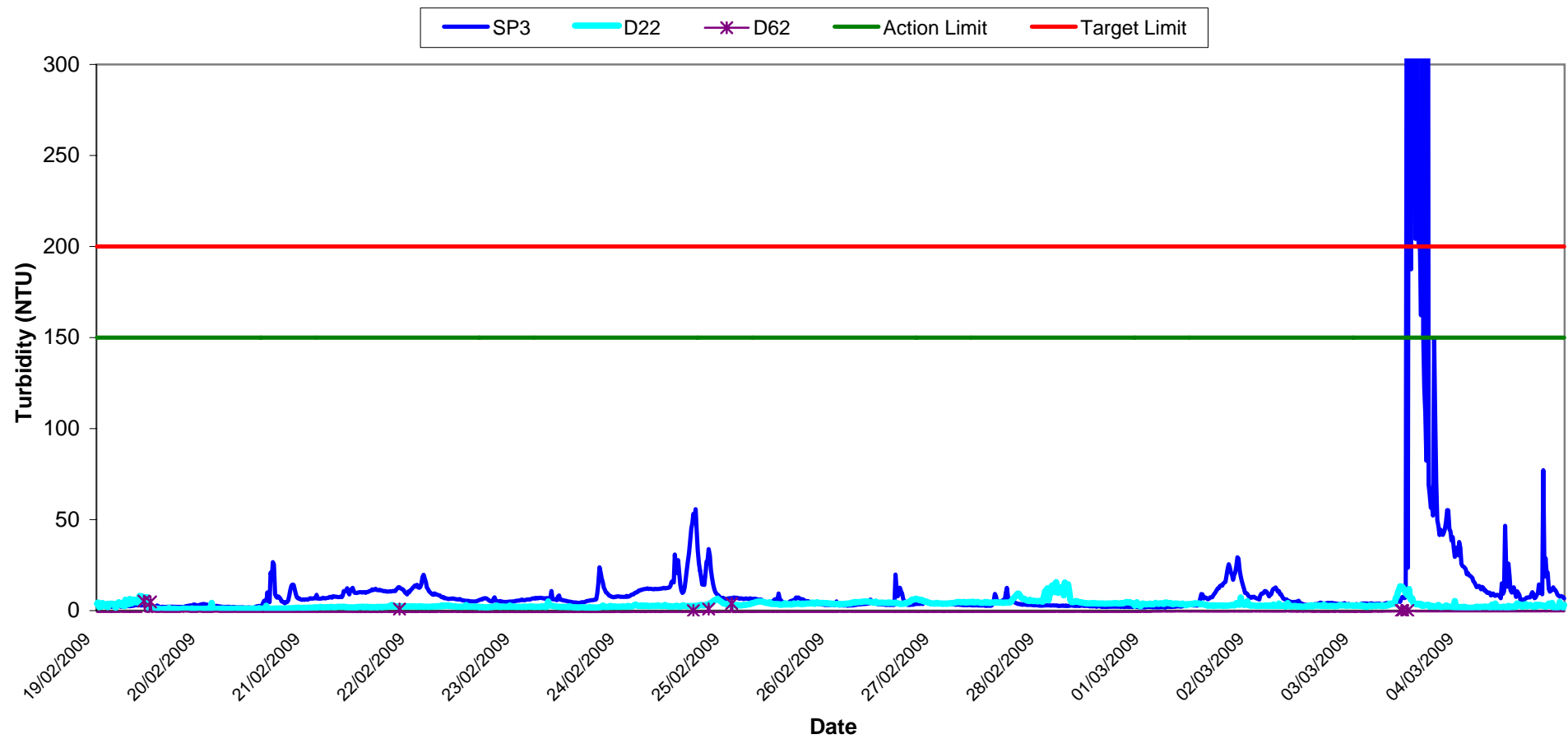
Temperature - Surface Waters
Wk 08-09



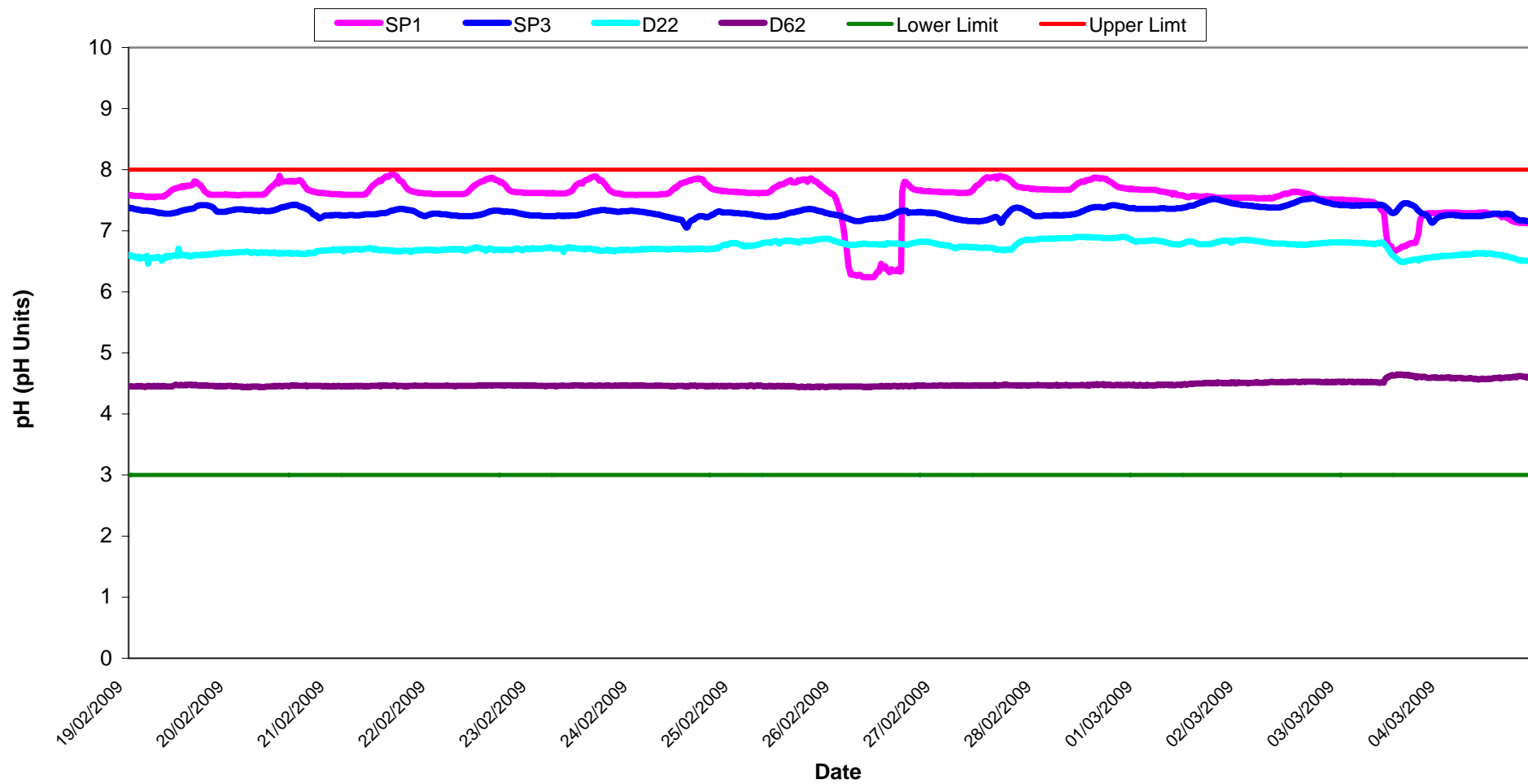
Conductivity - Surface Waters, Wk 08-09



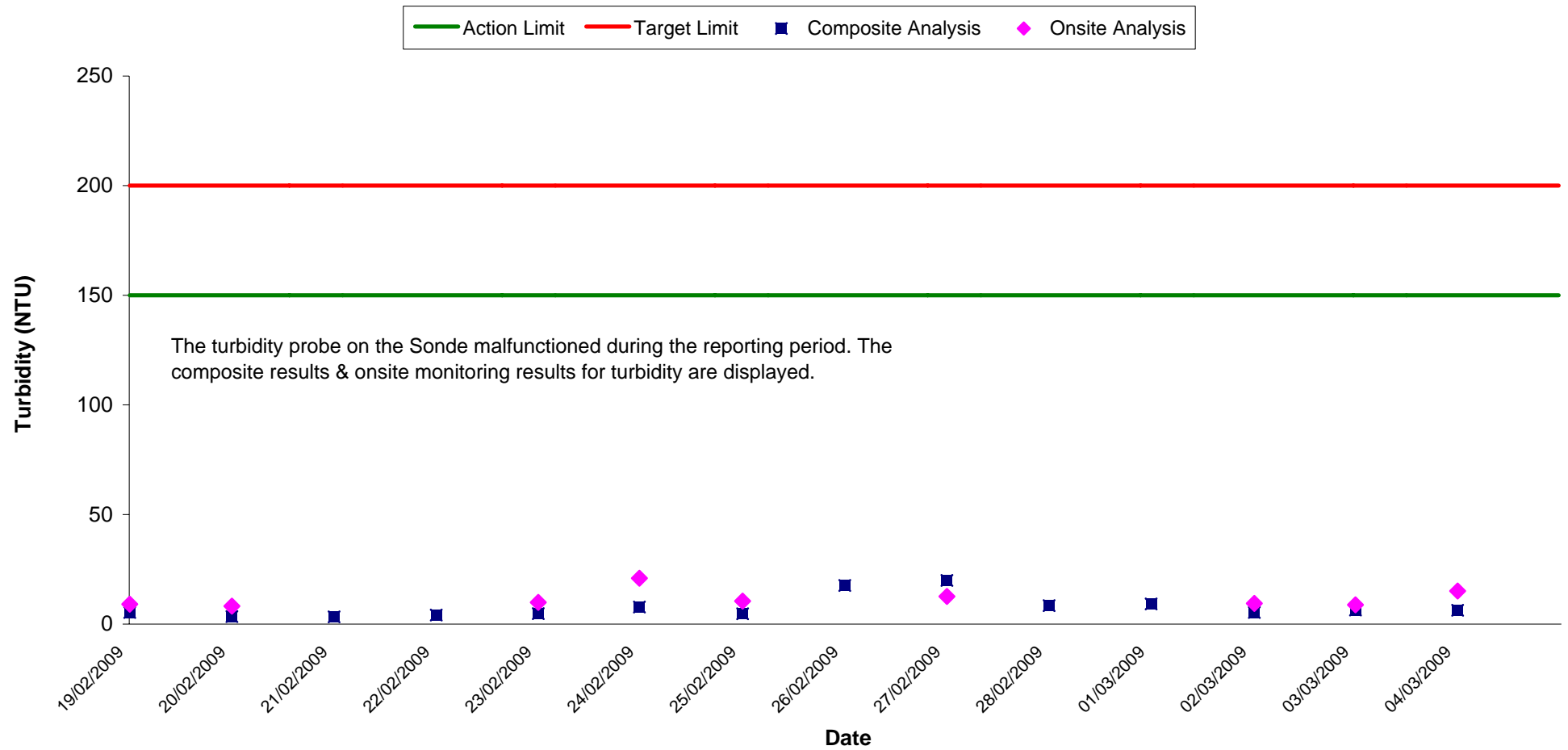
Turbidity - Surface Waters Wk 08-09



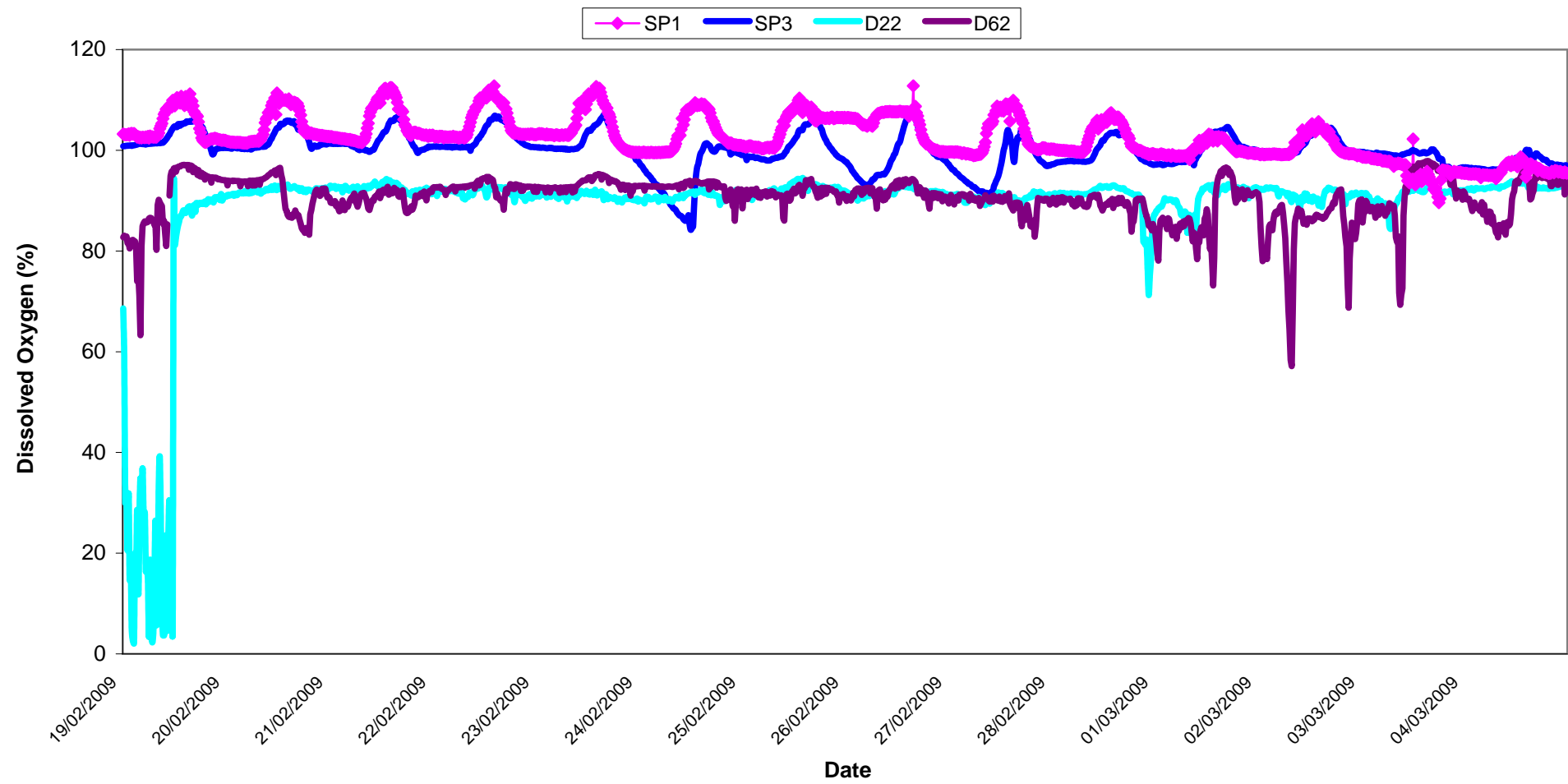
pH - Surface Waters
Wk 08-09



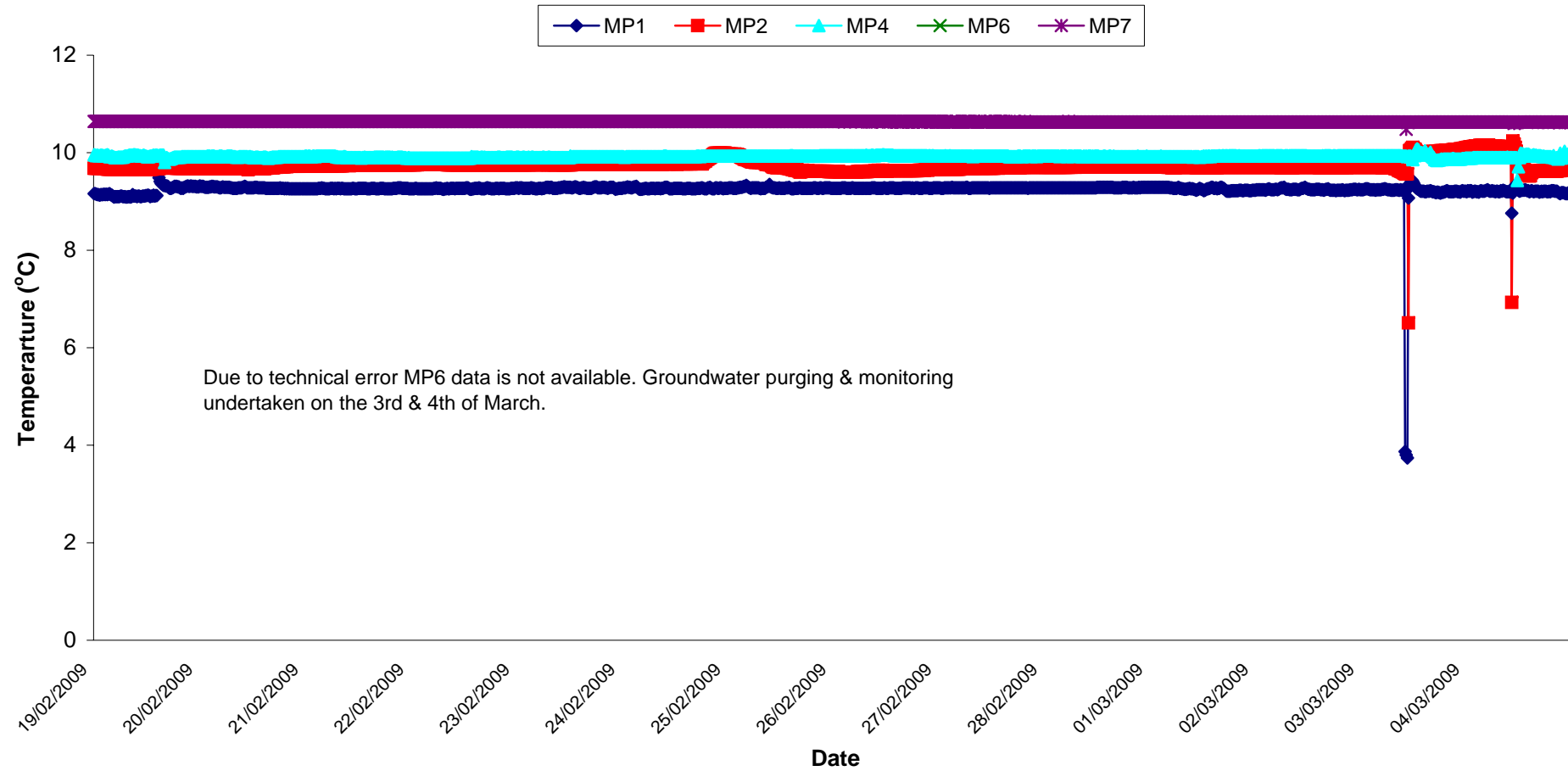
Turbidity - Surface Waters @ SP1, Wk 08-09



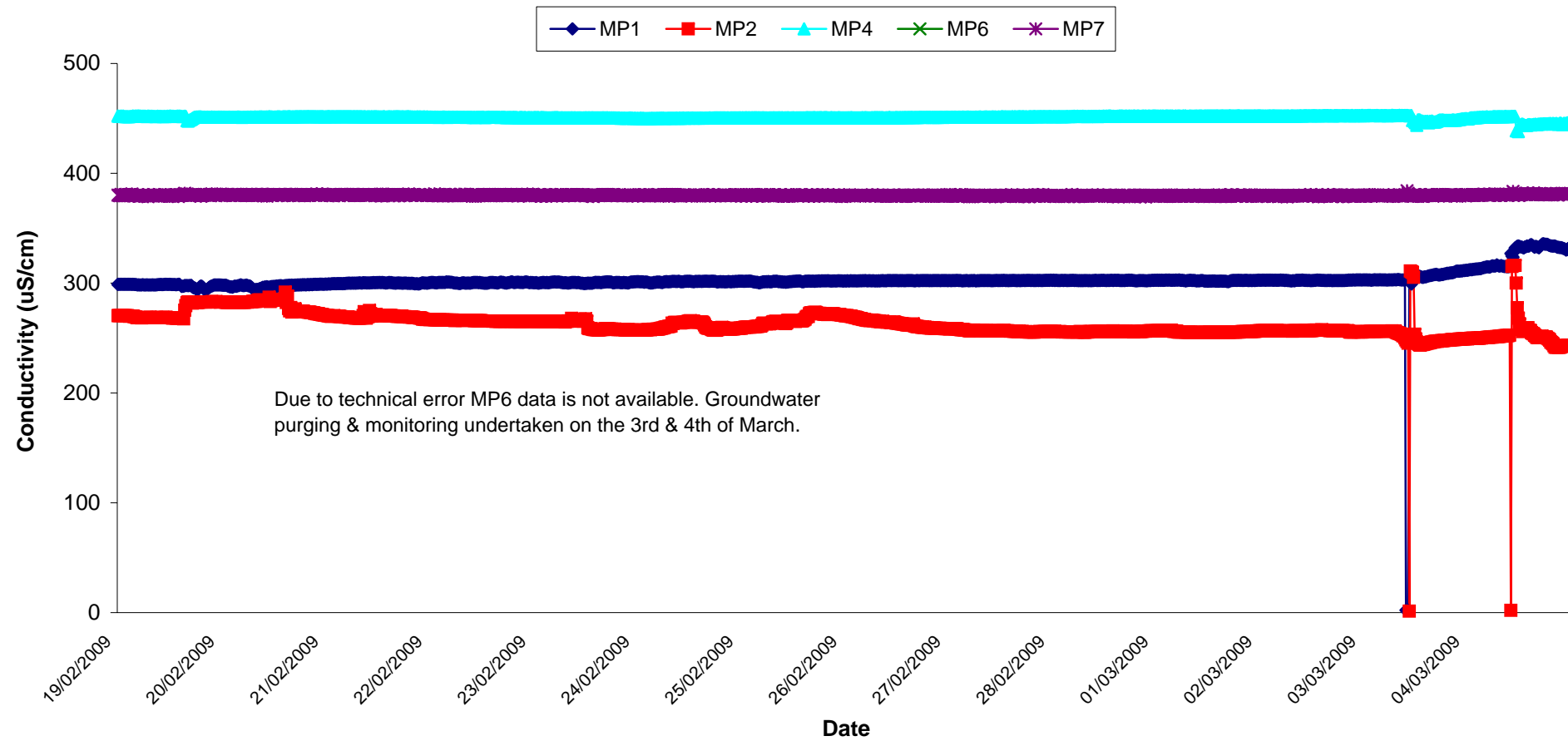
Dissolved Oxygen - Surface Waters,
Wk 08-09



