

<b>Final Environmental Report</b>	Period Ending: 21 <sup>st</sup> January 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 <sub>4</sub>	– The PO <sub>4</sub> analyser was operational during 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. – 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. ○ Any unusual values are explained on the relevant graph.
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

08/01/2009	0.000	15/01/2009	2.730
09/01/2009	0.000	16/01/2009	14.625
10/01/2009	18.330	17/01/2009	15.600
11/01/2009	24.570	18/01/2009	8.580
12/01/2009	1.170	19/01/2009	8.190
13/01/2009	2.730	20/01/2009	10.335
14/01/2009	9.750	21/01/2009	18.330
Total Rainfall 134.94mm			

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### 1.3 Summary

Environment	Comments
Surface Water	There was 1 no. reportable exceedance during the reporting period.
Groundwater	The groundwater data (Sonde) is within anticipated ranges.
Dust	Dust monitoring in progress.
Weather	There was a total of 134.94mm of rainfall during the reporting period, with a temperature range of -1.7°C to 12.1°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

There was two reported exceedance during the reporting period.

<b>Date and Time</b>	22 <sup>nd</sup> January 2009
<b>Location</b>	SP1
<b>Nature of Incident</b>	During the night of the 22 <sup>nd</sup> of January the TSS exceeded the 35mg/L at SP1 for a brief period. This exceedance is attributed to heavy rainfall over the passed number of days (total rainfall level over the last 5 days was 76mm). The level of TSS in the water reduced to within the limit after a number of hours. The following additional mitigation measures are being implemented.
<b>Actions Taken</b>	<ul style="list-style-type: none"> <li>• On going surveillance and maintenance of site drainage outside the main footprint area.</li> <li>• Close monitoring of total suspended solids will be carried out at SP1.</li> <li>• Storage and pumping back to Axonic's of footprint waters.</li> <li>• Using the northern settlement pond for increasing the water attenuating capacity thus improving water quality.</li> </ul>
<b>Category</b>	Environmental Exceedance
<b>Status</b>	Closed

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<b>Date and Time</b>	13 <sup>th</sup> of January 2009
<b>Location</b>	SP1
<b>Nature of Incident</b>	A value of 261µg/l was recorded for total aluminium at SP1 on the 13 <sup>th</sup> of January 2009. This value is in exceedance of the site discharge limit for total aluminium of 200µg/l.
<b>Actions Taken</b>	<ul style="list-style-type: none"> <li>• On going surveillance and maintenance of site drainage outside the main footprint area.</li> <li>• Close monitoring of Total Aluminium will be carried out at SP1.</li> <li>• Storage and pumping back to Axonic's of footprint waters.</li> <li>• Continued implementation of agreed surface water actions.</li> </ul>
<b>Category</b>	Environmental Exceedance
<b>Status</b>	Open

### 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 <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																									
MP 2																									
MP 3																									
MP 4																									
MP 5																									
MP 6																									
MP 7																									
MP 8																									
MP 10a																									
MP 11																									

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

No Groundwater Monitoring during the reporting period.

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	25/07/2008	25/08/2008	182830	29/08/2008	04/09/2008	86	
D2	25/07/2008	25/08/2008	182831	29/08/2008	04/09/2008	166	
D3	25/07/2008	25/08/2008	182833	29/08/2008	04/09/2008	41	
D4	25/07/2008	25/08/2008	182834	29/08/2008	04/09/2008	76	
D1	25/08/2008	25/09/2008	185830	26/09/2008	30/09/2008	135	
D2	25/08/2008	25/09/2008	185831	26/09/2008	30/09/2008	92	
D3	25/08/2008	25/09/2008	185832	26/09/2008	30/09/2008	102	
D4	25/08/2008	25/09/2008	185833	26/09/2008	30/09/2008	83	
D1	25/09/2008	24/10/2008	188708	24/10/2008	28/10/2008	233	
D2	25/09/2008	24/10/2008	188709	24/10/2008	28/10/2008	186	
D3	25/09/2008	24/10/2008	188710	24/10/2008	28/10/2008	155	
D4	25/09/2008	24/10/2008	188711	24/10/2008	28/10/2008	208	
D1	24/10/2008	21/11/2008	191474	21/11/2008	27/11/2008	174	
D2	24/10/2008	21/11/2008	191475	21/11/2008	27/11/2008	167	
D3	24/10/2008	21/11/2008	191476	21/11/2008	27/11/2008	171	
D4	24/10/2008	21/11/2008	191477	21/11/2008	27/11/2008	180	
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	22/12/2008	28/01/2009	295	
D2	22/12/2009	22/01/2009	197096	22/12/2008	28/01/2009	324	
D3	22/12/2009	22/01/2009	197097	22/12/2008	28/01/2009	261	
D4	22/12/2009	22/01/2009	197098	22/12/2008	28/01/2009	324	
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. (Max)	Air Temp. (Min)	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									60			
Target Limit									65			
N1	7.7	4.1	08/01/2009	08:00:00	14:00:00	2539533	4.1	43.8	49.7	73.2	30.0	
N1	8.4	4.7	09/01/2009	08:00:00	14:00:00	2539533	4.5	176.7	51.5	85.9	31.2	
N1	9.9	5.9	10/01/2009	08:00:00	14:00:00	2539533	9.8	28.5	59.9	83.6	46.4	Values impacted by high wind speeds
N1	12.1	9.6	11/01/2009	08:00:00	14:00:00	2539533	9.7	19.3	59.7	82.4	47.1	Values impacted by high wind speeds
N1	9.4	4.4	12/01/2009	08:00:00	14:00:00	2539533	2.6	53.7	48.4	78.3	36.5	
N1	7.5	-1.7	13/01/2009	08:00:00	14:00:00	2539533	1.1	113.6	49.3	71.2	34.6	
N1	11.4	-0.8	14/01/2009	08:00:00	14:00:00	2539533	6.4	289.2	37.8	82.1	42.0	Values investigated no significant noise source
N1	10.6	5.2	15/01/2009	08:00:00	14:00:00	2539533	6.6	94.0	56.6	81.6	35.4	Values investigated no significant noise source
N1	9.3	5.1	16/01/2009	08:00:00	14:00:00	2539533	5.2	86.1	52.8	75.0	39.7	Values investigated no significant noise source
N1	7.8	2.3	17/01/2009	08:00:00	14:00:00	2539533	7.8	139.4	61.8	87.3	43.1	Values investigated no significant noise source
N1	6.5	2.0	18/01/2009	08:00:00	14:00:00	2539533	5.4	102.7	44.6	59.0	41.7	Values investigated no significant noise source
N1	5.8	0.9	19/01/2009	08:00:00	14:00:00	2539533	4.7	85.6	52.6	91.2	38.2	Values investigated no significant noise source
N1	6.4	2.1	20/01/2009	08:00:00	14:00:00	2539533	5.1	89.7	50.9	73.8	41.9	Values investigated no significant noise source
N1	10.3	1.7	21/01/2009	08:00:00	14:00:00	2539533	4.6	175.2	52.8	78.4	38.2	
* 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 <sub>Aeq</sub>	L <sub>Amax</sub>	L <sub>Amin</sub>	
Action Limit									50			
Target Limit									55			
N1	4.1	7.7	08/01/2009	22:00:00	10:00:00	2539533	4.1	43.8	44.9	67.2	30.0	
N1	4.7	8.4	09/01/2009	22:00:00	10:00:00	2539533	4.5	176.7	59.0	84.3	42.8	Values impacted by high wind speeds
N1	5.9	9.9	10/01/2009	22:00:00	10:00:00	2539533	9.8	28.5	58.8	83.3	46.6	Values impacted by high wind speeds
N1	9.6	12.1	11/01/2009	22:00:00	10:00:00	2539533	9.7	19.3	51.6	75.9	38.8	Values impacted by high wind speeds
N1	4.4	9.4	12/01/2009	22:00:00	10:00:00	2539533	2.6	53.7	44.4	70.9	36.0	
N1	-1.7	7.5	13/01/2009	22:00:00	10:00:00	2539533	1.1	113.6	60.7	79.0	53.9	
N1	-0.8	11.4	14/01/2009	22:00:00	10:00:00	2539533	6.4	289.2	55.0	80.4	40.2	
N1	5.2	10.6	15/01/2009	22:00:00	10:00:00	2539533	6.6	94.0	51.1	75.7	34.6	Values impacted by high wind speeds
N1	5.1	9.3	16/01/2009	22:00:00	10:00:00	2539533	5.2	86.1	49.7	73.8	42.9	Values impacted by high wind speeds
N1	2.3	7.8	17/01/2009	22:00:00	10:00:00	2539533	7.8	139.4	52.5	82.1	42.7	Values impacted by high wind speeds
N1	2.0	6.5	18/01/2009	22:00:00	10:00:00	2539533	5.4	102.7	47.7	68.8	41.5	Values impacted by high wind speeds
N1	0.9	5.8	19/01/2009	22:00:00	10:00:00	2539533	4.7	85.6	49.5	78.3	41.8	Values impacted by high wind speeds
N1	2.1	6.4	20/01/2009	22:00:00	10:00:00	2539533	5.1	89.7	45.0	65.2	39.2	Values impacted by high wind speeds
N1	1.7	10.3	21/01/2009	22:00:00	10:00:00	2539533	4.6	175.2	53.9	75.6	47.4	

