

Corrib Gas Development

Report for PMC Meeting Dated 11th January 2006

Prepared by : P. Mahon Senior Engineer, Project Manager for Mayo County Council

Access to site/ Environmental Issues

- Access to the Bellanaboy site has been unrestricted since shortly after the last PMC meeting.
- A significant quantity of cloudy water remains in the excavated area of the terminal footprint and has continued overtopping into the site drainage system.
- Samples of surface water continue to be taken by Mayo County Council at the discharge point from the site, on the Bellanaboy River and at Carrowmore lake. The summaries of these results are attached.
- Samples of surface water from other rivers in the Carrowmore lake catchment have also been taken by Mayo County Council in order to compare water quality with the Bellanaboy River.
- The main impact on the Bellanaboy river from the cloudy water leaving the site is a consistent increase in the Total Aluminium levels in the river downstream of the discharge point from the terminal site. Average Total Aluminium Levels at the discharge point from the site for the last measuring period were 489ug/l. Average Total aluminium levels in the Bellanaboy River for the last measuring period were 55ug/l upstream of the discharge point and 164ug/l downstream from this point. There is also an increase in the average Suspended Solids level from 10mg/l upstream to 20mg/l downstream.
- Average Total Aluminium levels for Carrowmore Lake at the intake point for the Erris Regional Water Works for the same period are 85ug/l. The maximum allowable level for Aluminium in drinking water is 200ug/l.
- Mayo County Council is aware that the water treatment plant is installed on site. The testing and commissioning of the Axonics treatment plant has progressed slowly and has not been running long enough to confirm that the quality of treated water is acceptable to Mayo County Council.
- Preliminary results taken in December while the plant was running are generally positive and the treatment plant does convert cloudy water into clear water. However difficulties with the provision of a reliable power supply have meant that the unit has not been functioning continuously since before Christmas and it has not been possible to take further samples of treated water.
- It is critical that the Axonics treatment units are functioning properly and that the performance is verified by a series of samples of the treated water. It was anticipated that the units would be fully operational at this stage and that the main environmental issue at the site affecting the quality of surface water would have been put to bed by now.

Update on Roads and Transportation

Some accommodation works at Glenturkbeg remain outstanding. These works were to be carried out by Shell E&P Ireland but, following agreement with Mayo County Council, will be carried out by the Local Authority. Repairs to haul roads, in particular the R313 and L52581 have been agreed with Shell E&P Ireland and will be carried out by Mayo County Council as soon as weather permits.

CARROWMORE LAKE (Untreated)
Results from 21 /11 /2005 to 6 /01/2006 (30 samples)
(Only 7 results to date Awaiting results)
Analysis by Complete Laboratory Solutions, Rossmuc, Co. Galway

Parameter	Units	Average	Max	Min	Drinking Water Standards (S.I. No. 439 of 2000)
Colour	mg/l	175	207	143	Must be acceptable to consumers
Odour		0	0	0	As above
Turbidity	N.T.U	4.46	7	3.1	As above
pH	pH units	6.14	6.4	5.9	≥6.5 - ≤9
Conductivity	uS/cm	125.3	144	122	2,500
Iron	mg/l Fe	0.452	0.56	0.378	0.2
Manganese	mg/l Mn	0.049	0.08	0.005	0.05
Ammonia	mg/l NH ₄	0.074	0.39	0.005	0.5
Nitrate	mg/l NO ₃	0.44	0.44	0.44	50
Nitrite	mg/l NO ₂	0.035	0.17	0.005	0.5
Total Aluminium	ug/l Al	84.29	122	39	200

ERRIS REGIONAL WATERWORKS (Final Treated Water)
Results from 21 /11 /2005 to 5 /01 /2006 (33 samples)
Analysis carried out at Erris Regional Waterworks

Parameter	Units	Average	Max	Min	Drinking Water Limits
Colour	mg/l	2.56	8	0	<10 Haz
Turbidity	N.T.U	0.55	0.64	0.5	<2.0 NTU
pH	pH units	7.11	7.48	6.75	6.5 – 8.5
Free Chlo/Res	mg/l	0.81	0.35	1.12	>0.3
Total Chlo/Res	mg/l	0.94	1.21	0.66	>0.3
Flourine	ppm	0.78	0.97	0.53	0.6-0.8

