



REPORT

Fairymeadow Road Irrigation Project Water Quality Report Jul - Sept 2015 (Quarter 3)

Q-4130-15-RP-0022

Australia Pacific LNG Upstream

This quarterly report provides the reporting requirements as described under the Water Supply Agreement, Beneficial Use Approval (Irrigation of associated water), and Beneficial Use Approval (Livestock drinking water) for water supplied via the Fairymeadow Road Irrigation Project .

Uncontrolled when printed unless issued and stamped Controlled Copy.

Revision	Date	Description	Originator	Checked	QA/Eng	Approved
6	26/10/2015	Issued For Review	K. Loh	G.Bryant G.Nicolle	G.Simpson	S.Cawley
5	29/7/2015	Issue For Use	K. Loh	G.Bryant G.Nicolle	G.Simpson	S.Cawley
4	21/4/2015	Issued For Use	K. Loh	G.Bryant G.Nicolle	G.Simpson	S.Cawley

Release Notice

This document is available through the Australia Pacific LNG Upstream Phase 1 Project controlled document system TeamBinder™. The responsibility for ensuring that printed copies remain valid rests with the user. Once printed, this is an uncontrolled document unless issued and stamped Controlled Copy.

Third-party issue can be requested via the Australia Pacific LNG Upstream Project Document Control Group.

Document Conventions

The following terms in this document apply:

- **Will, shall or must** indicate a mandatory course of action
- **Should** indicates a recommended course of action
- **May or can** indicate a possible course of action.

Document Custodian

The custodian of this document is the Australia Pacific Upstream Project - Environmental Compliance Manager. The custodian is responsible for maintaining and controlling changes (additions and modifications) to this document and ensuring the stakeholders validate any changes made to this document.

Deviations from Document

Any deviation from this document must be approved by the Australia Pacific Upstream Project - Environmental Compliance Manager.

Table of Contents

- TERMS, ABBREVIATIONS AND DEFINITIONS 1
- 1. INTRODUCTION 1
- 2. EXECUTIVE SUMMARY 2
- 3. GENERAL BENEFICIAL USE APPROVAL (IRRIGATION OF ASSOCIATED WATER) 3
- 4. GENERAL BENEFICIAL USE APPROVAL (LIVESTOCK DRINKING WATER) 4
- 5. SAMPLE POINTS AND PERIOD 5
- 6. SAMPLING RESULTS 6

List of Tables

- Table 1: Points of Supply5
- Table 2: FRIP Water Quality Report for Quarter 3 2015 at Sample Point 4120-2 ex Talinga WTF6
- Table 3: FRIP Water Quality Report for Quarter 3 2015 at Sample Point 4520-2 ex Condabri WTF8

List of Figures

- Figure 1: Fairymeadow Road Irrigation sample points5

Terms, Abbreviations and Definitions

Term/Abbreviation	Definition
Australia Pacific LNG	Australia Pacific LNG Pty Limited
BUA	Beneficial use approval
CSG	Coal seam gas
CSG water	Refers to all CSG water streams, including untreated and treated CSG water
DEHP	Department of Environment and Heritage Protection (formerly part of DERM)
Fairymeadow Road Irrigation pipeline	Refers to the distribution water pipeline which will transfer treated CSG water, in either direction, between the Monreagh dam and the Condabri WTF
Monreagh dam	Refers to the irrigation storage dam of operating capacity 1873 ML treated water storage located on the Monreagh property
Supplier	Australia Pacific LNG
Treated CSG water	CSG water stream that has been treated to a quality such that it is suitable for its end use

1. Introduction

Australia Pacific LNG Pty Limited (Australia Pacific LNG) is a coal seam gas (CSG) to liquefied natural gas (LNG) joint venture between Origin Energy, Conoco Phillips and the Sinopec Group. The Australia Pacific LNG project proposes to supply CSG from the Walloons gas fields in south central Queensland to an LNG plant located on Curtis Island, near Gladstone, on the central Queensland coast.

