

CORRIB GAS DEVELOPMENT

Report for PMC (Terminal) Meeting on 12th November 2014.

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Project Manager for Mayo County Council.**

Water Quality – Carrowmore Lake

- Mayo County Council's Project Team has continued to monitor the surface waters in and around the Bellanaboy site. Summaries of the most recent verified results are attached, which are available on Mayo County Council Website www.mayococo.ie.
- The results show that in the last monitoring period the discharge of surface water from the Terminal Site has had no significant impact on the water quality of the Bellanaboy River and Carrowmore Lake.
- The results also show that the discharge of surface water from the Terminal Site has had no adverse impact on the quality of drinking water produced at the Erris Regional Water Supply Scheme at Barnatra.

Environmental Issues at the Bellanaboy Site

- Construction work at the terminal site is substantially complete and the facility is now in preservation mode. Work is ongoing on snagging and modification programmes. Works are ongoing on the final reinstatement of the site.
- Surface water runoff from the terminal footprint, the carrier drain road and other roads outside the terminal footprint, is treated by the axonics unit prior to discharge to the site drainage system.
- Surface water monitoring undertaken by the Developer has identified an exceedance of the Total Aluminium parameter on 9th October when a value of 216µg/l was recorded against a limit of 200µg/l. The exceedance was associated with a period of very heavy rainfall and subsequent sampling showed that the discharges had returned to within the site discharge limits.

Community Fund

- Works have been completed on all projects for which funding was allocated.

Transportation/Roads

There are no roadworks underway at present and there have been no transportation issues since the last meeting.

CARROWMORE LAKE
Results from 27/08/2014 to 21/10/2014 (2 Samples)
Analysis by Environmental Laboratory Services, Cork

Parameter	Units	Average	Max	Min
Suspended Solids	mg/l	11	16	6
Turbidity	N.T.U	7.6	12.9	2.3
pH	pH units	7.6	7.8	7.4
Conductivity	uS/cm	140	142	138
Phosphate	mg/l P	0.017	0.025	<0.009
Ammonia	mg/l NH ₃ -N	0.036	0.04	0.032
Nitrate	mg/l NO ₃ -N	<0.12	<0.12	<0.12
Nitrite	mg/l NO ₂ -N	<0.013	<0.013	<0.013
Total Aluminium	ug/l Al	63	107	18

ERRIS REGIONAL WATERWORKS (Final Treated Water)
Results from 01/09/2014 to 31/10/2014 (61 Samples)
Analysis carried out at Erris Regional Waterworks

Parameter	Units	Average	Max	Min	Drinking Water Limits
Colour	mg/l	0.8	5	0	<10 Haz
Turbidity	N.T.U	0.17	0.3	0.01	<2.0 NTU
pH	pH units	7.0	8.1	6.5	6.5 – 8.5
Free Chlo/Res	mg/l	1.34	1.75	0.81	>0.3
Total Chlo/Res	mg/l	1.46	1.87	0.94	>0.3
Flourine	ppm	0.72	0.8	0.6	0.6-0.8
Total Aluminium	ug/l	47	84	0	200

BELLANABOY TERMINAL DEVELOPMENT

BELLANABOY RIVER

Upstream and Downstream of discharge from Terminal site – to be monitored on a quarterly basis for 2014. Results for September 2014.

Parameter	Units	BEL 1 (upstream)	BEL 2 (downstream)
		Result	Result
Suspended Solids	mg/l	5	5
Turbidity	N.T.U	2.3	2.2
pH	pH units	7.5	7.4
Conductivity	uS/cm	237	262
Phosphate	mg/l P	0.011	0.013
Ammonia	NH₃-N	0.199	0.048
Nitrate	mg/l NO₃-N	<0.12	<0.12
Nitrite	mg/l NO₂-N	<0.013	<0.013
Total Aluminium	ug/l Al	23.1	23.4

SP1 (Discharge point from terminal site)
Results for August, September and October 2014 (4 Samples)
Analysis by Environmental Laboratory Services, Cork

SP 1				
Parameter	Units	Average	Max	Min
Suspended Solids	mg/l	7	11	<5
Turbidity	N.T.U	8.3	14.3	1.5
pH	pH units	7.8	8.2	7.5
Conductivity	uS/cm	311	361	249
Phosphate	mg/l P	0.01	0.013	<0.009
Ammonia	mg/l NH ₃ -N	0.04	0.05	0.03
Nitrate	mg/l NO ₃ -N	0.2	0.33	0.14
Nitrite	mg/l NO ₂ -N	<0.013	<0.013	<0.013
Total Aluminium	ug/l Al	145	257	23

