

Corrib Gas Pipeline Environmental Report	Period Ending:	30 th September 2011
Compiled By:	Siobhan Sheridan & Carmel Carey	
Approved By:	Aoife Reynolds	

1 Monitoring Data

1.1 Monitoring Equipment

Noise	One noise monitoring location currently being used- AN2. The sound meter records in the 1/3 octave band.
Vibration	There is a single vibration monitoring point being used- V3
Weather Station	The data used for this reporting period was taken from the Terminal Site meteorological station.
TSS	The TSS analyser was operational during the reporting period
Sonde	The results are displayed graphically.
Discharge pipe flow	The results are displayed graphically.

1.2 Rainfall Data

Date	Rainfall mm	Date	Rainfall mm	Date	Rainfall mm
01/09/2011	2.6	12/09/2011	7.6	23/09/2011	12.2
02/09/2011	9.6	13/09/2011	2.8	24/09/2011	4.2
03/09/2011	6.4	14/09/2011	2.0	25/09/2011	10.2
04/09/2011	15.4	15/09/2011	1.0	26/09/2011	3.6
05/09/2011	20.8	16/09/2011	8.2	27/09/2011	1.4
06/09/2011	8.6	17/09/2011	9.0	28/09/2011	1.6
07/09/2011	9.2	18/09/2011	1.2	29/09/2011	0.6
08/09/2011	4.0	19/09/2011	12.6	30/09/2011	9.4
09/09/2011	3.6	20/09/2011	0.4		
10/09/2011	17.6	21/09/2011	3.8		
11/09/2011	22.0	22/09/2011	0.0		
Total Rainfall 211.6mm					

1.3 Summary

Environment	Comments
Vibration	Power failure during reporting period resulted in loss of data. During this time the monitor was moved, resulted in elevated results.
Weather	There was a total of 113.6mm of rainfall during the reporting period, with a temperature range of 5.6°C to 19.5°C
Noise	Elevated noise levels during the reporting period. The erection of the Eastern Perimeter fence in close proximity to the noise meter at noise sensitive dwelling AN2. The monitoring station is not a dwelling, and although it is being used for noise limit compliance monitoring, it does not represent a noise sensitive receptor. In order to demonstrate compliance with the Board's condition, noise modelling is presented in a report in Appendix 4.

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Environment	Comments
Surface Water	<p>Where there are gaps in the data on the surface water graphs, this is due to no discharge from the water treatment unit during that time. Surface water sonde located at SB2 malfunctioned on 29th and 30th Sept resulting in a loss of data. The error has since been resolved. Composite results available to cover the shortfall. The surface water discharge from the siltbuster had elevated pH values during the reporting period. Elevated total suspended solids values for the reporting period were due to quick run discharges and periods of recycling from the siltbuster. Also for this enabling phase the siltbuster was manually put into recycle, not discharging. The composite sampler is independent of this process and continues to sample when no water is being discharged. Elevations in the composite results occur during these time periods. As the surface water treatment system expands the sampling technology will also upgrade.</p> <p>As per the Look Up tables, when the monthly results were assessed the results yielded for the parameters conductivity, pH and suspended solids show that there was a non-compliance with the discharge criteria.</p>
Groundwater Monitoring	Monitoring of groundwater undertaken during the reporting period does not show any unusual results.

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

2 Environmental Exceedances / Incidents / Complaint

2.1 Complaint

Date	Nature of complaint	Actions taken as a result of the complaint
18-Sep-11	Complaint regarding delay in provision of noise monitoring at private dwelling.	SEPII offered to undertake a noise monitoring survey on the 21 st of September.

2.2 Exceedance

Date and Time	September
Location	Silt Buster Discharge
Nature of Incident	The pH and conductivity level of the surface water elevated over the target limits. The cause of the exceedance was due to the dosing concentration being set too low. The automatic dosing system was adjusted to a 1/0.5 of a pH unit.
Actions Taken	<ul style="list-style-type: none"> Adjust the automatic dosing system down 1/0.5 of a pH unit Continue to monitor pH of the surface water from the plant. Upgrade of dosing pump.
Category	Environmental Exceedance
Status	Open

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Date and Time	September
Location	Silt Buster Discharge
Nature of Incident	The TSS levels of the surface water elevated over the target limits. The cause of the exceedance was due to quick run discharges and periods during which the plant was recycling throughput.
Actions Taken	<ul style="list-style-type: none"> Siltbuster Technician on sit, works undertaken on the system operation to ensure that the treatment system is operating
Category	Environmental Exceedance
Status	Open

2.3 Incidents

There was no incident during the reporting period.

Surface Water Monitoring Results - Accredited Laboratory												
	Date	Cond.	Turbidity	DO %	pH	TSS	Orthophosphate as PO4	Extractable HC/DRO (C8-C40) total and dissolved	PRO (C5-C12) total and dissolved	TOC	DIN (TON as N + Ammonia as N)	COD
		µS/cm	NTU	mg/l		mg/l	mg/l	ug/l	ug/l	mg/l	mg/l	mg/l
Action Limits		400	150		<3.5 or >7.5							
Target Limits		500	200		<3 or >8.5	50						
Composites												
SB1	01/09/2011	564	1.8	80.2	9.7	<2	<0.030	<100	<100	23.10	0.01	36
SB2	01/09/2011	500	7.6	85.4	8.7	18	0.137	<200	<100	6.26	<0.1	31
SB1	02/09/2011	596	1.8	79.8	9.3	<2	0.034	<200	<100	25.60	0.02	31
SB2	02/09/2011	592	8.2	79.4	8.2	<2	0.041	<100	<100	23.60	<0.1	34
SB1	03/09/2011	425	2.3	80.2	8.8	<2	<0.030	<100	<100	16.80	0.02	31
SB2	03/09/2011	406	1.8	80.3	8.8	11	<0.030	<100	<100	15.70	0.19	36
SB1	04/09/2011	419	2.8	78.9	8.2	4	<0.030	<100	<100	12.90	0.03	34
SB2	04/09/2011	418	1.0	81.1	8.6	6	<0.030	<100	<100	15.50	0.05	43
SB1	05/09/2011	558	14.3	68.1	9.2	70	<0.030	<200	<100	4.34	0.05	26
SB2	05/09/2011	443	2.3	68.5	7.3	18	<0.030	<400	<100	3.58	0.05	34
SB1	06/09/2011	382	98.2	68.3	7.0	<2	0.031	<1000	<100	14.60	<0.1	42
SB2	06/09/2011	446	2.8	67.9	8.7	<2	<0.030	<100	<100	4.76	0.09	29
SB2	07/09/2011	256	25.8	68.7	6.5	44	<0.030	<200	<100	3.10	0.04	41
SB2	08/09/2011	259	16.4	68.7	6.6	2	0.066	<500	<100	4.90	0.05	25
SB2	09/09/2011						No discharge from siltbuster					
SB2	12/09/2011	598	6.2	69.9	7.5	17	1.330	<1000	<100	6.39	<0.1	26
SB1	14/09/2011						No discharge from siltbuster					
SB2	14/09/2011						No discharge from siltbuster					
SB1	16/09/2011	450	89.5	68.5	6.8	63	0.039	<1000	<100	32.30	<0.1	233
SB2	16/09/2011	465	79.7	68.5	7.4	82	0.037	<200	<100	32.80	<0.1	173
SB2	17/09/2011	720	14.4	68.5	9.3	<2	0.031	<200	<100	20.50	0.09	102
SB1	18/09/2011	1142	68.5	68.5	11.4	112	0.056	<200	<100	47.50	0.02	237
SB2	18/09/2011	1207	35.1	68.9	11.5	107	0.098	<200	<100	27.60	0.04	112
SB2	19/09/2011	839	46.2	66.1	10.3	70	0.060	<200	<100	28.90	0.03	132
SB1	20/09/2011	1098	37.8	65.3	10.4	87	0.056	<200	<100	33.10	<0.1	140
SB2	20/09/2011	533	12.7	64.9	9.7	29	0.030	<200	<100	10.30	0.07	42
SB1	21/09/2011	684	69.4	68.3	10.0	38	0.037	<200	<100	27.10	0.05	173
SB2	21/09/2011	527	21.4	97.9	9.5	31	0.038	<200	<100	15.30	0.01	113
SB2	22/09/2011	645	15.8	68.6	9.6	24	<0.030	<200	<100	16.50	0.05	158
SB1	23/09/2011	609	26.2	68.5	9.5	38	<0.030	<200	<100	16.40	0.21	132
SB2	23/09/2011	412	7.7	68.5	7.9	15	0.032	<200	<100	11.20	0.25	45
SB1	24/09/2011	388	1.4	67.8	7.6	<2	<0.030	<200	<100	9.39	0.19	35
SB2	24/09/2011	386	1.7	67.9	7.6	<2	0.032	<200	<100	9.96	0.18	38
SB1	25/09/2011	370	33.7	68.1	8.0	40	0.034	<200	<100	16.80	0.14	131
SB2	25/09/2011	356	36.3	68.3	7.8	48	0.037	<200	<100	17.20	0.11	137
SB1	26/09/2011	428	2.5	68.5	7.5	<2	0.040	<200	<100	10.20	0.24	24
SB2	26/09/2011	410	20.1	68.5	9.1	33	0.039	<200	<100	14.00	0.17	53
SB1	27/09/2011	483	19.6	66.8	9.4	13	0.035	<200	<100	21.40	0.19	72
SB2	27/09/2011	589	26.8	68.5	9.1	116	0.039	<200	<100	23.30	0.07	91
SB1	28/09/2011	705	26.9	65.8	8.6	64		<200	<100	20.00	0.79	83
SB2	28/09/2011	604	23.6	65.8	8.6	41	0.039	<200	<100	23.10	0.04	86
SB1	29/09/2011	715	27.3	68.5	9.1	43	0.045	<200	148	24.00	0.04	93
SB2	29/09/2011	669	16.4	67.8	9.7	29	0.034		315	22.80	0.02	62
SB1	30/09/2011	510	26.4	68.9	8.3	50	0.08	<200		18.00	0.06	113
SB2	30/09/2011	511	23.6	66.8	8.6	36	0.033	<200		21.90	0.07	93
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.											