To produce gas from a coal seam, the CSG water in the reservoir must first be withdrawn using a lift pump installed in the gas well. Flow from the gas well is separated into water and gas, from which the CSG water is distributed to a Water Treatment Facility (WTF). Water supplied to the Fairymeadow Road Irrigation Project (FRIP) is sourced from two WTFs - the Talinga WTF, and the Condabri WTF.

In supplying water to landholders via the FRIP, Australia Pacific LNG is obliged to comply with the following instruments:

- Water Supply Agreements (WSAs),
- General Beneficial Use Approval - Irrigation of associated water (the Irrigation General BUA) issued by (DEHP) in December 2013; and
- The General Beneficial Use Approval - Associated water (including coal seam gas water), otherwise known as Stock General BUA issued by DEHP in May 2014.

The *Stock General BUA* still requires domestic, stock, stock intensive drinking water and water for incidental land management activities to be compliant with the requirements of the ANZECC guidelines Tables 4.3.1 - 4.3.3 inclusive.

2. Executive Summary

This Quarter 3 report covers sampling from July 2015 to end September 2015 i.e. third quarter of 2015.

Water Quality Ex- Talinga WTF (Sample Point 4120-2)

35 water quality parameters including radionuclides were sampled (Table 2). None of the 35 parameters exceeded any of the specified irrigation or stock drinking water limits stated within the WSA and the BUAs (refer Section 6).

Water Quality Ex- Condabri WTF (Sample Point 4520-4)

35 water quality parameters including radionuclides were sampled (Table 3). None of the 35 parameters exceeded any of the specified irrigation or stock drinking water limits stated within the WSA and the BUAs (refer Section 6).

Additional Information

1. Laboratory testing of radionuclides in water samples take approximately 4 to 6 weeks. This waiting time contributes to the publication date of these quarterly reports.
2. The tests for radionuclides at both Talinga and Condabri WTFs were originally conducted monthly. However, as three consecutive samples showed less than 50% of the Stock BUA water quality limits, radionuclide tests are now conducted on a 6-monthly basis¹.

¹ as stated in the FRIP Quality Report 2014 Quarter 2

3. General Beneficial Use Approval (Irrigation of Associated Water)

Further to the WSA, the Department of Environment and Heritage Protection (DEHP) issued the standards expected for the irrigation of CSG water via the Irrigation General BUA in December 2013. DEHP has designed these standards to ensure that the irrigation of CSG water carries no greater risk than what is acceptable for any other irrigation scheme.

The Irrigation General BUA can be accessed at

<http://www.ehp.qld.gov.au/management/non-mining/documents/general-bua-irrigation-of-associated-water.pdf>

The BUA monitoring requires at a minimum:

- fortnightly sampling for SAR, pH and EC; and
- initially monthly for other parameters, and then six-monthly after three consecutive detects which is less than 50 per cent of the water quality parameters listed in the BUA Appendix 1.

Water quality results for the Quarter 3 of 2015 are attached in Section 7. **All** water quality results sampled were compliant with the Irrigation General BUA. Section 2 discusses these results.

4. General Beneficial use Approval (Livestock Drinking Water)

DEHP has detailed the standards expected for a range of other beneficial uses of CSG water, including livestock watering. These standards were designed to ensure that CSG water is appropriately conditioned for the purpose authorised.

The Stock General BUA can be accessed at

<http://www.ehp.qld.gov.au/management/non-mining/documents/general-bua.pdf>

Water quality results for the Quarter 3 of 2015 are attached in Section 7. All water quality results sampled were compliant with the Stock General BUA. Section 2 discusses these results.