Axonics Water Treatment Units (Post-treatment Results)
Results from August and October 2014 (2 samples)*
Analysis by Environmental Laboratory Services, Cork

Post-Treatment (1 Samples)				
Parameter	Units	Result	Max	Min
Suspended Solids	mg/l	<5	<5	<5
Turbidity	N.T.U	2.8	4.6	1.0
pH	pH units	7.2	7.7	6.7
Conductivity	uS/cm	402	416	387
Phosphate	mg/l P	<0.009	<0.009	<0.009
Ammonia	mg/l NH ₃ -N	0.098	0.178	0.018
Nitrate	mg/l NO ₃ -N	0.22	0.28	0.16
Nitrite	mg/l NO ₂ -N	<0.013	<0.013	<0.013
Total Aluminium	ug/l Al	463	556	369

* No discharge in September

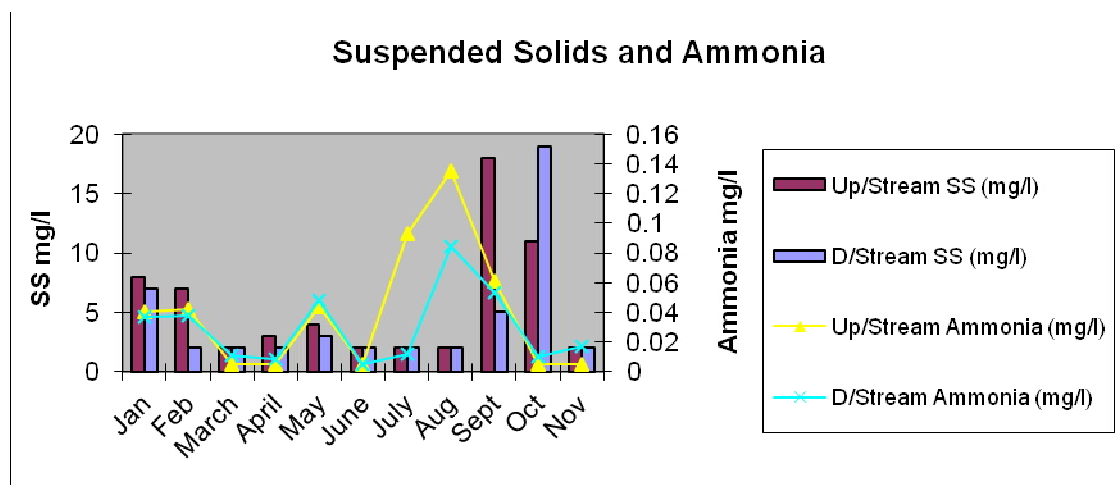
Srahmore Peat Repository
WL 0199-02
Environmental Management System Up-Date No. 70 (12/11/14)

Environmental Monitoring:

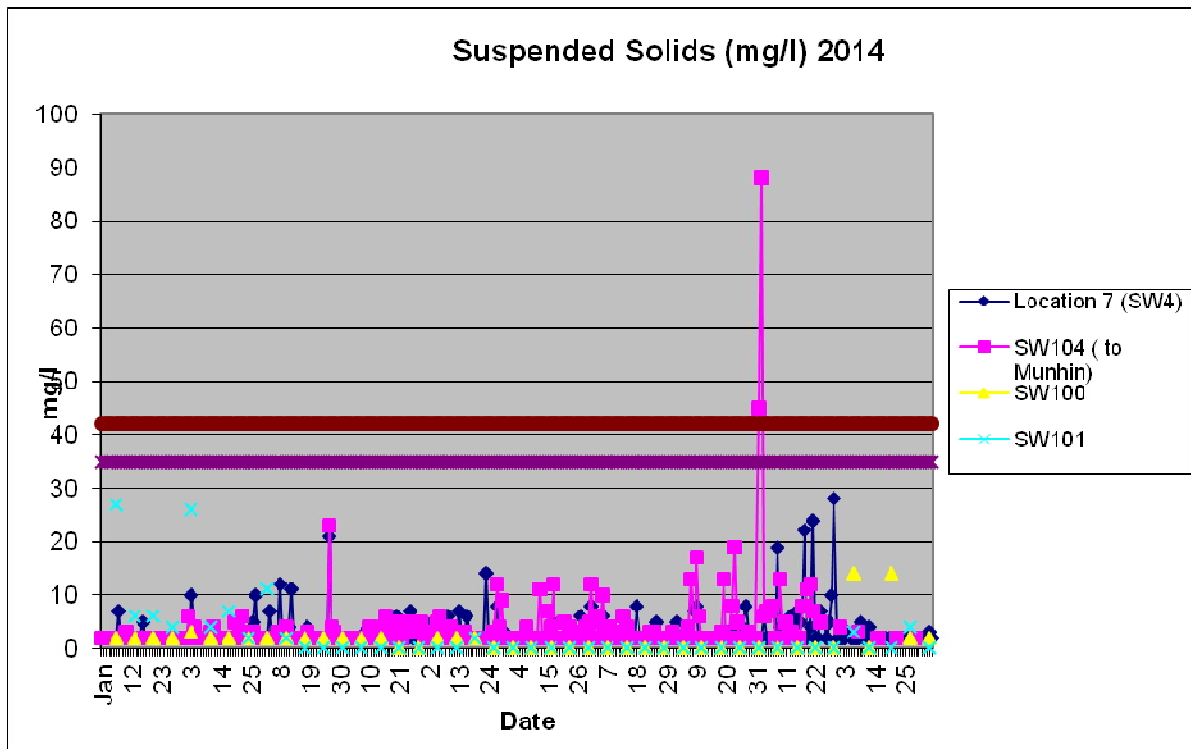
- There were no non-compliances since the last meeting in Sept 2014
- There were no complaints since the last meeting in Sept 2014.
- There were no incidents since the last meeting in Sept 2014.