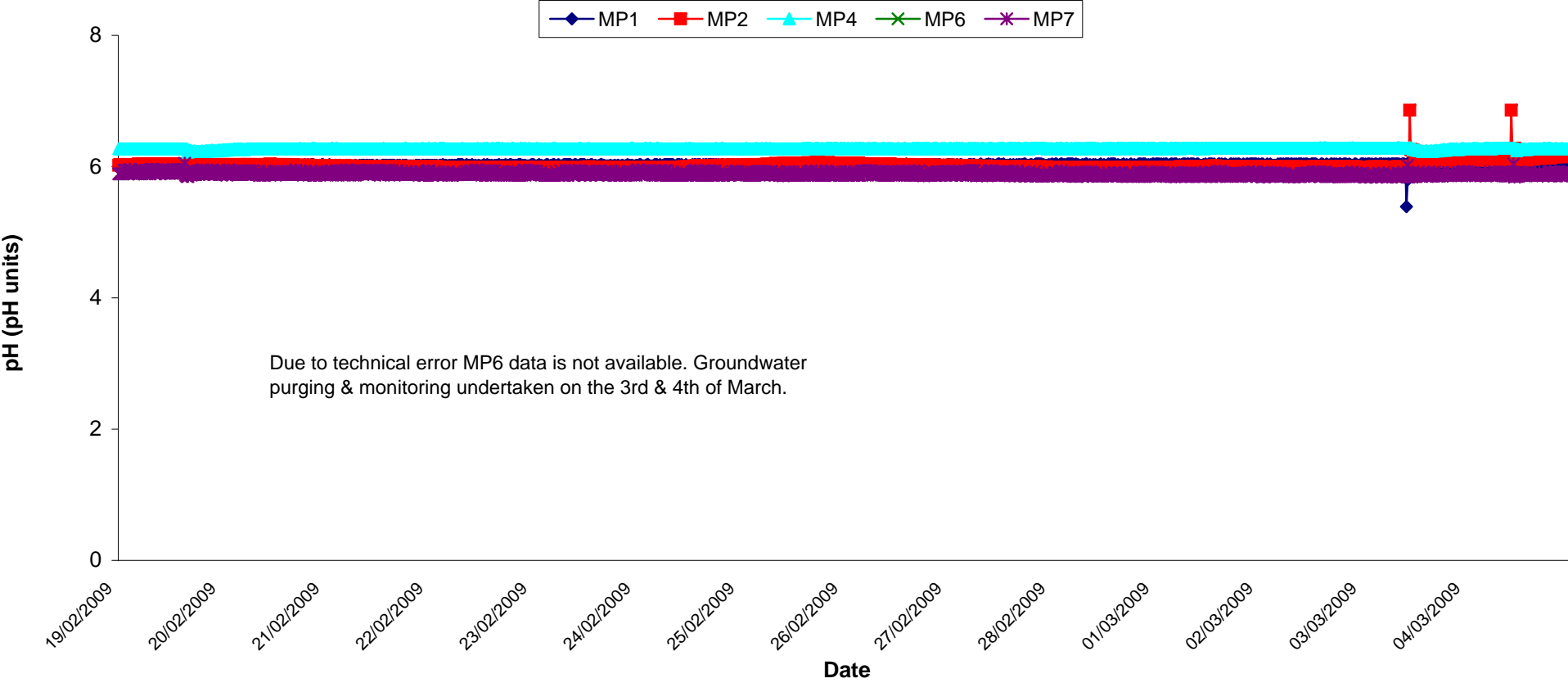
Temperature - Groundwaters Wk 08-09



Conductivity - Groundwaters Wk 08-09



pH - Groundwaters
Wk 08-09



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 ⁻¹	Ortho-phosphate as P µg l ⁻¹	Nitrate as N mg l ⁻¹	Nitrate as NO ₃ mg l ⁻¹	Total Phosphorus as P mg l ⁻¹	Ammonia as NH ₃ -N mg l ⁻¹	Nitrite as NO ₂ mg/l	Aluminium (dissolved) ug/l	Aluminium (total) ug/l	Phosphate as PO ₄ mg/l	Total dissolved solids mg/l
Settlement Pond Monitoring																	