BELLANABOY RIVER

(Upstream and Downstream of discharge from Terminal site)

Results from 21 /11/2005 to 5/ 01/2006 (30 samples)

(Only 10 results to date Awaiting results)

Analysis by Complete Laboratory Solutions, Rossmuc, Co. Galway

Parameter	Units	BEL 1 (upstream)			BEL 2 (downstream)		
		Average	Max	Min	Average	Max	Min
Temp.	°C	4.41	6.1	2.2	5.02	6.4	3.3
Dissolved Oxygen	% Sat.	95.2	101	90	92.57	95	88
Suspended Solids	mg/l	9.88	40	1	20.5	63	4
Turbidity	N.T.U	4.41	9.6	1.2	5.89	14.7	2.5
pH	pH units	5.87	6.4	5.1	5.76	6.3	5.1
Conductivity	uS/cm	168.4	197	121	162.67	201	109
Total Dissolved Solids	mg/l	106.3	148	71	93.1	116	64
Phosphate	mg/l P	0.029	0.087	0.013	0.045	0.126	0.017
Phosphate	µg/l PO ₄	91	267	41	128.23	387	8
Total Phosphorus	mg/l P	0.04	0.13	0.025	0.069	0.204	0.036
Ammonium	mg/l NH ₄	0.078	0.108	0.039	0.07	0.126	0.02
Ammonia	mg/l NH ₃	0.056	0.084	0.016	0.05	0.098	0.022
Nitrate	mg/l NO ₃	0.455	0.525	0.44	0.578	1.013	0.44
Nitrite	mg/l NO ₂	0.017	0.023	0.017	0.017	0.017	0.17
Total Aluminium	ug/l Al	55.2	98	28	163.56	440	69

SP 1

(Discharge point from terminal site)

Results from 29/11/2005 to 6/01/2005 (9 samples)

Only results received for samples to date awaiting others

Analysis by Complete Laboratory Solutions, Rosmuc, Co. Galway

SP 1				
Parameter	Units	Average	Max	Min
Temp.	°C	10.67	11.3	10
Dissolved Oxygen	% Sat.	96	98	96
Suspended Solids	mg/l	18	33	7
Turbidity	N.T.U	18.58	29	3.4
pH	pH units	5.90	6.2	5.7
Conductivity	uS/cm	217	229	211
Total Dissolved Solids	mg/l	128	134	122
Phosphate	mg/l P	0.04	0.041	0.032
Phosphate	µg/l PO ₄	112	126	100
Total Phosphorus	mg/l P	0.07	0.072	0.056
Ammonium	mg/l NH ₄	0.05	0.054	0.035
Ammonia	mg/l NH ₃	0.04	0.042	0.027
Nitrate	mg/l NO ₃	0.67	0.886	0.487
Nitrite	mg/l NO ₂	0.02	0.019	0.017
Total Aluminium	ug/l Al	488.75	650	374

Bellanaboy Bridge Site

Report to the Project Monitoring Committee

11th January 2006

Work undertaken

- No construction activities were carried out during the last reporting period.
- Environmental or geotechnical monitoring works continued.
- Surface water treatment equipment installed and is currently being commissioned.

on or off site during the months of November and December.

Waste – Approximately 30m³ (3 skips – 1 metal, 1 timber and 1 general waste) of non-hazardous waste was removed off site during the months of November and December. No hazardous waste was removed. The effluent holding tanks were emptied and approximately 26 m³ (26,140 litres or 5,750 gallons) was removed. Approximately 2.7m³ (2,728 litres or 600 gallons) were removed from the on site portaloos.

Outlook from January 2006 onwards

- Installation of weir structures for the purpose of flow monitoring at the surface water monitoring location downstream of the settlement ponds and upgrading of the weirs upstream of the ponds will take place at the end of January.
- Environmental care, monitoring & maintenance works.
- Operate surface water treatment equipment to deal with surface water resulting from rainfall in order to prevent run off erosion of fine silt into watercourses.
- Geotechnical monitoring.