Monitoring Results:

Munhin River (2014)



SW4/104/100&101 to 03/11/2014



The average Suspended Solids for 2014 to date was 3.09 mg/l at SW 4 and 3.71 mg/l at the discharge from the site to the Munhin at SW104, and 1.56 and 2.36 mg/l at SW100 and 101.

Srahmore Site Update:

Personnel:

On Site

		Tractor & General Oper.	0	Environmental	0
BnM (Engineering)	0	Fitters	0	Archaeological	0
Site Admin & Mgt.	1	Electricians	0		
		Site Supervisors	2		
		Excavator & Shovel	0		
TOTAL EMPLOYED					3

Contractors

Security	0	Catering	0		
TOTAL EMPLOYED					0

Off Site

Head Offices Staff	3			BnM (Support)	0
Environmental Officer	1				
TOTAL EMPLOYED					4

OVERALL TOTAL EMPLOYED	7
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Srahmore Site Operations:

Peat deposition is now completed. The site has been demobilised and is currently being monitored as per the licence requirements for stabilisation.

The Annual Environmental Report for 2013 was submitted to the EPA in March 2014 and is available for viewing at <http://www.epa.ie/terminalfour/waste/index.jsp>.

As of the 3rd of November 2014 the Srahmore site is compliant with Waste Licence W0199-02.

Bellanaboy Bridge Terminal Site

Report to the Project Monitoring Committee

12th November 2014

Works Undertaken

The following construction and related operations are ongoing:

- Operation of water treatment plants, environmental and geotechnical monitoring.
- Maintenance of Temporary Construction Facility (TCF).
- Minor Mechanical and Electrical Modification in preparation for operation.

Outlook November 2014 Onwards:

- Minor Mechanical and Electrical Modification in preparation for operation
- Commencement of Terminal operations.
- Continuation of environmental monitoring, geotechnical monitoring and water treatment plants operation.
- Maintenance (and partial demobilisation) of Temporary Construction Facility.
- Landscaping and supplementary reinstatement of temporary support areas commenced (including potential use of rock-breaking and sheet piling).

ENVIRONMENTAL REPORT

Dust

Dust deposition results for September and October.

D1	D2
September Dust Results	
104	89
October Dust Results	
195	228

Noise – All construction related noise levels recorded were below the agreed noise limits and any unusual values were attributed to instrumentation or weather conditions.

Traffic – traffic movements are given in the below table.

Traffic Movements		
August	September	October
1,235	1,781	1,254

Fuel – Approximately 185.53m³ of fuel was delivered to site during September and October.

Waste – The following non-hazardous waste quantities were removed from site during September and October: 12 skips of cardboard/plastics, 14 skips of timber, 3 skips of organic waste, 4 skips of metal and 2 skips of residual waste.

There were 7 collections for the removal of oily waste and chemical waste for the period. The effluent holding tanks were emptied of approximately 1,216m³ of sewage during the same period.

