| | |
|---|---|
| Subcontractor's name | **Greencap Ltd** |
| Subcontract No. | **0 - 6037- P- 3365-SC119** |
| | |
| Subcontract Package Name: | **ENVIRONMENTAL IMPACT MONITORING PROGRAM** |
| | |
| DOCUMENT TITLE: | WASTE DISCHARGE LICENCE 192-2 ANNUAL AUDIT AND COMPLIANCE REPORT 2016 – BLADIN POINT – ENVIRONMENTAL IMPACT MONITORING PROGRAM |
| Subcontractor's Doc. No.: | **AEC149** |

**ICHTHYS ONSHORE LNG FACILITIES**

JKC AUSTRALIA LNG PTY LTD

INPEX

Darwin, Australia

| | |
|---|---|
| Subcontractor ISSUE PURPOSE | ☐FA ☐FR ☐FI X FC ☐AB ☐CA |
| CTR RESULT CODE | ☐A ☐B ☐ N ☐F |
| NEXT STATUS : | ☐ FA ☐FR ☐FI ☐FC ☐AB ☐NA |
| Subcontractor RESUB / NEXTSUB DATE : | |

Approval or review hereunder shall not be construed to relieve Vendor / Subcontractor of his responsibilities and liability under the Contract.

| CTR ORGANIZATION | DEPT. NAME | SIGNATURE |
|---|---|---|
| PJ DEPT. | | |
| RESPONSIBLE DEPT. | | |
| RELATED DEPT. | | |

DOC-EIMP
Code A Approved.
A.Black 27/09/16

CTR REVIEW DATE :

| JOB. NO. | 0-6037-2 | REVIEW CLASS | 3 |
|---|---|---|---|

| | SYSTEM no. - CLASS/DISC. - TYPE - SERIAL no. | REV |
|---|---|---|
| CPY DOC.no. | L 290 - AH - REP - 10395 | 0 |
| CTR DOC.no. | Subcontract No. - SERIAL no.. V - 3365 - SC119 - 8149 | |

INDRA 27-SEP-2016

# Waste Discharge Licence 192-2 Annual Audit and Compliance Report 2016

## Ichthys On-Shore LNG Facilities

## Bladin Point

Prepared for:
**JKC Australia LNG Pty Ltd**

Date: 23rd September 2016



Prepared by:

GREENCAP

**GREENCAP LTD**

11 Winnellie Central, 14 Winnellie Road, Winnellie, NT 0820, P O BOX 39546, Winnellie NT 0820

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27-SEP-2016

# Waste Discharge Licence 192-2 Annual Audit and Compliance Report 2016 – Bladin Point – Environmental Impact Monitoring Program

Contractor Doc. No: V-3365-SC119-8149

Company Doc. No: L290-AH-REP-10395

AEC Doc No.: AEC149

## GREENCAP DOCUMENT CONTROL

| | | | | | |
|---|---|---|---|---|---|
| **Report Title & Job Ref:** Waste Discharge Licence 192-2 Annual Audit and Compliance Report 2016 – Bladin Point – Environmental Impact Monitoring Program | | | **Filename:** Waste Discharge Licence 192-2 Annual Audit and Compliance Report 2016 | | |
| **Written:**<br>  <br>**Caroline French**<br>**Environmental Scientist** | | **Checked:**<br>  <br>**Chris Gamble**<br>**Project Coordinator** | | **Approved:**<br>  <br>**Brent Ridgard**<br>**Project Director** | |
| **Rev No.** | **Status** | **Date** | **Author** | **Checker** | **Reviewer** |
| A | Draft | 19/09/2016 | CF | SS | BR |
| 0 | Final | 23/09/2016 | CF | CG | BR |

| **Rev No** | **Copies** | **Recipient** |
|---|---|---|
| A | 1 x Electronic Copy | JKC Australia Pty Ltd |
| 0 | 1 x Electronic Copy | JKC Australia Pty Ltd |

INDRA
27-SEP-2016

# TABLE OF CONTENTS

**WDL192-1** ..... 1
ADMINISTRATIVE ..... 2
OPERATIONAL ..... 5
DISCHARGES AND EMISSIONS ..... 9
MONITORING ..... 15
RECORDING AND REPORTING ..... 20
**WDL192-2** ..... 27
ADMINSTRATIVE ..... 28
OPERATIONAL ..... 32
DISCHARGES AND EMISSIONS ..... 36
MONITORING ..... 41
RECORDING AND REPORTING ..... 47
**APPENDICES** ..... 53

A Application to Amend WDL192-1
B Notice of Amendment of WDL192-1
C NT EPA Correspondence
D Non-compliance Investigation Reports
E Monitoring Field Records
F Ichthys Onshore LNG Facilities Community Relations Plan
G DPC Notification of Installation
H Monitoring Results Summary Tables
I Laboratory Certificates
J Terrestrial Sample Point Signage Photograph



INDRA 27-SEP-2016

# WDL192-1

Northern Territory Government

## WASTE DISCHARGE LICENCE

(Pursuant to section 74 of the *Water Act*)

**Licence Details**

| | |
|---|---|
| Licence Number: | **WDL 192-1** |
| Commencement Date: | 1 August 2013 |
| Renewal Date: | 1 August 2015 |
| Expiry Date | 31 July 2017 |

**Licensee Details**

| | | |
|---|---|---|
| Legal Entity Name: | | JKC Australia LNG Pty Ltd |
| ABN: | | 14 154 383 409 |
| Registered Business Address: | | Level 50, BankWest Tower<br>108 St Georges Terrace<br>PERTH WA 6000 |
| Postal Address: | | GPO Box 2079<br>DARWIN NT 0801 |
| Contact Person: | | Emma Gilliver |
| Position Title: | | Approvals and Regulatory Compliance Officer |
| Contact Details: | b/h: | 08 8931 8721 |
| | mobile: | 0427 038 089 |
| | email: | gilliver.emma@jkc-lng.com |

**Location of Premises**

| | |
|---|---|
| Name: | Ichthys LNG, Bladin Point |
| Address: | 144 Wickham Point Road<br>WICKHAM POINT NT |

**24 hour emergency response**

| | | |
|---|---|---|
| Contact Person 1: | | Suzanne Mayne (Project Environment Manager) |
| | mobile: | 0418 413 382 |
| Contact Person 2: | | Ross McEwen (Resident Construction Manager) |
| | mobile: | 0422 621 909 |
| 24 hour contact line: | | (08) 8931 8888/ 0477 364 286 |

| | |
|---|---|
| **Licensed Activity** | Discharge of wastewater from the Bladin Point Ichthys LNG Temporary Wastewater Treatment Plant (WwTP) to Darwin Harbour subject to this Licence. |

INDRA 27-SEP-2016

| ADMINISTRATIVE | | |
|---|---|---|
| 1. | Action | **The Licensee must notify the NT EPA within 24 hours if there are changes to the details of the 24-hour emergency contact as provided on page one of this Licence.** |
| | How | Desktop review. |
| | Evidence | Verification from Suzanne Mayne (Project Environment Manager) and Ross McEwen (Resident Construction Manager) that the 24-hour emergency response contacts provided to the NT EPA are current. |
| | When (Date) | Desktop review completed on 08/06/2016. |
| | Status | Compliant. |
| 2. | Action | **The Licensee must notify the NT EPA within 14 days if there are changes to the Licensee details shown on page one of this Licence.** |
| | How | Desktop review. |
| | Evidence | Verification from Anthony Black (Lead Environmental Advisor) that the Licensee details are current. |
| | When (Date) | Desktop review completed on 08/06/2016. |
| | Status | Compliant. |
| 3. | Action | **The Licensee must notify the NT EPA within 14 days after ceasing to conduct the activity to which this Licence relates.** |
| | How | Desktop review. |
| | Evidence | The Licenced activity: *Discharge of wastewater from the Bladin Point Ichthys LNG Temporary Wastewater Treatment Plant (WwTP) to Darwin Harbour subject to this Licence* commenced in March 2015 and remains active and notification is not applicable. WDL 192-1 was due to expire on 31 July 2017. An application to amend WDL 192-1 was submitted to the NT EPA on 9 May 2016. The application is attached to this Annual Audit and Compliance Report as **Appendix A**. The application approval cover letter (Subject: Waste Discharge Licence WDL 192-2) and Notice of Amendment issued by the NT EPA on 25 May 2016 is attached to this Annual Audit and Compliance Report as **Appendix B**. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | When (Date) | Desktop review completed on 31/05/2016. |
| | Status | Compliant. |
| 4. | Action | **The Licensee must notify the NT EPA prior to making any operational change that will cause, or is likely to cause, an increase in the potential for environmental harm, environmental nuisance, material environmental harm or serious environmental harm.** |
| | How | Desktop review. |
| | Evidence | No operational changes to the WwTP have occurred that will cause, or are likely to cause, an increase in the potential for environmental harm, environmental nuisance, material environmental harm or serious environmental harm. |
| | When (Date) | Desktop review completed on 08/06/2016. |
| | Status | Compliant. |
| 5. | Action | **The Licensee must cause a copy of this Licence to be available at all times:**<br>**5.1 at the Darwin Site Office, Bladin Point** |
| | How | Site inspection. |
| | Evidence | A hard copy of the licence is maintained in the Project Environment Manager's office at the Bladin Point Ichthys LNG, 144 Wickham Point Road, Wickham Point NT. A site inspection has been conducted to verify, with hard copy sighted. |
| | When (Date) | A site inspection was conducted and a hard copy of WDL 192-1 was sighted on 20/05/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

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| 6. | Action | **Where this Licence requires the provision of any notice, document or other correspondence to the NT EPA, the relevant contact is:**<br>**Pollution Control**<br>**Postal Address: GPO Box 3675, Darwin NT 0801**<br>**Email: pollution@nt.gov.au** |
| | How | Desktop review. |
| | Evidence | All correspondence to the NT EPA pertaining to WDL 192-1 has been addressed to Pollution Control at pollution@nt.gov.au<br>Refer to: NT EPA "Notification of Non-Compliance" Correspondence attached as **Appendix C**. |
| | When (Date) | Desktop review completed on 08/06/2016. |
| | Status | Compliant. |
| 7. | Action | **All notices, documents or other correspondence required to be provided pursuant to this Licence must be provided in electronic form unless otherwise specified as a condition of this Licence.** |
| | How | Desktop review. |
| | Evidence | All notices, documents or other correspondence to the NT EPA to date have been provided in electronic form.<br>Refer to:<br>An application to amend WDL 192-1 was submitted to the NT EPA on 9 May 2016. The application is attached to this Annual Audit and Compliance Report as **Appendix A**.<br>NT EPA "Notification of Non-Compliance" Correspondence attached as **Appendix C**.<br>Non-compliance investigation reports for March and April 2016 are provided as an attachment in **Appendix D.** |
| | When (Date) | Desktop review completed on 08/06/2015. |
| | Status | Compliant. |