Surface Water Monitoring Results - Accredited Laboratory												
	Date	Cond.	Turbidity	DO %	pH	TSS	Orthophosphate as PO4	Extractable HC/DRO (C8-C40) total and dissolved	PRO (C5-C12) total and dissolved	TOC	DIN (TON as N + Ammonia as N)	COD
		µS/cm	NTU	mg/l		mg/l	mg/l	ug/l	ug/l	mg/l	mg/l	mg/l
Action Limits		400	150		<3.5 or >7.5							
Target Limits		500	200		<3 or >8.5	50						
Composites												
Grab Samples DL2												
DL2	02/09/2011	118	1.4	84.5	4.8	3	<0.03	<200	<100	18.50	0.02	68
DL2	05/09/2011	79	4.9	64.9	5.1	<2	0.031	<200	<100	17.90	<0.1	65
DL2	06/09/2011	101.0	13.6	66.3	7.7	3	0.042	<200	<100	14.80	<0.1	67
DL2	07/09/2011	81.3	10.2	67.3	5.1	<2	<0.03	<200	<100	13.40	0.04	63
DL2	08/09/2011	60.0	15.9	68.5	6.1	3	<0.03	<100	<100	15.70	<0.1	60
DL2	09/09/2011	99.9	9.8	68.3	5.8	<2	<0.03	<200	<100	17.20	<0.1	71
DL2	12/09/2011	102.0	12.4	68.5	5.9	36	<0.03	<100	<100	12.80	0.01	44
DL2	13/09/2011	149	9.7	68.8	5.7	16	0.045	<200	<100	10.50	0.12	52
DL2	14/09/2011	169.0	0.9	68.3	5.5	5	<0.03	<100	<100	9.95	<0.1	36
DL2	15/09/2011	173.0	0.7	68.3	5.9	<2	<0.03	<100	<100	11.30	0.02	41
DL2	16/09/2011	155.0	1.3	68.5	6.7	2	<0.03	<200	<100	12.80	0.01	50
DL2	19/09/2011	140.0	2.1	68.5	7.4	<2	0.040	<200	<100	11.50	0.05	44
DL2	20/09/2011	176.0	2.6	65.3	6.3	<2	0.033	<200	<100	10.30	0.01	60
DL2	21/09/2011	170.0	1.2	67.3	7.8	<2	0.059	<200	<100	10.90	0.01	80
DL2	22/09/2011	170.0	1.0	68.1	8.3	<2	0.269	<200	<100	12.30	<0.1	80
DL2	23/09/2011	163.0	2.5	68.1	7.6	3	0.031	<200	<100	14.30	0.05	82
DL2	26/09/2011	168.0	1.3	68.3	7.0	4	<0.03	<200	<100	5.34	0.05	58
DL2	27/09/2011	179.0	1.1	68.5	8.2	<2	0.035	<100	<100	9.60	0.03	89
DL2	28/09/2011	202.0	1.3	68.5	7.7	3	0.034	<100	<100	11.30	0.02	87
DL2	29/09/2011	112.0	0.6	66.3	4.5	<2	<0.03	<100	<100	19.40	0.02	127
DL3	30/09/2011	116.0	0.6	65.3	5.2	<2	<0.03	<100	<100	19.50	<0.1	78
Sruwaddaon Bay												
Sbay 1	29/09/2011	714.0	0.8		8.0	<2		<200	<100	1.42		
Sbay 3	29/09/2011	24.6	0.9		7.8	<2		<200	<100	3.01		
Sbay 4	29/09/2011	52.6	1.1		8.0	<2		<200	<100	2.53		
Sbay 6	29/09/2011	57.5	0.5		8.1	<2		<200	<100	1.85		
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.											

Location	Date	DO	Temp	Cond.	pH	TDS	BOD	Suspended Solids	Turbidity	Orthophosphate as PO4 -P	Ammonia as NH3-N	Total Phosphorus as P	Nitrate as NO ₃	Nitrite as NO ₂	Phosphate as PO4	COD	Copper
		% Sat	°C	uS/cm	pH Units	mg/l	mg/l	mg/l	N.T.U	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	ug/l
GW1	14/09/2011	44	12.0	410	6.1	212	2	498	232.0	0.129	0.12	1.14	<0.44	<0.017	0.40	15	27
GW2	14/09/2011	23	10.9	473	6.2	245	13	482	479.0	0.036	2.28	0.09	<0.44	<0.017	0.11	34	7
GW3	14/09/2011	13	10.5	366	6.0	185	13	137	45.9	<0.01	3.19	0.08	<0.44	<0.017	<0.03	31	4
GW4	14/09/2011	11	11.0	400	6.2	205	4	63	119.0	<0.01	0.65	0.08	<0.44	<0.017	<0.03	21	3

Location	Date	Arsenic, total	Chromium, total	Lead, total	Cadmium, total	Tin, total	Iron, total	Mercury	TOC	Total Hardness	Zinc	Extractable HC/ DRO (C8-C40) total and dissolved	PRO (C5 - C12) total and dissolved	Total Phosphorus as P	Manganese	Chloride	Water Level
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	mg/l	mg/l	ug/l	ug/l	ug/l	mg/l	ug/l	mg/l	m
GW1	14/09/2011	16	16	29.0	4.0	<0.5	22330	<0.05	5.76					1.14	3382	53.6	4.0
GW2	14/09/2011	4	7	30.0	<0.5	<0.5	25140	<0.05	8.68					0.09	686	50.0	2.0
GW3	14/09/2011	4	4	2.0	<0.5	<0.5	50290	<0.05	3.62					0.08	237	54.0	3.0
GW4	14/09/2011	2	1	<0.5	<0.5	0.6	40350	<0.05	3.45					0.08	1389	56.0	3.0

Grey shaded areas denote parameters that cannot or were not analysed on-site or at the lab.

Day Time Noise Monitoring Record Sheet

Determinant Results

Location	Air Temp. (Min)	Air Temp. (Max)	Start Date	Time	Duration	Wind		Results dB			*Comments
						Speed (m/s)*	Direction (Degrees)	L _{Aeq}	L _{Amax}	L _{Amin}	
Action Limit								60.0			
Target Limit								65.0			
AN2	11.2	17.0	01/09/2011	16:00	1:00	2.7	168.6	69.3	94.6	49.1	Fence erection in close proximity to noise meter
AN2	11.3	14.5	02/09/2011	12:00	1:00	3.7	206.6	70.3	90.4	47.5	Fence erection in close proximity to noise meter
AN2	6.1	14.8	05/09/2011	15:00	1:00	4.2	251.6	80.6	106.0	38.5	Fence erection in close proximity to noise meter
AN2	10.7	14.1	06/09/2011	15:00	1:00	6.7	268.8	68.0	85.6	48.4	Fence erection in close proximity to noise meter
AN2	9.8	13.1	07/09/2011	11:00	1:00	4.6	271.8	68.7	84.2	43.1	Fence erection in close proximity to noise meter
AN2	10.4	13.9	08/09/2011	8:00	1:00	2.7	168.6	69.1	87.0	43.1	Fence erection in close proximity to noise meter
AN2	10.9	19.5	09/09/2011	12:00	1:00	3.7	206.6	61.4	88.1	40.6	Fence erection in close proximity to noise meter
AN2	11.8	15.0	12/9/2011	9:00	1:00	9.5	237.4	71.4	90.7	51	Fence erection in close proximity to noise meter
AN2	9.6	13.9	13/09/2011	17:00	1:00	6.7	268.8	79.4	94.1	61.3	Fence erection in close proximity to noise meter
AN2	10.6	12.7	14/09/2011	7:00	1:00	4.6	271.8	76.6	91.0	36.5	Fence erection in close proximity to noise meter
AN2	10.0	17.4	15/09/2011	8:00	1:00	4.6	143.8	65.4	79.4	51.8	
AN2	11.0	15.0	16/09/2011	12:00	1:00	4.0	184.0	60.6	87.9	35.4	
AN2	10.4	15.0	19/09/2011		1:00	3.8	233.8				No data due to equipment fault
AN2	9.1	14.0	20/09/2011	18:00	1:00	4.7	237.9	63.7	87.7	38.8	
AN2	9.3	14.2	21/09/2011	17:00	1:00	7.0	250.0	64.1	85.5	43.0	
AN2	9.1	14.4	22/09/2011	17:00	1:00	4.1	240.0	61.4	81.2	44.3	
AN2	12.2	16.1	23/09/2011	15:00	1:00	6.8	196.3	62.8	84.1	39.2	
AN2	8.9	14.9	25/09/2011	17:00	1:00	2.6	200.4	57.8	84.2	31.0	
AN2	6.0	15.3	26/09/2011	15:00	1:00	6.0	185.8	62.6	86.5	38.0	
AN2	11.9	17.4	27/09/2011	11:00	1:00	6.6	150.8	63.0	82.4	33.4	
AN2	15.1	22.2	28/09/2011	9:00	1:00	6.6	150.8	60.9	80.4	36.4	
AN2	12.5	17.9	29/09/2011	13:00	1:00	4.5	174.4	59.2	79.3	34.8	
AN2	9.1	17.5	30/09/2011	12:00	1:00	3.9	224.8	63.7	84.0	40.3	

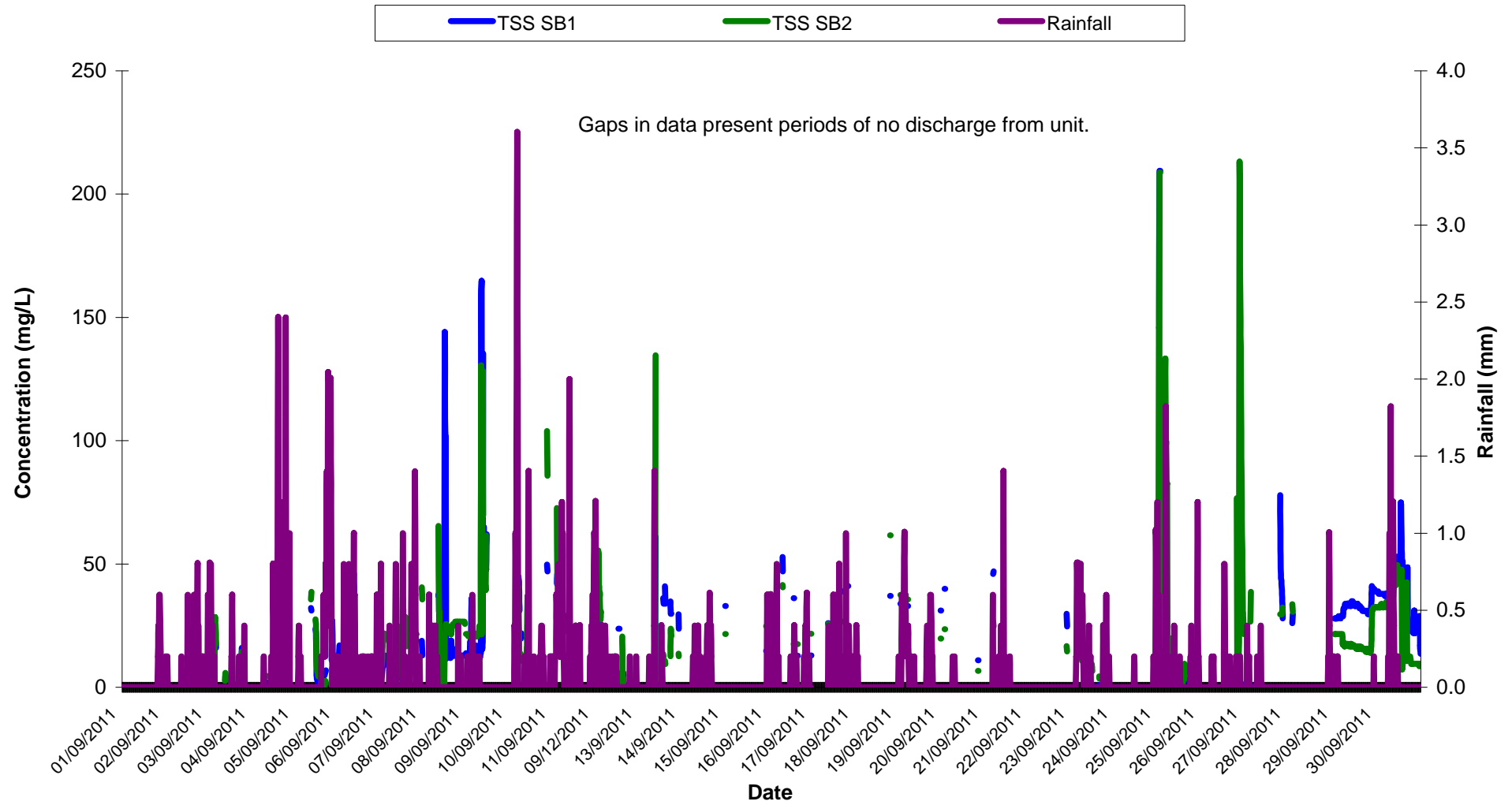
* Wind speeds in excess of 5 m/s negatively impact noise readings (as per EPA Guidance Note on Noise Measurement).