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



## Determinant Results

Date	SP1			SP3		
	Max (l/s)	Min (l/s)	Avg (l/s)	Max (l/s)	Min (l/s)	Avg (l/s)
08/01/2009	1.77	0.49	1.08	1.77	2.55	1.08
09/01/2009	2.55	0.44	1.04	2.55	0.44	1.04
10/01/2009	71.28	1.65	22.69	71.28	1.65	22.69
11/01/2009	238.89	32.06	83.19	238.89	32.06	83.19
12/01/2009	38.52	18.76	25.20	38.52	18.76	25.20
13/01/2009	23.22	8.81	16.60	23.22	8.81	16.60
14/01/2009	43.08	6.95	19.74	43.08	6.95	19.74
15/01/2009	26.29	14.42	18.30	26.29	14.42	18.30
16/01/2009	86.04	12.70	28.64	86.04	12.70	28.64
17/01/2009	157.91	34.63	67.51	157.91	34.63	67.51
18/01/2009	54.13	29.94	44.46	54.13	29.94	44.46
19/01/2009	42.23	20.64	33.85	42.23	20.64	33.85
20/01/2009	84.10	35.01	50.15	84.10	35.01	50.15
21/01/2009	208.92	18.76	47.52	208.92	18.76	47.52

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

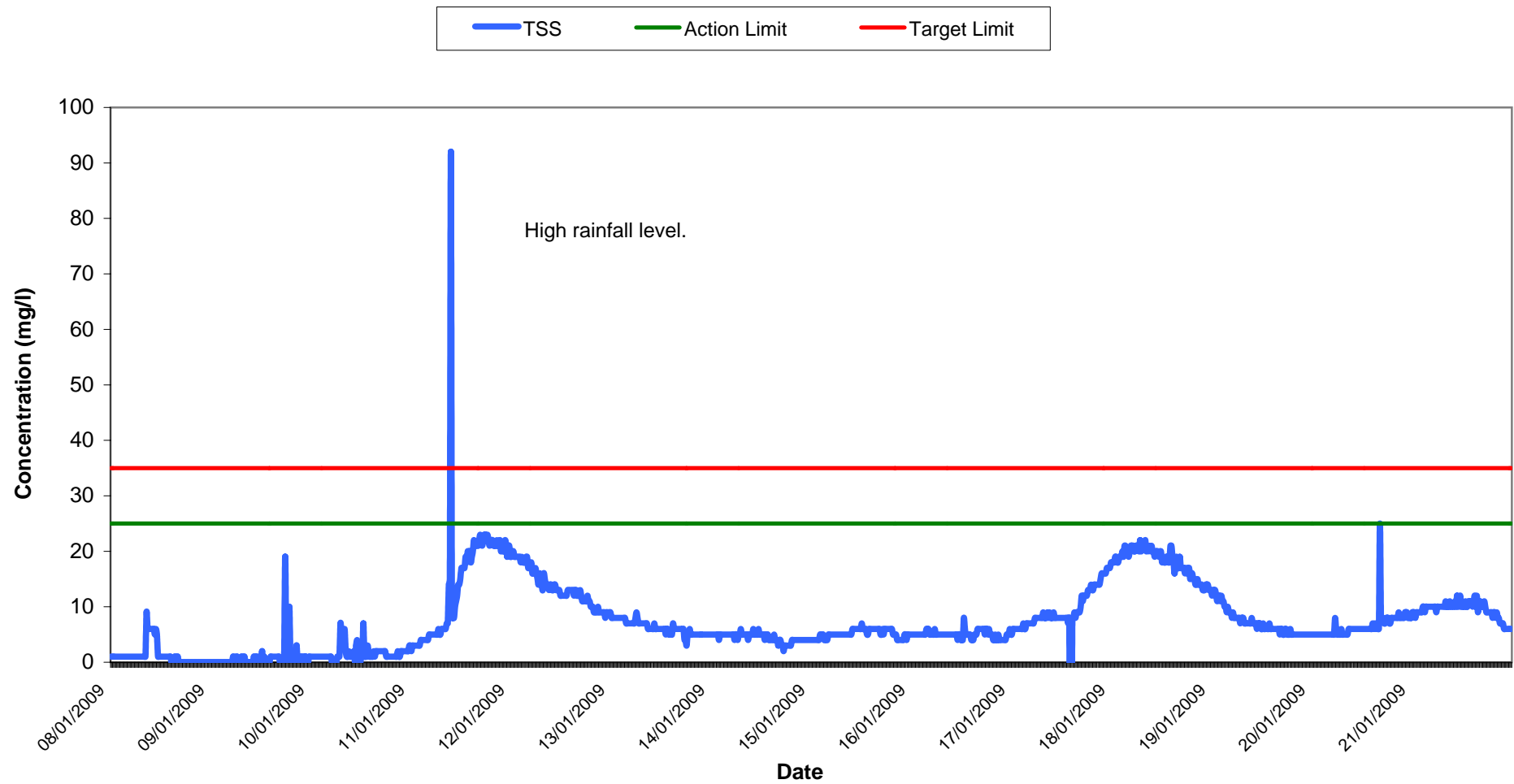
## Vibration Monitoring Record Sheet

Determinant Results	
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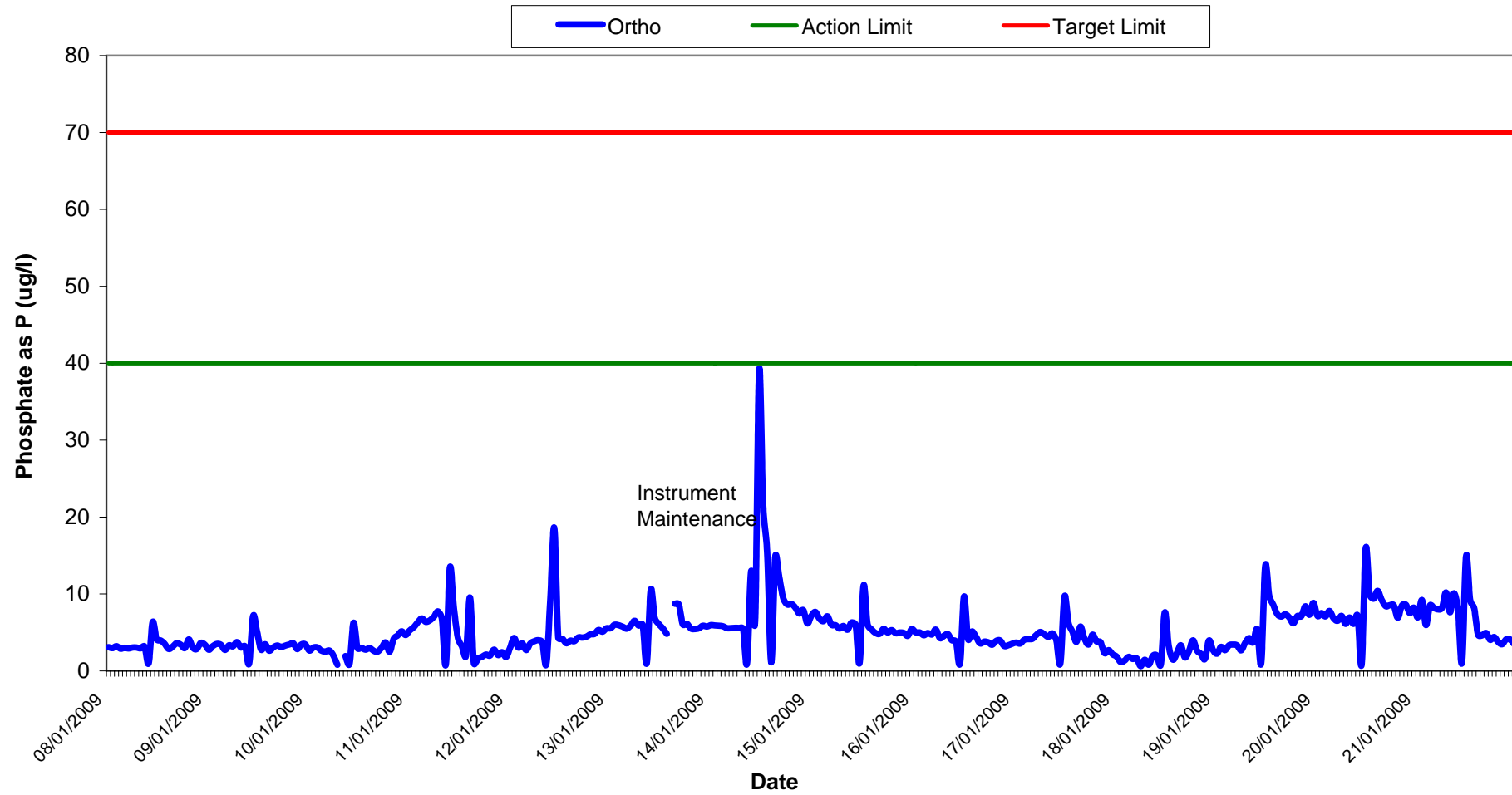
[illegible]

Vibration meter was located at V1 only.

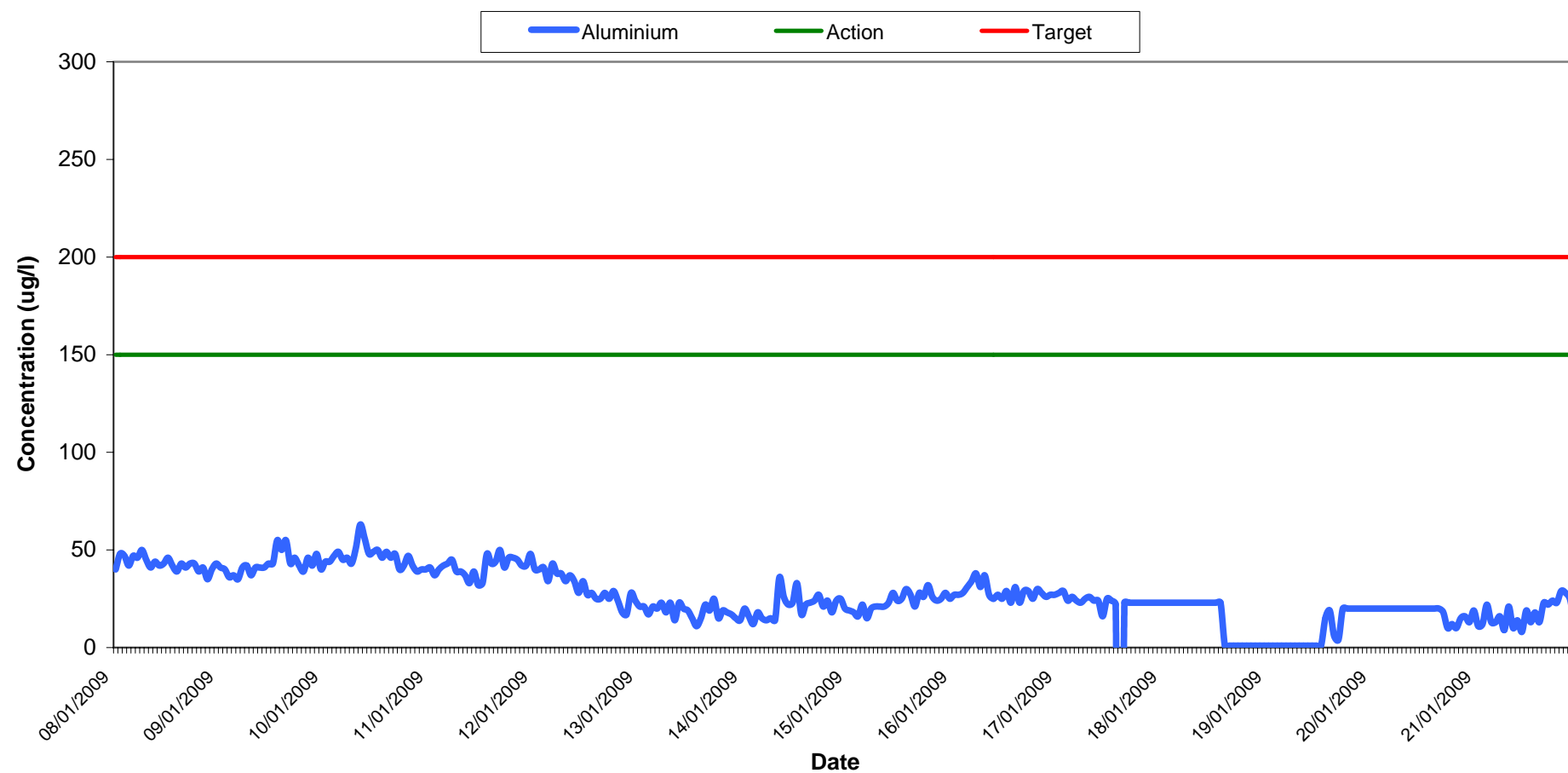
# Total Suspended Solids Results at SP1 Wk 02-03