SP1	19/02/2009	335	9.1	6.5	97.3	7.1			0.6			<LOD		57	204	0.06	237
SP1	20/02/2009	342	8.2	13.4	92.7	7.1			0.3			<LOD		55	185	0.05	230
SP1	23/02/2009	358	9.9	8.4	98.5	7.6			0.1			0.07		46	165	0.14	244
SP1	24/02/2009	352	8.6	20.9	90.3	6.5			<LOD			0.05		46	179	0.04	233
SP1	25/02/2009	363	8.8	10.5	91.5	7.5			0.3			0.03		38	116	0.05	237
SP1	26/02/2009			No Flow at SP1													
SP1	27/02/2009	351	9.3	12.6	96.3	7.0			0.4			0.01		<LOD	113	0.04	231
SP1	02/03/2009	331	9.3	9.4	96.9	7.4			0.3			<LOD		<LOD	102	0.04	224
SP1	03/03/2009	306	8.4	13.7	93.6	6.5			0.1			0.08		<LOD	84	0.03	197
SP1	04/03/2009	328	7.2	8.8	93.7	6.9			0.4			<LOD		25	417	0.02	251
SP3	19/02/2009	396	12.1	6.6	95.7	7.6			0.3			<LOD		24		0.08	273
SP3	20/02/2009	439	8.7	5.4	93.7	7.6			0.8			0.11		<LOD		0.05	290
SP3	23/02/2009	379	10.2	8.9	95.0	7.3			0.4			0.10		<LOD		0.05	260
SP3	24/02/2009	374	10.5	48.7	92.7	6.3			<LOD			0.14		22		0.03	245
SP3	25/02/2009	370	8.1	10.2	91.5	7.2			0.4			0.10		<LOD		0.05	243
SP3	26/02/2009			No Flow at SP1													