INDRA 27-SEP-2016

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| **OPERATIONAL** | | |
| 8. | Action | **The Licensee must, without limiting any other condition of this Licence in conducting the Activity do all things reasonable and practicable to ensure the Activity does not adversely affect the Declared Beneficial Uses and Objectives as declared from time to time, including those applying to:**<br>• **Darwin Harbour Region** |
| | How | Surface Water Monitoring Program, per Appendix 1 of WDL 192-1. |
| | Evidence | The outfall pipeline and diffuser were designed and positioned at a deep water location along an eastward alignment to the north-east of the WwTP near the mouth of the Elizabeth River.<br>Regional oceanographic modelling was undertaken to determine the location of the outfall pipeline and diffuser ports to best achieve flushing by ocean currents and dilution through deep water installation and effluent jet velocity. The outfall has been erected 1m above the seabed to avoid siltation interference. The diffuser has been designed with positively buoyant jets to increase the jet path and further disperse treated effluent.<br>The design of the WwTP segregates wastewater streams from the sanitary sewage system, reducing the influent of sewage (and effluent) and minimising potential pollutants.<br>The Beneficial Uses currently declared under the Water Act for the Darwin Harbour Region include Aquaculture, Environment and Cultural. The surface water monitoring program undertaken in accordance with Appendix 1 of WDL 192-1 enables the measurement and reporting of the health and condition of the receiving environment against the benchmark that has been developed per the Water Quality Objectives relating to their beneficial uses and environmental values.<br>An environmental risk assessment was undertaken for the proposed discharge from the WwTP and presented within the document L290-AH-FRM-10004 (JKC Australia LNG Pty Ltd, 2013) as part of the WDL application process. The risk assessment process was developed in line with Australian Standard AS/NZS ISO 31000:2009, Risk management principles and guidelines, for the purpose of evaluating the potential risk to the beneficial uses identified for Darwin Harbour/Elizabeth River associated with the proposed discharge of treated effluent. Environmental risks (potential impacts) were identified, the likelihood and consequences of those risks were assessed and mitigation measures and controls were developed to reduce those risks identified such that 'Residual Risks' were reduced to as low as reasonably practicable.<br>Surface water compliance monitoring per Appendix 1 of WDL 192-1 commenced in August 2015. The monitoring data collected to date, which comprises 10 monthly monitoring events (August 2015 to May 2016), confirms that the Declared Beneficial Uses and Objectives of the subject waterways have not been adversely affected by the Licensed Activity.<br>Field and analytical results obtained during the monitoring period were considered generally representative of an estuarine |



INDRA 27-SEP-2016

| | | |
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| | | environment. The distribution of all field-measured physico-chemical parameters during the monitoring period was consistent across all monitoring locations, including the reference sites, and was therefore considered consistent with natural background conditions. Most of the analytes sampled in the surface water compliance monitoring period were below the selected trigger values. Wastewater discharged from the authorised discharge point (outfall diffuser) and waters in the receiving environment in the vicinity of the outfall diffuser did not:<br>• contain any visible matter, petroleum hydrocarbon sheen or scum, or litter or other objectionable matter, with the exception of October 2015 where some floating bubbles and scum were noted at all impact sites;<br>• cause or generate odours which would adversely affect the use of surrounding waters;<br>• cause algal blooms;<br>• cause visible change in the behaviour of fish or other aquatic organisms;<br>• cause mortality of fish or other aquatic organisms; or<br>• cause adverse impacts on plants.<br>Results from the surface water compliance monitoring program supported the conclusion that WwTP discharges were not impacting on the marine environment during the Licence period and the risk of the WwTP discharge resulting in environmental harm was low. Field records for the surface water compliance monitoring events conducted between August 2015 and May 2016 are provided as an attachment in **Appendix E.** The field records have recorded environmental observations at the time of conducting the compliance monitoring program at the outfall diffuser and at selected reference sites in Darwin Harbour. |
| | When (Date) | Discharge from the WwTP commenced on 12/03/2015.<br>Surface water compliance monitoring was conducted per conditions of WDL 192-1 on:<br>• 25/08/2015;<br>• 24/09/2015;<br>• 22/10/2015;<br>• 19/11/2015;<br>• 08/12/2015;<br>• 19/01/2016;<br>• 17/02/2016;<br>• 17/03/2016;<br>• 18/04/2016; and<br>• 16/05/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

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| 9. | Action | **The Licensee must maintain and implement a communication plan which includes a strategy for communicating with members of the public who are likely to have a real interest in or be affected by the Activity.** |
| | How | Desktop review. |
| | Evidence | A Community Relations Plan has been developed by JKC. This is an Ichthys Gas Field Development Project-wide plan and refers to the range of community engagement procedures which are in effect across Project.<br>The implementation of the Community Relations Plan is via a range of measures including (but is not limited to):<br>• Website and feedback numbers including a 24 hour / 7 days a week (24/7) 1300 community general enquiry number and a 24/7 1300 community feedback number;<br>• Community briefing and consult sessions;<br>• Media releases and television advertising;<br>• Fact sheets;<br>• Community newsletters and bulletins. It is noted that advice re dye testing for the temporary WwTP was included in one of these bulletins;<br>• Specific letter box drops and mail outs when potential construction related impacts may occur; and<br>• Phone surveys.<br>The Ichthys Onshore LNG Facilities Community Relations Plan (Document L290-AB-PLN-0150 (JKC Australia LNG Pty Ltd, 2013) is provided as an attachment in **Appendix F**. |
| | When (Date) | Desktop review completed on 08/06/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

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| 10. | Action | **The Licensee must maintain a log of each complaint, made in relation to the Activity, to any persons involved in the Activity.**<br>**The log must include details of the following.**<br>• **the date and time of the complaint;**<br>• **the contact details of the complainant if known, or where no details are provided a note to that effect;**<br>• **the nature of the complaint;**<br>• **the nature of events giving rise to the complaint;**<br>• **prevailing weather conditions at the time of the complaint;**<br>• **the action taken in relation to the complaint, including any follow-up contact with the complainant; and**<br>• **if no action was taken, why no action was taken.** |
| | How | Desktop review. |
| | Evidence | The JKC Community Relations department operate a system for complaint monitoring. The complaint monitoring system is an Ichthys Gas Field Development Project wide system called Database Consultation Manager as part of the implementation of the Community Relations Plan. All community complaints associated with the Ichthys Gas Field Development Project received on the 24/7 1300 community general enquiry number and the 24/7 1300 community feedback number are logged.<br>It has been confirmed that no community complaints have been received specific to the WwTP and its operations. |
| | When (Date) | Desktop review completed on 08/06/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

<table>
<tr><td colspan="3">DISCHARGES AND EMISSIONS</td></tr>
<tr><td>11.</td><td>Action</td><td>This Licence authorises wastewater to be discharged from the discharge point identified in Table 1, and in Appendix 1.
<table>
<tr><td colspan="3">Table 1: Authorised Discharge Point</td></tr>
<tr><td></td><td>Description</td><td>Location<br>Zone MGA52; GDA94</td></tr>
<tr><td>Outfall Diffuser</td><td>Deepwater location within East Arm (Elizabeth River) along an eastward alignment from the STP</td><td>Easting: 710158<br>Northing: 8614623<br>Longitude: 130.93404<br>Latitude: -12.5249</td></tr>
</table></td></tr>
<tr><td></td><td>How</td><td>Desktop review.</td></tr>
<tr><td></td><td>Evidence</td><td>Survey documentation provided as an attachment in Appendix G details the location of the waste discharge outfall diffuser and reflects the coordinates identified in Table 1 and Appendix 1 of WDL 192-1.</td></tr>
<tr><td></td><td>When (Date)</td><td>Desktop review completed 08/06/2016.</td></tr>
<tr><td></td><td>Status</td><td>Compliant.</td></tr>
<tr><td>12.</td><td>Action</td><td>Wastewater discharged from the authorised discharge point in Table 1 must not:<br>• contain any visible matter, petroleum hydrocarbon sheen or scum, or litter or other objectionable matter;<br>• cause or generate odours which would adversely affect the use of surrounding waters;<br>• cause algal blooms;<br>• cause visible change in the behaviour of fish or other aquatic organisms;<br>• cause mortality of fish or other aquatic organisms; or<br>• cause adverse impacts on plants.</td></tr>
</table>



INDRA 27-SEP-2016

| | | |
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| | How | Surface Water Monitoring Program, per Appendix 1 of WDL 192-1.<br>Desktop review. |
| | Evidence | Surface water compliance monitoring per Appendix 1 of WDL 192-1 commenced in August 2015. The monitoring data collected to date, which comprises 10 monthly monitoring events (August 2015 to May 2016) under WDL192-1, confirms that the Declared Beneficial Uses and Objectives of the subject waterways have not been adversely affected by the Licensed Activity.<br>There was no visible matter, petroleum hydrocarbon sheen or scum, litter or other objectionable matter observed during monitoring events conducted in the receiving environment. There was no evidence of wastewater discharge causing or generating odours which would adversely affect the use of surrounding waters. There was no evidence of algal blooms, abnormal fish behaviour or mortality and no evidence of adverse impacts on marine and intertidal plant species.<br>The monitoring results have demonstrated that the characteristics of the effluent discharged to Darwin Harbour to date have achieved the treated effluent design specifications. In addition, it has been confirmed that no community complaints have been received specific to the WwTP and its operations.<br>Field records for the surface water compliance monitoring events conducted between August 2015 and May 2016 are provided as an attachment in **Appendix E.** The field records have recorded environmental observations at the time of conducting the compliance monitoring program at the outfall diffuser and at selected reference sites in Darwin Harbour. |
| | When (Date) | Discharge from the WwTP commenced on 12/03/2015.<br>Compliance Monitoring was conducted per conditions of WDL 192-1 on:<br>• 25/08/2015;<br>• 24/09/2015;<br>• 22/10/2015;<br>• 19/11/2015;<br>• 08/12/2015;<br>• 19/01/2016;<br>• 17/02/2016;<br>• 17/03/2016;<br>• 18/04/2016; and<br>• 16/05/2016.<br>Desktop review completed on 08/06/2016. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | Status | Compliant. |
| 13. | Action | **In accordance with the Declaration of Beneficial Uses for Darwin Harbour, surface water monitoring for sampling locations STPM-01, STPM-02, STPM-03 and STPM-04 and detailed in Appendix 1 must:**<br>• **meet the water quality objectives for "upper estuary" specified in Tables 8 and 9 of the document titled *Water Quality Objectives for the Darwin Harbour Region – Background Document (NRETAS, 2010)*; and**<br>• **if particular water quality objectives relevant to a beneficial use are not specified in Tables 8 and 9, the relevant guideline values for 95% species protection specified in Chapters 3 and 5 of the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000)* apply.** |
| | How | Surface Water Monitoring Program per Appendix 1 of WDL 192-1.<br>Desktop review. |
| | Evidence | Surface water compliance monitoring per Appendix 1 of WDL 192-1 commenced in August 2015. The monitoring data collected, which comprises 10 monthly monitoring events (August 2015 to May 2016), confirms that the Declared Beneficial Uses and Objectives of the subject waterways have not been adversely affected by the Licensed Activity.<br>In accordance with WDL 192-1, the relevant trigger values from the Water Quality Objectives for the Darwin Harbour Region – Background Document (Darwin Harbour Water Quality Objectives [WQOs]) (NRETAS, 2010a) and Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000) (ANZECC Guidelines) have been adopted for the assessment of discharge impacts on the ambient water quality of the receiving environment.<br>Marine field and analytical results obtained during the monitoring period were considered generally representative of an estuarine environment. The distribution of all field-measured physico-chemical parameters during the monitoring period was consistent across all monitoring locations, including the reference sites and was therefore considered consistent with natural background conditions. Overall, there did not appear to be any impact on physico-chemical properties from WwTP discharge.<br>Most of the analytes sampled in the surface water compliance monitoring period were below the selected trigger values. Trigger value exceedances throughout the monitoring period are outlined below:<br>August 2015<br>- Exceedance at STPM-R1 for ammonia;<br>- Exceedance at STPM-R1 for total nitrogen;<br>- Exceedances at STPM-01, STPM-02, STPM-03, STPM-04 and STPM-R2 for oxides of nitrogen; and<br>- Exceedance at STPM-R1 for total phosphorous. |



