Public Report

Q-4411-15-RP-001

Talinga Water Treatment Facility Discharge Water Quality Report

Contents

1. Summary

Australia Pacific LNG is a joint venture between Origin, ConocoPhillips and Sinopec, to deliver a CSG to LNG project which will deliver gas to domestic and overseas markets.

Australia Pacific LNG is the leading CSG producer in Queensland, supplying more than 40% of the State's domestic gas requirements.

The Talinga Water Treatment Facility (TWTF) has been designed using the best available technology to treat water produced as part of the gas extraction process so that it can be put to a number of beneficial uses, including discharge to the Condamine River, which is a source of public drinking water.

This report presents a summary of the water quality monitoring results obtained during the first six months of 2011 and demonstrates that the TWTF consistently and reliably treats CSG water to a standard which is safe for discharge into a source of public drinking water.

2. Introduction

Coal seam gas (CSG) production relies on the removal of water from the coal seams allowing the flow of gas so that it can be readily extracted. The removed water is referred to as CSG water.

CSG water is brackish and highly alkaline in nature and therefore has very few applications for use. However, after treatment through a desalination process, CSG water can be put to effective and beneficial use.

The Talinga Water Treatment Facility (TWTF) is one of Australia Pacific LNG's major installations where CSG water is treated. The TWTF uses the best available technologies to treat the water to a high standard.

Once treated, the CSG water is used onsite for Australia Pacific LNG's business activities including for drinking and domestic purposes, operations process water and construction activities. This reduces Australia Pacific LNG's reliance on other water resources.

The treated CSG water is also discharged to the Condamine River where it contributes to the base flows. The Condamine River is an essential resource to local communities and landowners in the region. It is the principal drinking water supply for the Condamine Township (located approximately thirty kilometres downstream of the TWTF discharge location) as well being used for agricultural irrigation and to support local industries. Protecting its existing quality and condition is therefore vital to ensure its long term sustainable use.

Figure 1 - TWTF Discharge Location

To ensure the safety and reliability of the treated CSG water entering the River, Australia Pacific LNG is engaged in a comprehensive ongoing monitoring program of water quality sampling, testing and reporting. This report summarises the results of that monitoring conducted during the first half of 2011.

In presenting this information Australia Pacific LNG honours its commitment to providing transparency and ensuring the community, landowners and other key stakeholders have confidence that the treated CSG water can be safely discharged into a source of drinking water.

This is the first report that publishes information on TWTF's treated CSG water quality. Quarterly reporting will continue throughout the Facility's operational life while it is discharging water into a source of drinking water.

All the reporting is publically available and can be viewed and downloaded from the Australia Pacific LNG website at www.aplng.com.au. Any enquiries relating to this report should be made to toll free number 1800 526 369.

Alternatively, general enquires can be made by email (contact@aplng.com.au) or mail to Australia Pacific LNG Pty Limited, GPO Box 148, Brisbane, QLD, 4001.

3. Talinga Water Treatment Facility Scheme Description

The TWTF uses a series of water screening, filtration and desalination processes to remove impurities from the CSG water to ensure its safety and reliability for supply into a drinking water source and beneficial uses. The key treatment processes include:

- Feed pond;
- Filtration;
- Reverse osmosis; and
- Treated CSG water conditioning.