Orthophosphate Results at SP1  
Wk 02-03

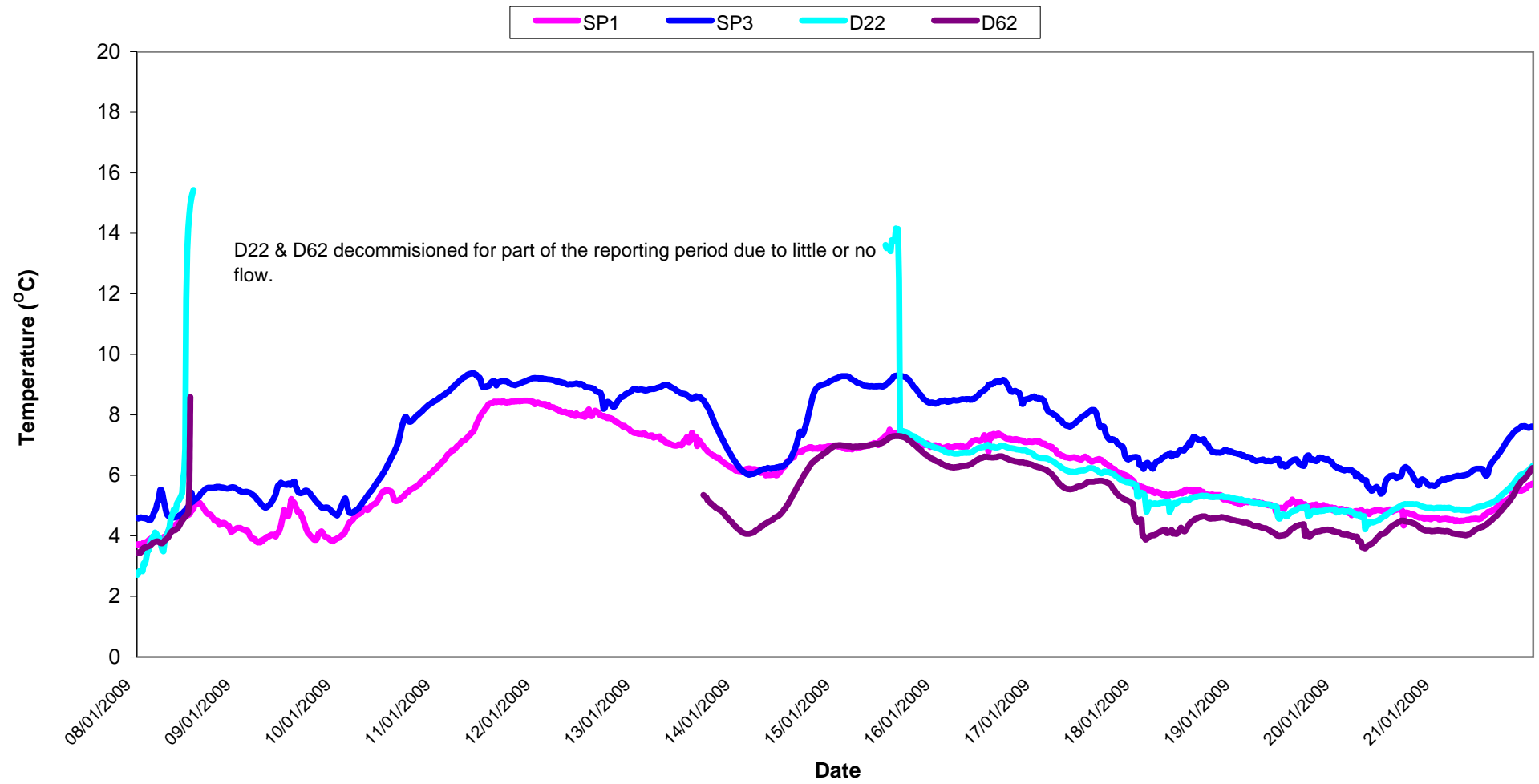


# Aluminium Concentration at SP1 Wk 02-03

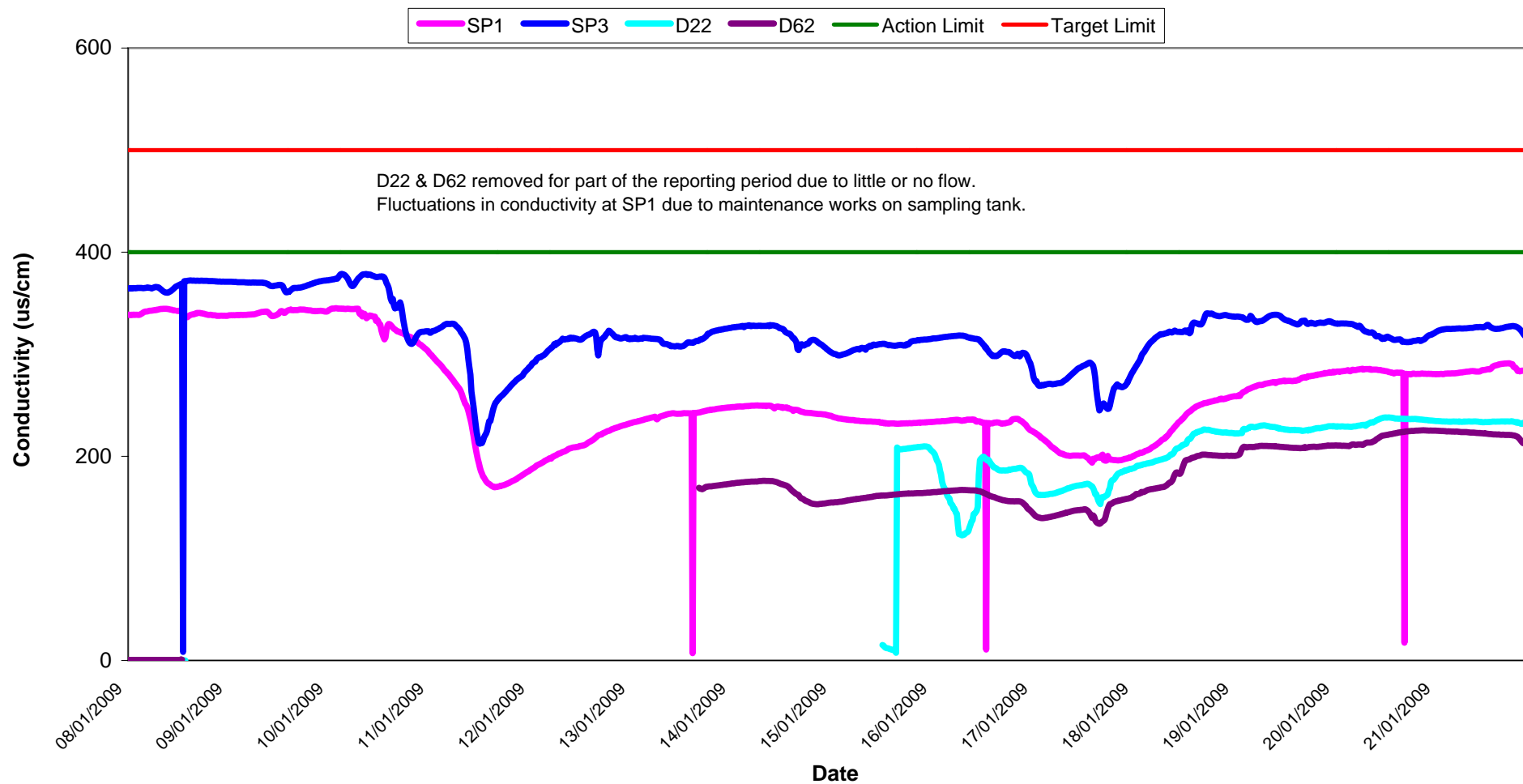