Water quality – Apart from the period between 20th November and 6th December when personnel could not access the site, all locations were accessible for download, recalibration and reinstallation during the months of November and December. There have been a number of intermittent

Phosphate equipment errors (power supply and calibration issues) during the period, and the analyser is currently out of action. The problems are expected to be rectified in the near future. The dissolved oxygen sondes have been causing problems and specialist maintenance is scheduled for later this month. Grab sampling continued at all monitoring locations and as a result of the equipment errors sampling frequencies were increased at SP1). A summary of the main surface water parameters measured for the grab sampling events in November and December at SP1 (range of lowest to highest) are presented below:

pH

6.3 – 7.4

Suspended solids (mg/l)

<4 - 22

ENVIRONMENTAL REPORT

Dust – No dust monitoring was undertaken (no construction work undertaken).

Fuel – Approximately 2.5m³ (~2,420 litres or 532 gallons) were delivered to site in November and approximately 14m³ (13,750 litres or 3,025 gallons) were delivered in December.

Noise – No noise monitoring was undertaken (no construction work undertaken).

Traffic – There were no HCV (heavy construction traffic) traffic movements

Phosphate ($\mu\text{g/L P}$)

13 – 53

Conductivity ($\mu\text{S/cm}$)

136 - 231

Dissolved Oxygen (% Sat O_2)

No results.

Turbidity (mg/L)

15.4 – 37.8

Nitrate (mg/L NO_3)

<0.44 – 2.83

Monthly graphs for TSS, Orthophosphate (only grab samples results are provided due to equipment malfunction) and Turbidity are attached for the months of November and December. Action and Trigger Levels presented on the graphs are described in Section 7.0 of the Environmental Monitoring Plan.

Groundwater samples were taken and down hole monitoring equipment was downloaded for the months of November and December. A summary of the main groundwater parameters measured (range of lowest to highest):

pH

5.8 – 6.8

Temperature ($^{\circ}\text{C}$)

11.1 – 12.1

Conductivity ($\mu\text{S/cm}$)

256 – 416

Nitrate (mg/L NO_3)

<0.44 – 4.55

Phosphate ($\mu\text{g/L P}$)

<10

Total Dissolved Solids

206 – 243

Vibration monitoring – No vibration monitoring took place during the months of November and December.

Complaints – There were no construction activity related complaints logged with either SEPIL or RBL during the months of November and December. Protest action at the main gates remained and site was not accessible for a 2 week period end of November/early December.

Incidents – There were three monitored or recorded environmental exceedances and near misses during the months of November and December. These were:

Incident No. 1: The ISS action level (25mg/l) was exceeded on the 12th November at 13.00. This was due to mineral rich water from the terminal footprint making its way into the surface water drainage system. The water in the southern section of the terminal footprint was then recirculated into the north eastern part of the footprint.

Status – Actioned and Closed.

Incident No. 2: Equipment Failure – The PO_4 analyser started to produce negative results. The results were forwarded to the manufacturer for review.

Status – Open. A technician from the manufacturer is due on site Wednesday 11th January.

Incident No. 3: On the 08th December two site employees (one RBL and one Shell) went to retrieve the surface and groundwater sondes for the fortnightly download and recalibration. The sonde at MP1 (as per Environmental Monitoring Location Map) located near to Gate 3 (gate to the settlement ponds) was missing. The sonde suspension cable was loose on the ground. An inspection of the surrounding area provided no trace of

the sonde. A down-hole investigation was carried out but the sonde was no present. The instrument disappearance was reported to the Gardai who followed this up with a site visit.

Status – Investigated by Shell and An Garda Síochana and remains Open.

the ponds will take place at the end of January. Telemetry technology also to be installed on the downstream device to facilitate downloading and will also act as an early alarm.