**Allowance of +/- 1.5dB accuracy of sound level meter (ref: IEC 61672 (2002-2005))

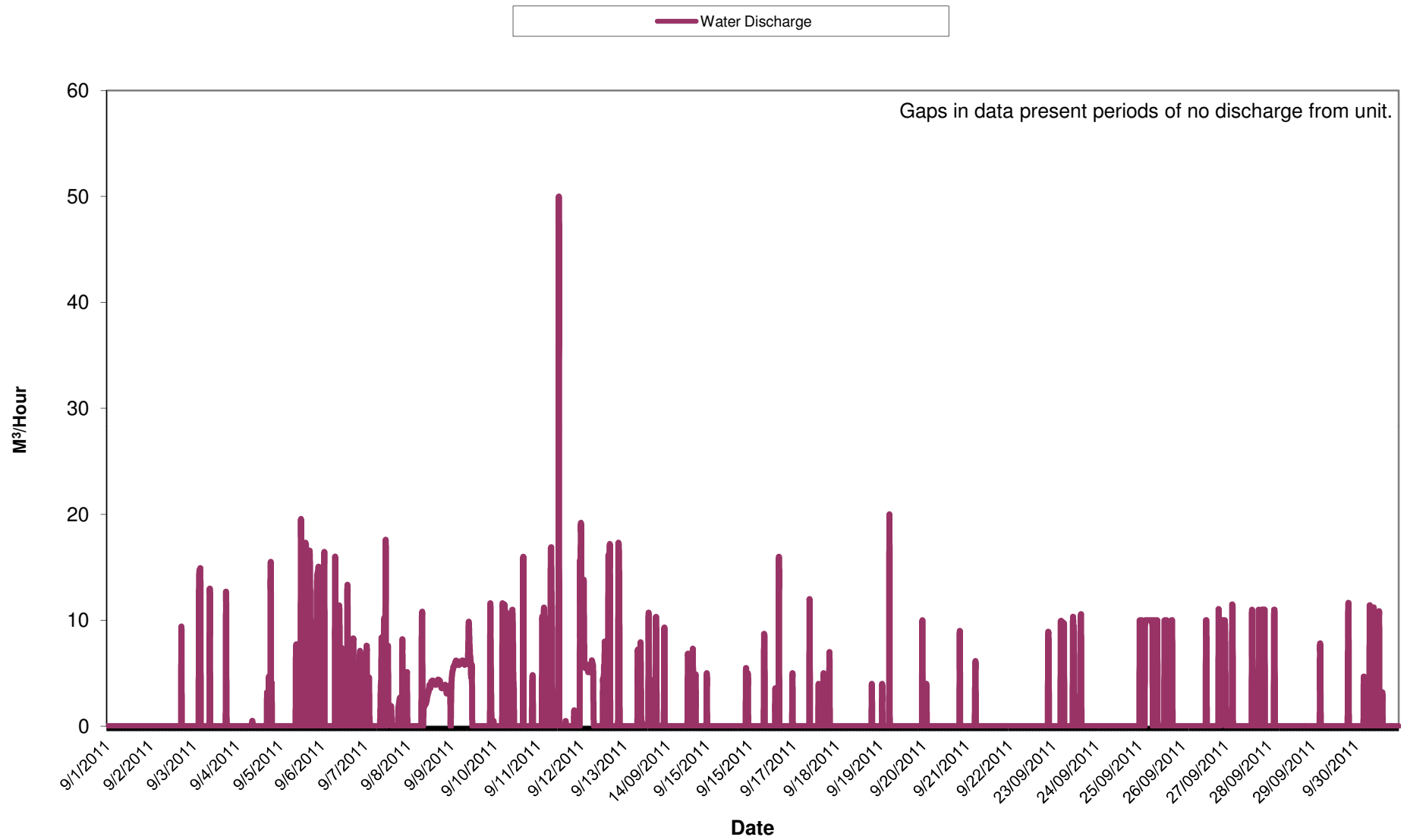
The results show the maximum Laeq(1hr) for each day of monitoring

Vibration Monitoring Record Sheet			
Location	Date	PPV max (mm/s)	Comment
Minimum Criterion 8mm/s			
V3	01/09/2011	0.64	
V3	02/09/2011	0.64	
V3	05/09/2011	No Data	Technical fault resulted in loss of data
V3	06/09/2011	No Data	Technical fault resulted in loss of data
V3	07/09/2011	20.00	Intereference with geo-phone gave elevated result
V3	08/09/2011	No Data	Technical fault resulted in loss of data
V3	09/09/2011	No Data	Technical fault resulted in loss of data
V3	12/09/2011	No Data	Technical fault resulted in loss of data
V3	13/09/2011	2.97	
V3	14/09/2011	1.04	
V3	15/09/2011	1.37	
V3	16/09/2011	0.56	
V3	19/09/2011	4.42	
V3	20/09/2011	0.96	
V3	21/09/2011	1.69	
V3	22/09/2011	1.69	
V3	23/09/2011	1.12	
V3	24/09/2011	2.09	
V3	26/09/2011	1.20	
V3	27/09/2011	1.21	
V3	28/09/2011	3.13	
V3	29/09/2011	1.12	
V3	30/09/2011	1.12	