# Temperature - Surface Waters

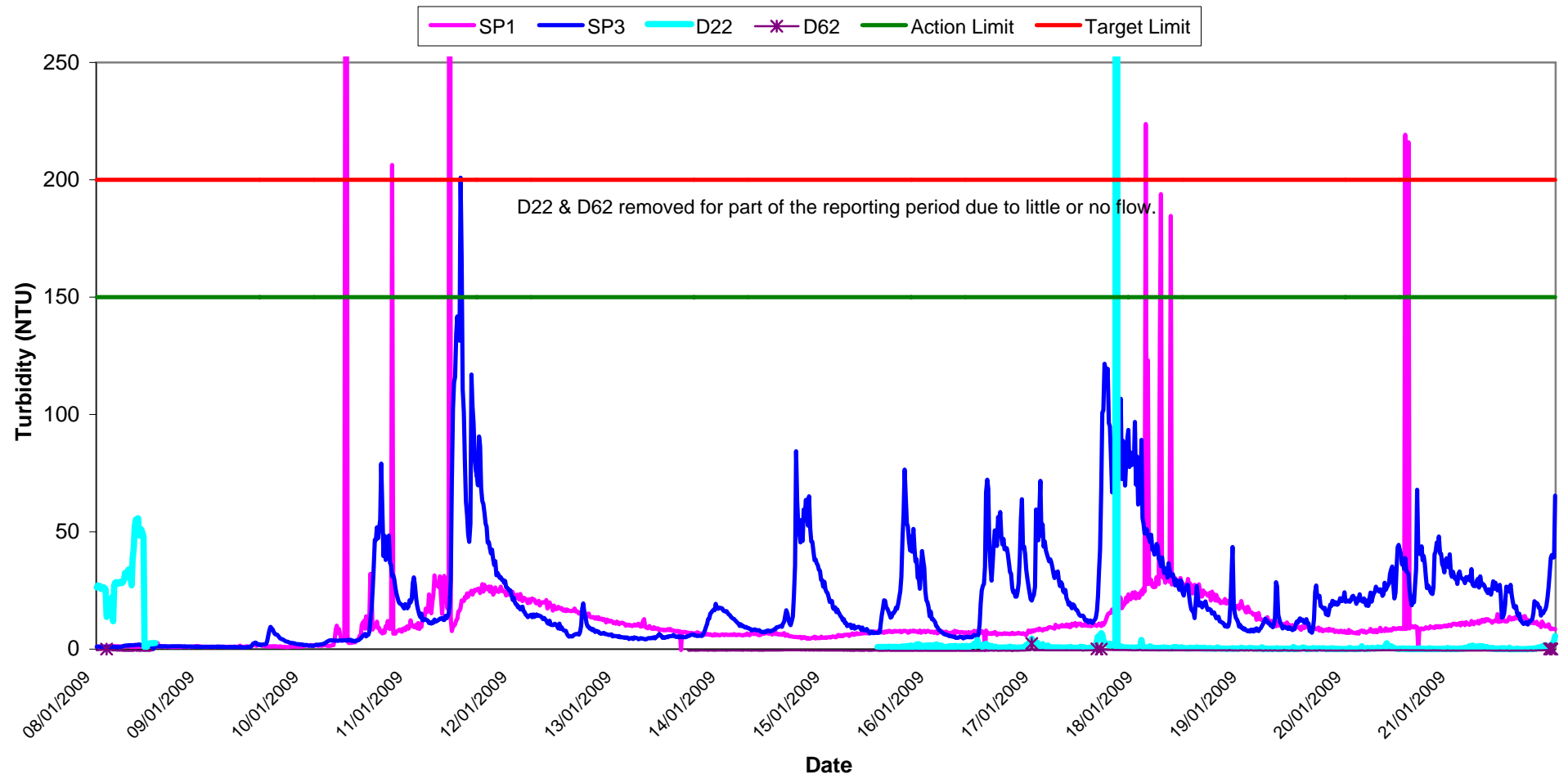
## Wk 02-03



# Conductivity - Surface Waters, Wk 02-03

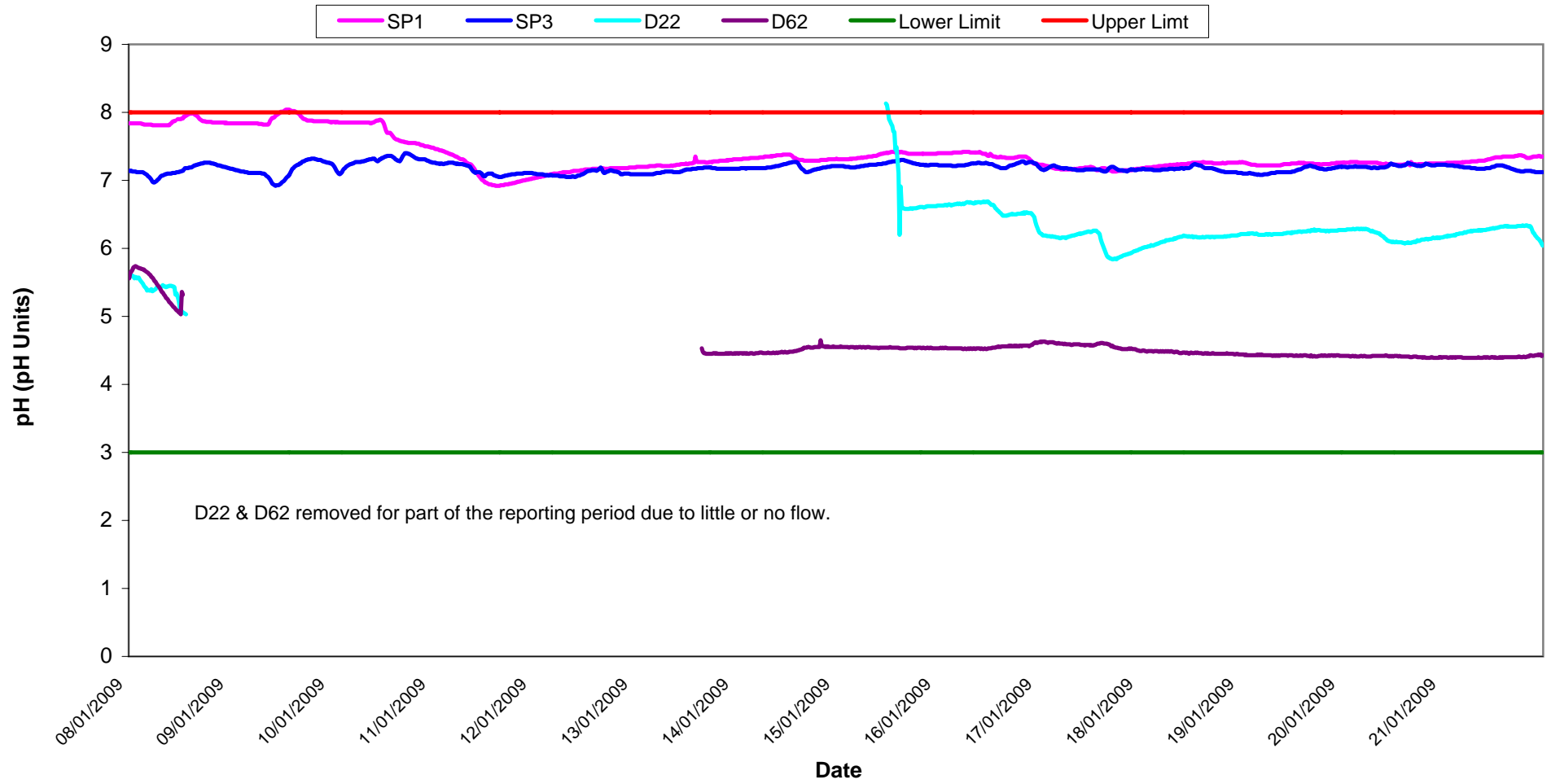