- Commissioning and continuous operation of on-site surface water treatment plant (Axonics).
- Remove of all waste and effluent from site on an as needs basis.
- Inspect, repair (if required) and recalibrate all in situ monitoring equipment.
- Monitor/sample and download water (surface and ground) quality monitoring devices.

November 23rd Report Incidents Follow-Up

Incident: There was a fuel leak from one of the A40s. The machine was overfilled and diesel spilled when the machine moved. The spilled diesel was cleaned up using absorbent material and bagged for disposal to a licensed contractor. A small area of contaminated soil (approx 0.5m x 0.5m and approx 100-200mm deep) was excavated and is presently stored on site for disposal. Disposal of this material will be in accordance with the site Waste Management Plan.

Status – Investigated and Closed.

Incident: There was a fuel leak from the on-site fuel tanker re-fuelling hose and nozzle. The spilled diesel was cleaned up using absorbent material and bagged for disposal to a licensed contractor. A small area of contaminated soil was excavated (approx. 1m x1m and approx 200mm deep) and is presently stored on site for disposal. Disposal of this material will be in accordance with the site Waste Management Plan. The tanker was moved into the on-site fuel storage bunded area and a container placed under the nozzle.

Status – Investigated and Closed.

Near Miss: The phosphate (PO4) action limit was exceeded.

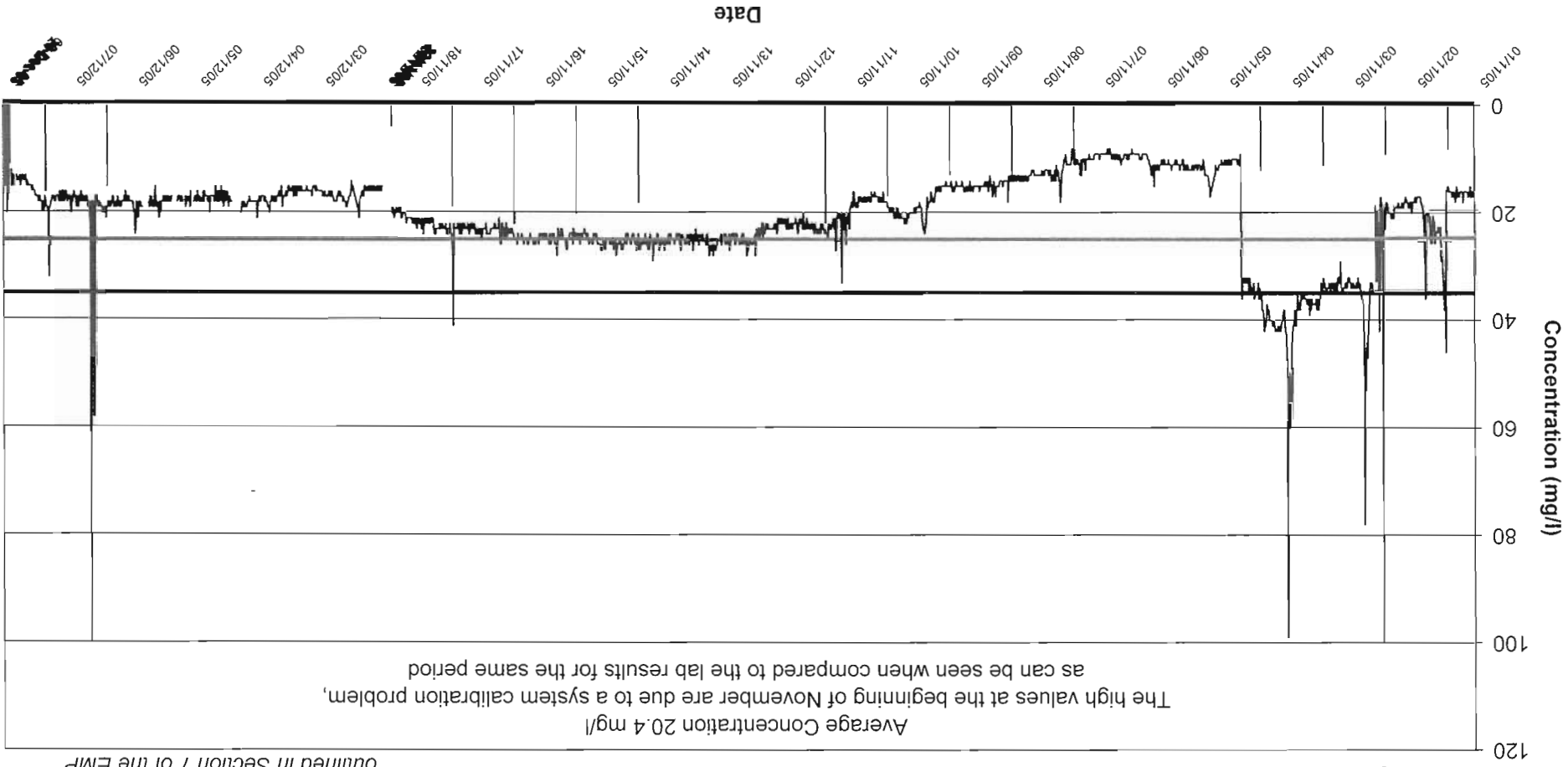
Status – Additional grab samples were taken for laboratory confirmed analyses to confirm. No further action taken. Closed.