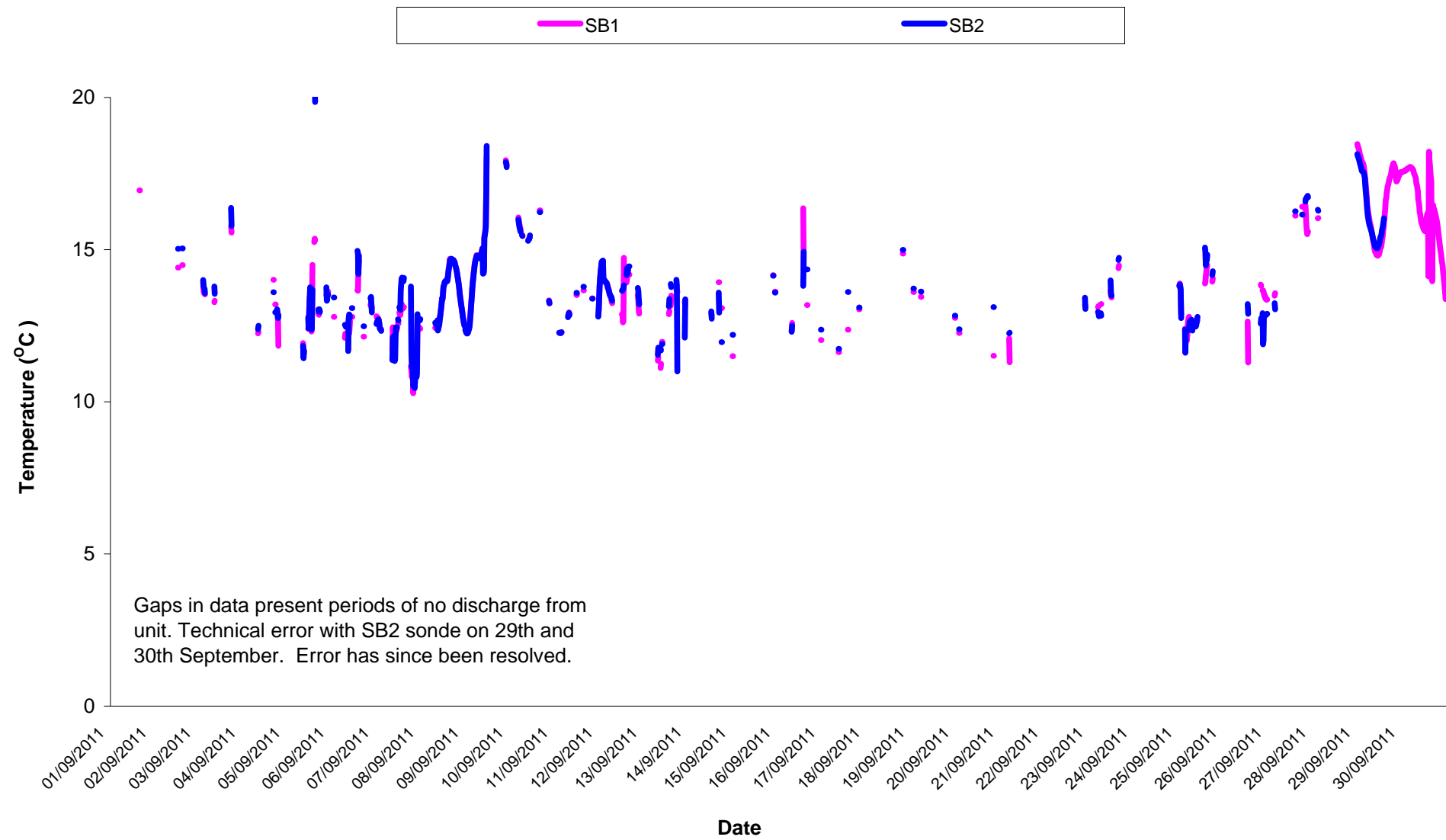
Total Suspended Solids September 2011



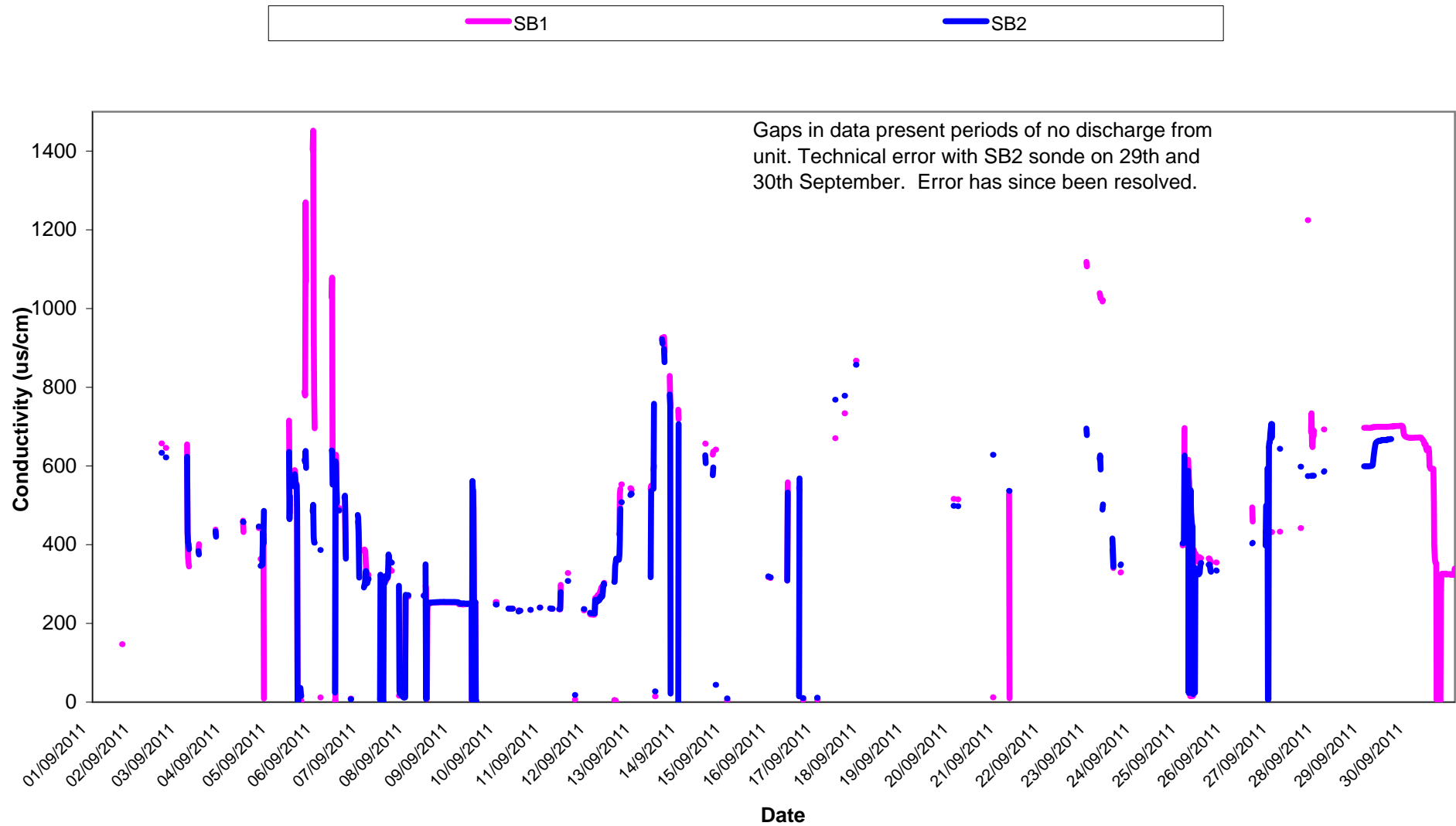
Surface Water Discharge September 2011



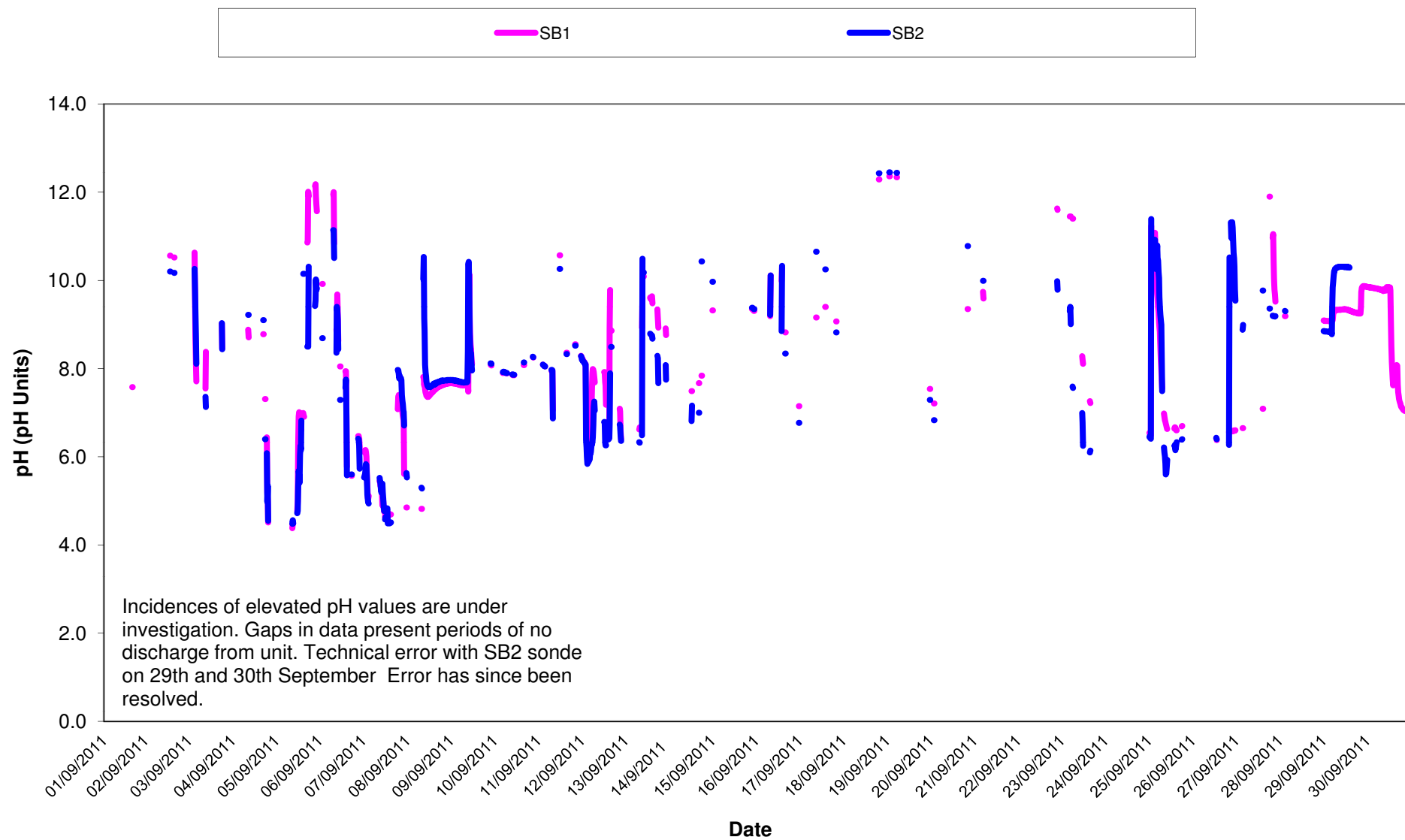
Temperature - Surface Water Discharge September 2011



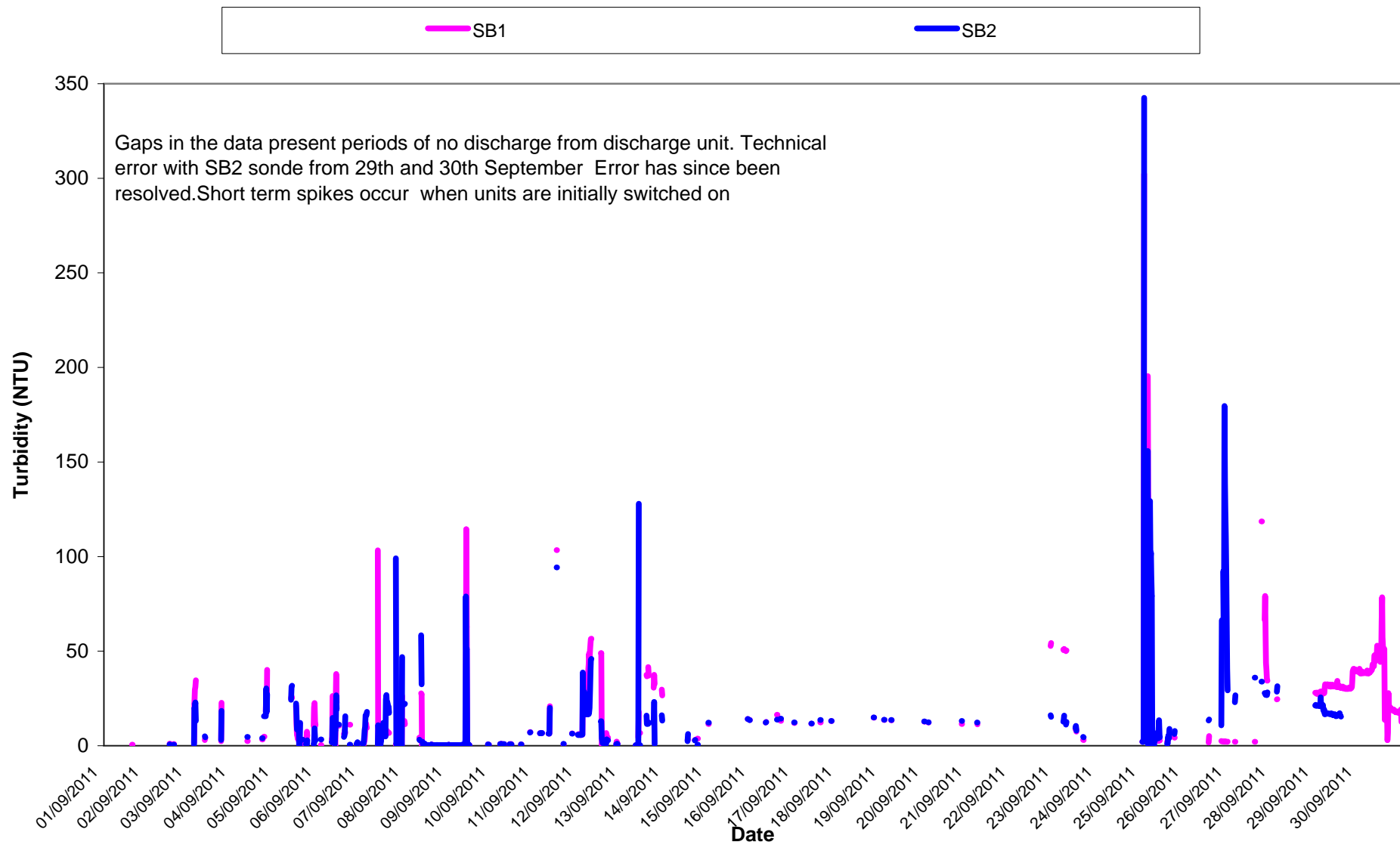
Conductivity - Surface Water Discharge September 2011