INDRA 27-SEP-2016

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|---|---|---|
| | | September 2015<br>- Exceedances at STPM-01, STPM-02 and STPM-03 for oxides of nitrogen.<br><br>October 2015<br>- No exceedances.<br><br>November 2015<br>- No exceedances.<br><br>December 2015<br>- Exceedances at STPM-01, STPM-02 and STPM-R2 for dissolved oxygen (DO);<br>- Exceedances at STPM-01, STPM-02, STPM-03 and STPM-R2 for chlorophyll-a;<br>- Exceedances at STPM-01, STPM-03, STPM-04, STPM-R1 and STPM-R2 for oxides of nitrogen; and<br>- Exceedance at STPM-04 for total phosphorous.<br><br>January 2016<br>- Exceedances at STPM-01, STPM-02, STPM-03, STPM-04, STPM-R1 and STPM-R2 for DO;<br>- Exceedance at STPM-R2 for oxides of nitrogen; and<br>- Exceedances at STPM-01, STPM-02, STPM-03 and STPM-04 for total phosphorous.<br><br>February 2016<br>- Exceedances at STPM-01, STPM-02, STPM-03, STPM-04, STPM-R1 and STPM-R2 for DO;<br>- Exceedances at STPM-03, STPM-04, STPM-R1 and STPM-R2 for ammonia;<br>- Exceedance at STPM-01 for total nitrogen; and<br>- Exceedance at STPM-01 for filterable reactive phosphorous (FRP).<br><br>March 2016<br>- Exceedances at STPM-01, STPM-02, STPM-03 and STPM-04 for DO;<br>- Exceedances at STPM-01, STPM-02, STPM-03, STPM-04 and STPM-R1 for ammonia;<br>- Exceedances at STPM-01, STPM-02, STPM-03, STPM-04, STPM-R1 and STPM-R2 for oxides of nitrogen;<br>- Exceedances at STPM-01 and STPM-R1 for total phosphorous; and<br>- Exceedance at STPM-R1 for enterococci.<br><br>April 2016<br>- Exceedances at STPM-01, STPM-02, STPM-03, STPM-04, STPM-R1 and STPM-R2 for DO;<br>- Exceedance at STPM-02 for ammonia; and<br>- Exceedance at STPM-01 for total phosphorus.<br>May 2016<br>- Exceedance at STPM-01 for oxides of nitrogen; and<br>- Exceedance at STPM-01 for total phosphorus. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | | Non-compliance notifications were submitted to NT EPA for all the above trigger value exceedances (See Conditions 17 to 19 and **Appendix D**) and following a review of the WDL192 monitoring parameter concentrations during the monitoring period, it was concluded that WwTP discharges were not having a deleterious effect on the receiving marine environment. Analytical results obtained from the WwTP holding tank outlet complied with reporting limits and achieved target design specifications and with the diffuser designed to achieve dilutions of at least 250-fold for 90% of the time, there was generally no correlation observed between discharged wastewater and receiving environment trigger value exceedances. Further, exceedances were often recorded at both impact sites and reference sites during the monitoring period, indicative of broader Harbour wide and ambient conditions. Those exceedances that were recorded at impact sites only were mostly isolated in nature and not indicative of plumes.<br><br>Non-compliance investigation report memorandums for the trigger value exceedances in March and April 2016 were produced as per the request received from the NT EPA on 4 May 2016.<br><br>The investigation conducted in response to the non-compliance in March 2016 concluded that the exceedances reported for ammonia and oxides of nitrogen were not caused by the WwTP discharge and the potential for environmental harm as a result of the exceedance is considered to be low. The investigation report concluded that the March 2016 trigger value exceedances of ammonia and oxides of nitrogen unnecessarily triggered regulatory reporting and no further management response was required. Detailed lines of evidence for these conclusions are presented in WDL 192-1 Non-Compliance Investigation Report, March 2016.<br><br>The investigation conducted in response to the non-compliance in April 2016 concluded that the exceedance reported for ammonia at STPM-02 was not caused by the WwTP discharge and the potential for environmental harm as a result of the exceedance is low. The investigation also concluded that the exceedance reported for total phosphorous at STPM-01 may have been caused by the WwTP discharge; however, the potential for environmental harm as a result of the exceedance is considered to be low. Detailed lines of evidence for these conclusions are presented in WDL 192-1 Non-Compliance Investigation Report, April 2016.<br><br>It is noted that following the issue WDL192-2 with approved amendments, all exceedances identified above would not have triggered Condition 13 and non-compliance reporting to NT EPA would not have been required.<br><br>Results from the surface water compliance monitoring program support the conclusion that WwTP discharges were not impacting on the marine environment or its beneficial uses during the Licence period.<br><br>NT EPA “Notification of Non-Compliance” Correspondence attached as **Appendix C**.<br><br>Non-compliance investigation reports for March and April 2016 are provided as an attachment in **Appendix D.**<br><br>Field records for the surface water compliance monitoring events conducted between August 2015 and May 2016 are provided as an attachment in **Appendix E.**<br><br>Monitoring results summary tables are provided as an attachment in **Appendix H**. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | | Copies of the chain of custodies and laboratory reports, including laboratory QAQC reports, for the WDL 192-1 monitoring period are included as **Appendix I**. |
| | When (Date) | Discharge from the WwTP commenced on 12/03/2015.<br>Compliance Monitoring was conducted per conditions of WDL 192-1 on:<br>• 25/08/2015;<br>• 24/09/2015;<br>• 22/10/2015;<br>• 19/11/2015;<br>• 08/12/2015;<br>• 19/01/2016;<br>• 17/02/2016;<br>• 17/03/2016;<br>• 18/04/2016; and<br>• 16/05/2016.<br>Desktop review completed on 31/05/2016. |
| | Status | Non-compliant. |



INDRA 27-SEP-2016

| MONITORING | | |
|---|---|---|
| 14. | Action | **The Licensee must, for all terrestrial sampling points required by this Licence:**<br>• **install, maintain and provide appropriate identification signage so that they are easily identifiable at all times; and**<br>• **maintain safe access and egress, as is reasonably practicable.** |
| | How | Site inspection and desktop review. |
| | Evidence | The only terrestrial sampling location applicable to WDL 192-1 is STPM-T1 at the WwTP tank outlet. The sampling location is a dedicated sample tap installed on the tank outlet pipe within the restricted access WwTP boundary. The sample location is identified on plant layout and design plans, is known by plant operators and its location has been communicated and shown to the personnel tasked with conducting the compliance monitoring per Appendix 1 of WDL 192-1. Signage has been installed and maintained on the dedicated sample tap STPM-T1.<br>Safe access and egress to the terrestrial sampling location STPM-T1 at the WwTP tank will be maintained as part of standard plant operational procedures. Safe access and egress has been confirmed via the successful completion of compliance monitoring at this sampling location between August 2015 and May 2016.<br>A photograph of signage installed at the STPM-T1 sample tap is provided as an attachment in **Appendix J**. |
| | When (Date) | Compliance monitoring was conducted at the terrestrial sampling location STPM-T1 per conditions of WDL 192-1 on:<br>• 25/08/2015;<br>• 24/09/2015;<br>• 22/10/2015;<br>• 19/11/2015;<br>• 08/12/2015;<br>• 19/01/2016;<br>• 17/02/2016;<br>• 17/03/2016;<br>• 18/04/2016; and<br>• 16/05/2016.<br>Desktop review completed on 31/05/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

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| 15. | Action | **For each sample required to be collected by this Licence the following information must be recorded and retained**<br>• **the date(s) on which the sample was taken;**<br>• **the time(s) at which the sample was collected;**<br>• **the point(s) at which the sample was taken;**<br>• **the name of the person who collected the sample;**<br>• **the chain of custody forms relating to the sample(s);**<br>• **the field measurements and/or analytical results for the sample; and**<br>• **laboratory QA/QC documentation.** |
| | How | Desktop review. |



INDRA 27-SEP-2016

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| | Evidence | Surface water compliance monitoring per Appendix 1 of WDL 192-1 commenced in August 2015.<br><br>For each sample collected, the following information is recorded on field records:<br><br>• The date(s) on which the sample was taken;<br>• The time(s) at which the sample was collected;<br>• The point(s) at which the sample was taken;<br>• The name(s) of the person(s) who collected the sample;<br>• Sampling devices and monitoring equipment;<br>• Field measured physico-chemical parameter measurements;<br>• Weather observations;<br>• Field observations during sampling including evidence of pollution (sheens, scum, fish kills, olfactory observations, turbidity, presence of litter);<br>• No. and type of sample bottles collected;<br>• No. and type of QA/QC samples collected;<br>• Notification of equipment calibration and decontamination procedures; and<br>• Notification of equipment failures, if applicable.<br><br>All samples were submitted to the analytical laboratory with an accompanying and signed chain of custody.<br><br>All analyses undertaken per the WDL 192-1 compliance monitoring program are analysed under the laboratory's National Association of Testing Authority (NATA) accreditation.<br><br>All documentation, including field records, NATA accredited laboratory reports, laboratory QA/QC documentation are saved and stored in electronic file on the Greencap Darwin server.<br><br>Field records for the surface water compliance monitoring events conducted between August 2015 and May 2016 are provided as an attachment in **Appendix E.**<br><br>Copies of the chain of custodies and laboratory reports, including laboratory QA/QC reports, for the 192-1 monitoring period are included as **Appendix I**. |



INDRA 27-SEP-2016

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| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-1 on:<br>• 25/08/2015;<br>• 24/09/2015;<br>• 22/10/2015;<br>• 19/11/2015;<br>• 08/12/2015;<br>• 19/01/2016;<br>• 17/02/2016;<br>• 17/03/2016;<br>• 18/04/2016; and<br>• 16/05/2016.<br>Desktop review completed on 31/05/2016. |
| | Status | Compliant. |
| 16. | Action | **Surface water monitoring must be conducted in accordance with Appendix 1.** |
| | How | Desktop review. |
| | Evidence | Surface water compliance monitoring per Appendix 1 of WDL 192-1 commenced in August 2015.<br>A review of the field records, COCs and NATA laboratory reports from the monitoring events conducted between August 2015 and May 2016, confirms surface water sampling was conducted in accordance with Appendix 1 of WDL 192-1.<br>Appendix 1 of WDL 192-1 requires seasonal monitoring for endocrine disrupting chemicals within the treated effluent at terrestrial sampling location STPM-T1 at the WwTP tank outlet. Seasonal monitoring as defined in WDL 192-1 is *one sampling event in the dry season and one sampling event in the wet season*. Seasonal sampling for endocrine disrupting chemicals was undertaken during March 2016 (wet season).<br>Field records for the surface water compliance monitoring events conducted between August 2015 and May 2016 are provided as an attachment in **Appendix E.**<br>Monitoring results summary tables are provided as an attachment in **Appendix H**; and<br>Copies of the chain of custodies and laboratory reports, including laboratory QA/QC reports, for the WDL 192-1 monitoring period are included as **Appendix I**. |



INDRA 27-SEP-2016

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| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-1 on:<br>• 25/08/2015;<br>• 24/09/2015;<br>• 22/10/2015;<br>• 19/11/2015;<br>• 08/12/2015;<br>• 19/01/2016;<br>• 17/02/2016;<br>• 17/03/2016;<br>• 18/04/2016; and<br>• 16/05/2016.<br>Desktop review completed on 31/05/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

| RECORDING AND REPORTING | | |
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| 17. | Action | **All records required to be kept by this Licence must be in a legible format.** |
| | How | Desktop review. |
| | Evidence | A desktop review has confirmed that all monitoring records and reports required to be kept by WDL 192-1 are in a legible format.<br>Refer to:<br>An application to amend WDL 192-1 was submitted to the NT EPA on 9 May 2016. The application is attached to this Annual Audit and Compliance Report as **Appendix A**.<br>The application approval cover letter (Subject: Waste Discharge Licence WDL 192-2) and Notice of Amendment issued by the NT EPA on 25 May 2016 is attached to this Annual Audit and Compliance Report as **Appendix B**.<br>The Ichthys Onshore LNG Facilities Community Relations Plan (Document L290-AB-PLN-0150 (JKC Australia LNG Pty Ltd, 2013) is provided as an attachment in **Appendix F**.<br>Non-compliance investigation reports for March and April 2016 are provided as an attachment in **Appendix D.**<br>Field records for the surface water compliance monitoring events conducted between August 2015 and May 2016 are provided as an attachment in **Appendix E**.<br>Copies of the chain of custodies and laboratory reports, including laboratory QAQC reports, for the WDL 192-1 monitoring period are included as **Appendix I**. |
| | When (Date) | Desktop review completed on 31/05/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