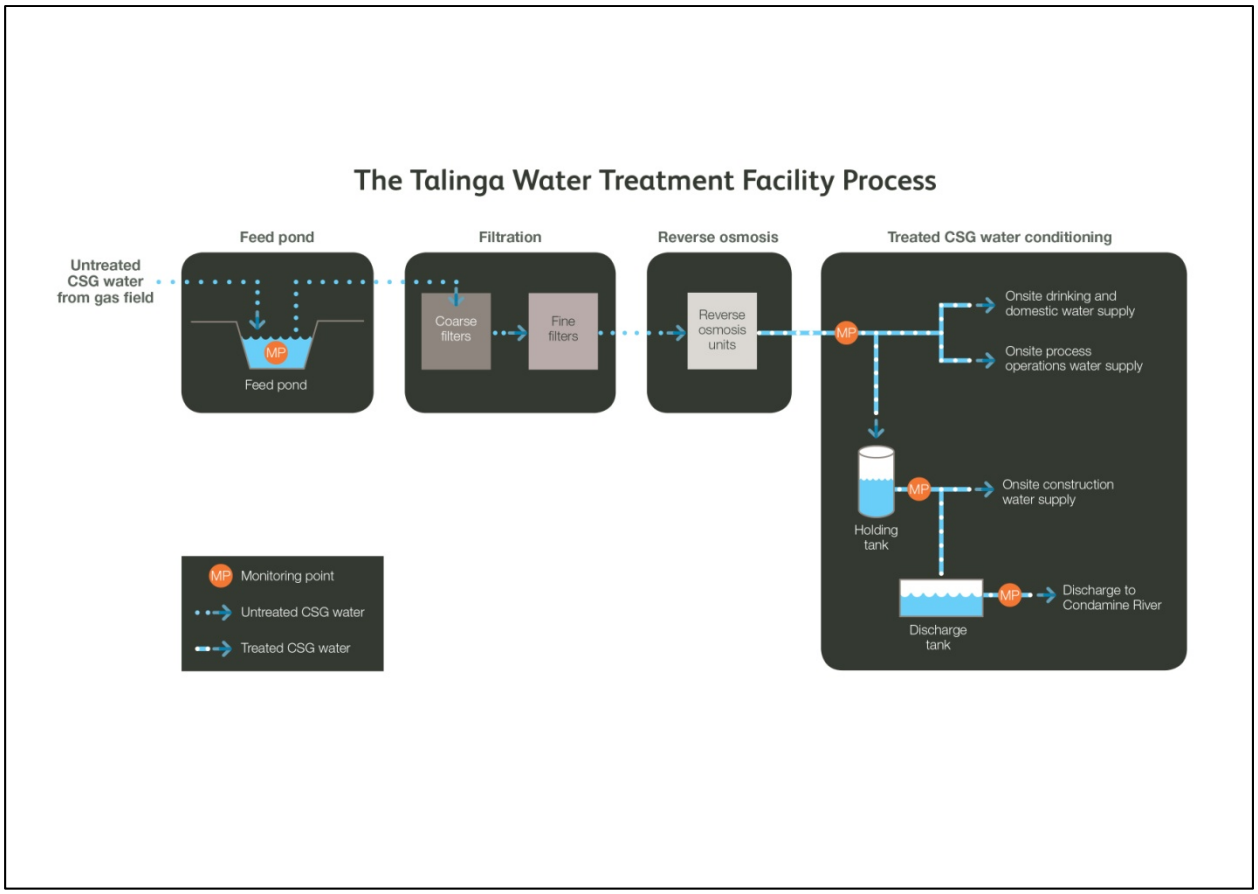

Figure 2 - TWTF Process Schematic

3.1. Feed Pond

Untreated CSG water gathered from the gas field is temporarily stored in a feed pond prior to its treatment by the TWTF. The feed pond holds the CSG water for a few weeks. This allows the settlement of coarse suspended sediments and provides opportunity for the CSG water to aerate and oxygenate.

3.2. Filtration

The CSG water is then passed through a coarse filter and then a fine filter to remove any particles or suspended sediments that have not settled within the feed pond. A disinfectant commonly used in domestic water treatment facilities is also add during filtration process to protect the membranes used in the following reverse osmosis process.

3.3. Reverse Osmosis

Reverse osmosis involves passing the CSG water through fine membranes at high pressure. This removes most of the dissolved salts and other trace elements.

At this point the water is either transferred to a holding tank where it is held prior to discharge or piped for use onsite.

3.4. Treated CSG Water Conditioning

Prior to entering the holding tank, the pH of the treated CSG water is adjusted to ensure its suitability for use and the disinfectant added during the filtration process is removed.