Water Quality – A summary of the main surface water parameters measured for grab sampling during September and October (available range of lowest to highest) at SP1 is presented below:

pH (pH Units)

7.5 – 7.8

Suspended Solids (mg/l)

5.0 – 9.0

Orthophosphate (µg/l P)

<10.0 – 17.0

Nitrite (mg/l NO₂)

<0.017 (detection limit)

Conductivity (µS/cm)

239 - 244

Turbidity (NTU)

9.7 – 13.8

Groundwater samples were taken and borehole monitoring data downloaded for the month of September. A summary of the main groundwater parameters measured (range of lowest to highest) follows:

pH (pH Units) 5.3 to 6.4

Conductivity (µS/cm) 292 to 440

Nitrate (mg/l NO₃) <0.44 to 0.81

Total Dissolved Solids (mg/l) 148 to 246

Complaints – There were no written construction activity related environmental complaints logged with SEPII during the reporting period.

Incidents – There were no environmental incidents during the reporting period.

Exceedances – There was 1 exceedance during the reporting period.

A value of 216µg/l was recorded for total aluminium at SP1 on the 9th October 2014. This value is in exceedance of the site discharge limit for total aluminium of 200µg/l. Heavy rainfall levels contributed to this increase in concentration. The exceedance was caused by the effects of excessive rainfall levels on the site surface waters over a short period of time. In advance of the exceedance, there was 50.8mm of rainfall. A subsequent sample was taken on the 16th October which had a total aluminium concentration of 198µg/l which is within the site discharge limit.

Update on pH exceedance incident:

Subsequent to the high pH elevations encountered at SP1 in November 2012 modification works on the channel were completed in June. Monitoring of pH has been undertaken since the completion of the works on the channel. From reviewing the monitoring results the pH levels of the surface water at SP1 is within the pH discharge criteria. Exceedance has been closed.

Necessary Environmental Works

- Continue operation of on-site surface water treatment plant. The treatment plant has operated with good performance over the period of adverse weather conditions.
- Removal of all waste and effluent from site as required.
- Inspect, repair (when required) and recalibrate all in situ monitoring equipment.
- Monitor/sample and download water (surface and ground) quality monitoring devices.