Necessary Environmental Works

- Continuous drainage maintenance
- Installation of weir structures at the monitoring location downstream of the settlement ponds and upgrading of the weirs upstream of

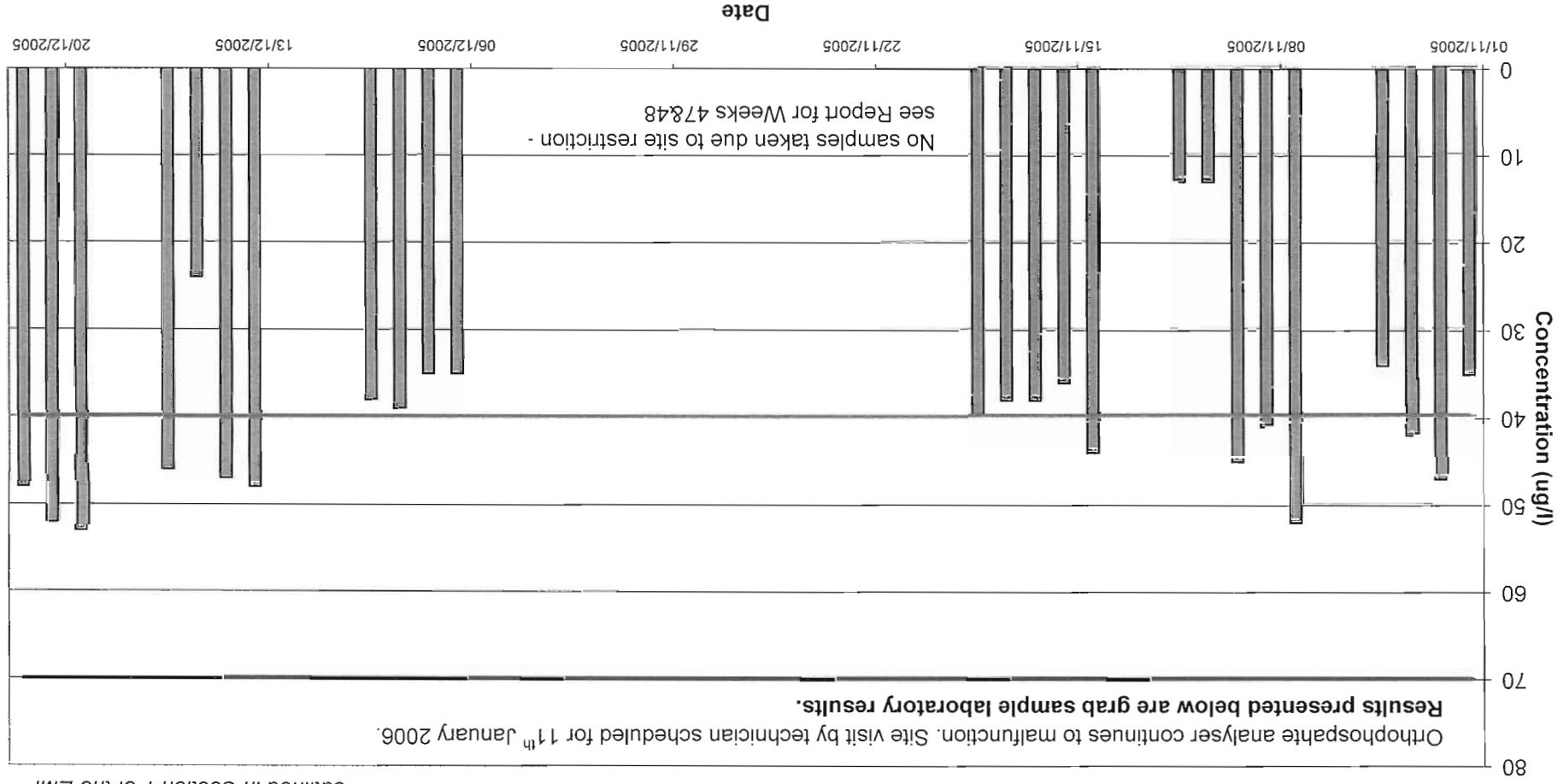
Total Suspended Solids Results at SP1 for Nov/Dec 2005