Where the treated CSG water is discharged to the Condamine River calcium and magnesium salts are added. This conditioning is undertaken to ensure a minimum level of these elements is present in the Condamine River. These natural salts are normally present at much higher concentrations in river waters and municipal drinking water supplies.

4. Monitoring, Approvals and Results

In order to discharge to the Condamine River, Australia Pacific LNG gained approval from the Queensland Government's Department of Environment and Resource Management (DERM). This involved undertaking intensive and comprehensive quality and performance monitoring of the TWTF process.

The monitoring also helped define and develop a targeted ongoing monitoring program that has been implemented for the TWTF.

4.1. CSG Water Characterisation Study

Prior to commencing discharge to the Condamine River in September 2010, an extensive study of the untreated and treated CSG water was undertaken to determine its characteristics.

The study was used to confirm that the TWTF process was sufficient to ensure the quality of treated CSG water would safely and reliably meet public health based water quality limits set by DERM for discharging into a drinking water source.

The monitored limits were based on various health criteria defined by recognised national and international public health authorities such as Queensland Health, the National Health and Medical Research Council and the World Health Organisation.

During the characterisation study 63 samples were taken covering 280 parameters resulting in a complete data set of over 17,000 results.

Representative samples of untreated CSG water were taken from forty seven online CSG production wells and the TWTF feed pond; with treated CSG water samples taken immediately after the reverse osmosis process and holding tank.

The CSG water characterisation study showed that after the initial process of settlement, aeration and oxygenation in the feed pond the only parameter found to be consistently elevated above the discharge water quality limits was fluoride. The results summarised below show that the TWTF is effective at treating fluoride, with the maximum level reported after treatment well below the water quality limit.

4.2. Commissioning Monitoring

During the first three months the TWTF was discharging to the Condamine River extensive monitoring was undertaken. This verified the operational reliability of the TWTF at treating the CSG water to within the DERM-specified water quality limits with one exception. This exception related to N-Nitrosodimethylamine (NDMA). NDMA levels were detected to be above the water quality limit on ten sampling occasions.

NDMA is a by-product of the disinfection process and the water quality limit set for the TWTF discharge is 0.01 µg/L. This limit is based on a level to which it can be reliably detected by the Queensland Forensics and Scientific Services laboratory and is one-tenth of the World Health Organisation's limit for drinking water.

On all ten sampling occasions the presence of NDMA in the treated CSG water remained below the World Health Organisation limit. Further, the National Health and Medical Research Council do not presently set a limit for NDMA in its Australian Drinking Water Quality Guidelines; however its proposed limit is the same as that for the World Health Organisation.

NDMA levels were effectively resolved by simply substituting use of untreated for treated CSG water in the disinfectant production process. Since making this change in December 2010, NDMA levels have not been detected above the water quality limit.

DERM was satisfied with the action Australia Pacific LNG took in relation to NDMA on its discovery, its subsequent management and reporting.

4.3. Ongoing Operations Monitoring

Regular and comprehensive water quality monitoring is currently undertaken to guarantee the ongoing effectiveness of the TWTF in treating CSG water. This includes:

- periodic comprehensive characterisation testing of the untreated CSG water quality;
- continuous live monitoring throughout various stages of the TWTF process to ensure operational performance against the plant's design specifications; and
- weekly independent monitoring of the treated CSG water quality discharged to the Condamine River.

4.3.1. Regular External Laboratory Monitoring

The CSG water and treated CSG water is regularly sampled and sent to an independent laboratory for testing. The sampling takes place at three monitoring locations:

- at the feed pond;
- on exit from the holding tank; and
- within the discharge tank prior to the release of the treated CSG water to the Condamine River.

The samples are tested for a comprehensive range of parameters (as shown in Attachment 1 provided at the end of this report).

This water quality monitoring is undertaken using an industry-wide protocol developed by Standards Australia and DERM. Following these standards ensures the water samples are correctly obtained, stored and transported to allow accurate and representative testing in the laboratory.