# Turbidity - Surface Waters Wk 02-03



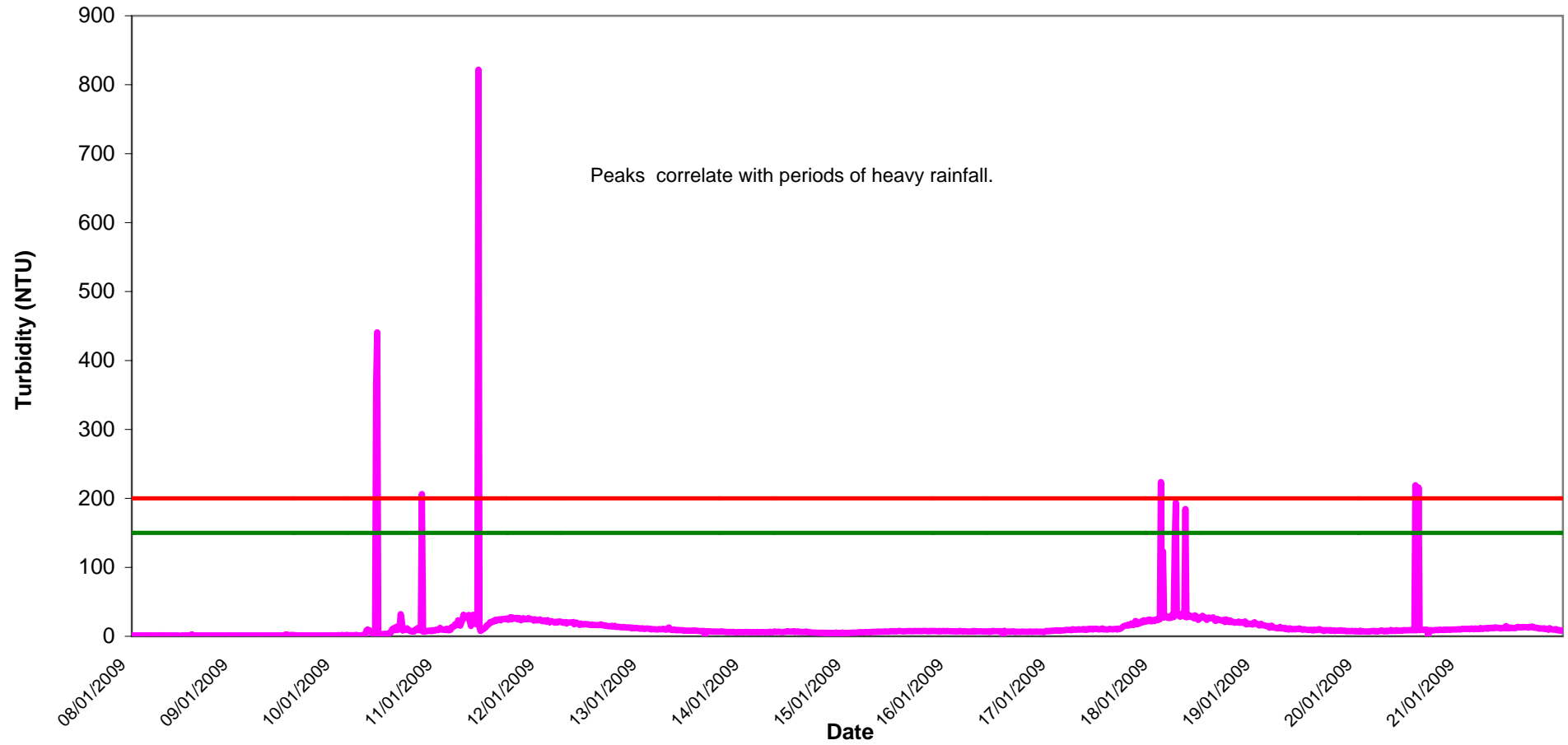


# pH - Surface Waters Wk 02-03

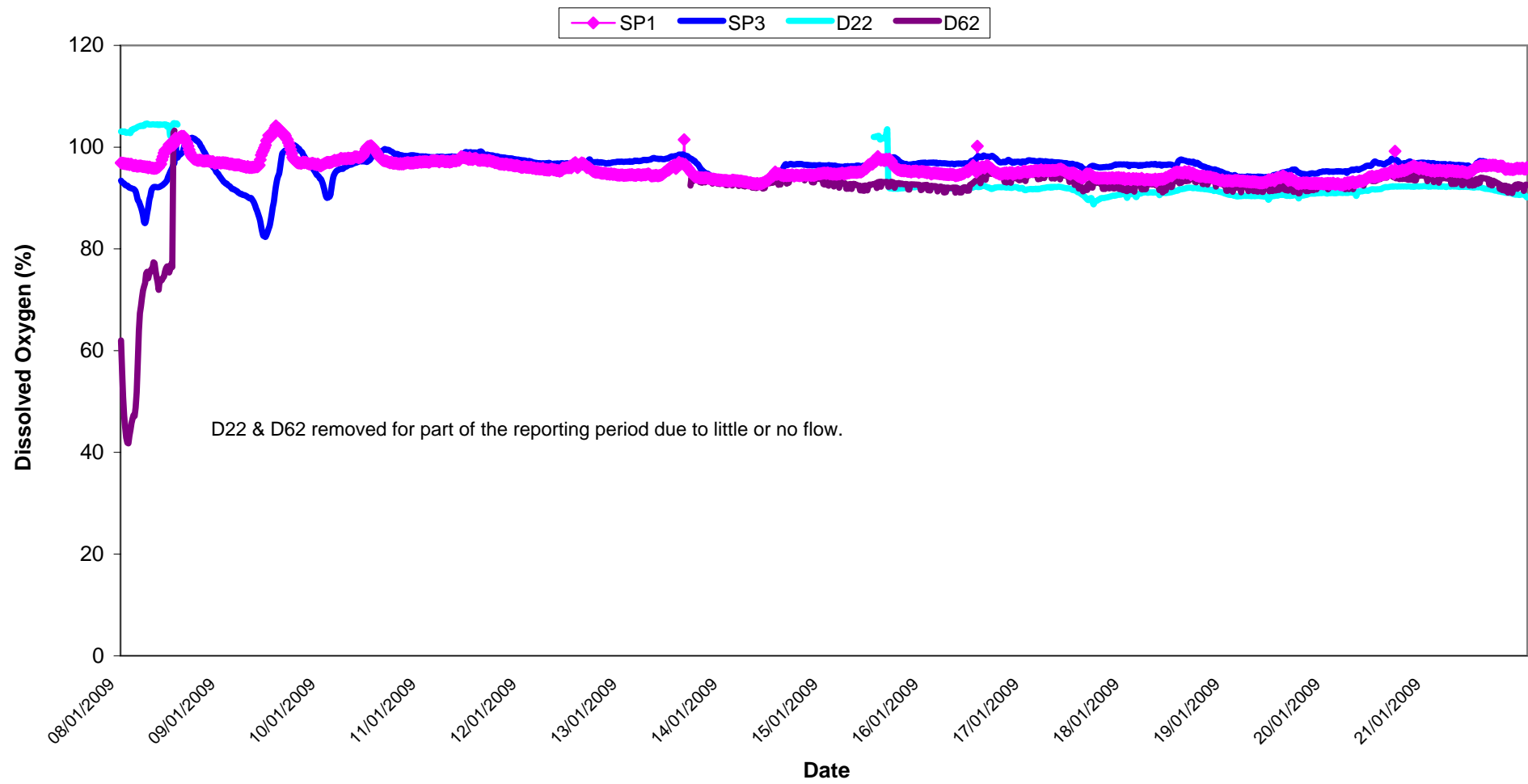


# Turbidity - Surface Waters @ SP1, Wk 