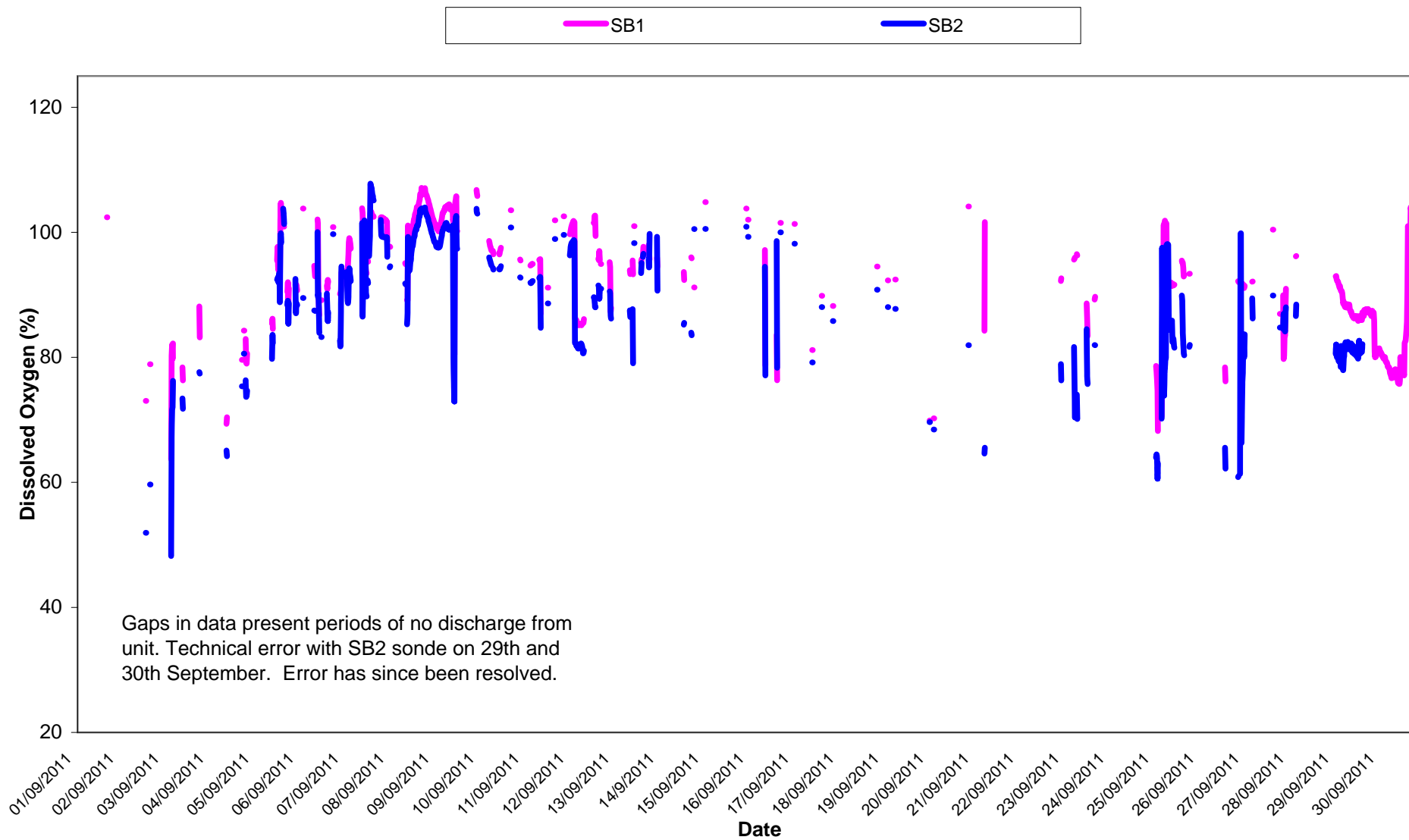
pH - Surface Water Discharge September 2011



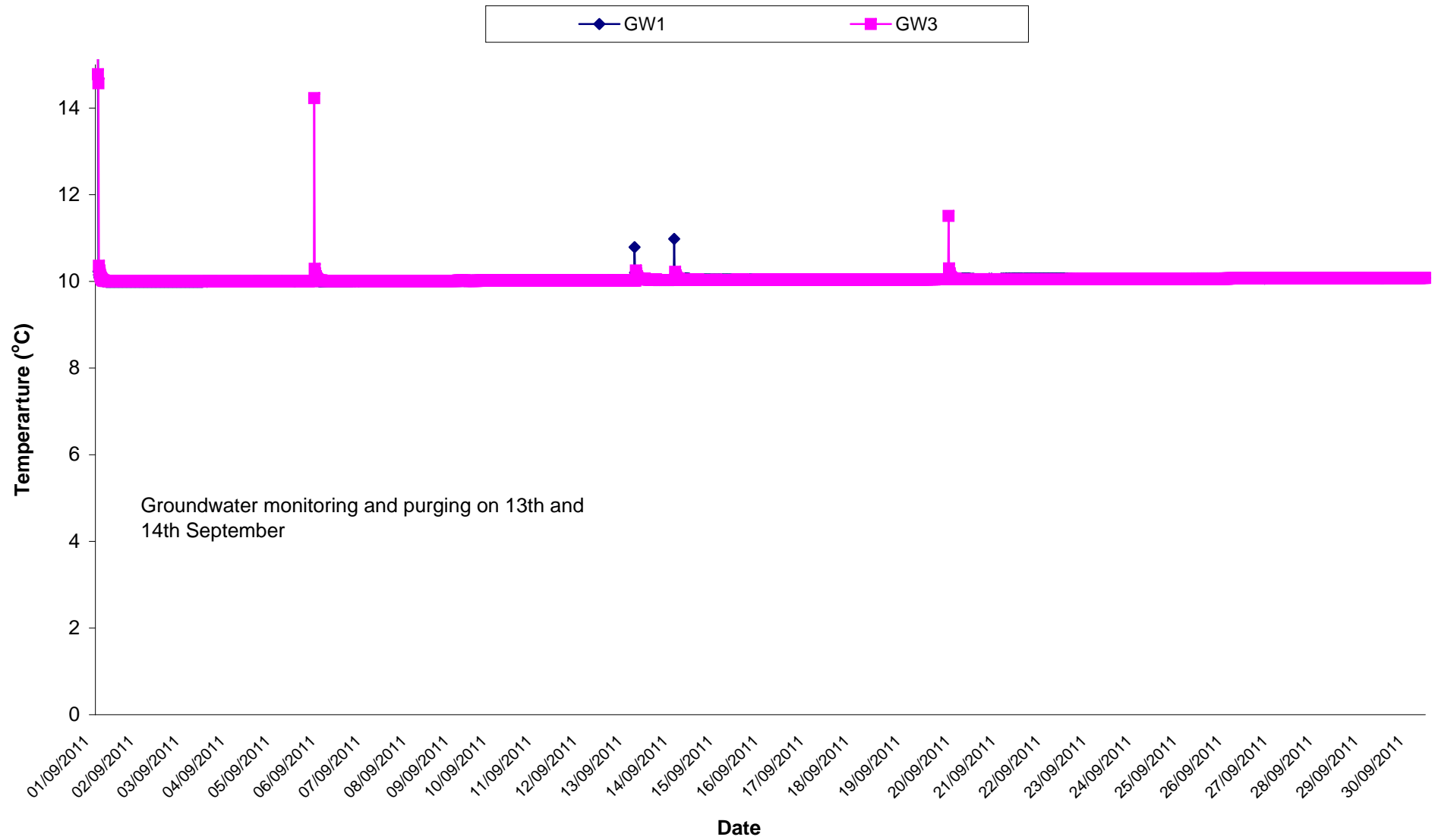
Turbidity- Surface Water Discharge September 2011



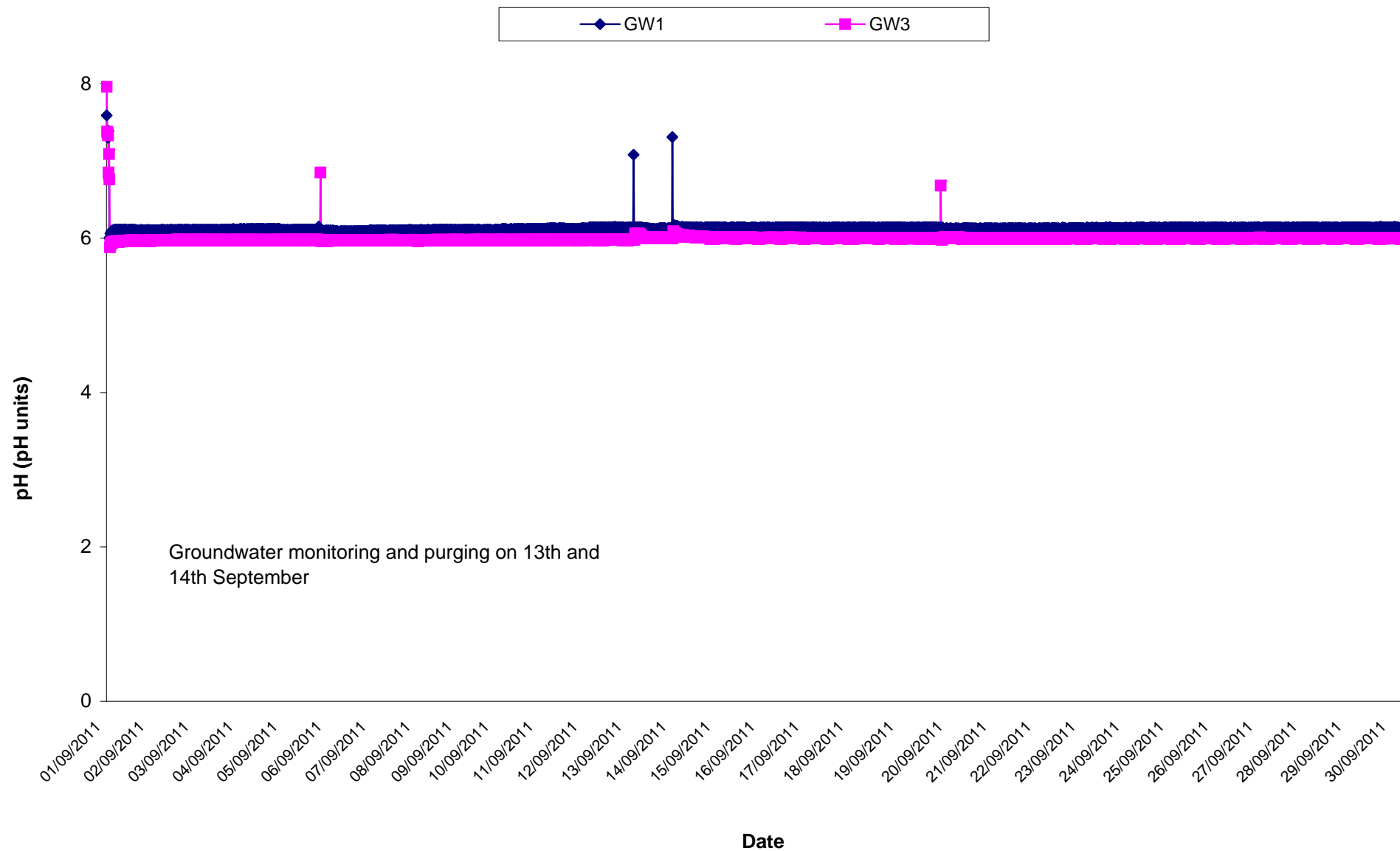
Dissolved Oxygen - Surface Water Discharge September 2011