Water Quality Monitoring Graphs

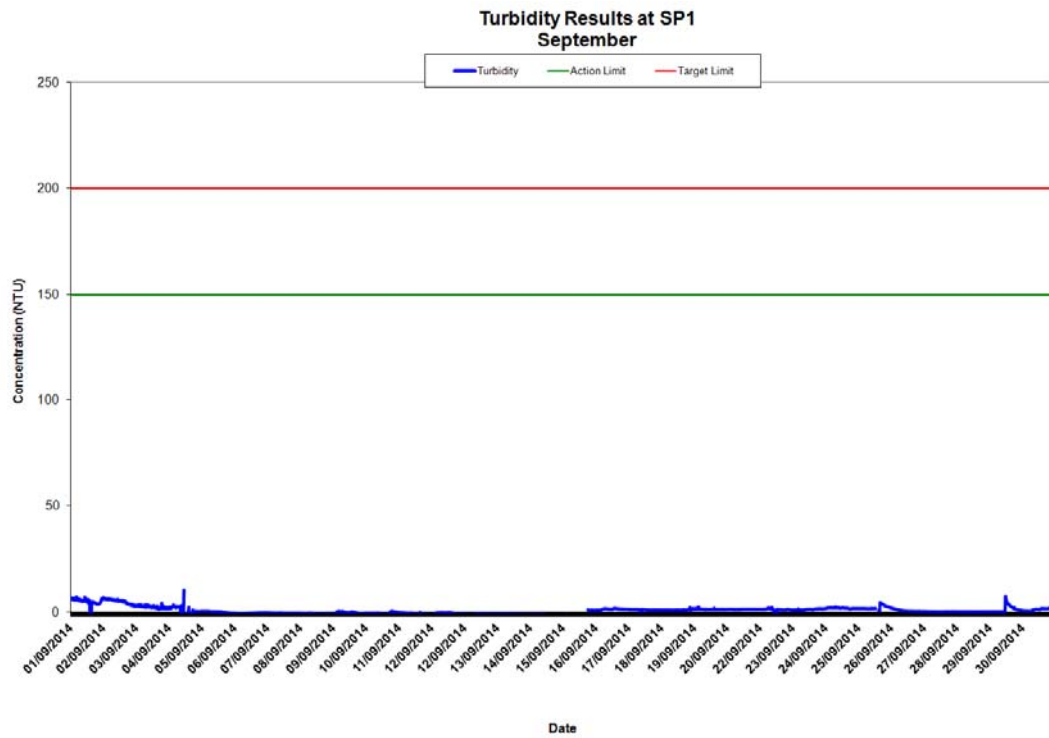
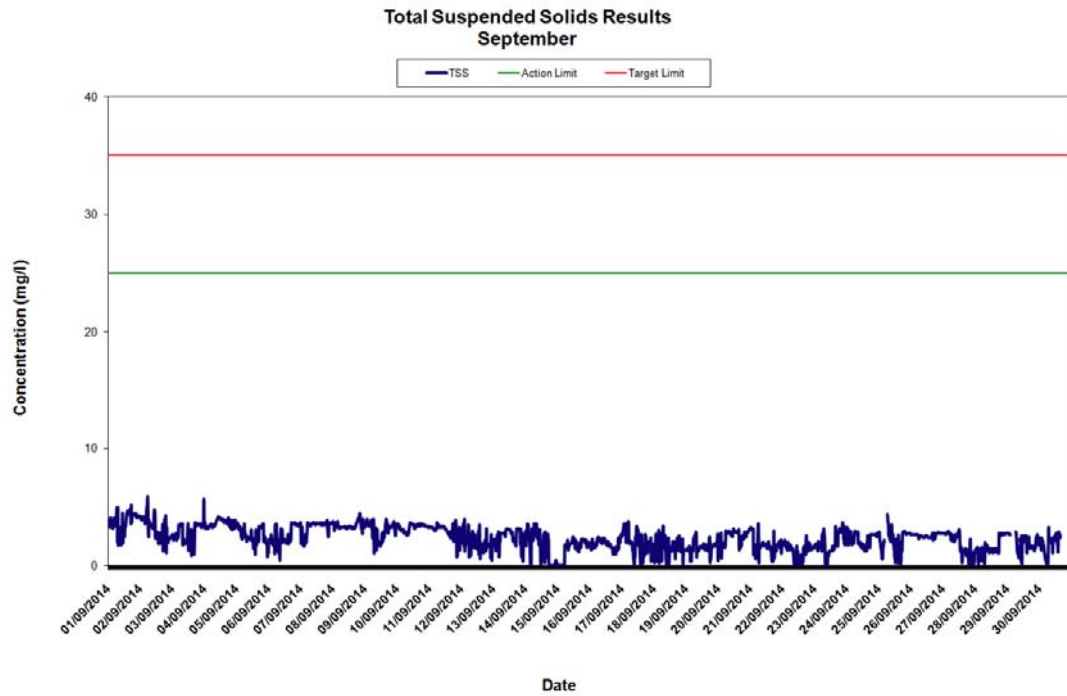
Graphs are attached for monthly continuous monitoring data at SP1 for total suspended solids, turbidity, and orthophosphate. Please see commentary below for each graph.

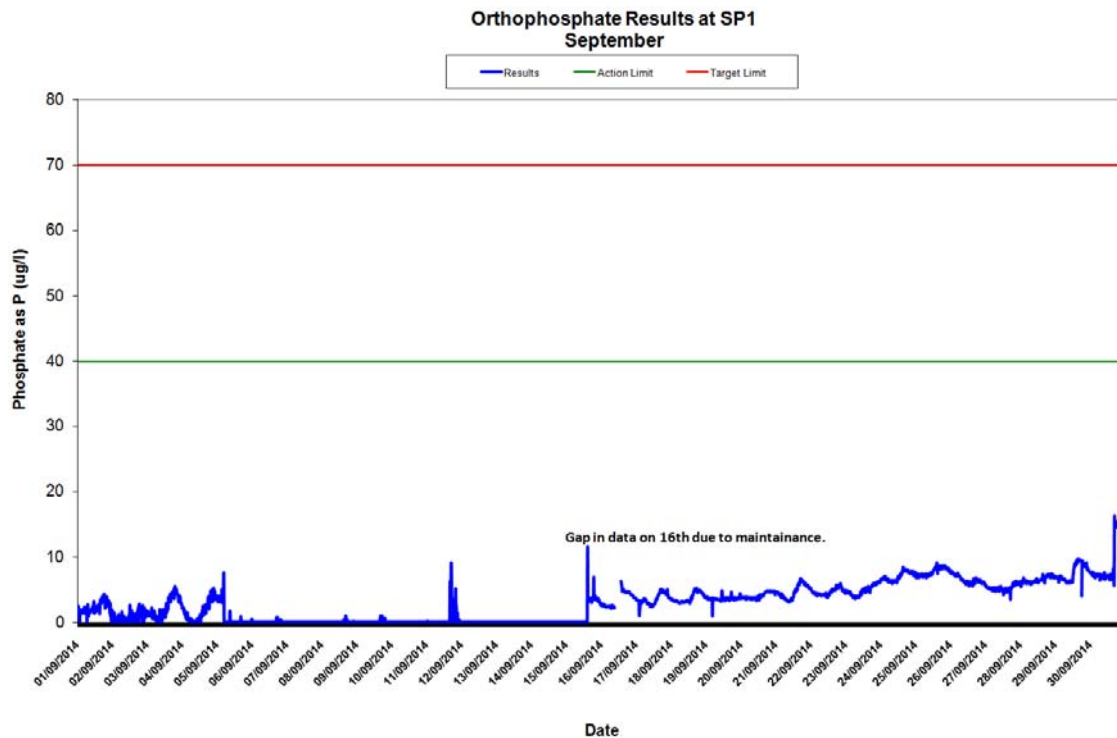
Total Suspended Solids: The TSS graphs for September and October are displayed below. Spikes in the chart are evident during periods of heavy rainfall.