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| 18. | Action | **The Licensee must keep records of all non-compliances with this Licence.** |
| | How | Desktop review. |
| | Evidence | A desktop review has confirmed that electronic records of all non-compliances with WDL-192-1 have been kept.<br>NT EPA "Notification of Non-Compliance" Correspondence attached as **Appendix C**.<br>Non-compliance investigation reports for March and April 2016 are provided as an attachment in **Appendix D.**<br>Field records for the compliance monitoring event conducted between August 2015 and May 2016 are provided as an attachment in **Appendix E**.<br>Monitoring results summary tables for the compliance monitoring events conducted between August 2015 and May 2016 are provided as an attachment in **Appendix H**.<br>Copies of the chain of custodies and laboratory reports, including laboratory QAQC reports, for the WDL 192-1 compliance monitoring events conducted between August 2015 and May 2016 are included as **Appendix I**. |
| | When (Date) | Desktop review completed on 09/06/2016. |
| | Status | Compliant. |
| 19. | Action | **The Licensee must as soon as practicable and in any case within 24 hours of becoming aware, notify the NT EPA of non-compliances with this Licence.** |
| | How | Desktop review. |



INDRA 27-SEP-2016

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| | Evidence | JKC Incident Report 005313 (NT EPA Incident PRL5179) Waste Discharge Licence 192-1: Failure to notify noncompliance within 24 hours, was logged by JKC Environment team and reported to the NT EPA on 15/03/2016.<br><br>Following logging of the incident report, an incident investigation was undertaken by JKC Environment team. The purpose of the investigation was to determine the reasons behind the late reporting of the exceedances and to establish appropriate mitigation measures to prevent the recurrence of late reporting and provide greater scrutiny of the operational aspects of the WwTP. The root cause of the incident was a communication oversight between responsible parties JKC and sub-consultant Greencap-NAA Pty Ltd (Greencap), with regards to the routine review and reporting of compliance monitoring data and access to operational effluent data from the WwTP.<br><br>Mitigation measures were initiated to provide greater visibility of the operational monitoring datasets required in accordance with WDL192-1 conditions and to prevent reoccurrence of late reporting to NT EPA. These included:<br><br>• Communication processes between JKC and Greencap were reviewed via discussion between both parties and documented processes were established for communication of monthly compliance monitoring data. Greencap representatives provided monthly compliance monitoring data directly to the responsible JKC Environment team representative and an additional team member in order to address the potential for staff absences. In the case of identification of any non-compliances that require reporting to NT EPA, JKC Environment team members also provided this notification to at least two JKC ARC team members to address the potential for staff absences.<br>• Monthly compliance monitoring was undertaken by Greencap in accordance with WDL-192-1 requirements. Once results were received from the NATA accredited laboratory, Greencap prepared an excel spreadsheet comparing the data against the receiving environment criteria as per WDL192-1. A laboratory QA/QC processes was undertaken to verify the results.<br>• Greencap submitted the spreadsheet to JKC Environment team as per the outlined communication process, providing notification of any exceedances in the associated email correspondence. Greencap also provided the times the samples were each collected and the tide phase during sampling within the same email correspondence.<br>• On receipt of the Greencap data, the responsible JKC Environment team representative reviewed and assessed the data and if applicable, communicated any non-compliances to the JKC ARC team to enable notification to NT EPA within 24 hours as per WDL-192-1 requirements. Notification to NT EPA included presentation of the results and an assessment of potential environmental risks and impacts.<br><br>Further detail is provided within NT EPA “Notification of Non-Compliance” Correspondence attached as **Appendix C**.<br><br>Non-compliance investigation reports for March and April 2016 are provided as an attachment in **Appendix D.** |
| | When (Date) | Desktop review completed on 09/06/2016. |
| | Status | Non-compliant. |



INDRA 27-SEP-2016

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| 20. | Action | **The Licensee must immediately and in any case within 24 hours of becoming aware, notify the NT EPA of any potential or actual environmental harm or pollution by contacting the Pollution Hotline on telephone number 1800 064 567 and by emailing pollution@nt.gov.au.** |
| | How | Surface Water Monitoring Program per Appendix 1 of WDL 192-1.<br>Desktop review. |
| | Evidence | Surface water compliance monitoring per Appendix 1 of WDL 192-1 commenced in August 2015. The monitoring data collected to date, which comprises 10 monthly monitoring events (August 2015 to May 2016), confirms that the Declared Beneficial Uses and Objectives of the subject waterways have not been adversely affected by the Licensed Activity.<br>There was no visible matter, petroleum hydrocarbon sheen or scum, litter or other objectionable matter observed during monitoring events conducted in the receiving environment. There was no evidence of wastewater discharge causing or generating odours which would adversely affect the use of surrounding waters. There was no evidence of algal blooms, abnormal fish behaviour or mortality and no evidence of adverse impacts on marine and intertidal plant species.<br>Results from the surface water compliance monitoring program support the conclusion that WwTP discharges were not impacting on the marine environment or its beneficial uses during the Licence period.<br>The monitoring results have demonstrated that the characteristics of the effluent discharged to Darwin Harbour to date has achieved the treated effluent design specifications. In addition, it has been confirmed that no community complaints have been received specific to the WwTP and its operations.<br>Field records for the surface water compliance monitoring events conducted between August 2015 and May 2016 are provided as an attachment in **Appendix E.** The field records have recorded environmental observations at the time of conducting the compliance monitoring program at the outfall diffuser and at selected reference sites in Darwin Harbour.<br>Copies of the chain of custodies and laboratory reports, including laboratory QA/QC reports, for the WDL 192-1 compliance monitoring events conducted between August 2015 and May 2016 are included as **Appendix I**. |



INDRA 27-SEP-2016

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| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-1 on:<br>• 25/08/2015;<br>• 24/09/2015;<br>• 22/10/2015;<br>• 19/11/2015;<br>• 08/12/2015;<br>• 19/01/2016;<br>• 17/02/2016;<br>• 17/03/2016;<br>• 18/04/2016; and<br>• 16/05/2016.<br>Desktop review completed on 09/06/2016. |
| | Status | Compliant. |
| 21. | Action | **The Licensee must comply with the requirements of section 14 of the *Waste Management and Pollution Control Act.*** |
| | How | Surface Water Monitoring Program per Appendix 1 of WDL 192-1.<br>Desktop review. |
| | Evidence | Section 14 of the *Waste Management and Pollution Control Act* pertains to the duty to notify of incidents causing or threatening to cause pollution.<br>Section 14 of the *Waste Management and Pollution Control Act* states that "incident" includes:<br>(a) an accident, emergency or malfunction; and<br>(b) a deliberate action, whether or not that action was taken by the person conducting the activity in the course of which the incident occurred.<br>As there have been no incidents causing or threatening to cause pollution as a result of the Licenced Activity, this condition has been noted. |
| | When (Date) | Desktop review completed on 09/06/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

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| 22. | Action | **The Licensee must provide to the NT EPA a monitoring report a minimum of 20 Business Days prior to the anniversary of the renewal date for this Licence, for each year of this Licence noting that the NT EPA may require the Licensee to revise, amend and/or resubmit the monitoring report.**<br>**The monitoring report must:**<br>**22.1 be prepared in accordance with the requirements for a Monitoring Report identified on pages 12-21 of the document: *Guidelines for Consultants Reporting on Environmental Issues* available from:**<br>**http://www.ntepa.nt.gov.au/data/assets/pdf_file/0005/136481/guidelines_consultants_reporting_environmental_issues.pdf**<br>**22.2 include a tabulation of field results and analytical parameters required as a condition of this Licence; and**<br>**22.3 include a trend analysis and detailed interpretation of surface water monitoring results required as a condition of this Licence** |
| | How | Desktop review. |
| | Evidence | Due to WDL192-1 being superseded by WDL192-2 on 25/05/2016, the monitoring report for this Licence will be submitted to the NT EPA by 30/09/2016, fulfilling condition 28 of WDL192-2 (amended condition 22 of WDL 192-1). |
| | When (Date) | Desktop review completed on 09/06/2016. |
| | Status | Compliant. |
| 23. | Action | **The Licensee must complete the attached Annual Audit and Compliance Report (AACR), Appendix 2 and provide to the NT EPA a minimum of 20 Business Days prior to the anniversary of the renewal date of this Licence, for each year of this Licence noting that the NT EPA may require the Licensee to revise, amend and/or resubmit the AACR.** |
| | How | Refer to this report. |
| | Evidence | This report fulfils Condition 31 of WDL192-2 (amended condition 23 of WDL 192-1). |
| | When (Date) | Due to WDL192-1 being superseded by WDL192-2 on 25/05/2016, the AACR will be submitted to the NT EPA by 30/09/2016, fulfilling condition 31 of WDL192-2 (amended condition 23 of WDL 192-1). |



INDRA 27-SEP-2016

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| | Status | Compliant. |
| 24. | Action | **The Licensee must provide to the NT EPA a minimum of 20 Business Days prior to the expiry date of this Licence a Licence Report. The Licence Report must include:**<br>• **an update of the environmental risk assessment provided in the document *S-0290-1140-3210 - Waste Discharge Licence Application: Supporting Documentation - Temporary Sewage Treatment Plant*, based on the evidence collected during this Licence period.** |
| | How | Refer to the Waste Discharge Licence Report 2017. |
| | Evidence | Refer to the Waste Discharge Licence Report 2017. |
| | When (Date) | The Waste Discharge Licence Report 2017 will be submitted to the NT EPA on 03/07/2017, which equates to 20 Business Days prior to the expiry date of this Licence (31/07/2017). The submission of the Waste Discharge Licence Report will fulfil Condition 24 of WDL 192-1. |
| | Status | Compliant. |



INDRA 27-SEP-2016

## WDL192-2

Northern Territory Government

# WASTE DISCHARGE LICENCE

(Pursuant to section 74 of the *Water Act*)

**Licence Details**

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| Licence Number: | **WDL 192-2** |
| Commencement Date: | 1 August 2013 |
| Renewal Date: | 25 May 2016 |
| Expiry Date | 31 July 2017 |

**Licensee Details**

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|---|---|---|
| Legal Entity Name: | | JKC Australia LNG Pty Ltd |
| ABN: | | 14 154 383 409 |
| ACN | | 154 383 409 |
| Registered Business Address: | | Level 50, BankWest Tower<br>108 St Georges Terrace<br>PERTH WA 6000 |
| Postal Address: | | GPO Box 2079<br>DARWIN NT 0801 |
| Contact Person: | | Emma Gilliver |
| Position Title: | | Approvals and Regulatory Compliance Officer |
| Contact Details: | b/h: | 08 8931 8721 |
| | mobile: | 0427 038 089 |
| | email: | gilliver.emma@jkc-lng.com |

**Location of Premises**

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|---|---|
| Name: | Ichthys LNG, Bladin Point |
| Address: | 144 Wickham Point Road<br>WICKHAM POINT NT |

**24 hour emergency response**

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| Contact Person 1: | | Suzanne Mayne (Project Environment Manager) |
| | mobile: | 0418 413 382 |
| Contact Person 2: | | Ross McEwen (Resident Construction Manager) |
| | mobile: | 0422 621 909 |
| 24 hour contact line: | | (08) 8931 8888/ 0477 364 286 |

**Licensed Activity** Discharge of wastewater from the Bladin Point Ichthys LNG Temporary Wastewater Treatment Plant (WwTP) to Darwin Harbour subject to this Licence.