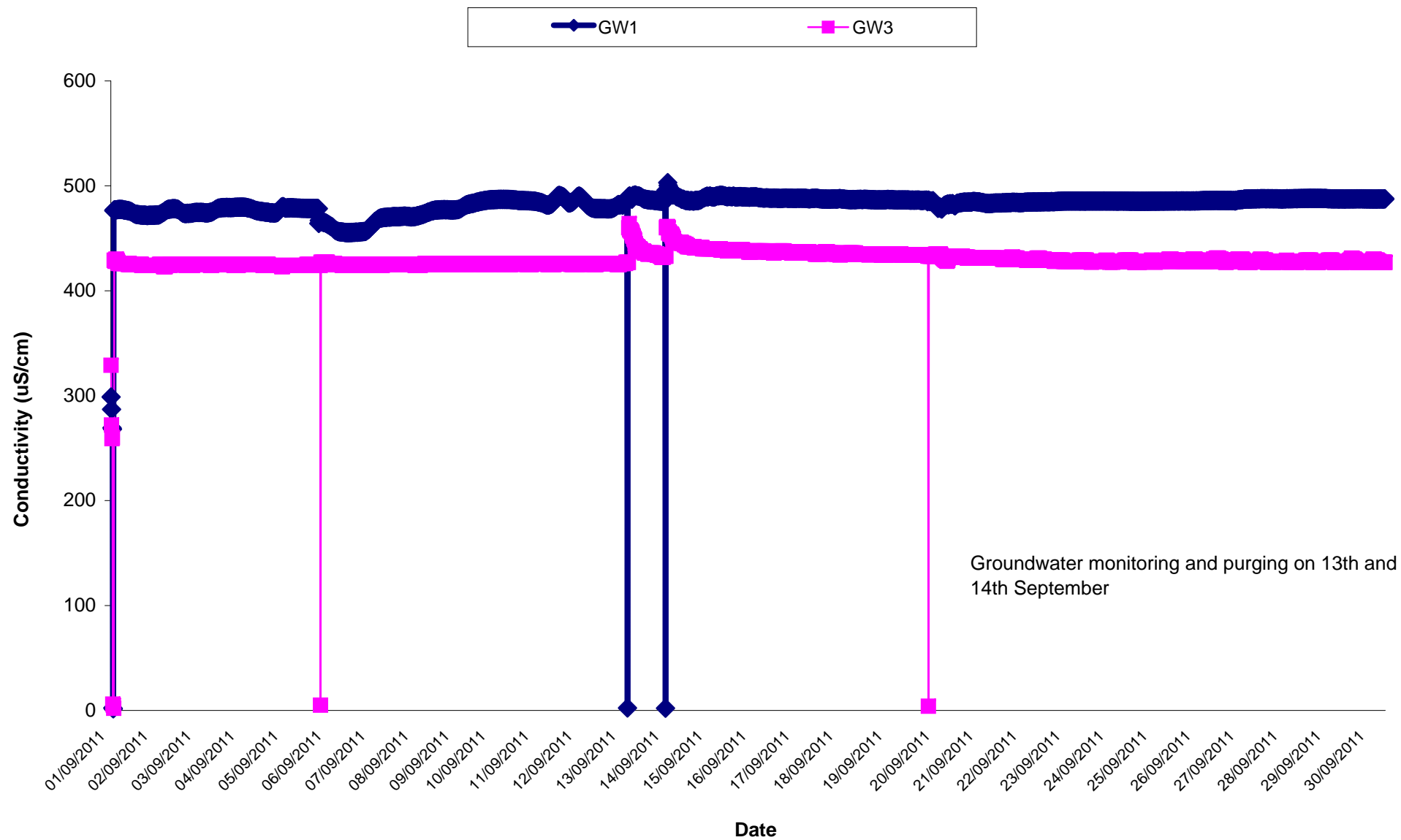
Temperature - Groundwaters September 2011



pH - Groundwaters September 2011



Conductivity - Groundwaters September 2011



Appendix 1

Appendix 1: Surface Water Monitoring Record Sheet- Onsite Monitoring

	Date	Temp oC	DO % Sat	Cond. µS/cm	Turbidity NTU	pH	Total dissolved mg/l
Grab samples							
DL 2	01/09/2011	13.0	76.6	164	5	5.8	95
DL 2	05/09/2011	14.2	81.9	116	10	5.4	68
DL 2	06/09/2011			190	22	6.8	119
DL 2	07/09/2011	12.9	82.7	99	18	6.6	60
DL 2	08/09/2011	8.7	67.0	120	24	6.8	70
DL 2	09/09/2011	17.4	88.5	120	12	6.7	72
DL 2	12/09/2011	13.4	74.1	128	27	5.2	75
DL 2	13/09/2011	13.1	74.7	188	85	6.6	107
DL 2	14/09/2011	14.1	94.6	200	5	6.3	122
DL 2	15/09/2011	14.2	97.0	213	3	5.8	123
DL 2	16/09/2011	14.5	91.7	200	3	6.5	114
DL 2	19/09/2011	16.7	90.2	188	9	8.2	117
DL 2	20/09/2011	13.4	87.5	199	5	5.9	128
DL 2	21/09/2011	12.9	73.3	200	9	6.1	129
DL 2	22/09/2011	14.7	85.5	210	4	6.4	120
DL 2	23/09/2011	14.6	83.3	197	98	7.0	111
DL 2	26/09/2011	12.3	79.8	203	15	6.9	116
DL 2	27/09/2011	14.6	83.7	214	5	6.1	135
DL 2	28/09/2011	15.9	72.4	238	4	6.3	161
DL 2	29/09/2011	16.4	83.5	243	11	6.5	160
DL 2	30/09/2011	15.9	58.5	292	44	6.9	196
Sruwaddacon Bay							
SBAY1	29/09/2011	14.0	97.5		2	8.3	
SBAY3	29/09/2011	14.8	95.4		4	8.2	
SBAY4	29/09/2011	14.5	10.7		11	8.2	
SBAY6	29/09/2011	14.0	5.9		6	8.2	
Composites							
Composite SB1	01/09/2011			549	11	7.8	371
Composite SB2	01/09/2011			604	7	9.0	405
Composite SB1	05/09/2011			588	19	8.5	398
Composite SB2	05/09/2011			474	7	7.1	318
Composite SB1	06/09/2011			413	>LOD	7.6	277
Composite SB2	06/09/2011			464	9	7.9	309
Composite SB2	07/09/2011			307	64	6.6	206
Composite SB2	08/09/2011			297	27	7.0	200
Composite SB2	09/09/2011			433	64	7.1	302
Composite SB2	12/09/2011			632	15	7.1	424
Composite SB2	13/09/2011			433	64	7.1	302
Composite SB1	14/09/2011			741	65	9.1	500
Composite SB2	14/09/2011			758	65	9.3	509
Composite SB1	16/09/2011			502	162	6.4	333
Composite SB2	16/09/2011			515	136	6.9	342
Composite SB2	17/09/2011			770	51	8.1	517
Composite SB1	18/09/2011			1170	135	10.7	794
Composite SB2	18/09/2011			1266	103	10.9	857
Composite SB1	23/09/2011			443	16	6.0	283
Composite SB2	23/09/2011			423	13	6.2	273
Composite SB1	24/09/2011			407	4	6.2	261
Composite SB2	24/09/2011			405	7	6.3	261
Composite SB1	25/09/2011			390	63	6.7	256
Composite SB2	25/09/2011			376	71	6.9	245
Composite SB1	26/09/2011			471	4	6.2	318
Composite SB2	26/09/2011			442	35	6.6	298
Composite SB1	27/09/2011			516	31	8.3	348
Composite SB2	27/09/2011			633	47	8.4	425
Composite SB1	28/09/2011			714	37	6.7	477
Composite SB2	28/09/2011			600	34	7.1	400
Composite SB1	29/09/2011			685	40	7.8	459
Composite SB2	29/09/2011			639	22	8.6	426
Composite SB1	30/09/2011			498	48	7.2	327
Composite SB2	30/09/2011			500	35	7.7	335
	Grey shaded areas denote parameters that were not analysed on-site. = Indicative Only						

Appendix 1: Surface Water Monitoring Record Sheet- Onsite Monitoring

	Date	Temp °C	DO % Sat	Cond. µS/cm	Turbidity NTU	pH	Total dissolved mg/l
Treatment Unit Monitoring							
Pre Siltbuster	05/09/2011			469	>LOD	6.0	309
Post Siltbuster	05/09/2011			492	8	6.1	330
Pre Siltbuster	06/09/2011			136	25	7.1	76
Pre Siltbuster	07/09/2011			206	>LOD	5.5	118
Post Siltbuster	07/09/2011			299	14	5.4	203
Post Siltbuster	09/09/2011			529	46	8.5	359
Pre Siltbuster	28/09/2011			308	731	6.2	208
Post Siltbuster	28/09/2011			687	44	7.9	463
Post Siltbuster	28/09/2011			595	42	7.9	403
Pre Siltbuster	29/09/2011			307	543	6.3	203
Post Siltbuster	29/09/2011			700	53	8.2	465
Post Siltbuster	29/09/2011			664	53	9.5	449
Pre Siltbuster	30/09/2011			196	>LOD	6.0	124
Post Siltbuster	30/09/2011			679	45	10.3	463
Post Siltbuster	30/09/2011			475	10	9.3	321
	Grey shaded areas denote parameters that were not analysed on-site.						
	= Indicative Only						

Appendix 2

1. MONITORING PERIOD

This summary report relates to September 2011 and includes:

- Bird monitoring of the Sruwaddacon Bay area and onshore pipeline area in general; and
- Monitoring during construction at Aughooose.

2. HABITATS/VEGETATION

During the site visit on 9th September the project ecologist observed the trial of equipment designed to strip the vegetation layer for transfer to the peat storage areas. The trial was successful and the methodology was found to be fit for the task.

3. BIRDS

3.1 Aughooose/Sruwaddacon Bay

Weekly low water and high water counts have continued during September in the Sruwaddacon Bay area as scheduled, to summarise:

- Numbers of wading birds, particularly Oystercatcher, Curlew and Redshank grew during the month with birds on passage to wintering grounds
- Some casual observations of species rarely recorded during this and previous years – Hen Harrier & Eider both observed in the second half of the month
- No avoidance or disturbance events recorded from vicinity of works. Mallard and Red-breasted Merganser observed just below works compound at Aughooose prior to the installation of screening.
- No Brent Geese sightings to the end of September but they are expected to return in the coming month. On the east coast this species has returned up to 2 weeks earlier this year than recorded in 2010.
- The Aughooose compound was visited on 2 occasions during September and will continue to be monitored throughout the winter of 2011/12.

3.2 Sand Martin monitoring

The main colony at Glengad (Colony A) was active into September with some chicks fledging very late in the season, the last birds having departed by the 12th of September 2011 - in contrast to August 28th in 2010.

Activity had also ceased at the other local colonies by 12th September, although a small number of individuals were observed on the wing on the 13th of September 2011.

4. NON-AVIAN FAUNA

Site inspections have continued during September in relation to faunal mitigation measures. The next phase of “during construction” faunal surveys will commence in October.

5. SITE INSPECTIONS

Site inspections at Aughooose were undertaken by the project ecologist on 9th and 14th September. A further site inspection was undertaken on 28th September, on behalf of the project ecologist, by a member of the ecological team.

The main purpose of the site inspections was to:

- Check the condition of habitat / surface vegetation in the context of storage for reinstatement.
- Check the erection of the palisade security fence in relation to required mitigation measures.