The water is tested at the Queensland Health Forensic and Scientific Services laboratory. This laboratory is independent to Australia Pacific LNG's operations and is National Association of Testing Authorities (NATA) accredited.

"NATA is the authority that provides independent assurance of technical competence through a proven network of best practice industry experts for customers who require confidence in the delivery of their products and services" – NATA website.

4.3.2. TWTF Online Indicator Monitoring

The TWTF has a number of online test probes located throughout the treatment process. These provide real-time data about water quality and assurance that the TWTF is within acceptable operating limits. The online monitoring looks at a number of fundamental indicator parameters including pH, turbidity, conductivity, dissolved oxygen and total chlorine.

It is not practical to continually test all of the parameters that are externally monitored; however the indicators checked by the online system provide a view of the performance of the facility. Should any of these indicators vary from their expected limits, the onsite use and discharge to the Condamine River is suspended immediately until further investigation and monitoring is undertaken and any required corrections made.

4.4. Discharged Treated CSG Water Quality

During the first half of 2011 the treated CSG water met all the discharge water quality limits set by DERM prior to its discharge to the Condamine River. A total of 22 samples were collected and analysed for 200 parameters. Of the 200 parameters analysed, only 26 parameters were detected.

The summary table below presents only the results of parameters that were detected at any point during the past six months. Those parameters that were detected are notably less than the discharge water quality limits. This confirms the TWTF processes are both safe and reliable at treating CSG water prior to its discharge into a source of drinking water.

A complete summary of the monitoring data is provided in Attachment 1 of this report along with a glossary of the parameters analysed.

Table 1 - Summary of Maximum Detected Monitoring Results for Treated CSG Water

Parameter		Compliance with Water Quality Limit	Water Quality Limit	Unit	Maximum Detected Concentration for Treated CSG Water
BTEX	All Tested Parameters	100%	Various	Various	ND
Chlorinated Hydrocarbons	All Tested Parameters	100%	Various	Various	ND
Disinfection By-products	All Tested Parameters	100%	Various	Various	ND
Endocrine-Disrupting Chemicals and Hormones	Nonylphenol	100%	500	µg/L	0.2
	Bisphenol A		200	µg/L	0.1
Haloacetic Acids	All Tested Parameters	100%	Various	Various	ND
Inorganic Compounds	Ammonia as N	100%	500	µg/L	440
	Bromide		7000	µg/L	300
	Bromine		7000	µg/L	48
	Fluoride		1500	µg/L	210
	Iodine		100	µg/L	25
	Nitrite (as N)		3000	µg/L	8
	Sulphate		500000	µg/L	10600
Metals	Aluminium	100%	200	µg/L	20
	Barium		700	µg/L	3.2
	Boron		4000	µg/L	1200
	Cadmium		2	µg/L	0.6
	Chromium VI		50	µg/L	1
	Copper		2000	µg/L	1
	Iron		300	µg/L	10
	Lead		10	µg/L	0.2
	Manganese		500	µg/L	0.4
	Nickel		20	µg/L	0.8

Parameter		Compliance with Water Quality Limit	Water Quality Limit	Unit	Maximum Detected Concentration for Treated CSG Water
Metals	Strontium		4000	µg/L	7.6
	Zinc		3000	µg/L	4
Nitrosamines	N-Nitrosodimethylamine (NDMA)	100%	0.01	µg/L	0.008*
Poly Aromatic Hydrocarbons	All Tested Parameters	100%	Various	Various	ND
Total Petroleum Hydrocarbons	Total Petroleum Hydrocarbons	100%	200	µg/L	ND
Trihalomethanes	Chloroform	100%	200	µg/L	6.8
Radiological Products	Alpha Emitters	100%	0.5	Bql-1	0.16
	Beta Emitters	100%	0.5	Bql-1	0.2
	Radon	100%	0.5	Bql-1	0.2

Notes:

ND – Not detected by Laboratory.

* Detected on one occasion in January 2011.