INDRA 27-SEP-2016

| ADMINSTRATIVE | | |
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| 1. | Action | **The Licensee must notify the NT EPA within 24 hours if there are changes to the details of the 24-hour emergency contact as provided on page one of this Licence.** |
| | How | Desktop review. |
| | Evidence | Verification from Suzanne Mayne (Project Environment Manager) and Ross McEwen (Resident Construction Manager) that the 24-hour emergency response contacts provided to the NT EPA are current. |
| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 2. | Action | **The Licensee must notify the NT EPA within 14 days if there are changes to the Licensee details shown on page one of this Licence.** |
| | How | Desktop review. |
| | Evidence | Verification from Anthony Black (Lead Environmental Advisor) that the Licensee details are current. |
| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 3. | Action | **The Licensee must notify the NT EPA within 14 days after ceasing to conduct the activity to which this Licence relates.** |
| | How | Desktop review. |
| | Evidence | The Licenced activity: *Discharge of wastewater from the Bladin Point Ichthys LNG Temporary Wastewater Treatment Plant (WwTP) to Darwin Harbour subject to this Licence* commenced in March 2015 and remains active and notification is not applicable. WDL 192-2 is due to expire on 31 July 2017. WDL192-2 was issued following an application to amend WDL 192-1, submitted to the NT EPA on 9 May 2016. The application is attached to this Annual Audit and Compliance Report as **Appendix A**. The application approval cover letter (Subject: Waste Discharge Licence WDL 192-2) and Notice of Amendment issued by the NT EPA on 25 May 2016 is attached to this Annual Audit and Compliance Report as **Appendix B**. |



INDRA 27-SEP-2016

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| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 4. | Action | **The Licensee must notify the NT EPA prior to making any operational change that will cause, or is likely to cause, an increase in the potential for environmental harm, environmental nuisance, material environmental harm or serious environmental harm.** |
| | How | Desktop review. |
| | Evidence | No operational changes to the WwTP have occurred that will cause, or are likely to cause, an increase in the potential for environmental harm, environmental nuisance, material environmental harm or serious environmental harm. |
| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 5. | Action | **The Licensee must cause a copy of this Licence to be available at all times:**<br>**5.1 at the Darwin Site Office, Bladin Point** |
| | How | Site inspection. |
| | Evidence | A hard copy of the licence is maintained in the Project Environment Manager's office at the Bladin Point Ichthys LNG, 144 Wickham Point Road, Wickham Point NT. A site inspection has been conducted to verify, with hard copy sighted. |
| | When (Date) | A site inspection was conducted and a hard copy of WDL 192-2 was sighted on 03/06/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

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| 6. | Action | **Where this Licence requires the provision of any notice, document or other correspondence to the NT EPA, the relevant contact is:**<br>**Pollution Control**<br>**Postal Address: GPO Box 3675, Darwin NT 0801**<br>**Email: pollution@nt.gov.au** |
| | How | Desktop review. |
| | Evidence | No notices, documents or other correspondence per WDL 192-2 have yet been required to be provided to the NT EPA. If required, it is noted that the relevant contact is<br>Pollution Control<br>Postal Address: GPO Box 3675, Darwin NT 0801<br>Email: pollution@nt.gov.au |
| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 7. | Action | **All notices, documents or other correspondence required to be provided pursuant to this Licence must be provided in electronic form unless otherwise specified as a condition of this Licence.** |
| | How | Desktop review. |
| | Evidence | No notices, documents or other correspondence per WDL 192-2 have yet been required to be provided to the NT EPA. If required, all notices, documents and other correspondence will be provided in electronic form to pollution@nt.gov.au. |
| | When (Date) | Desktop review completed on 15/08/2015. |
| | Status | Compliant. |
| 8. | Action | **The Licensee must provide to the NT EPA within 10 business days of a request, or as otherwise agreed, a copy of any document, monitoring data or other information in relation to the activity, in the format requested by the NT EPA.** |



INDRA 27-SEP-2016

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| | How | Desktop review. |
| | Evidence | No requests have yet been received from the NT EPA. |
| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

| OPERATIONAL | | |
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| 9. | Action | **The Licensee must, without limiting any other condition of this Licence in conducting the Activity do all things reasonable and practicable to ensure the Activity does not adversely affect the Declared Beneficial Uses and Objectives as declared from time to time, including those applying to:**<br>**9.1 Darwin Harbour Region** |
| | How | Surface Water Monitoring Program, per Appendix 1 of WDL 192-2. |
| | Evidence | The outfall pipeline and diffuser were designed and positioned at a deep water location along an eastward alignment to the north-east of the WwTP near the mouth of the Elizabeth River.<br>Regional oceanographic modelling was undertaken to determine the location of the outfall pipeline and diffuser ports to best achieve flushing by ocean currents and dilution through deep water installation and effluent jet velocity. The outfall has been erected 1m above the seabed to avoid siltation interference. The diffuser has been designed with positively buoyant jets to increase the jet path and further disperse treated effluent.<br>The design of the WwTP segregates wastewater streams from the sanitary sewage system, reducing the influent of sewage (and effluent) and minimising potential pollutants.<br>The Beneficial Uses currently declared under the Water Act for the Darwin Harbour Region include Aquaculture, Environment and Cultural. The surface water monitoring program undertaken in accordance with Appendix 1 of WDL 192-2 enables the measurement and reporting of the health and condition of the receiving environment against the benchmark that has been developed per the Water Quality Objectives relating to their beneficial uses and environmental values.<br>An environmental risk assessment was undertaken for the proposed discharge from the WwTP and presented within the document L290-AH-FRM-10004 (JKC Australia LNG Pty Ltd, 2013) as part of the WDL application process. The risk assessment process was developed in line with Australian Standard AS/NZS ISO 31000:2009, Risk management principles and guidelines, for the purpose of evaluating the potential risk to the beneficial uses identified for Darwin Harbour/Elizabeth River associated with the proposed discharge of treated effluent. Environmental risks (potential impacts) were identified, the likelihood and consequences of those risks were assessed and mitigation measures and controls were developed to reduce those risks identified such that 'Residual Risks' were reduced to as low as reasonably practicable.<br>Surface water compliance monitoring per Appendix 1 of WDL 192-2 commenced in June 2016. The monitoring data collected to date, which comprises two (2) monthly monitoring events (June 2016 and July 2016), confirms that the Declared Beneficial Uses and Objectives of the subject waterways have not been adversely affected by the Licensed Activity.<br>Field and analytical results obtained during the two (2) monitoring rounds were considered generally representative of an |



INDRA 27-SEP-2016

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| | | estuarine environment. The distribution of all field-measured physico-chemical parameters during the monitoring period was consistent across all monitoring locations, including the reference sites, and was therefore considered consistent with natural background conditions. Most of the analytes sampled in the surface water compliance monitoring period were below the selected trigger values.<br><br>Wastewater discharged from the authorised discharge point (outfall diffuser) and waters in the receiving environment in the vicinity of the outfall diffuser did not:<br><br>• contain any visible matter, petroleum hydrocarbon sheen or scum, or litter or other objectionable matter;<br>• cause or generate odours which would adversely affect the use of surrounding waters;<br>• cause algal blooms;<br>• cause visible change in the behaviour of fish or other aquatic organisms;<br>• cause mortality of fish or other aquatic organisms; or<br>• cause adverse impacts on plants.<br><br>Results from the surface water compliance monitoring program supported the conclusion that WwTP discharges were not impacting on the marine environment during the Licence period. |
| | When (Date) | Discharge from the WwTP commenced on 12/03/2015.<br><br>Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br><br>• 14/06/2016; and<br>• 12/07/2016. |
| | Status | Compliant. |
| 10. | Action | **The Licensee must maintain and implement a communication plan which includes a strategy for communicating with members of the public who are likely to have a real interest in or be affected by the Activity.** |
| | How | Desktop review. |



INDRA 27-SEP-2016

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| | Evidence | A Community Relations Plan has been developed by JKC. This is an Ichthys Gas Field Development Project-wide plan and refers to the range of community engagement procedures which are in effect across Project.<br>The implementation of the Community Relations Plan is via a range of measures including (but is not limited to):<br>• Website and feedback numbers including a 24 hour / 7 days a week (24/7) 1300 community general enquiry number and a 24/7 1300 community feedback number;<br>• Community briefing and consult sessions;<br>• Media releases and television advertising;<br>• Fact sheets;<br>• Community newsletters and bulletins. It is noted that advice re dye testing for the temporary WwTP was included in one of these bulletins;<br>• Specific letter box drops and mail outs when potential construction related impacts may occur; and<br>• Phone surveys.<br>The Ichthys Onshore LNG Facilities Community Relations Plan (Document L290-AB-PLN-0150 (JKC Australia LNG Pty Ltd, 2013) is provided as an attachment in **Appendix F**. |
| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 11. | Action | **The Licensee must maintain a log of each complaint, made in relation to the Activity, to any persons involved in the Activity.**<br>**The log must include details of the following.**<br>**11.1 the date and time of the complaint;**<br>**11.2 the contact details of the complainant if known, or where no details are provided a note to that effect;**<br>**11.3 the nature of the complaint;**<br>**11.4 the nature of events giving rise to the complaint;**<br>**11.5 prevailing weather conditions at the time of the complaint;**<br>**11.6 the action taken in relation to the complaint, including any follow-up contact with the complainant; and**<br>**11.7 if no action was taken, why no action was taken.** |
| | How | Desktop review. |



INDRA 27-SEP-2016

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| | Evidence | The JKC Community Relations department operate a system for complaint monitoring. The complaint monitoring system is an Ichthys Gas Field Development Project wide system called Database Consultation Manager as part of the implementation of the Community Relations Plan. All community complaints associated with the Ichthys Gas Field Development Project received on the 24/7 1300 community general enquiry number and the 24/7 1300 community feedback number are logged.<br><br>It has been confirmed that no community complaints have been received specific to the WwTP and its operations. |
| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

<table>
<tr><td colspan="3">DISCHARGES AND EMISSIONS</td></tr>
<tr><td>12.</td><td>Action</td><td>This Licence authorises wastewater to be discharged from the discharge point identified in Table 1, and in Appendix 1.
<table>
<tr><td colspan="3">Table 1: Authorised Discharge Point</td></tr>
<tr><td></td><td>Description</td><td>Location<br>Zone MGA52; GDA94</td></tr>
<tr><td>Outfall Diffuser</td><td>Deepwater location within East Arm (Elizabeth River) along an eastward alignment from the STP</td><td>Easting: 710158<br>Northing: 8614623<br>Longitude: 130.93404<br>Latitude: -12.5249</td></tr>
</table></td></tr>
<tr><td></td><td>How</td><td>Desktop review.</td></tr>
<tr><td></td><td>Evidence</td><td>Survey documentation provided as an attachment in Appendix G details the location of the waste discharge outfall diffuser and reflects the coordinates identified in Table 1 and Appendix 1 of WDL 192-2.</td></tr>
<tr><td></td><td>When (Date)</td><td>Desktop review completed 15/08/2016.</td></tr>
<tr><td></td><td>Status</td><td>Compliant.</td></tr>
<tr><td>13.</td><td>Action</td><td>Wastewater discharged from the authorised discharge point in Table 1 must not:<br>13.1 contain any visible matter, petroleum hydrocarbon sheen or scum, or litter or other objectionable matter;<br>13.2 cause or generate odours which would adversely affect the use of surrounding waters;<br>13.3 cause algal blooms;<br>13.4 cause visible change in the behaviour of fish or other aquatic organisms;<br>13.5 cause mortality of fish or other aquatic organisms; or<br>13.6 cause adverse impacts on plants.</td></tr>
</table>