5. Sample Points and Period

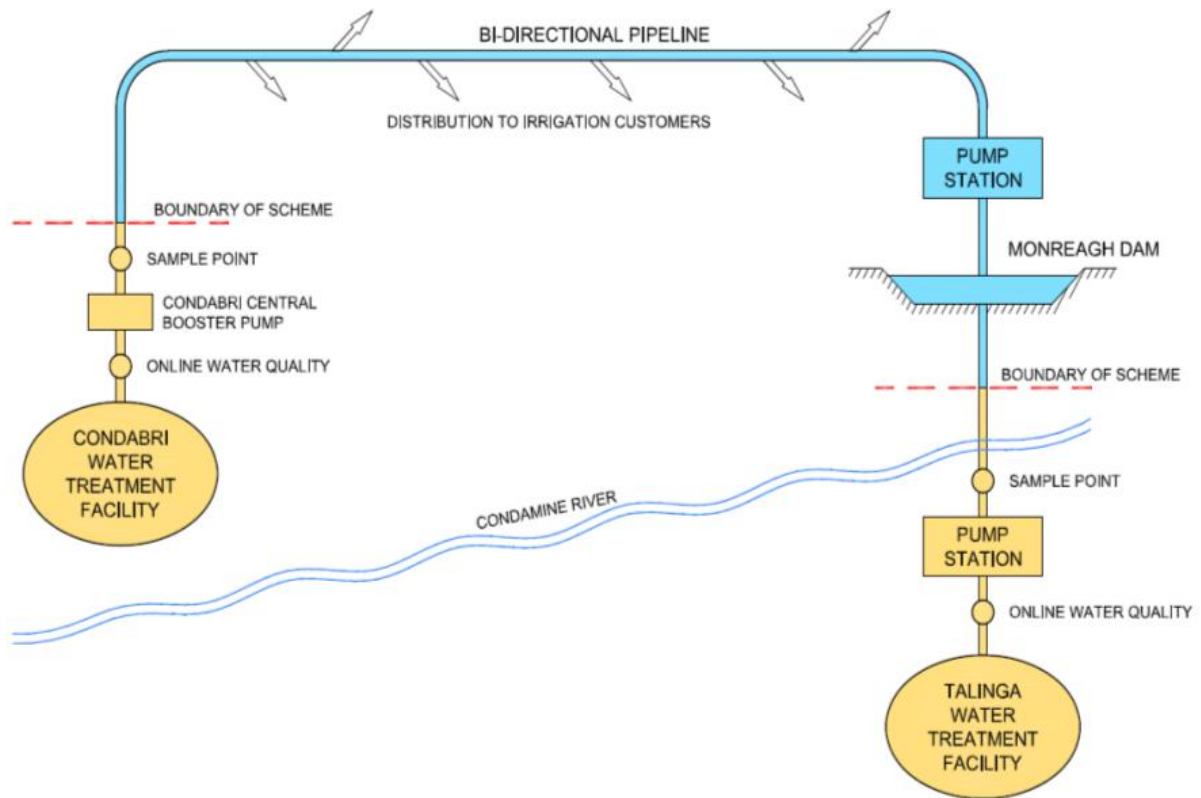


Figure 1: Fairymeadow Road Irrigation sample points

As the Scheme Operator, Australia Pacific LNG monitors the quality of the Resource entering the Scheme at two (2) Points of Supply as shown in Figure 1. Their locations are described in Table 1.

Table 1: Points of Supply

Point of Supply Sample point No.	Description	Longitude	Latitude
4520-4	Downstream of Condabri WTF	150°11'26.53830"	-26°48'11.33383"
4120-2	Downstream of Talinga WTF	150°20'52.37844"	-26°45'14.95502"

The water sampling results in this report are from:

- Talinga sample point 4120-2 between July 2015 to September 2015; and
- Condabri sample point 4520-4 for the same period.