Attachment 1: Summary of Weekly Treated CSG Water Quality Monitoring

The following section presents a full summary of the weekly monitoring undertaken on the treated CSG water discharged to the Condamine River. The results cover the reporting period from 1 January 2011 to 30 June 2011. The monitoring results have been summarised to show the following:

Parameter – This lists the public health water quality parameters tested at the point of discharge. An explanation of the parameters is provided in the Glossary.

Water Quality Limit – This shows the limits set by DERM.

Unit –This shows the corresponding parameter unit of measurement. It is presented in micro-grams (µg)) per litre (L) unless otherwise stated. This unit can also be represented as 'parts per billion' (ppb). Exceptions to this are listed in the reporting tables.

Monitoring Results – For any sample where the laboratory detected the presence of one of the test parameters on one or more occasion, the minimum, maximum and average (mean) concentration is reported. Also shown is the concentration below which 95% of the monitoring results fall. This is represented as the '95th percentile' and allows any anomalies and outlying high results to be removed from the average.

Sampling Results – For reasons explained below the results table, there are instances where sampling was not conducted on several of the weeks within the reporting period. For this reason, the total number of reporting weeks is shown, along with the number of samples taken, the number of samples analysed and the number of sample results pending.

Parameter		Disinfectant product	Water Quality Limit	Units	Monitoring Results for the Reporting Period				Sampling Results for the Reporting Period				
					Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95th Percentile	Number of Times Parameter Detected	Total Number Weeks	Total Number of Samples Taken	Total Number of Samples Analysed and Reported	Sample Results Pending
BTEX	Benzene		1	µg/L	ND				0	26	22	22	0
	Toluene		800	µg/L	ND				0	26	22	22	0
	Ethylbenzene		300	µg/L	ND				0	26	22	22	0
	Xylene Total		600	µg/L	ND				0	26	22	22	0
Chlorinated Hydrocarbons	1,1-dichloroethene	*	30	µg/L	ND				0	26	22	22	0
	1,2-dichlorobenzene	*	1500	µg/L	ND				0	26	22	22	0
	1,2-dichloroethane	*	3	µg/L	ND				0	26	22	22	0
	cis-1,2-dichloroethene		60	µg/L	ND				0	26	22	22	0
	1,4-dichlorobenzene	*	40	µg/L	ND				0	26	22	22	0
	Bromochloromethane	*	40	µg/L	ND				0	26	22	22	0
	Chlorobenzene	*	300	µg/L	ND				0	26	22	22	0
Disinfection By-	Bromochloroacetonitrile	*	0.7	µg/L	ND				0	26	22	22	0

Parameter		Disinfectant product	Water Quality Limit	Units	Monitoring Results for the Reporting Period				Sampling Results for the Reporting Period				
					Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95th Percentile	Number of Times Parameter Detected	Total Number Weeks	Total Number of Samples Taken	Total Number of Samples Analysed and Reported	Sample Results Pending
products	Dichloroacetonitrile	*	2	µg/L	ND				0	26	22	22	0
Endocrine-Disrupting Chemicals and Hormones	Nonylphenol		500	µg/L	0.2	0.2	0.2	0.2	1	26	22	22	0
	Bisphenol A		200	µg/L	0.1	0.1	0.1	0.1	1	26	22	22	0
Haloacetic Acids	Bromochloroacetic acid	*	0.014	µg/L	ND				0	26	22	22	0
	Chloroacetic acid	*	150	µg/L	ND				0	26	22	22	0
	Dibromoacetic acid	*	0.014	µg/L	ND				0	26	22	22	0
	Dichloroacetic acid	*	100	µg/L	ND				0	26	22	22	0
	Trichloroacetic acid	*	100	µg/L	ND				0	26	22	22	0
Inorganic Compounds	Ammonia as N		500	µg/L	68	440	292	380	22	26	22	22	0
	Bromate		20	µg/L	ND				0	26	22	22	0
	Bromide		7000	µg/L	110	300	162	291	20	26	22	22	0