Turbidity: All values for September and October are all lower than the action limit.

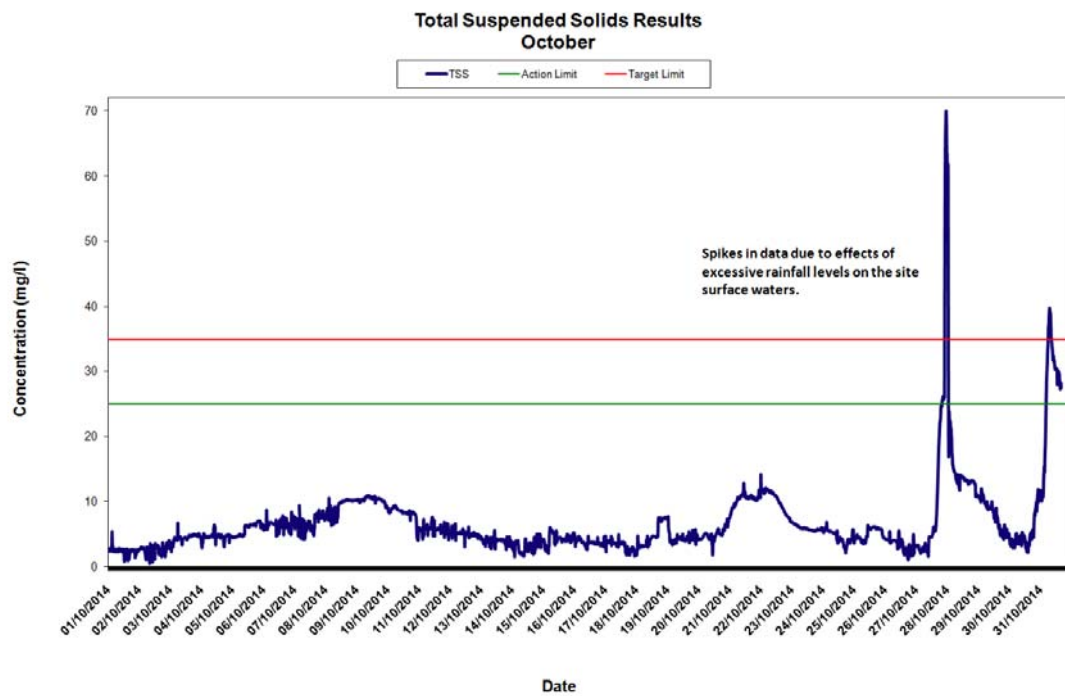
Orthophosphate: The results yielded for September and October were below the action limit.