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | How | Surface Water Monitoring Program, per Appendix 1 of WDL 192-2.<br>Desktop review. |
| | Evidence | Surface water compliance monitoring per Appendix 1 of WDL 192-2 commenced in June 2016. The monitoring data collected to date comprises two (2) monthly monitoring events (June 2016 and July 2016).<br>There was no visible matter, petroleum hydrocarbon sheen or scum, litter or other objectionable matter observed during monitoring events conducted in the receiving environment. There was no evidence of wastewater discharge causing or generating odours which would adversely affect the use of surrounding waters. There was no evidence of algal blooms, abnormal fish behaviour or mortality and no evidence of adverse impacts on marine and intertidal plant species.<br>Field records for the surface water compliance monitoring events conducted during June 2016 and July 2016 are provided as an attachment in **Appendix E.** The field records have recorded environmental observations at the time of conducting the compliance monitoring program at the outfall diffuser and at selected reference sites in Darwin Harbour. |
| | When (Date) | Discharge from the WwTP commenced on 12/03/2015.<br>Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br>• 14/06/2016; and<br>• 12/07/2016.<br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 14. | Action | **The Licencee must ensure:**<br>**14.1 discharge from temporary outfall diffuser does not cause the median value of surface water quality at the mixing zone monitoring sites specified in Appendix 1 to exceed the water quality trigger values specified in Appendix 2; and**<br>**14.2 the exceedance is not also present at the upstream reference site, determined from the tide phase at the time of sampling.** |
| | How | Surface Water Monitoring Program, per Appendix 1 of WDL 192-2.<br>Desktop review. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | Evidence | Surface water compliance monitoring per Appendix 1 of WDL 192-2 commenced in June 2016. The monitoring data collected to date comprises two (2) monthly monitoring events (June 2016 and July 2016).<br><br>Most of the analytes sampled in the surface water compliance monitoring period were below the selected water quality trigger values, per Appendix 2 of WDL 192-2. Trigger value exceedances throughout the monitoring period are outlined below:<br><br>June 2016<br>- Mixing zone and upstream reference medians exceeded for total phosphorous.<br><br>July 2016<br>- Mixing zone and upstream reference medians exceeded for total phosphorous.<br><br>Although mixing zone median total phosphorous results were reported in exceedance of the trigger value, these did not trigger Condition 14 of WDL192-2 because exceedances were also present at upstream reference site STPM-R2, determined by an incoming tide during sampling on both occasions. Total phosphorus was found to be ubiquitous in Darwin Harbour during June to August 2016, recorded in similar concentrations at numerous EIMP impact and reference sites during the monthly surface water monitoring program. Thus, elevated total phosphorous recorded at WDL192-2 monitoring sites were considered indicative of broader Harbour wide ambient conditions and not related to WwTP discharge.<br><br>Field records for the surface water compliance monitoring events conducted during June 2016 and July 2016 are provided as an attachment in **Appendix E.**<br><br>Monitoring results summary tables are provided as an attachment in **Appendix H**.<br><br>Copies of the chain of custodies and laboratory reports, including laboratory QAQC reports, for the WDL 192-2 monitoring period are included as **Appendix I**. |
| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br><br>• 14/06/2016; and<br>• 12/07/2016.<br><br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 15. | Action | **The Licensee must ensure the median value for any of the water quality results collected at the four mixing zone sites does not exceed the trigger value for any water quality parameter and is not also present at the upstream reference site, determined from the tide phase at the time of sampling more than once out of ten contiguous monthly sampling events.** |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | How | Surface Water Monitoring Program, per Appendix 1 of WDL 192-2.<br>Desktop review. |
| | Evidence | There has yet  not been a sufficient number of monitoring events per Appendix 1 of WDL 192-2 to realise condition 15. |
| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br>• 14/06/2016; and<br>• 12/07/2016.<br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 16. | Action | **The Licensee must ensure that waste water discharged from the water treatment plant as measured at STPM-T1 does not exceed the reporting limits for STPM-T1 specified in Appendix 2.** |
| | How | Surface Water Monitoring Program, per Appendix 1 of WDL 192-2.<br>Desktop review. |
| | Evidence | Surface water compliance monitoring of STPM-T1 per Appendix 1 of WDL 192-2 commenced in June 2016. The monitoring data collected to date comprises two (2) monthly monitoring events (June 2016 and July 2016)<br>Surface water quality parameters sampled at STPM-T1 in June and July 2016 did not exceed any of the reporting limits specified in Appendix 2 of WDL 192-2.<br>Field records for the surface water compliance monitoring events conducted during June 2016 and July 2016 are provided as an attachment in **Appendix E.**<br>Monitoring results summary tables are provided as an attachment in **Appendix H**.<br>Copies of the chain of custodies and laboratory reports, including laboratory QAQC reports, for the WDL 192-2 monitoring period are included as **Appendix I**. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br>• 14/06/2016; and<br>• 12/07/2016.<br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

| MONITORING | | |
|---|---|---|
| 17. | Action | **The Licensee must, for all terrestrial sampling points required by this Licence:**<br>**17.1 install, maintain and provide appropriate identification signage so that they are easily identifiable at all times; and**<br>**17.2 maintain safe access and egress, as is reasonably practicable.** |
| | How | Site inspection and desktop review. |
| | Evidence | The only terrestrial sampling location applicable to WDL 192-1 is STPM-T1 at the WwTP tank outlet. The sampling location is a dedicated sample tap installed on the tank outlet pipe within the restricted access WwTP boundary. The sample location is identified on plant layout and design plans, is known by plant operators and its location has been communicated and shown to the personnel tasked with conducting the compliance monitoring per Appendix 1 of WDL 192-1. Signage has been installed and maintained on the dedicated sample tap STPM-T1.<br>Safe access and egress to the terrestrial sampling location STPM-T1 at the WwTP tank will be maintained as part of standard plant operational procedures. Safe access and egress has been confirmed via the successful completion of compliance monitoring at this sampling location between June 2016 and July 2016.<br>A photograph of signage installed at the STPM-T1 sample tap is provided as an attachment in **Appendix J**. |
| | When (Date) | Compliance monitoring was conducted at the terrestrial sampling location STPM-T1 per conditions of WDL 192-2 on:<br>• 14/06/2016; and<br>• 12/07/2016.<br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 18. | Action | **The Licensee must ensure that all samples and field environmental data are representative of the conditions at the time of sampling.** |
| | How | Surface Water Monitoring Program, per Appendix 1 of WDL 192-2.<br>Desktop review. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | Evidence | A review of the field records and NATA laboratory reports from the monitoring events conducted during June 2016 and July 2016, confirms all samples and field environmental data obtained from the Surface Water Monitoring Program, per Appendix 1 of WDL 192-2, were representative of the conditions at the time of sampling. Field records have recorded environmental observations in addition to monitoring parameters at the time of conducting the compliance monitoring program at the outfall diffuser and selected reference sites in Darwin Harbour.<br><br>Field records for the surface water compliance monitoring events conducted during June 2016 and July 2016 are provided as an attachment in **Appendix E.**<br><br>Copies of the chain of custodies and laboratory reports, including laboratory QA/QC reports, for the WDL 192-2 monitoring period are included as **Appendix I**. |
| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br>• 14/06/2016; and<br>• 12/07/2016.<br><br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 19. | Action | **The Licensee must ensure that all samples and field environmental data are collected in accordance with recognised Australian Standards and guidelines (such as AS/NZS 5667, ANZECC/ARMCANZ).** |
| | How | Surface Water Monitoring Program, per Appendix 1 of WDL 192-2.<br><br>Desktop review. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | Evidence | A review of the field records, COCs and NATA laboratory reports from the monitoring events conducted during June 2016 and July 2016 confirms all samples and field environmental data collected for the WDL 192-2 Surface Water Monitoring Program were collected as per Greencap's document titled *Waste Discharge Licence Surface Water Monitoring Instructions* (001-BPWDL_MI_REVC_060616), which was developed in accordance with recognised Australian Standards and guidelines, including:<br>• AS/NZS 5667.1:1998 *Water quality – Sampling 'Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples';*<br>• AS/NZS 5667.4:1998 *Water quality – Sampling 'Part 4: Guidance on sampling from lakes, natural and man-made';*<br>• AS/NZS 5667.6:1998 *Water quality – Sampling 'Part 6: Guidance on sampling of rivers and streams;*<br>• AS/NZS 5667.9:1998 *Water quality – Sampling 'Part 9: Guidance on sampling from marine waters'.* |
| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br>• 14/06/2016; and<br>• 12/07/2016.<br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 20. | Action | **The Licensee must ensure that all monitoring samples are analysed at a laboratory with current N.A.T.A. certification for the analytical method for the parameters to be measured.** |
| | How | Desktop review. |
| | Evidence | A review of the laboratory reports from the monitoring events conducted during June 2016 and July 2016, confirms all monitoring samples collected for WDL192-2 were analysed at laboratories that hold National Association of Testing Authority (NATA) accreditation for the analyses undertaken. The primary laboratory used for sample analyses was Eurofins\|MGT Pty Ltd (MGT), while the secondary laboratory was ALS Global Pty Ltd (ALS).<br>Copies of the chain of custodies and laboratory reports, including laboratory QAQC reports, for the WDL 192-2 monitoring period are included as **Appendix I**. |
| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| 21. | Action | **For each sample required to be collected by this Licence the following information must be recorded and retained**<br>**21.1 the date(s) on which the sample was taken;**<br>**21.2 the time(s) at which the sample was collected;**<br>**21.3 the point(s) at which the sample was taken;**<br>**21.4 the name of the person who collected the sample;**<br>**21.5 the chain of custody forms relating to the sample(s);**<br>**21.6 the field measurements and/or analytical results for the sample; and**<br>**21.7 laboratory QA/QC documentation.** |
| | How | Desktop review. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | Evidence | Surface water compliance monitoring per Appendix 1 of WDL 192-2 commenced in August 2015.<br><br>For each sample collected, the following information is recorded on field records:<br><br>• The date(s) on which the sample was taken;<br>• The time(s) at which the sample was collected;<br>• The point(s) at which the sample was taken;<br>• The name(s) of the person(s) who collected the sample;<br>• Sampling devices and monitoring equipment;<br>• Field measured physico-chemical parameter measurements;<br>• Weather observations;<br>• Field observations during sampling including evidence of pollution (sheens, scum, fish kills, olfactory observations, turbidity, presence of litter);<br>• No. and type of sample bottles collected;<br>• No. and type of QA/QC samples collected;<br>• Notification of equipment calibration and decontamination procedures; and<br>• Notification of equipment failures, if applicable.<br><br>All samples were submitted to the analytical laboratory with an accompanying and signed chain of custody.<br><br>All analyses undertaken per the WDL 192-2 compliance monitoring program are analysed under the laboratory's National Association of Testing Authority (NATA) accreditation.<br><br>All documentation, including field records, NATA accredited laboratory reports, laboratory QA/QC documentation are saved and stored in electronic file on the Greencap Darwin server.<br><br>Field records for the surface water compliance monitoring events conducted during June 2016 and July 2016 are provided as an attachment in **Appendix E.**<br><br>Copies of the chain of custodies and laboratory reports, including laboratory QA/QC reports, for the WDL 192-2 monitoring period are included as **Appendix I**. |
| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br><br>• 14/06/2016; and<br>• 12/07/2016.<br><br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |

INDRA 27-SEP-2016

| | | |
|---|---|---|
| 22. | Action | **Surface water monitoring must be conducted in accordance with Appendix 1.** |
| | How | Desktop review. |
| | Evidence | Surface water compliance monitoring per Appendix 1 of WDL 192-2 commenced in June 2016.<br>A review of the field records, COCs and NATA laboratory reports from the monitoring events conducted during June 2016 and July 2016 confirms surface water sampling was conducted in accordance with Appendix 1 of WDL 192-2.<br>Field records for the surface water compliance monitoring events conducted during June 2016 and July 2016 are provided as an attachment in **Appendix E.**<br>Monitoring results summary tables are provided as an attachment in **Appendix H**.<br>Copies of the chain of custodies and laboratory reports, including laboratory QA/QC reports, for the WDL 192-2 monitoring period are included as **Appendix I**. |
| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br>• 14/06/2016; and<br>• 12/07/2016.<br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

| RECORDING AND REPORTING | | |
|---|---|---|
| 23. | Action | **All records required to be kept by this Licence must be in a legible format.** |
| | How | Desktop review. |
| | Evidence | A desktop review has confirmed that all monitoring records and reports required to be kept by WDL 192-2 are in a legible format.<br>Refer to:<br>The Ichthys Onshore LNG Facilities Community Relations Plan (Document L290-AB-PLN-0150 (JKC Australia LNG Pty Ltd, 2013) is provided as an attachment in **Appendix F**.<br>Field records for the surface water compliance monitoring events conducted during June 2016 and July 2016 are provided as an attachment in **Appendix E**.<br>Copies of the chain of custodies and laboratory reports, including laboratory QAQC reports, for the WDL 192-2 monitoring period are included as **Appendix I**. |
| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| 24. | Action | **The Licensee must keep records of all non-compliances with this Licence, including those assessed as trivial or negligible.** |
| | How | Desktop review. |
| | Evidence | A desktop review has confirmed that there have not been any non-compliances with WDL192-2. Electronic records of any future non-compliances with WDL 192-2 will be kept.<br>Monitoring results summary tables for the compliance monitoring events in June 2016 and July 2016 are provided as an attachment in **Appendix H**. |
| | When (Date) | Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 25. | Action | **The Licensee must as soon as practicable, and in any case within 24 hours, after becoming aware, notify the NT EPA:**<br>**25.1 any non-compliance with this Licence; and**<br>**25.2 when the median value of the mixing zone monitoring sites exceeds the trigger value for any water quality parameter by more than two times the trigger value.** |
| | How | Desktop review. |
| | Evidence | A desktop review has confirmed that there have not been any non-compliances with WDL192-2. |
| | When (Date) | Desktop review completed on 27/05/2015. |
| | Status | Compliant. |
| 26. | Action | **The Licensee must immediately and in any case within 24 hours of becoming aware, notify the NT EPA of any potential or actual environmental harm or pollution by contacting the Pollution Hotline on telephone number 1800 064 567 and by emailing pollution@nt.gov.au.** |
| | How | Surface Water Compliance Monitoring Program per Appendix 1 of WDL 192-2.<br>Desktop review. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | Evidence | Surface water compliance monitoring per Appendix 1 of WDL 192-2 commenced in June 2016. The monitoring data collected to date, which comprises two (2) monthly monitoring events (June 2016 and July 2016), confirms that the Declared Beneficial Uses and Objectives of the subject waterways have not been adversely affected by the Licensed Activity.<br><br>There was no visible matter, petroleum hydrocarbon sheen or scum, litter or other objectionable matter observed during monitoring events conducted in the receiving environment. There was no evidence of wastewater discharge causing or generating odours which would adversely affect the use of surrounding waters. There was no evidence of algal blooms, abnormal fish behaviour or mortality and no evidence of adverse impacts on marine and intertidal plant species.<br><br>Results from the surface water compliance monitoring program support the conclusion that WwTP discharges were not impacting on the marine environment or its beneficial uses during the Licence period.<br><br>The monitoring results have demonstrated that the characteristics of the effluent discharged to Darwin Harbour to date has achieved the treated effluent design specifications. In addition, it has been confirmed that no community complaints have been received specific to the WwTP and its operations.<br><br>Field records for the surface water compliance monitoring events conducted during June 2016 and July 2016 are provided as an attachment in **Appendix E.** The field records have recorded environmental observations at the time of conducting the compliance monitoring program at the outfall diffuser and at selected reference sites in Darwin Harbour. |
| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br>• 14/06/2016; and<br>• 12/07/2016.<br><br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 27. | Action | **The Licensee must comply with the requirements of section 14 of the *Waste Management and Pollution Control Act*.** |
| | How | Compliance monitoring Program per Appendix 1 of WDL 192-2.<br><br>Desktop review. |
| | Evidence | Section 14 of the *Waste Management and Pollution Control Act* pertains to the duty to notify of incidents causing or threatening to cause pollution.<br><br>Section 14 of the *Waste Management and Pollution Control Act* states that “incident” includes: |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| | | (a) an accident, emergency or malfunction; and<br>(b) a deliberate action, whether or not that action was taken by the person conducting the activity in the course of which the incident occurred.<br><br>As there have been no incidents causing or threatening to cause pollution as a result of the Licenced Activity, this condition has been met and noted for future monitoring events. |
| | When (Date) | Surface water compliance monitoring was conducted per conditions of WDL 192-2 on:<br><br>• 14/06/2016; and<br>• 12/07/2016.<br><br>Desktop review completed on 15/08/2016. |
| | Status | Compliant. |
| 28. | Action | **The Licensee must provide to the NT EPA an annual Monitoring Report by 30 September for each year of this Licence.** |
| | How | Desktop review. |
| | Evidence | The 2016 monitoring report for this Licence will be submitted to the NT EPA by 30/09/2016. |
| | When (Date) | Desktop review completed on15/08/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| 29. | Action | **The Licensee must ensure that the Monitoring Report required under condition 28 is prepared in accordance with the NT EPA Guideline for Reporting on Environmental Monitoring, and includes:**<br>**29.1 tabulation of field results and analytical parameters required as a condition of this Licence;**<br>**29.2 summary of the investigation, causes of an exceedance of the reporting limit and trigger values, and assessment of likely environmental impact when this occurred during the reporting period;**<br>**29.3 long term trend analysis of monitoring data to demonstrate any environmental impact associated with the activity over a minimum period of three years (where the data is available);**<br>**29.4 assessment of environmental impact from the activity; and**<br>**29.5 report on the following parameters associated with wastewater discharge:**<br>• **total discharge (ML/year);**<br>• **total biochemical oxygen demand (tonnes/year);**<br>• **total phosphorus (tonnes/year); and**<br>• **total nitrogen (tonnes/year).** |
| | How | Desktop review. |
| | Evidence | The 2016 monitoring report for this Licence will be submitted to the NT EPA by 30/09/2016. It will be prepared in accordance with the NT EPA Guideline for Reporting on Enviromental Monitoring and condition 29 of WDL 192-2. |
| | When (Date) | Desktop review completed on15/08/2016. |
| | Status | Compliant. |
| 30. | Action | **The NT EPA may require the Licensee to revise or amend and resubmit any Monitoring Report. Where the NT EPA requires the Monitoring Report to be resubmitted, the Licensee must submit it to the NT EPA by the date specified by the NT EPA.** |
| | How | Desktop review. |
| | Evidence | The 2016 monitoring report for this Licence will be submitted to the NT EPA by 30/09/2016. If the Monitoring Reports is required to be resubmitted, it will be resubmitted to the NT EPA by the date specified. |
| | When (Date) | Desktop review completed on15/08/2016. |
| | Status | Compliant. |



INDRA 27-SEP-2016

| | | |
|---|---|---|
| 31. | Action | **The Licensee must complete the attached Annual Audit and Compliance Report (AACR), Appendix 3 and provide to the NT EPA by end September, for each year of this Licence noting that the NT EPA may require the Licensee to revise, amend and/or resubmit the AACR.** |
| | How | Refer to this report. |
| | Evidence | This report fulfils Condition 31 of WDL 192-2. |
| | When (Date) | This Waste Discharge Licence Annual Audit and Compliance Report 2016 will be submitted to the NT EPA by 30/09/2016. |
| | Status | Compliant. |
| 32. | Action | **The Licensee must provide to the NT EPA a minimum of 20 Business Days prior to the expiry date of this Licence a Licence Report. The Licence Report must include:**<br>**32.1 an update of the environmental risk assessment provided in the document S-0290-1140-3210 – Waste Discharge Licence Application: Supporting Documentation – Temporary Sewage Treatment Plant, based on the evidence collected during this Licence period.** |
| | How | Refer to the Waste Discharge Licence Report 2017. |
| | Evidence | Refer to the Waste Discharge Licence Report 2017. |
| | When (Date) | The Waste Discharge Licence Report 2017 will be submitted to the NT EPA on 03/07/2017, which equates to 20 Business Days prior to the expiry date of this Licence (31/07/2017). The submission of the Waste Discharge Licence Report will fulfil Condition 32 of WDL 192-2. |
| | Status | Compliant. |



INDRA 27-SEP-2016

# APPENDIX A
# Application to Amend WDL192-1

INDRA
27-SEP-2016

ntepa Northern Territory Environment Protection Authority

*Water Act*

# APPLICATION TO AMEND A WASTE DISCHARGE LICENCE

*Pursuant to Section 93*

For guidance on completing this form please refer to the *Guidelines on Waste Discharge Licensing under the Water Act* available on the Northern Territory Environment Protection Authority (NT EPA) website at http://www.ntepa.nt.gov.au/waste-pollution/guidelines.

This is an approved form in accordance with section 3 of the *Water Regulations*. Information on this form is being collected for the purposes of assessing your application to amend a waste discharge licence under the *Water Act*. Failure to provide the information requested on this form may result in your application not being considered. Information is collected and managed in accordance with the NT EPA Privacy Statement and the *Information Act*. The privacy statement can be found at: http://www.ntepa.nt.gov.au/privacy.

## 1. APPLICANT DETAILS

**Licence Holder** (the Licence Holder must be a legal entity).

| | | | |
|---|---|---|---|
| Legal Entity Name: | JKC Australia LNG Pty Ltd | | |
| Trading Name | JKC Australia LNG Pty Ltd | | |
| ABN | 14 154 383 409 | ACN | 154 383 409 |

**Registered Business Address**

| | | | | | |
|---|---|---|---|---|---|
| Street Number | Level 50 / 108 | Street Name | St Georges Terrace | | |
| Suburb | Perth | State | WA | Postcode | 6000 |
| Registered Business Address | | | | | |

**Postal Address** (for all correspondence in relation to this licence application)

| | | | |
|---|---|---|---|
| PO Box | GPO Box 2079 | Suburb | Darwin |
| State | NT | Post Code | 0801 |

**Contact Details**
All official correspondence will be directed to this person.

| | | | |
|---|---|---|---|
| Contact Person | Emma Gilliver | Position Title | Government Approvals Advisor |
| B/Hours Phone | (08) 8931 8721 | A/Hours Phone | |
| Mobile | 0427 038 089 | Fax | |
| Email | gilliver.emma@jkc-lng.com | | |

## 2. DETAILS OF CURRENT LICENCE

| | | | |
|---|---|---|---|
| Licence number: | WDL 192-1 | Expiry date of licence: | 31 July 2017 |

INDRA 27-SEP-2016

| | |
|---|---|
| Legal entity name of licensee: | JKC Australia LNG Pty Ltd |

## 3. EMERGENCY CONTACT

Please provide contact details for someone who can respond to an incident relating to the licensed activity 24 hours a day.

| | |
|---|---|
| Name | Emergency Contact 1 - Suzanne Mayne (Project Environment Manager)<br>Emergency Contact 2 - Ross McEwen (Resident Construction Manager) |
| Position description | As above |
| Telephone Number | Emergency Contact 1 - 0418 413 382<br>Emergency Contact 2 - 0422 621 909 |

## 4. REASON AND NATURE OF PROPOSED CHANGE

Please provide the details of the proposed change including a discussion on the potential impacts of the change supported, where applicable, by monitoring data. Applications cannot be processed unless all that appropriate documentation accompanies the application form.

| | |
|---|---|
| Current condition number and description and or Appendix | Condition 13 - refer attached spreadsheet<br>Condition 18 - refer attached spreadsheet<br>Condition 19 - refer attached spreadsheet<br>Condition 22 - refer attached spreadsheet<br>Condition 23 - refer attached spreadsheet |
| Proposed condition description and or Appendix | Condition 13 - refer attached spreadsheet<br>New Condition - refer attached spreadsheet<br>Condition 18 - refer attached spreadsheet<br>Condition 19 - refer attached spreadsheet<br>Condition 22 - refer attached spreadsheet<br>Condition 23 - refer attached spreadsheet |
| Reason for the proposed change including supporting data and an assessment of environmental risk. | As discussed with NT EPA, JKC is proposing changes to selected licence conditions following recent JKC investigations into reported exceedances. The proposed changes are intended to facilitate effective implementation of the licence conditions whilst continuing to meet the intent of the licence and to improve compliance with WDL 192-1. |