SP3	27/02/2009	416	9.1	7.4	92.1	7.5			0.2			<LOD		<LOD		0.07	275
SP3	02/03/2009	412	9.8	7.9	99.1	7.4			0.4			<LOD		<LOD		0.02	267
SP3	03/03/2009	369	8.7	11.0	96.0	6.8			0.2			<LOD		<LOD		0.01	257
SP3	04/03/2009	385	6.7	12.2	95.3	7.0			0.3			0.02		29		0.07	288
Additional Monitoring																	
D22	19/02/2009	245	7.6	8.4	82.7	6.5			<LOD			>LOD		30		0.09	170
D62	19/02/2009	208	7.2	0.6	85.8	5.5			0.3			<LOD		20		0.05	129
D22	25/02/2009	268	9.6	12.3	89.6	6.9			<LOD			0.12		35		0.07	182
D62	25/02/2009	209	8.6	2.6	85.0	5.4			0.4			0.10		<LOD		0.02	131
Axonics Monitoring																	
Pre	19/02/2009	409		>1000		6.8			<LOD			1.82		>LOD		0.31	280
Post	19/02/2009	418		5.6		6.7			0.2			0.25		<LOD	289	0.01	286
Pre	20/02/2009	400		122.0		7.0			<LOD			0.13		236		0.09	271
Post	20/02/2009	434		4.8		6.8			0.1			0.02		23	182	0.07	291
Pre	23/02/2009	404		291.0		7.1			<LOD			0.26		>LOD		0.04	275
Post	23/02/2009	430		2.9		7.0			0.5			0.16		61	267	0.01	290
Pre	24/02/2009	409		401.0		6.4			<LOD			0.64		477		0.02	267