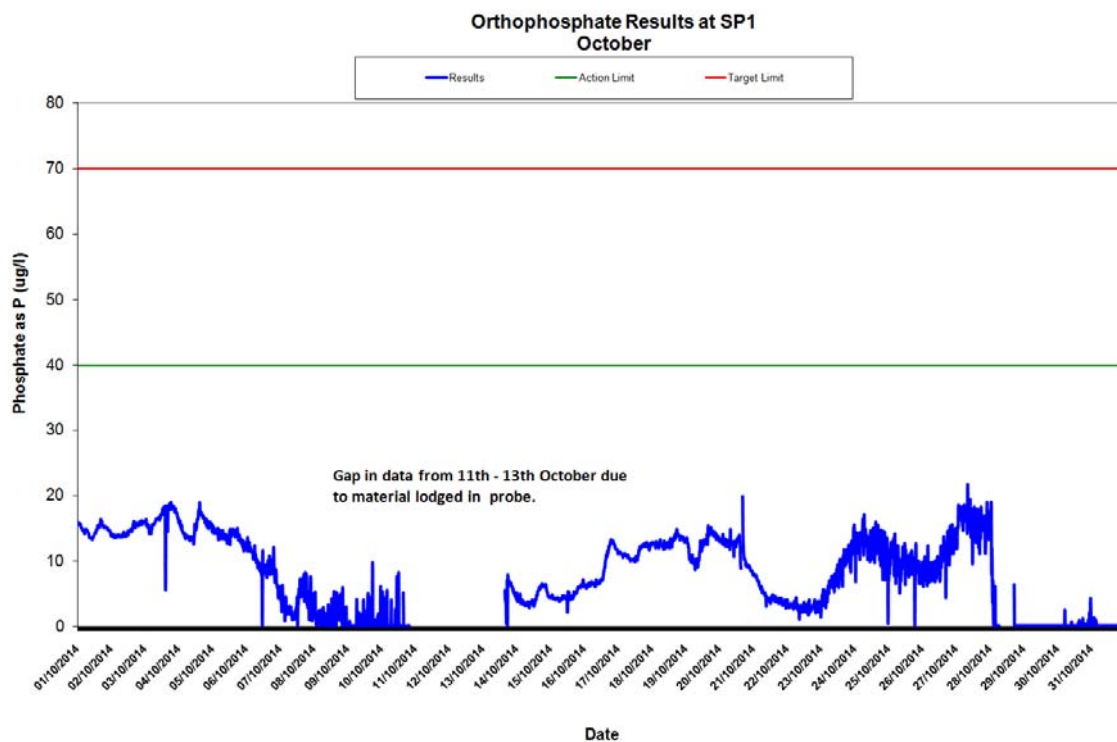
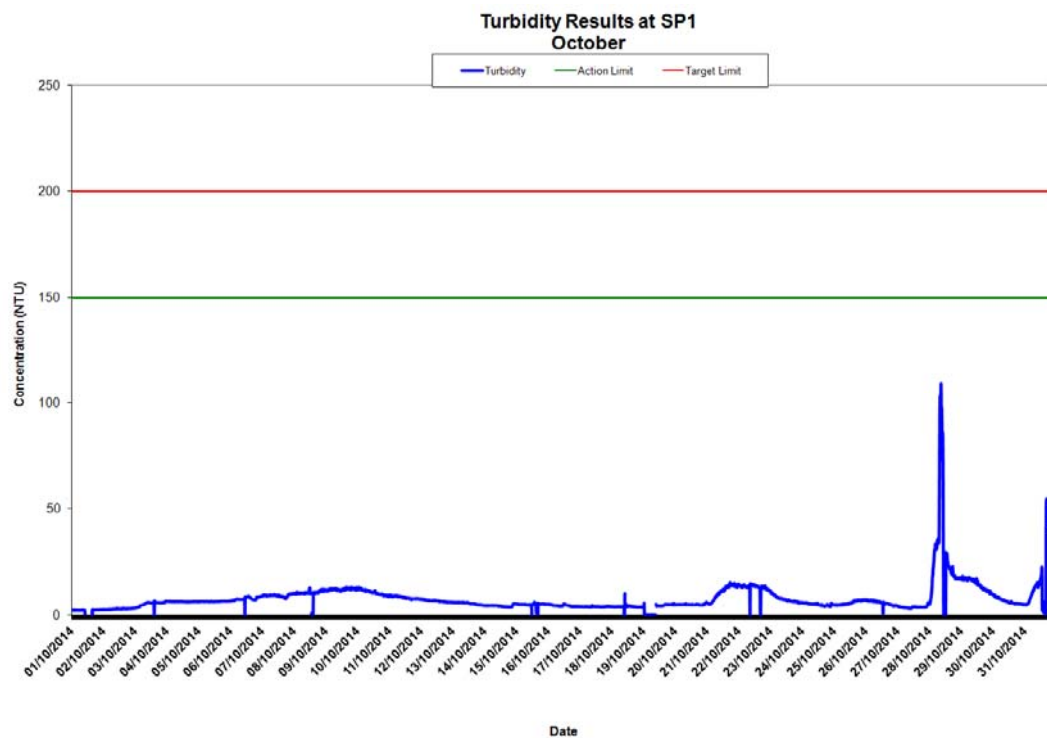
September Graphs





October Graphs





Review of Construction Environmental Monitoring

Summary Report to Project Monitoring Committee

November 2014

1.0 Introduction

Planning approval was granted by An Bord Pleanála in October 2014. Construction of the Bellanaboy Bridge Gas Terminal (BBGT) commenced in December 2004. From the date of commencement of construction SEPIL was required in accordance with Condition 19 to develop and implement an environmental management system (EMS) and also undertake an environmental monitoring plan (EMP) with respect to Condition 33.