*NB - Action and Trigger Levels are
outlined in Section 7 of the EMP*



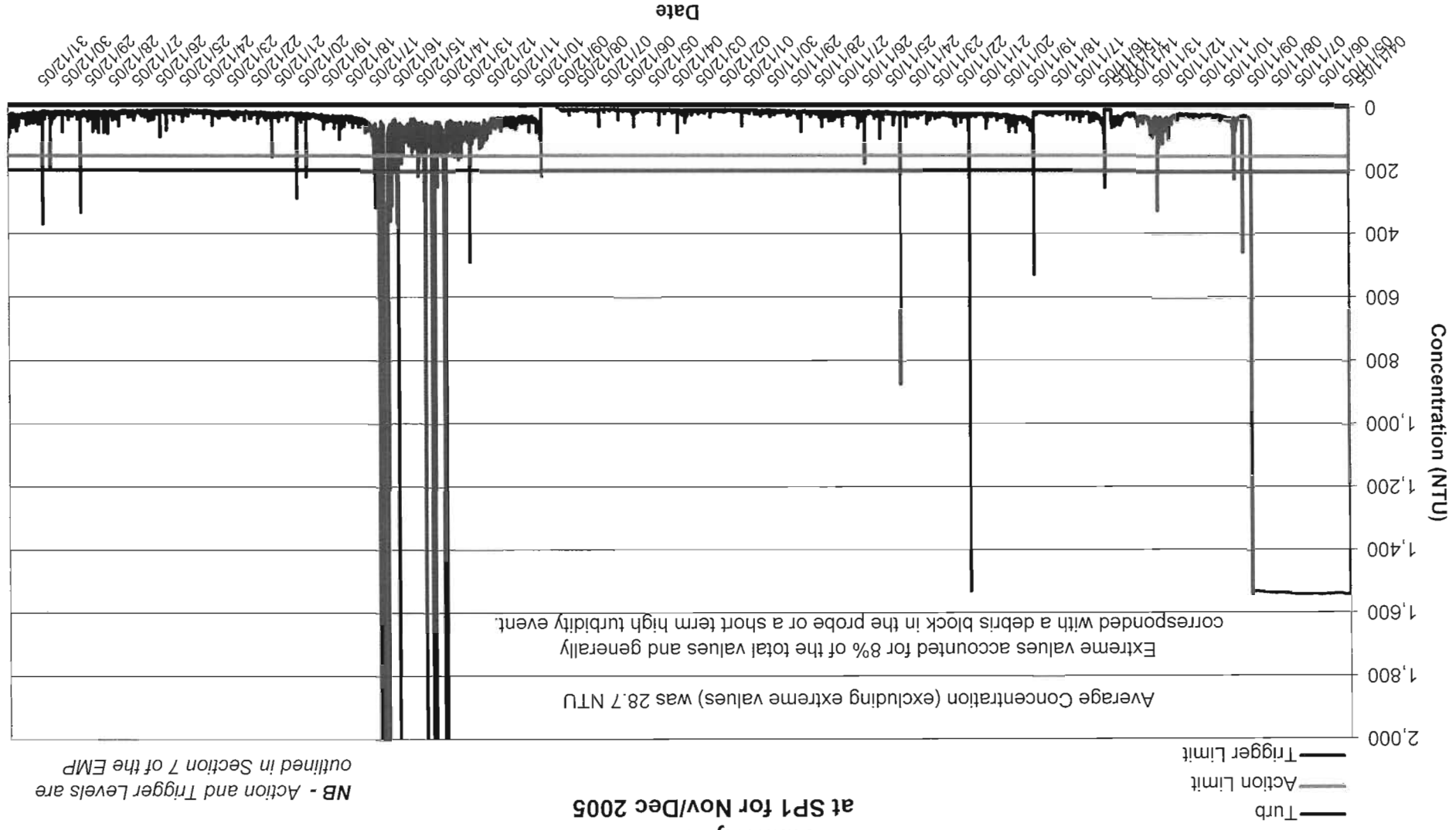
Orthophosphate Results at SP1 for Nov/Dec 2005