Appendix 3

REPORT AS6399.111010.NMR2.1

CORRIB ONSHORE PIPELINE PROJECT NOISE EMISSIONS

TECHNICAL REPORT

Noise Emissions Modelling
Aughoose Compound Construction
during **SEPTEMBER 2011**

Prepared: 10th October 2011

**Shell E&P Ireland Ltd
Corrib House
52 Lower Leeson Street
Dublin 2**

CONTENTS

1.	Introduction	1
2.	Noise Modelling Methodolgy	2
2.1	<i>Meteorological Conditions</i>	3
2.2	<i>Assessment Locations</i>	3
2.3	<i>Calculation Assumptions and Input Data</i>	4
3.	Conclusions	5

I. INTRODUCTION

Noise emissions associated with the tunnelling compound at Aughooose were previously assessed as part of the planning application process for the Corrib Gas onshore pipeline project. Noise emissions restrictions were imposed in the planning consent, at condition number 47, reproduced below:

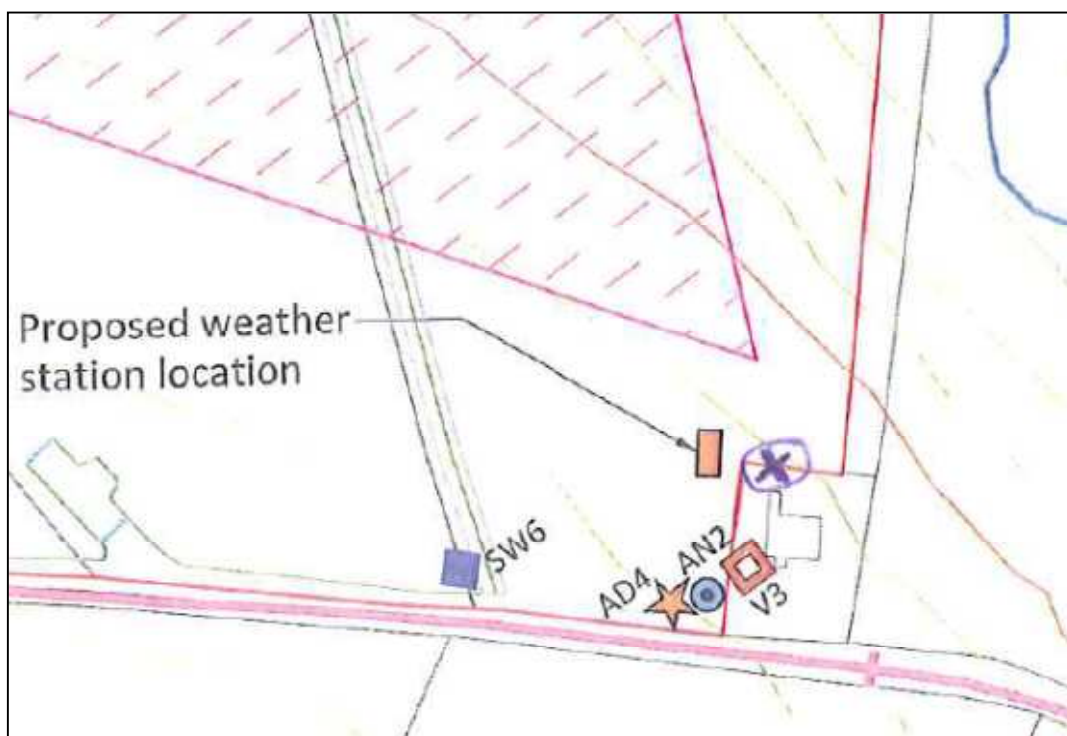
Aughooose

Only essential work shall be carried out between 2000 and 0700, avoiding audible tones and impulsive noise. Noise generation at night shall be controlled on site and kept to the lowest possible achievable levels. Noise levels at the nearest noise sensitive receptor (dwellings) shall not exceed –

Day	0700 – 2000 Hours	Overall limit:	65dB $L_{Aeq}(1hr)$
Night	2000 – 0700 Hours	Target level for design:	35dB $L_{Aeq}(1hr)$
	Calm night limit:		40dB $L_{Aeq}(1hr)$
	Overall night limit:		45dB $L_{Aeq}(1hr)$

Reason: *To protect the residential amenity of the area.*

Compliance monitoring in relation to this condition has been carried out from the commencement of site construction, by continuous noise logging at a monitoring station close to receptor N20, the SEPIL owned property at the entrance to site. The location of this monitor is indicated by the circle below the text 'AN2' on the figure below.



Noise levels in excess of the noise emissions overall limit (65dB $L_{Aeq,1hr}$) were noted on the Noise Monitoring Record Sheets kept by SEPIL on the 2nd, 5th, 8th, 13th and 14th of September.

ASA has been asked to investigate the events which gave rise to these noise level readings, and provide an expert view as to whether it could have given rise to a breach of the planning consent in relation to condition 47.

The reported noise monitoring levels throughout September 2011 are shown in figure 2 below.

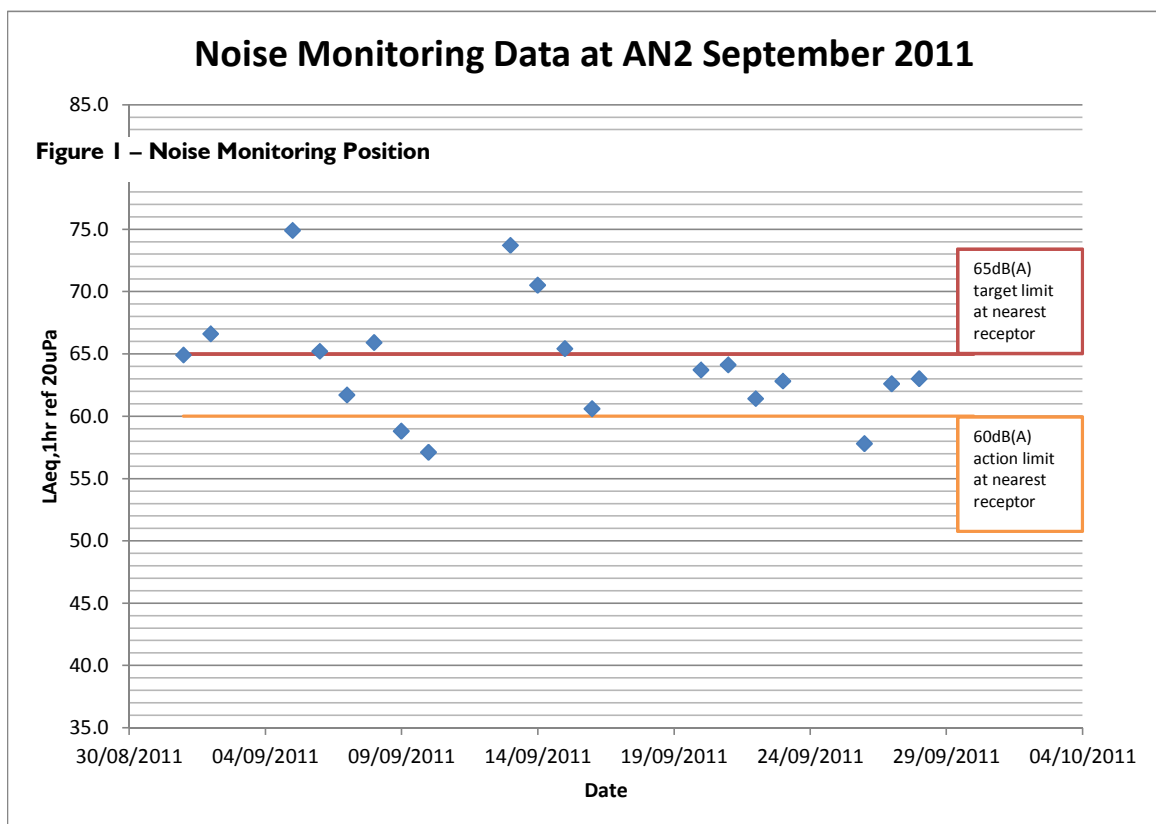


Figure 2 - Noise Monitoring Data

2. NOISE MODELLING METHODOLOGY

To calculate noise emissions levels over a wide area surrounding the Aughooose site, a noise propagation model was developed using ISO9613^[1] algorithms implemented by

¹ ISO 9613 Acoustics - Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere and Part 2: General method of calculation.'

integration with topographical GIS data and standard vehicle noise emissions levels using a recognised computer modelling package^[2] to industry accepted standards. This allows meteorological, air absorption, ground absorption and topographical effects to be considered in detail, enabling far field predictions of noise emissions to the environment to be modelled with known precision.

In summary terms, the ISO9613 method applies the following equation to predict the equivalent continuous downwind octave-band sound pressure level $L_{fi}(DW)$ at each receiver location (or point on the mapping grid), calculated between 63Hz and 8kHz:

$$L_{fi}(DW) = L_w + D_c - (A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{misc})$$

Where L_w and D_c are the sound power level and directivity of the source respectively, and the A terms represent geometrical divergence, atmospheric absorption, ground attenuation, barrier and miscellaneous^[3] other effects respectively.

For each receptor calculation, levels from each contributing source (including image sources due to reflections) are summed logarithmically per source and across the eight standard octave bands following the application of the standard A-weighting to relate to human hearing response.

$$L_{AT}(DW) = 10 \lg \left\{ \sum_{i=1}^n \left[\sum_{j=1}^8 10^{0.1[L_{fi}(ij) + A_f(j)]} \right] \right\} \quad \text{dB}$$

where:

n is the number of contributions i (sources and paths);

j is an index indicating the eight standard octave bands from 63Hz to 8kHz

A_f denotes the standard A-weighting defined in IEC 651

2.1 Meteorological Conditions

Temperature, humidity and atmospheric pressure were set to nominal values of 0°C, 60% and 101.3 kPa respectively. The calm wind condition case has been considered, to align with the wording of condition 47.

2.2 Assessment Locations

The assessment locations have been defined as the nearest receptor (ref N19), and the noise monitoring station itself, to relate to the data measured directly. In addition noise

² Bruel & Kjaer: 'Predictor' v8.01, type 7810-A

³ A_{misc} comprises the contribution associated with propagation through foliage, industrial areas and built up regions.

contour plots have been calculated on a 50m by 50m grid at 1.5m above local ground height until the point at which levels drop below 35dB(A).

2.3 Calculation Assumptions and Input Data

The model was populated using detailed topographical data for the planning application, which has been taken to be sufficiently current. In addition, this has been validated by ASA from site observations and photography.

The majority of the landform around the Aughoose site comprises natural vegetation – peat, grasses, shrubs and trees, these being acoustically absorptive. The default ground absorption characteristic in the noise emissions model, therefore, is set to a ground absorption factor of 1.0. However, the paved and tarmac areas on the site itself, and the water of the Sruwaddacon are defined individually as zero – i.e. acoustically reflective.

Noise source data was based on information supplied from site on the activities which occurred on the five days in question, as below.

2/9/11 66.6 dB(A)	Fencing: Access B gates erected. Entrance Road: Laying pipes and ducts. Traffic: Minor stone movement.
5/9/11 74.9 dB(A)	Fencing: Closing remaining roadside fence and type 3 fence. Entrance Road: Laying pipes and ducts. Installing service lines and preparing entrance roads. Traffic: Minor stone movement.
8/9/11 65.9 dB(A)	Fencing: Perimeter fence installation Entrance Road: Preparing entrance roads. Getting ready for kerbing Traffic: Minor HCV movement.
13/9/11 73.7 dB(A)	Fencing: Type 2 fencing East. Erected new gate at Access A Entrance Road: Completion of kerbing Traffic: Minor HCV movement
14/9/11 70.5 dB(A)	Fencing: Completion of type 2 fencing East and tied into roadside fencing. Erection of visual screens Entrance Road: Preparation for surface dressing Traffic: Minor HCV movement

Figure 3 – Noise monitoring observations

Two scenarios have been developed based on this information, one in which activity is more concentrated in the direct vicinity of the noise monitor (scenario 1) and the other relating to activity concentrated on the entrance road area.

The noise source input data, based on information supplied from site on the plant involved in the fence construction process, was taken for the following plant items, assumed to be operating at 65% of any given hour at maximum rated duty, with two HCV movements in the same hour.