6. Sampling Results

Table 2: FRIP Water Quality Report for Quarter 3 2015 at Sample Point 4120-2 ex Talinga WTF

Sample Point 4120-2	MSA Water Quality Limit	Irrigation BU A Water Quality Limit	Stock BU A Water Quality Limit	Units	Monitoring Results for the Quarter 3 Reporting Period						Sampling Frequency (F-formightly; M-monthly)
					Total Number of Samples Taken	Number of Times Parameter Detected	Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95 th Percentile	
pH	6.0 - 8.5	6.0 - 8.5	-	-	8	8	7.1	8.2	7.8	8.2	F
Electrical Conductivity	1000	950	-	µS/cm	8	8	400	470	444	470	F
Sodium Absorption Ratio	6	6	-	-	8	8	4	6	4.9	5.7	F
Total Dissolved Solids			4000*	mg/L	8	8	210	230	225	230	F
Aluminium	5	20	5	mg/L	8	0	Not Detected				M
Arsenic	0.5	2	0.5	mg/L	8	0	Not Detected				M
Boron	1	1	5	mg/L	8	8	0.44	0.53	0.5	0.53	M
Cadmium	0.01	0.05	0.01	mg/L	8	0	Not Detected				M
Calcium	1000	-	-	mg/L	8	8	6.6	9.9	8.8	9.8	F
Chloride	175	-	-	mg/L	8	8	68	90	81	89	F
Chromium (VI)	1	-	-	mg/L	8	0	Not Detected				M
Chromium (Total)	-	1	1	mg/L	8	1	0.001	0.001	0.001	0.001	M
Cobalt	-	0.1	1	mg/L	8	0	Not Detected				M
Copper	0.4	5	1*	mg/L	8	0	Not Detected				M
Fluoride	2	2	2	mg/L	8	8	0.14	0.22	0.18	0.22	M

Sample Point 4120-2	MSA Water Quality Limit	Irrigation BU A Water Quality Limit	Stock BU A Water Quality Limit	Units	Monitoring Results for the Quarter 3 Reporting Period						Sampling Frequency (F-forfortnightly; M-monthly)
					Total Number of Samples Taken	Number of Times Parameter Detected	Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95 th Percentile	
Hardness as CaCO3	60	-	-	mg/L	8	8	24	49	41	48	F
Iron	10	10	-	mg/L	8	8	0.006	0.097	0.049	0.092	M
Lead	0.12	5	0.1	mg/L	8	1	0.004	0.004	0.004	0.004	M
Lithium	2.5	2.5	-	mg/L	8	3	0.005	0.007	0.006	0.007	M
Manganese	10	10	-	mg/L	8	5	0.001	0.009	0.003	0.008	M
Mercury	0.002	0.002	0.002	mg/L	8	0	Not Detected				M
Molybdenum	0.05	0.05	0.15	mg/L	8	0	Not Detected				M
Nickel	1	2	1	mg/L	8	3	0.002	0.005	0.004	0.005	M
Nitrogen (Total)	110	-	-	mg/L	8	8	0.21	0.45	0.27	0.39	F
Phosphorus	12	-	-	mg/L	8	0	Not Detected				F
Selenium	0.02	-	0.02	mg/L	8	0	Not Detected				M
Sodium	115	-	-	mg/L	8	8	66	77	73	77	F
Sulphur as SO4	1000	-	-	mg/L	8	0	Not Detected				F
Uranium	0.1	-	0.2	mg/L	8	0	Not Detected				M
Zinc	20	5	20	mg/L	8	4	0.001	0.005	0.003	0.005	M
Radium-226	-	-	5	Bq/L	1	0	Not Detected				M
Radium-228	-	-	2	Bq/L	1	0	Not Detected				M
Uranium-238	-	-	0.2	Bq/L	1	0	Not Detected				M
Gross Alpha	-	-	0.5	Bq/L	1	1	0.078	0.078	0.078	0.078	M
Gross Beta (excluding K-40)	-	-	0.5	Bq/L	1	0	Not Detected				M

* For beef cattle - other limits apply for other livestock

Table 3: FRIP Water Quality Report for Quarter 3 2015 at Sample Point 4520-2 ex Condabri WTF