02-03

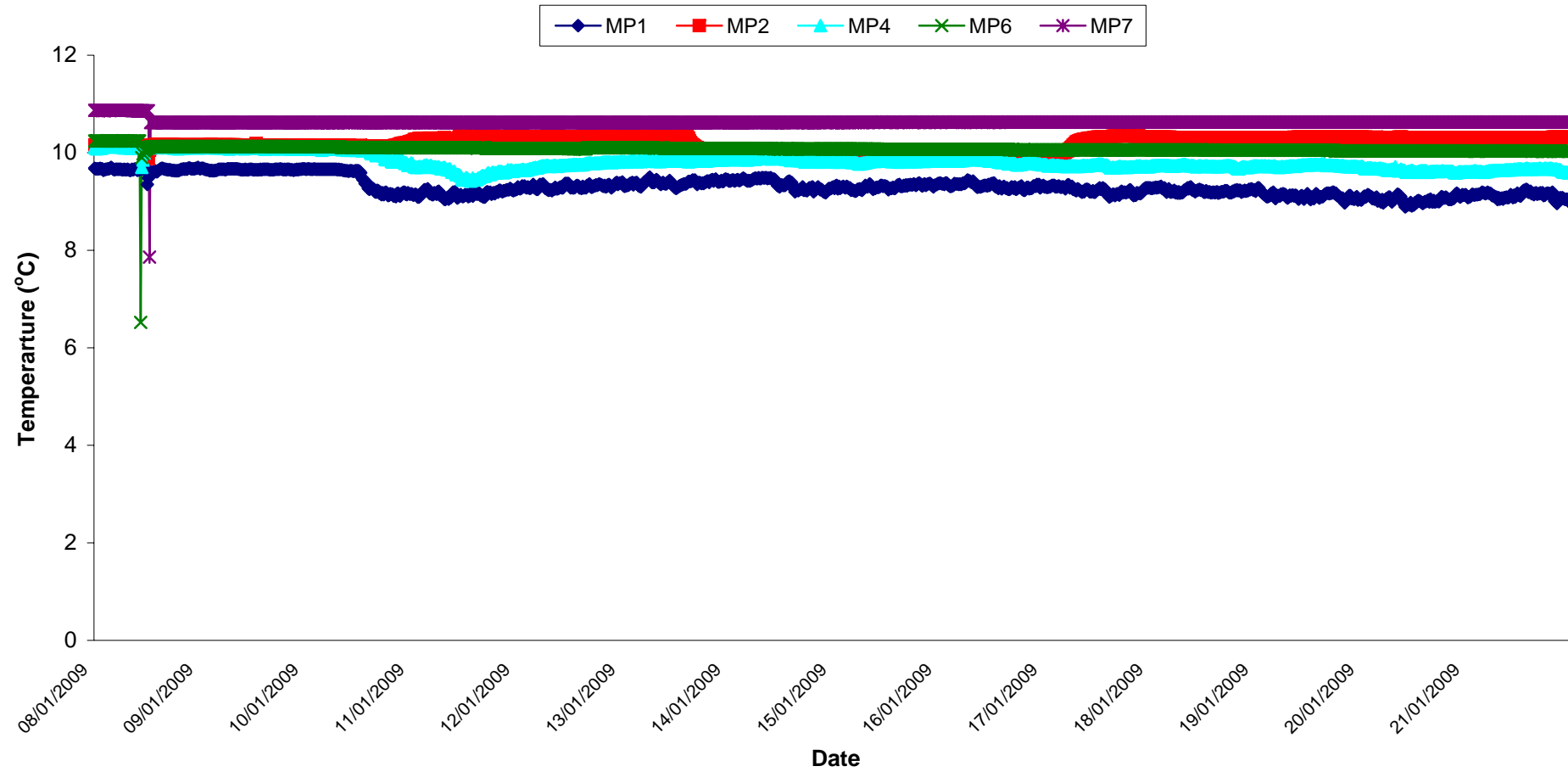
SP1    Action Limit    Target Limit



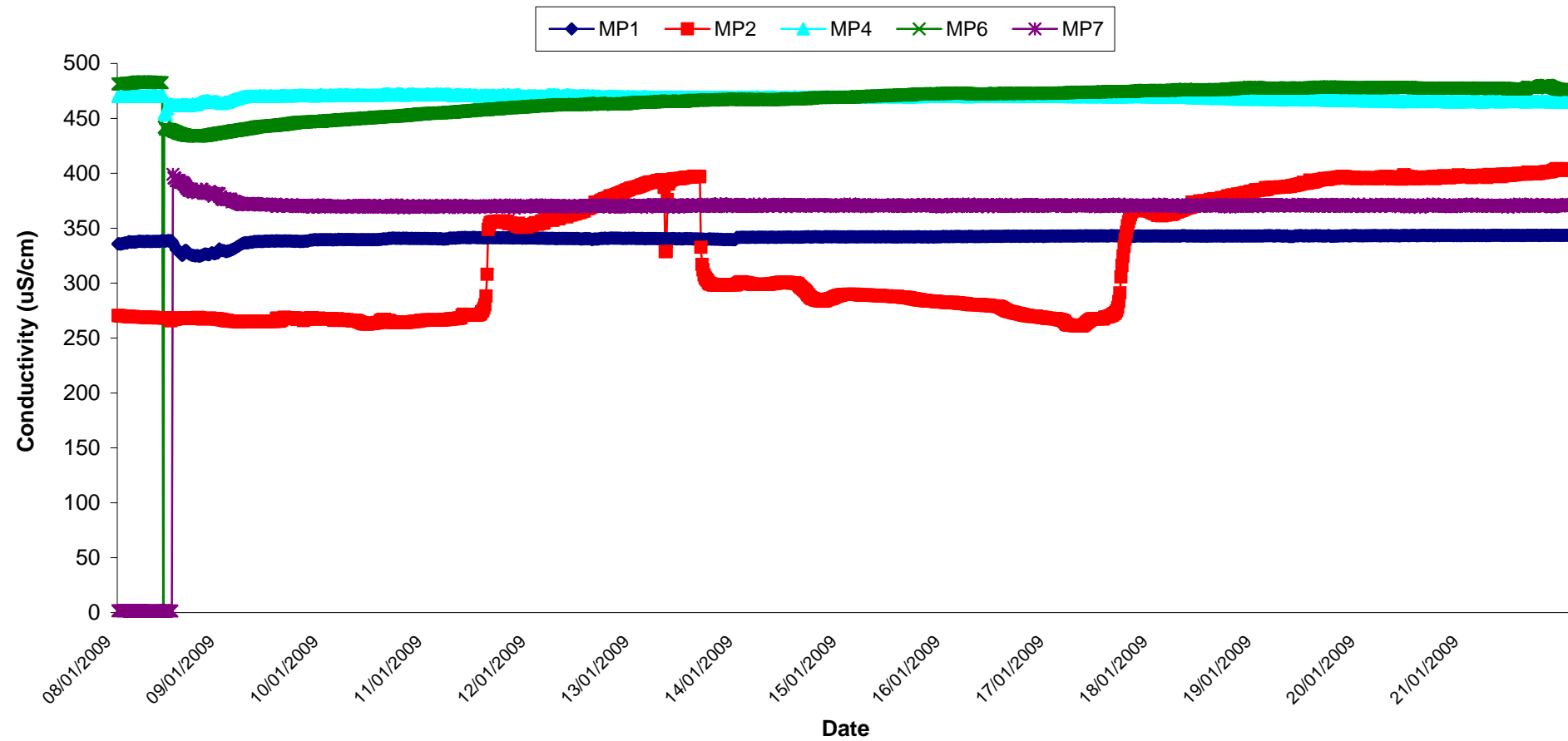
# Dissolved Oxygen - Surface Waters, Wk 02-03