Noise Source	sound power level @ octave band centra frequency								dB(A)
	63	125	250	500	1000	2000	4000	8000	
Bogmaster 140	106	96	95	93	93	94	85	78	98.7
Volvo 210 Excavator	109	99	98	96	96	97	88	81	101.7
Marooka Tracked Dumper	104	105	105	101	100	98	96	87	105.4
4 axle lorry (driveby)	101	106	106	106	102	101	96	94	108.1

Figure 4 – Noise model input data

The resultant noise map plots are attached, and summarised in the table below. To provide context on the cumulative effect of these activities in relation to other construction noise, an assumed level of 50dB(A) has been taken as an assumed nominal level due to other noise emissions from the site at location N19.

	AN2	N19	N19	N19
Results	model	model	other	total
Scenario 1	75.6	28.0	50.0	50.0
Scenario 2	65.6	29.5	50.0	50.0

Figure 5 – Noise model results in dB LAeq,1hr

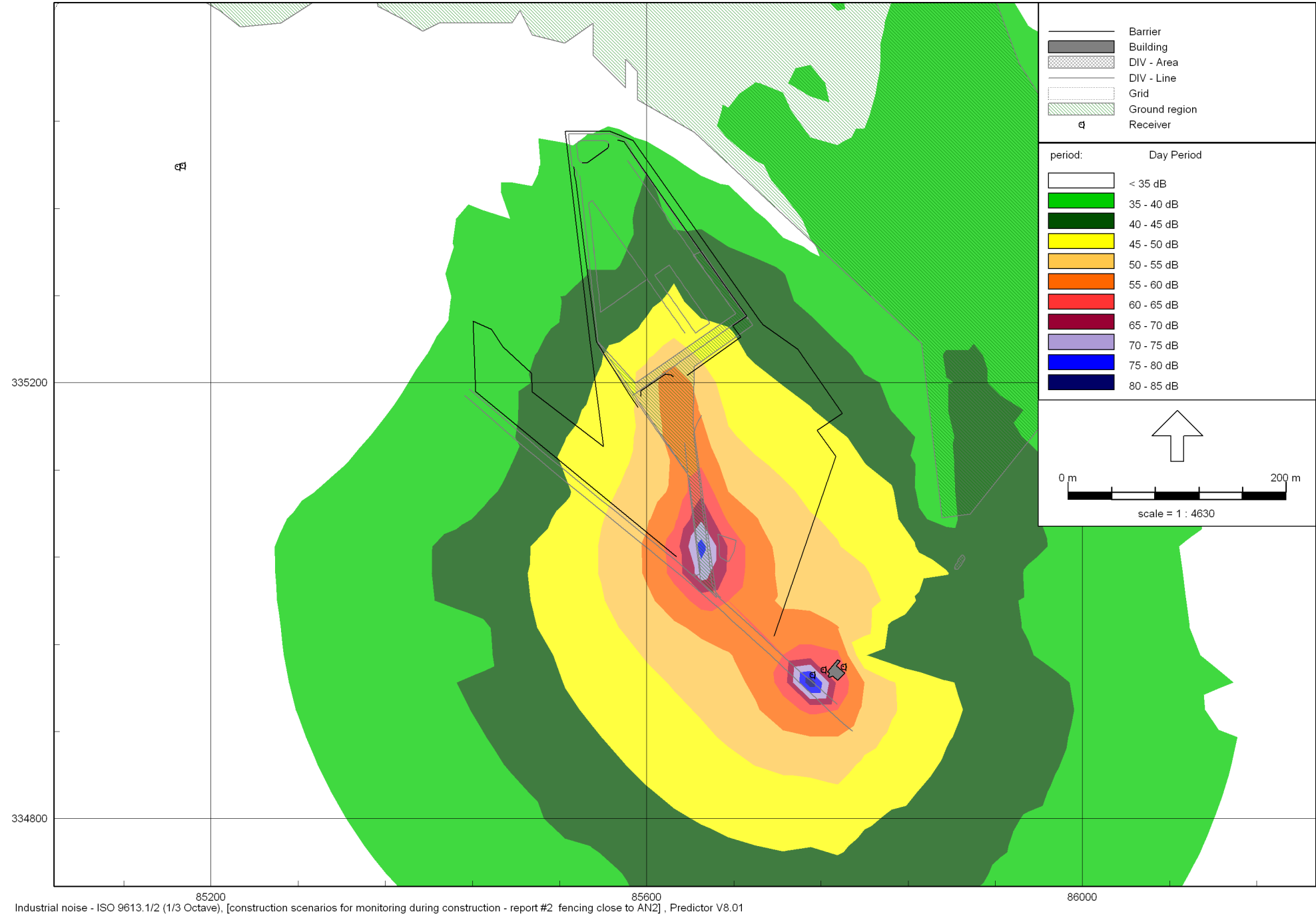
3. CONCLUSIONS

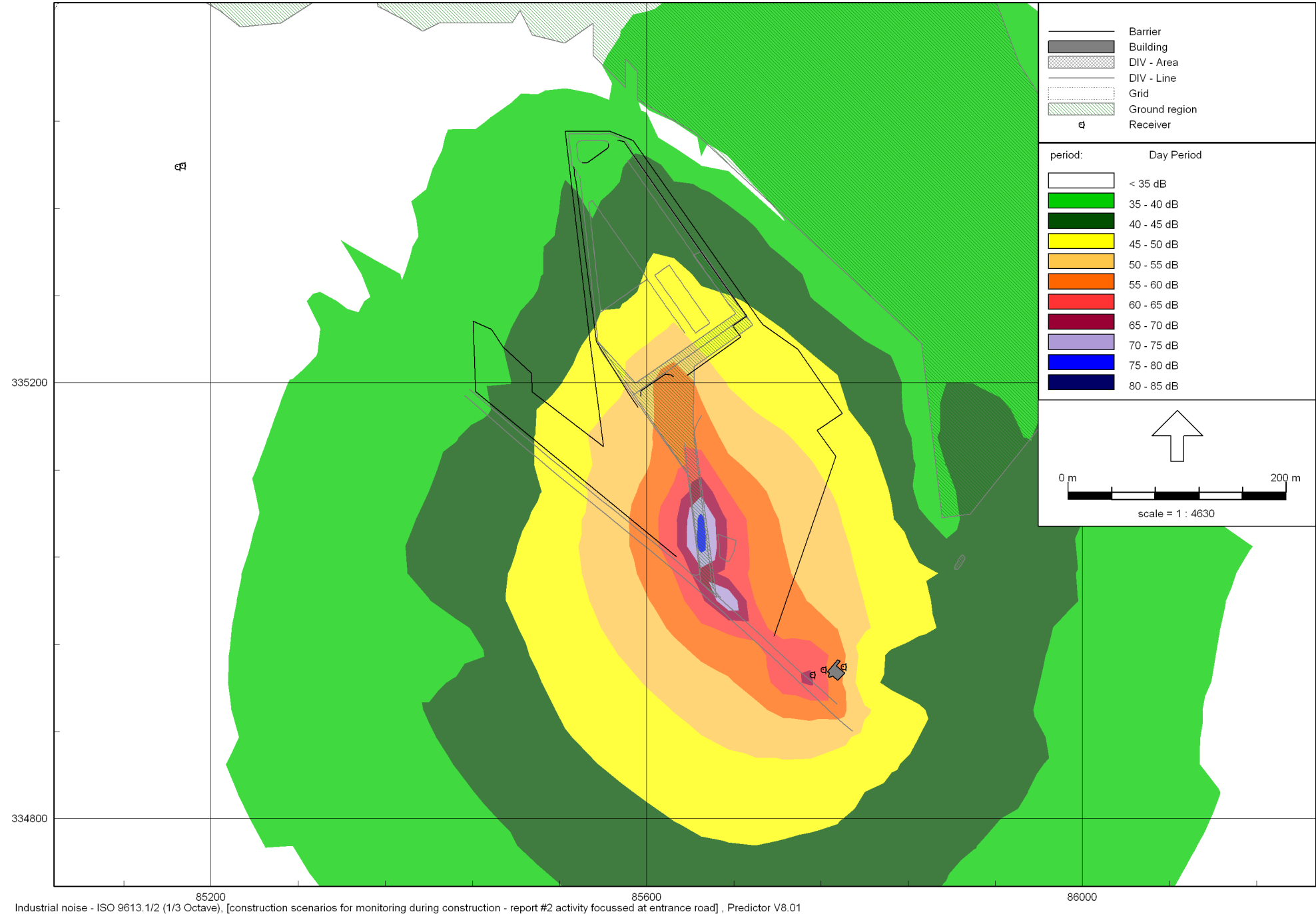
Although in excess of the 65dB $L_{Aeq,1hr}$ planning condition limit at AN2, noise levels have been shown to be a considerable margin within this limit at the nearest receptor (N19).

The downward trend in noise monitoring levels throughout the month of September coincides with the noisiest activities moving away from the noise logging station AN2.

E H Clarke

ALAN SAUNDERS ASSOCIATES





Appendix 4

Irish Archaeological Consultancy Ltd.

Corrib Onshore Pipeline
Monthly Archaeological Report
Aughoose Site

DoAHAG Licence number: 11E0214
DoAHAG Metal detection Licence ref: 11R0090
Director: James Kyle

Month Ending: 30th September 2011

IAC Irish Archaeological
Consultancy

1.0 General Review of Works

1.1 Stage (i) Works

Works commenced Monday the 25th of July 2011.

2.0 Staffing Levels

The following staff were a constant presence on site:

1 No Site Director –James Kyle, David Bayley

All plant machinery was provided by Roadbridge Ltd.

3.0 Areas Investigated

- Construction works were carried out on several areas of the Aughoose site these were monitored under strict archaeological supervision. These works comprised:
- Ongoing enlargement of the temporary compound area on the peat bog and the subsequent placement of bog mats within the compound area.
- The placement of bogmats and subsequent excavation of the roadside bank to the east and west of the temporary access gateway, to facilitate the erection of the site fencing.
- The construction of bog mat roads across the site, and the levelling of peat to facilitate construction works in specific site areas.
- The monitoring of the construction works for v-ditches on either side of the proposed main access road and access A and associated drainage lagoon.
- The construction of v-ditches and associated drainage lagoons/silt ponds, in advance of future access road continuation.
- The placement of bog mats around the site perimeter and erection of site fencing, including the excavation of trenches for the mammal proof fence is ongoing.
- The testing of the turving equipment and subsequent re-depositing of sod.
- Auxiliary temporary drainage works.

In addition to the above, all construction works which had any impact on the peat and underlying residual ground substrate were monitored and nothing of archaeological significance was revealed.

4.0 Projected Future Work and Staff

Monitoring of all groundworks on site will be ongoing for the duration of the project to ensure a constant archaeological presence on site. This will be conducted by two licenced archaeologists: James Kyle and David Bayley, on a week on week off rotational basis.

5.0 Reporting

An archaeological progress report is to be produced on an ongoing month by month basis, with a final report due after the completion of works.

6.0 Location of Artefacts and Samples

To date no artefacts or samples have been retrieved from site.

7.0 Information any Unforeseen Difficulties

N/A

8.0 Health and Safety Issues

All staff have been inducted after receiving the requisite conflict management training and manual handling training.

10 Third Party Consultations

N/A

Summary

Nothing of archaeological significance has been uncovered as a result of works on site to date.