**NB - Action and Trigger Levels are
outlined in Section 7 of the EMP**



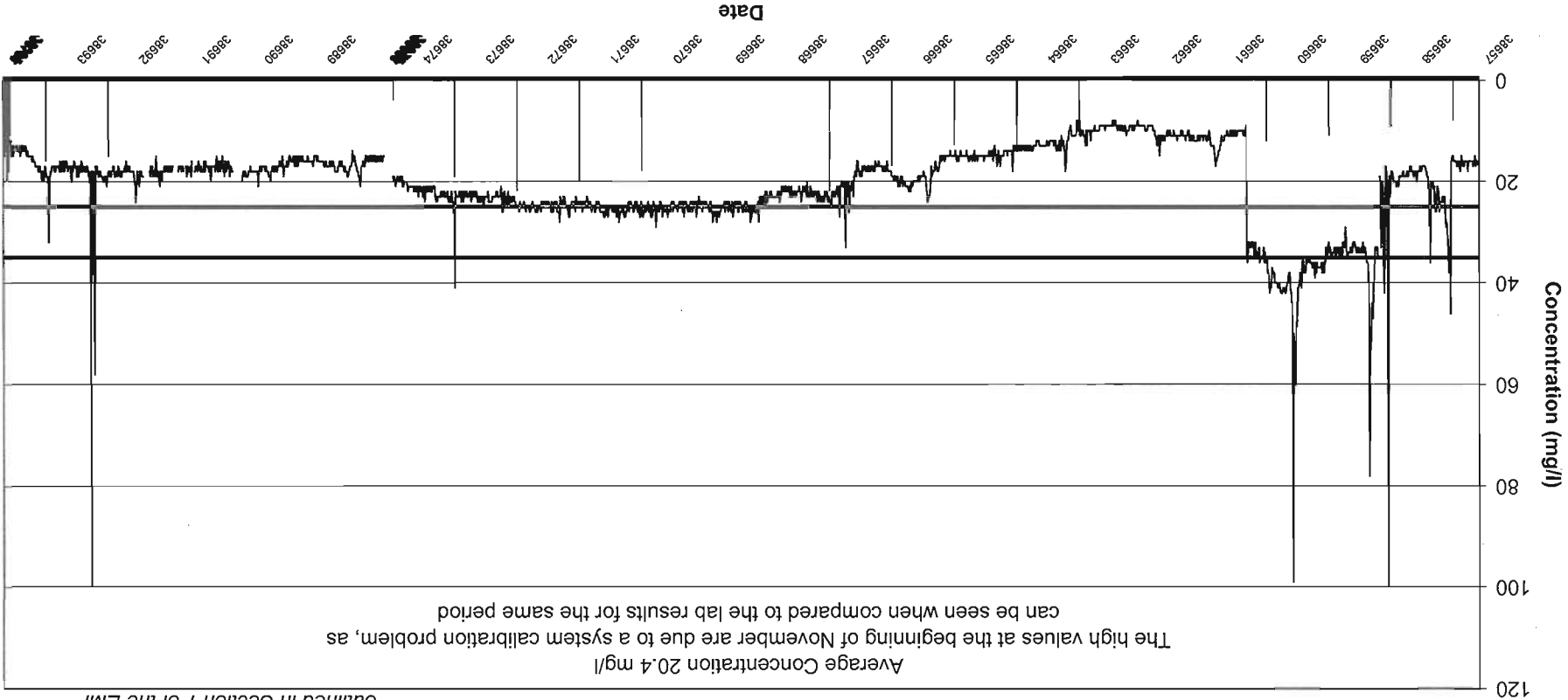
Turbidity Results at SP1 for Nov/Dec 2005