Parameter		Disinfectant product	Water Quality Limit	Units	Monitoring Results for the Reporting Period				Sampling Results for the Reporting Period				
					Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95th Percentile	Number of Times Parameter Detected	Total Number Weeks	Total Number of Samples Taken	Total Number of Samples Analysed and Reported	Sample Results Pending
Inorganic Compounds	Bromine#		7000	µg/L	44	48	46	48	4	26	4	4	0
	Chlorate		800	µg/L	ND				0	26	22	22	0
	Chlorine	*	5000	µg/L	ND				0	26	22	22	0
	Chlorite	*	300	µg/L	ND				0	26	22	22	0
	Cyanide Total		80	µg/L	ND				0	26	22	22	0
	Fluoride		1500	µg/L	100	210	146	220	21	26	22	22	0
	Iodide		100	µg/L	ND				0	26	22	22	0
	Iodine^		100	µg/L	5	25	15	24	4	26	4	4	0
	Monochloramine	*	3000	µg/L	ND				0	26	22	22	0
	Nitrate (as NO3-)		50000	µg/L	ND				0	26	22	22	0
	Nitrite (as N)		3000	µg/L	2.0	8.0	4.0	7.2	5	26	22	22	0
	Sulphate		500000	µg/L	1200	10600	6600	10500	21	26	22	22	0

Parameter		Disinfectant product	Water Quality Limit	Units	Monitoring Results for the Reporting Period				Sampling Results for the Reporting Period				
					Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95th Percentile	Number of Times Parameter Detected	Total Number Weeks	Total Number of Samples Taken	Total Number of Samples Analysed and Reported	Sample Results Pending
Metals	Aluminium		200	µg/L	3.0	20.0	8.0	17.6	13	26	22	22	0
	Antimony		3	µg/L	ND				0	26	22	22	0
	Arsenic		7	µg/L	ND				0	26	22	22	0
	Barium		700	µg/L	0.7	3.2	1.3	2.3	20	26	22	22	0
	Boron		4000	µg/L	29	1200	935	1225	22	26	22	22	0
	Cadmium		2	µg/L	0.1	0.6	0.3	0.5	5	26	22	22	0
	Chromium (hexavalent)		50	µg/L	0.1	1.0	0.4	0.9	10	26	22	22	0
	Copper		2000	µg/L	1.0	1.0	1.0	1.0	2	26	22	22	0
	Iron		300	µg/L	6.0	10.0	7.6	9.6	5	26	22	22	0
	Lead		10	µg/L	0.1	0.2	0.2	0.2	5	26	22	22	0
	Manganese		500	µg/L	0.2	0.4	0.2	0.3	18	26	22	22	0
	Mercury		1	µg/L	ND				0	26	22	22	0

Parameter		Disinfectant product	Water Quality Limit	Units	Monitoring Results for the Reporting Period				Sampling Results for the Reporting Period				
					Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95th Percentile	Number of Times Parameter Detected	Total Number Weeks	Total Number of Samples Taken	Total Number of Samples Analysed and Reported	Sample Results Pending
Metals	Molybdenum		50	µg/L	ND				0	26	22	22	0
	Nickel		20	µg/L	0.1	0.8	0.5	0.7	7	26	22	22	0
	Selenium		10	µg/L	ND				0	26	22	22	0
	Silver		100	µg/L	ND				0	26	22	22	0
	Strontium		4000	µg/L	0.2	7.6	3.7	6.1	21	26	22	22	0
	Thallium		Detection limit	µg/L	ND				0	26	22	22	0
	Titanium		Detection limit	µg/L	ND				0	26	22	22	0
	Uranium		20	µg/L	ND				0	26	22	22	0
	Vanadium		50	µg/L	ND				0	26	22	22	0
	Zinc		3000	µg/L	2.0	4.0	3.0	4.0	4	26	22	22	0
Nitrosamines	N-Nitrosodiethylamine (NDEA)	*	0.01	µg/L	ND				0	26	22	22	0