Post	24/02/2009	425		3.7		6.5			0.4			0.23		<LOD	171	<LOD	271
Pre	25/02/2009	459		>LOD		7.1			<LOD			>LOD		>LOD		<LOD	301
Post	25/02/2009	453		21.7		6.8			0.2			0.07		26	512	0.02	301
Pre	26/02/2009	Axonics on Recycle															
Post	26/02/2009	Axonics on Recycle															
Pre	27/02/2009	475		>1000		7.1			<LOD			>LOD		>LOD		<LOD	310
Post	27/02/2009	480		6.3		6.9			0.4			<LOD		<LOD	380	0.07	314
Pre	02/03/2009	415		>1000		7.3			<LOD			0.72		>LOD		0.16	271
Post	02/03/2009	437		6.0		6.7			0.6			<LOD		<LOD	275	<LOD	286
Pre	03/03/2009	408		>1000		6.7			<LOD			1.90		>LOD		0.40	262
Post	03/03/2009	432		9.6		6.4			0.6			0.12		<LOD	390	0.04	282
Pre	04/03/2009	387		>1000		6.8			<LOD			1.53		1370		0.01	289
Post	04/03/2009	410		9.0		6.7			0.3			<LOD		21	254	0.01	304
Grey shaded areas denote parameters that cannot or were not analysed on-site.																	
= Indicative Only																	
= Below Limit of Detection																	
= Above Limit of Detection																	