NB - Action and Trigger Levels are outlined in Section 7 of the EMP



Total Suspended Solids Results at SP1 for Nov/Dec 2005

NB - Action and Trigger Levels are outlined in Section 7 of the EMP



Environmental Management System Up-Date No. 9 (11/01/06)

Environmental Monitoring:

- One non-compliance was recorded in relation to the Waste Licence at the Srahmore site since the last PMC Meeting 23/11/05). A suspended solids result of 45 mg/l at SW4. The limit is 2/10 consecutive samples may exceed 1.2 times 35mg/l (42mg/l). Therefore the result was 3 mg/l above the limit. The result for the same day at SW104 (300-400m further downstream before discharge to the Munhin River) was 13mg/l. Results from the Munhin River, upstream and downstream of the Srahmore emission point, since deposition has commenced, have been on average 10 mg/l and 8 mg/l. The EPA has been notified, with no further action required.

- There were no complaints received at the site since the last meeting.

Environmental Work:

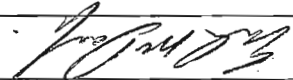
Two new 150mm pumps have been purchased and are being used to pump excess water from the swale into the controlled overflow area (Area 7), during heavy rainfall events.

All environmental remedial work has been completed at the site, and the winter environmental monitoring programme is on-going.

Three personnel remain on site during the suspension period for Environmental Monitoring and Security.

END.

Environmental Corrective/Preventative Action Report Form (EPF 2.1)

Reference Number		SR-CA/010	Date	11/01/06	Initiator:	Enda McDonagh, Bord na Mona Energy Ltd
Nature of non-compliance?		Actual / Potential		Description of non-compliance		
Exceedance of ELV at SW4. 45 mg/l where allowable ELV is 1.2 x 35mg/l (42mg/l) on 2/10 consecutive samples.						
Bodies Informed, Date and Details: Mayo County Council & North Western Regional Fisheries Board.						
Identified as a Result of: Composite sampler results from Complete Laboratory Services.						
The results from SW104 (300-400 metres down/stream of SW4), showed only 13 mg/l SS. This is located before discharge to the Mounhin River.						
Identified by:		Enda McDonagh				
Date of Identification:		09/01/06				
Action Plan:						
As was proposed under SR-CA/007-2, a new pump will be stationed at the swale gate, so as to pump into the controlled overflow during high rainfall periods. This new pump is now in-place and is being used to prevent excess water discharging to SW4, during heavy rainfall events. The controlled overflow area is now being utilised more efficiently. The effectiveness of this operation is being assessed using the results obtained weekly at SW4. As the exceedance was only 3 mg/l above the limit, subsequent results for the following weeks will be have to be consulted to establish the effectiveness of this operation.						
Responsibility: Enda McDonagh, Bord na Mona Energy Ltd						
Target Date for Completion:		Completed as and from		Actual Date of Completion:		
		21/12/05				
Closed by (Signature and Title): 						
Date:		11/01/06				