Parameter		Disinfectant product	Water Quality Limit	Units	Monitoring Results for the Reporting Period				Sampling Results for the Reporting Period				
					Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95th Percentile	Number of Times Parameter Detected	Total Number Weeks	Total Number of Samples Taken	Total Number of Samples Analysed and Reported	Sample Results Pending
Nitrosamines	N-Nitrosodimethylamine (NDMA)	*	0.01	µg/L	0.008	0.008	0.008	0.008	1	26	22	22	0
Poly Aromatic Hydrocarbons	2,4,5-Trichlorophenol		350	µg/L	ND				0	26	22	22	0
	2,4,6-Trichlorophenol		20	µg/L	ND				0	26	22	22	0
	2,4-Dichlorophenol	*	200	µg/L	ND				0	26	22	22	0
	2-Chlorophenol	*	300	µg/L	ND				0	26	22	22	0
	4-Methylphenol		600	µg/L	ND				0	26	22	22	0
	4-nitrophenol		30	µg/L	ND				0	26	22	22	0
	Acenaphthene		20	µg/L	ND				0	26	22	22	0
	Acenaphthylene		0.014	µg/L	ND				0	26	22	22	0
	Anthracene		150	µg/L	ND				0	26	22	22	0
	Benzo(a) pyrene		0.01	µg/L	ND				0	26	22	22	0

Parameter		Disinfectant product	Water Quality Limit	Units	Monitoring Results for the Reporting Period				Sampling Results for the Reporting Period				
					Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95th Percentile	Number of Times Parameter Detected	Total Number Weeks	Total Number of Samples Taken	Total Number of Samples Analysed and Reported	Sample Results Pending
Poly Aromatic Hydrocarbons	Phenanthrene		150	µg/L	ND				0	26	22	22	0
	Phenol		150	µg/L	ND				0	26	22	22	0
	Pyrene		150	µg/L	ND				0	26	22	22	0
Total Petroleum Hydrocarbons	Total Petroleum Hydrocarbons		200	µg/L	ND				0	26	22	22	0
Trihalomethanes	Bromodichloromethane	*	6	µg/L	ND				0	26	22	22	0
	Bromoform	*	100	µg/L	ND				0	26	22	22	0
	Dibromochloromethane		100	µg/L	ND				0	26	22	22	0
	Chloroform	*	200	µg/L	2.2	6.8	3.8	5.1	21	26	22	22	0
Radiological Products	Alpha Emitters		0.5	Bq/L	0.07	0.16	0.12	0.16	2	26	22	22	0
	Beta Emitters		0.5	Bq/L	0.18	0.20	0.19	0.20	2	26	22	22	0
	Radon		0.5	Bq/L	0.02	0.20	0.12	0.20	5	26	22	22	0

Notes:

ND – Not detected by the Laboratory

^ Iodine results reported are from samples collected between 17 August to 15 September 2010 for treated CSG water on exiting the holding tank. Refer to Data Summary for further explanation.

Bromine results reported are from samples collected between 17 August to 15 September for treated CSG water on exiting the holding tank. Refer to Data Summary for further explanation.

Data Summary

Whilst every effort has been made to assess and analyse all the parameters over the first half of 2011 there were certain instances (which are discussed below) where this was not possible or not necessary.

No discharge

During the first three weeks of January and the first week of February 2011 no discharge of treated CSG water to the Condamine River occurred. Therefore, no samples were collected during these weeks.

Flooding

Also during the first half of 2011 extreme rainfall events caused wide scale flooding in the region preventing access to discharge monitoring location on six occasions. On these occasions results of treated CSG water were monitored at the holding tank and have been reported in the summary tables provided above.

Missing Parameters

There are seven water quality parameters that were not monitored for the first half of 2011 being:

- Hydrazine and Chlorine Dioxide. These compounds break down exceptionally quickly therefore cannot be tested under laboratory conditions. If present within the treated CSG water they would also break down rapidly therefore removing any public health risk. It is anticipated that these parameters will not form part of the ongoing monitoring program.