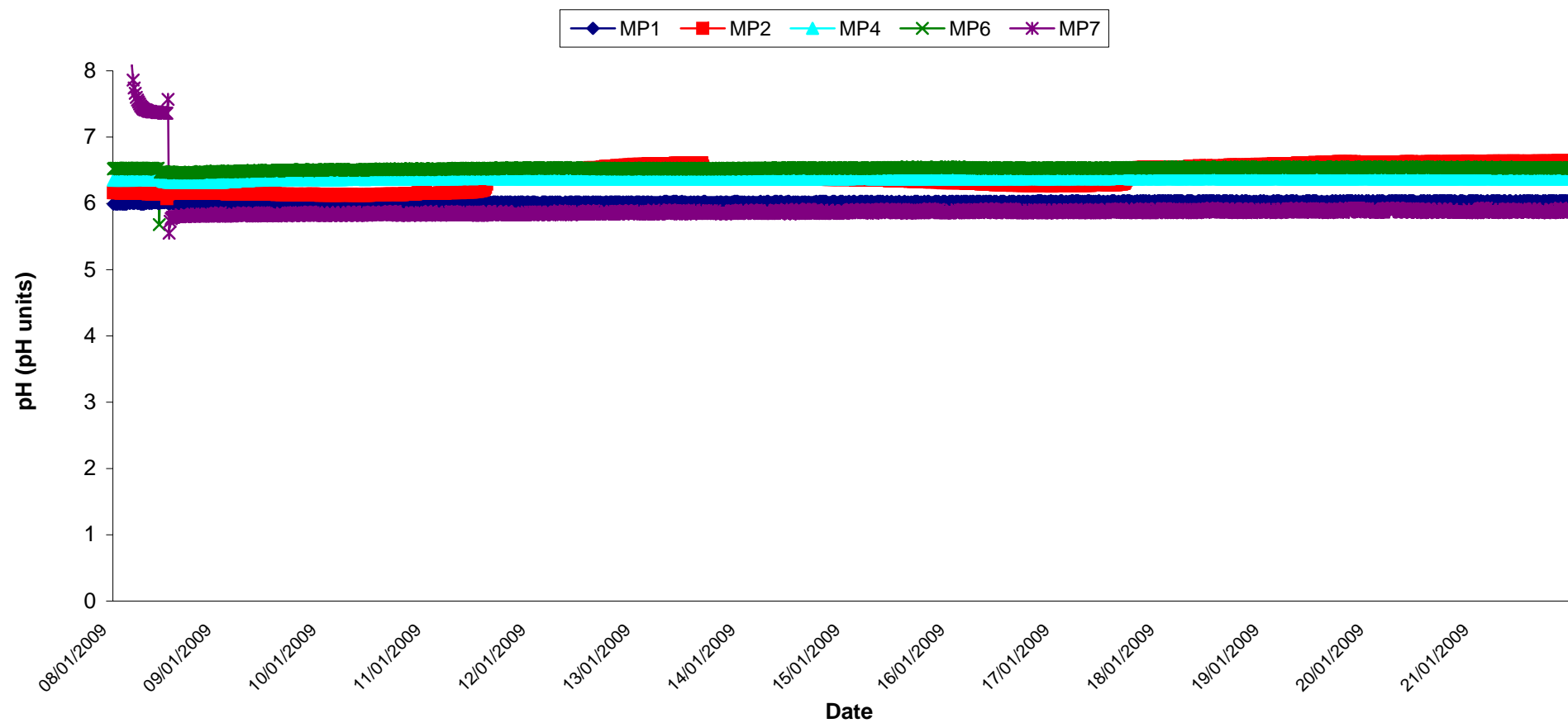
Temperature - Groundwaters  
Wk 02-03



# Conductivity - Groundwaters Wk 02-03



# pH - Groundwaters Wk 02-03



# **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	08/01/2009	377	5.6	13.4	92.8	6.9			0.4			<0.005		30	>LOD	<LOD	228
SP1	09/01/2009	373	5.0	6.3	91.8	7.3			0.3			<0.005		<LOD	158	0.07	239
SP1	12/01/2009	220	9.3	29.7	94.3	6.7			0.5			<0.005		21	232	0.69	152
SP1	13/01/2009	251	8.4	16.9	91.9	7.0			0.4			<0.005		24	118	0.07	169
SP1	14/01/2009	249	6.9	12.7	91.1	7.2			<LOD			<0.005		<LOD	138	0.04	164
SP1	15/01/2009	244	7.6	16.3	95.8	7.3			<LOD			<0.005		22	139	0.06	158
SP1	16/01/2009	240	8.7	19.6	91.9	7.3			<LOD			<0.005		22	109	0.12	157
SP1	19/01/2009	283	5.4	14.9	94.7	7.2			0.1			0.010		22	138	<LOD	192
SP1	20/01/2009	297	5.7	18.2	95.5	7.0			0.1			<LOD		<LOD	116	0.01	202
SP1	21/01/2009	292	6.0	20.5	94.2	6.8			0.4			0.200		<LOD	113	<LOD	196
SP3	08/01/2009	400	6.5	5.2	92.8	6.8			0.1			<0.005		<LOD		0.02	251
SP3	09/01/2009	397	5.8	5.5	82.3	6.8			0.2			<0.005		<LOD		0.01	249
SP3	12/01/2009	328	9.0	14.5	92.9	6.4			0.3			<0.005		24		0.04	212
SP3	13/01/2009	318	9.3	9.5	93.8	7.1			0.4			<0.005		<LOD		<LOD	207
SP3	14/01/2009	339	6.5	14.3	92.2	6.8			0.3			0.012		<LOD		0.05	216
SP3	15/01/2009	322	9.2	22.9	96.9	7.2			0.4			<0.005		<LOD		0.04	209
SP3	16/01/2009	325	9.1	10.4	95.0	7.1			0.3			<0.005		31		0.03	207
SP3	19/01/2009	348	6.4	17.4	95.6	7.0			0.2			0.010		45		0.03	234
SP3	20/01/2009	327	6.2	60.9	99.1	7.2			<LOD			0.010		27		0.01	221
SP3	21/01/2009	339	6.5	27.9	97.1	6.9			0.4			0.180		24		0.06	224
Additional Monitoring																	
D22	08/01/2009	284	6.2	11.9	85.2	6.8			0.1			<0.005		45		0.09	178
D62	08/01/2009	217	4.9	5.9	80.2	5.4			0.3			<0.005		<LOD		0.06	130
D22	15/01/2009	215	8.3	5.4	89.6	6.8			0.6			<0.005		30		0.06	135
D62	15/01/2009	184	7.5	11.1	90.5	5.3			0.6			<0.005		<LOD		0.04	107
Axonics Monitoring																	
Pre	08/01/2009	411		>LOD		6.8			2.4			<0.005		>LOD		0.77	248
Post	08/01/2009	445		8.1		6.8			<LOD			<0.005		<LOD	433	0.03	277
Pre	09/01/2009	419		>LOD		6.5			<LOD			<0.005		>LOD		0.88	263
Post	09/01/2009	448		7.3		6.5			0.3			<0.005		34	248	0.03	282
Pre	12/01/2009	304		238.0		6.7			<LOD			<0.005		382		0.05	197
Post	12/01/2009	382		3.2		6.8			0.5			<0.005		50	107	0.05	245
Pre	13/01/2009	310		>LOD		7.1			<LOD			<0.005		>LOD		0.11	200
Post	13/01/2009	326		4.8		6.7			0.1			<0.005		<LOD	196	0.01	209
Pre	14/01/2009	304		29.6		7.1			<LOD			<0.005		274		0.08	198
Post	14/01/2009	331		10.3		6.8			0.4			<0.005		<LOD	223	0.04	213
Pre	15/01/2009	318		215.0		7.1			<LOD			<0.005		564		0.03	205
Post	15/01/2009	334		4.7		6.9			0.7			<0.005		22	344	<LOD	215
Pre	16/01/2009	318		91.1		7.0			<LOD			<0.005		>LOD		0.02	204
Post	16/01/2009	335		4.3		6.8			0.5			<0.005		25	418	0.01	214
Pre	19/01/2009	331		49.4		7.0			<LOD			0.010		161		0.02	223
Post	19/01/2009	347		3.6		6.7			0.4			<LOD		<LOD	397	0.03	234
Pre	20/01/2009	348		166.0		6.9			<LOD			0.080		418		0.02	231
Post	20/01/2009	359		3.9		6.7			0.3			<LOD		<LOD	238	0.04	239
Pre	21/01/2009	339		132.0		7.0			<LOD			0.730		>LOD		0.01	226
Post	21/01/2009	353		4.1		6.7			0.5			0.120		<LOD	445	0.02	236
	Grey shaded areas denote parameters that cannot or were not analysed on-site.																
	= Indicative Only																
	Analysis undertaken by external lab																
< LOD	= Below Limit of Detection																
> LOD	= Above Limit of Detection																