Construction of the BBGT comprised of the following:

- Site activities and enabling works;
- Peat excavation and transport offsite;
- Earthworks site preparation and levelling;
- Groundworks (piling and civil);
- Structural framework (pipe-racks and equipment support);
- Construction and main buildings;
- Installation of major equipment items and installation;
- Piping fabrication and erection;
- Testing of equipment and systems;
- Installation of electrical and instrument systems;
- Commissioning of the plant and process;
- Landscaping of the site including tree planting, compensation habitat development and environmental conservation of the surrounding areas.

2.0 Environmental Monitoring

An EMP was implemented in accordance with Condition 33 which entailed monitoring of surface water, ground water, dust and noise. The EMP was reviewed on an annual basis and/or as required throughout the construction phase to reflect site conditions. The appropriate sampling and analytical techniques were undertaken by SEPIL for the sampling, analysis and quality control of the monitoring activities.

2.1 Surface Water

Surface water was monitored throughout the construction phase of the BBGT, prior to the discharge from the BBGT drainage system. The discharge monitoring location was known as SP1. Continuous analysers and telemetry were installed at SP1 for control and management of the site surface water discharge. Where surface water elevations were encountered during the construction phase corrective

measures were implemented to rectify site conditions and to meet discharge requirements. These elevations mainly occurred during periods of heavy rainfall and the system recovered within a short time after such periods.

A water treatment plant, known as Axonics, was established onsite to ensure compliance was achieved. The plant was also monitored to verify performance throughout the construction phase. Methods of diversion, collection and treatment have varied according to site requirements and the type of ground conditions encountered during construction. Surface water discharges have been subject to discharge limits which were monitored throughout the construction phase. A review of monitoring results over the period has shown no significant impact on the downstream surface water or Carromore Lake.

2.2 Groundwater

Groundwater monitoring was undertaken at the BBGT. The groundwater wells were positioned up gradient and down gradient of construction works on the terminal footprint. Groundwater monitoring consisted of analytical sampling and analysis. Some selected monitoring locations and some of the wells had continuous monitoring equipment installed which measured for conductivity, pH and temperature. A review of monitoring results over the period has shown no notable changes or variation in groundwater quality.

2.3 Dust Monitoring

Dust monitoring was undertaken as required under Condition 26. The locations that were selected were north, south, east and west points during earth works and initial construction phase on the BBGT. In recent years, two monitoring locations were used as the works being undertaken were less likely to cause dust generation. Onsite control measures were also implemented to ensure dust levels were maintained below the dust limit. During the construction period dust levels were minimised and where there were occasions of localised elevations investigations were undertaken to assess the cause and prevent a recurrence.

2.4 Noise

Noise monitoring was undertaken to ensure that construction site activities were not having an impact on the nearest noise sensitive receptors. During the period of construction a noise monitor operated continuously and there was no identified noise exceedance over the construction period.

3.0 Waste Management

During the construction phase of the BBGT a competent authorised waste contractor was engaged with to manage the waste activities onsite. The waste on the BBGT was segregated into the relevant waste streams and where possible the waste was reused, recovered or recycled. Waste management activities were closely monitored by SEPIL to ensure all waste activities were undertaken in accordance with the BBGT requirements.

4.0 Fuel Consumption

The fuel consumption levels were monitored on a monthly basis to ensure efficient use of fuel on the BBGT.

4.0 Complaints

In accordance with Condition 36, a complaints procedure was developed and a process put in place. When a complaint was received, the complaint was investigated and corrective actions were implemented to prevent a recurrence where possible. A response was provided to the complainant to provide follow up on the complaint. This procedure will continue to be implemented beyond the construction phase.

5.0 Incidents & Exceedance

As part of the BBGT EMS, a definition of when an occurrence of an incident and exceedance was provided, in addition to the reporting process involved. All exceedances or incidents were reported to Mayo County Council and were accompanied by an appropriate report which detailed the cause of the incident/ exceedance and identified corrective actions to address the incident/ exceedance to prevent a recurrence.