- Iodine and Bromine. Results are available for samples collected during the CSG Water Characterisation Study and are included in Attachment 1. The presence of these two elements where shown to be below the water quality limit for both the untreated and treated CSG water. Due to miscommunication with the laboratory subsequent analysis was not undertaken. It is anticipated that these parameters will not form part of the ongoing monitoring program.

- 4-Chlorophenol. This compound is not expected to be generated by the TWTF process. The laboratory was requested by Australia Pacific LNG to undertake this analysis, however, it has been identified that the laboratory did not have an appropriate test method. It is anticipated that this parameter will not form part of the ongoing monitoring program.

- 2, 2 Dichloropropionic Acid (DPA) and Acrylamide (2-propenamide). These compounds are not expected to be generated by the TWTF process. Due to miscommunication with the laboratory the analysis was not undertaken. It is anticipated that this parameter will not form part of the ongoing monitoring program.

Glossary

Whilst this document reports the quality of the discharged treated CSG water, extensive and weekly sampling is undertaken across the Facility, including testing the water pre and post treatment.

This allows Australia Pacific LNG to understand the composition of the CSG water and treat it to ensure it can be discharged into a source of drinking water.

The parameters set by DERM consider a wide chemistry associated with the petrochemical, oil and gas and water treatment industries. A brief definition of the sets of parameters contained within the reported information is provided below.

BTEX – BTEX is an acronym representing benzene, toluene, ethylbenzene, and xylenes. These are compounds that may be associated with oil and gas production. BTEX are generally not associated with CSG production, although may occur at trace levels.

Chlorinated Hydrocarbons – These are organic compounds that may be generated as a by-product of chlorination. They are considered commonplace in everyday life and can occur naturally, in some animals or as the by-product of fires.

Disinfection By-products – Disinfectants are routinely used in water treatment facilities to remove biological contaminants (predominantly algae and bacteria) that may decrease the efficiency and integrity of the water treatment process. Disinfectants may react with naturally-occurring matter to form by-products.

Endocrine-Disrupting Chemicals (EDCs) and Hormones – The two relevant compounds include Bysphenol A (BPA) and Nonylphenol. BPA is often associated with moulded plastic. Nonylphenol can be found in commercial detergents.

Haloacetic acids – These can be a by-product of drinking water chlorination or chloramination (that is the use of disinfectant). These chemicals are routinely used in drinking water treatment, to removal bacteria and other microbiological organisms.

Inorganic Compounds – These compounds relate to the branch of chemistry where two or more non-carbon based elements are combined. In terms of drinking water chemistry they include compounds such as ammonia, alkalinity (calcium carbonate), chloride, electrical conductivity, fluoride and total dissolved solids.

Metals – These naturally occur in drinking water due to the water passing through metal-enriched rock. Certain metals are essential for life. Also specific metal-based salts, namely calcium and magnesium, are added to the treated CSG water prior to discharge to the River.

Nitrosomines – These compounds are commonly associated with water treatment facilities that utilise choramines for disinfection.

Poly Aromatic Hydrocarbons (PAH) – PAH occur in oil, coal and tar products and may be associated with water extracted from coal seams at low levels. They are naturally occurring and do not readily dissolve in water.

Total Petroleum Hydrocarbons (TPH) – TPH is the term given to a mixture of hydrocarbons (compounds that contain hydrogen and carbon) that occur naturally and in oil, coal and tar products. TPH is associated with CSG water at low levels.

Trihalomethanes – These include the branch of chemical compounds that may be formed as a by-product of disinfecting drinking water with chorine or monochloramine.

Radiological Products – These occur naturally in drinking water at extremely low concentrations via contact with certain rock such as granite.

This Report has been produced in accordance with the Queensland Government's *Public Reporting Guideline for Recycled Water Schemes* (DERM, 2011) and the *Water Supply (Safety and Reliability) Act 2008* (the Act). Australia Pacific LNG currently operates under an approved interim recycled water management plan in accordance with the Act.