Sample Point 4520-4	WSA Water Quality Limit	Irrigation BUA Water Quality Limit	Stock BUA Water Quality Limit	Units	Monitoring Results for the Quarter 3 Reporting Period						Sampling Frequency (F-formightly; M-monthly)
					Total Number of Samples Taken	Number of Times Parameter Detected	Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95 th Percentile	
pH	6.0 - 8.5	6.0 - 8.5	-		7	7	7.1	7.9	7.6	7.9	F
Electrical Conductivity	1000	950	-	µS/cm	7	7	380	440	424	440	F
Sodium Absorption Ratio	6	6	-	-	7	7	4	5	4.7	5	F
Total Dissolved Solids			4000*	mg/L	7	7	200	220	211	220	F
Aluminium	5	20	5	mg/L	7	0	Not Detected				M
Arsenic	0.5	2	0.5	mg/L	7	0	Not Detected				M
Boron	1	1	5	mg/L	7	7	0.18	0.3	0.23	0.29	M
Cadmium	0.01	0.05	0.01	mg/L	7	0	Not Detected				M
Calcium	1000	-	-	mg/L	7	7	7	9.9	8.4	9.6	F
Chloride	175	-	-	mg/L	7	7	75	85	81	85	F
Chromium (VI)	1	-	-	mg/L	7	0	Not Detected				M
Chromium (Total)	-	1	1	mg/L	7	0	Not Detected				M
Cobalt	-	0.1	1	mg/L	7	0	Not Detected				M
Copper	0.4	5	1*	mg/L	7	0	Not Detected				M
Fluoride	2	2	2	mg/L	7	7	0.096	0.14	0.12	0.14	M

Sample Point 4520-4	MSA Water Quality Limit	Irrigation BUA Water Quality Limit	Stock BUA Water Quality Limit	Units	Monitoring Results for the Quarter 3 Reporting Period						Sampling Frequency (F-for fortnightly; M-monthly)
					Total Number of Samples Taken	Number of Times Parameter Detected	Minimum Detected Concentration	Maximum Detected Concentration	Mean Detected Concentration	95 th Percentile	
Hardness as CaCO ₃	60	-	-	mg/L	7	7	32	44	39	44	F
Iron	10	10	-	mg/L	7	3	0.001	0.001	0.001	0.001	M
Lead	0.12	5	0.1	mg/L	7	0	Not Detected				M
Lithium	2.5	2.5	-	mg/L	7	0	Not Detected				M
Manganese	10	10	-	mg/L	7	0	Not Detected				M
Mercury	0.002	0.002	0.002	mg/L	7	0	Not Detected				M
Molybdenum	0.05	0.05	0.15	mg/L	7	0	Not Detected				M
Nickel	1	2	1	mg/L	7	0	Not Detected				M
Nitrogen (Total)	110	-	-	mg/L	7	7	0.17	0.3	0.24	0.29	F
Phosphorus	12	-	-	mg/L	7	0	Not Detected				F
Selenium	0.02	-	0.02	mg/L	7	0	Not Detected				M
Sodium	115	-	-	mg/L	7	7	64	72	68	72	F
Sulphur as SO ₄	1000	-	-	mg/L	7	0	Not Detected				F
Uranium	0.1	-	0.2	mg/L	7	0	Not Detected				M
Zinc	20	5	20	mg/L	7	0	Not Detected				M
Radium-226	-	-	5	Bq/L	2	0	Not Detected				M
Radium-228	-	-	2	Bq/L	2	0	Not Detected				M
Uranium-238	-	-	0.2	Bq/L	2	0	Not Detected				M
Gross Alpha	-	-	0.5	Bq/L	2	2	0.024	0.047	0.036	0.046	M
Gross Beta (excluding K-40)	-	-	0.5	Bq/L	2	2	0.038	0.047	0.043	0.047	M

* For beef cattle - other limits apply for other livestock