INDRA 27-SEP-2016

| | |
|---|---|
| | JKC confirms that the risk assessment and management measures remain the same as in the original WDL 192 application. The proposed changes primarily relate to conditions associated with operational triggers and are intended to prevent and reduce potentially unneccessary reporting. Additional proposed changes relate to administrative amendments to reporting dates. |
| | |

## 5. CHECKLIST

Complete the checklist of elements required in a WDL amendment application indicating what elements are likely to be impacted by the proposed amendments. For further information on each element refer to the Guidelines for Waste Discharge Licences. Where an element is likely to be impact please address the requirements in the column labelled Comments.

| Element | No impact | Impact | Comments |
|---|---|---|---|
| 1. Discharge point(s) | X | | |
| 2. Mixing zone | X | | *Please provide monitoring data with an interpretation and an environmental risk assessment to support any proposed changes to a mixing zone.* |
| 3. Factors to be considered under Section 90 of the *Water Act* | X | | |
| 4. Environmental Assessment | X | | *Please provide an update as to how the requirements of an environmental assessment report have been addressed in relation to the WDL.* |
| 5. Mine Management Plan (or equivalent for petroleum sites) | X | | *Please provide a copy of the most current approved mine management plan (part A).* |

INDRA 27-SEP-2016

| | | | |
|---|---|---|---|
| 6. WDL justification | X | | *Please provide a copy of the most current WDL justification.* |
| 7. Continuous improvement plan | X | | *Please provide an update on the continuous improvement plan.* |
| 8. Discharge specifications | X | | *Please provide monitoring data with an interpretation and an environmental risk assessment to support the proposed amendments* |
| 9. Monitoring plan | X | | *Please provide monitoring data with an interpretation and an environmental risk assessment to support the proposed amendment(s).* |
| | | | |
| 10. Conceptual site model | X | | *Please provide an update of the conceptual site model.* |
| 11. Environmental aspects and impacts register | X | | *Please provide a copy of the most current register.* |
| 12. Emergency response plan | X | | *Please provide a copy of the most current emergency response plan.* |
| 13. Consultation and Communication plan | X | | *Please provide a copy of the most current emergency response plan.* |

## 6. DECLARATION

This declaration must only be signed by a person with the legal authority to sign it (i.e. a person authorised by the Legal Entity specified in this application).

**I hereby declare that the information provided in this application and accompanying documents is to the best of my knowledge, true and correct.**

| | |
|---|---|
| Signature |  |
| Name (printed) | Mark Worthington |
| Position | External Affairs Manager |
| Date | 9/5/16. |
| Seal (if signing under seal): | |

## 7. CHECKLIST OF ATTACHMENTS

| Section | Item | Complete and Attached |
|---|---|---|
| | Monitoring data, interpretation and environmental risk assessment. | |

INDRA
27-SEP-2016

| | | |
|---|---|---|
| | Environmental Assessment | |
| | Mine Management Plan (part A) | |
| | WDL Justification | |
| | Conceptual Site Model | |
| | Environmental Aspects and Impacts Register | |
| | Emergency Response Plan | |
| | Consultation and Communication Plan | |

INDRA
27-SEP-2016

# APPENDIX B
# Notice of Amendment of WDL192-1

INDRA
27-SEP-2016

Northern Territory Environment Protection Authority

Level 2, Suite 201
12 Salonika Street, Parap

**Postal address** GPO Box 3675
Darwin NT 0801
**Tel** 08 8924 4218
**Fax** 08 8924 4053
**Web** www.ntepa.nt.gov.au

**Our ref**: EN2012/0224~0074
**Your ref**: JKC-NTG-00066

Mr Mark Worthington
External Affairs Manager
Ichthys Project
JKC Australia LNG Pty Ltd
Level 6, 66 Smith Street
Darwin NT 0801

Dear Ms Labowitch

**WASTE DISCHARGE LICENCE WDL192-2**

The Northern Territory Environment Protection Authority (NT EPA) has approved your application to amend waste discharge licence WDL192-1.

The Notice of Amendment under section 93(1) of the *Water Act* is enclosed. Waste Discharge Licence WDL192-2 has been issued.

Yours sincerely

**William John Freeland**

Chairman

Delegate for the Controller of Water Resources

25 May 2016

INDRA
27-SEP-2016

ntepa Northern Territory Environment Protection Authority

**NOTICE OF AMENDMENT**

Section 93(1) *Water Act*

Issued to: *JKC Australia LNG Pty Ltd*
*Level 6, 66 Smith Street*
*Darwin NT 0801*

In relation to Waste Discharge Licence WDL192-1 issued to JKC Australia LNG Pty Ltd.

TAKE NOTICE THAT I, William John Freeland, Delegate for the Controller of Water Resources in accordance with subsection 93(1) have amended Waste Discharge Licence WDL192-1 as follows:

1. . A new condition 8 has been added to align with current standard conditions.
2. Condition 13 (now condition 14) has been amended to require the Licensee to ensure that discharge from the temporary outfall diffuser does not cause median surface water quality at the mixing zone monitoring sites to unnaturally exceed the water quality trigger levels specified in a new Appendix 2.
3. A new condition 15 has been added to provide an annual compliance requirement for achieving receiving environment quality for 10% of the time.
4. A new condition 16 has been added to specify never to be exceeded water quality limits for the discharge point, before it mixes with the receiving waters of Darwin Harbour.
5. New conditions 18, 19 and 20 have been added to align with current standard conditions.
6. Previous condition 18 (now condition 24) has been amended to include keeping records of all non-compliances, including those assessed as trivial or negligible.
7. Previous Condition 19 (now condition 25) requires notification within 24 hours when the mixing zone median value is more than double the trigger value.
8. Previous condition 22 (now condition 28) requires an annual monitoring report to be submitted to the NT EPA by 30 September for each year of the licence.
9. A new condition 29 has been added to specify contents of the annual monitoring report, in line with the current standard conditions.
10. The reference sites in Appendix 1 have been moved closer to the discharge location to minimise influence from other nearby wastewater discharges, not related to the Ichthys Project.
11. A new Appendix 2 has been added, which tabulates the water quality trigger values and limits for reporting.

Waste Discharge Licence WDL192-2 has been issued.

25 May 2016

William John Freeland

Delegate for the Controller of Water Resources.

INDRA
27-SEP-2016

# APPENDIX C
# NT EPA Correspondence

INDRA
27-SEP-2016

## Caroline French

**From:** Snyman VanStraaten <vanstraaten.snyman@jkc-lng.com>
**Sent:** Tuesday, 7 June 2016 8:39 AM
**To:** Shoanne Labowitch
**Subject:** FW: WDL 192-1: Notification of Non-Compliance

---

**From:** Emma Gilliver
**Sent:** Tuesday, 15 March 2016 4:50 PM
**To:** Jane Orr <Jane.Orr@nt.gov.au>
**Cc:** Snyman VanStraaten <vanstraaten.snyman@jkc-lng.com>; Suzanne Mayne <mayne.suzanne@jkc-lng.com>
**Subject:** FW: WDL 192-1: Notification of Non-Compliance

Thanks Jane

As indicated in the notification email I will give you a call tomorrow morning to provide further clarity around the circumstances and the reporting timeframe.

I will also be attending the NT EPA inspection of the temporary WWTP this Thursday morning and in conjunction with JKC Environment team members can elaborate further at this point if required.

Kind regards

**Emma Gilliver**
Government Approvals Advisor

**Ichthys Project**
JKC Australia LNG Pty Ltd
Level 6, 66 Smith St
Darwin NT 0800
Office: +61 08 8931 8721
Mobile: +61 427 038 089
gilliver.emma@jkc-lng.com

JKC AUSTRALIA LNG PTY LTD

---

**From:** Jane Orr [mailto:Jane.Orr@nt.gov.au] **On Behalf Of** Pollution NTEPA
**Sent:** Tuesday, 15 March 2016 4:40 PM
**To:** Emma Gilliver <gilliver.emma@jkc-lng.com>
**Subject:** RE: WDL 192-1: Notification of Non-Compliance

Hi Emma

Thank you for notifying the NT EPA. For your reference, these incidents have been logged in the NT EPA incident database as follows:

INDRA
27-SEP-2016

- PRL5175: WDL192-1 non-compliance condition 13 - exceedance of trigger value (NOx – 24 September 2016)
- PRL5178: WDL192-1 non-compliance condition 13 - exceedance of trigger value (TP – 19 January 2016)
- PRL5179: WDL192-1 non-compliance 19 - failure to notify non-compliance within 24 hours

It is understood that you will provide a summary of the corrective actions taken to prevent further failures to comply with condition 19 of WDL192-1.

We will review the information you have provided and will let you know what action, if any, the NT EPA will take.

Regards
Jane

**Jane Orr** | Senior Environmental Officer | Pollution Control
**Northern Territory Environment Protection Authority**
p: (08) 8924 4049 (direct) or (08) 8924 4218 | f: (08) 8924 4053
e: jane.orr@nt.gov.au | www.ntepa.nt.gov.au

Suite 201, Level 2, 12 Salonika Street, Parap, NT 0820
GPO Box 3675, Darwin NT 0801

ntepa Northern Territory Environment Protection Authority

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---

From: Emma Gilliver [mailto:gilliver.emma@jkc-lng.com]
Sent: Tuesday, 15 March 2016 2:37 PM
To: Pollution NTEPA
Cc: Jane Orr; Snyman VanStraaten; Suzanne Mayne
Subject: RE: WDL 192-1: Notification of Non-Compliance

Good afternoon

With regards to the notification below, please refer to the attached risk assessments which were omitted from the previous correspondence.

Kind regards

**Emma Gilliver**
Government Approvals Advisor

**Ichthys Project**
JKC Australia LNG Pty Ltd
Level 6, 66 Smith St
Darwin NT 0800

INDRA 27-SEP-2016

Office: +61 08 8931 8721
Mobile: +61 427 038 089
gilliver.emma@jkc-lng.com

JKC AUSTRALIA LNG PTY LTD

**From:** Emma Gilliver
**Sent:** Tuesday, 15 March 2016 2:29 PM
**To:** 'pollution@nt.gov.au' <pollution@nt.gov.au>
**Cc:** 'Jane Orr' <Jane.Orr@nt.gov.au>; Snyman VanStraaten <vanstraaten.snyman@jkc-lng.com>; Suzanne Mayne <mayne.suzanne@jkc-lng.com>
**Subject:** WDL 192-1: Notification of Non-Compliance

Good afternoon

In accordance with WDL 192-1 Condition 19 relating to non-compliance with the licence provisions, JKC Australia LNG Pty Ltd (JKC) hereby informs NT EPA with regards to two instances of exceedance of the WDL parameters, which occurred in September 2015 and January 2016. Details of these exceedances are as follows:

1. Laboratory analytical data of samples collected during monitoring in the marine surface water environment at the outfall of the temporary Wastewater Treatment Plant (WWTP) pipeline on 24 September 2015 has indicated exceedances of the trigger value for Oxides of Nitrogen (NOx). The median concentration of 36.5 µg /L for NOx was exceeded at three impact monitoring locations, STPM-01, STPM-02 and STPM-03, with concentrations ranging from 28 to 49 µg/L.

2. Laboratory analytical data of samples collected during monitoring in the marine surface water environment at the outfall of the temporary WWTP pipeline on 19 January 2016 has indicated exceedances of the trigger value for Total Phosphate (TP). The median concentration of 54.0 µg /L for TP was exceeded at two impact monitoring locations, STPM-01 and STPM-04, with concentrations of 160 and 67 µg/L respectively.

In both these instances risk assessment has shown that the identified spikes in NOx and TP did not result in any adverse impacts to the receiving environment based on WDL indicators and the load requirement for algal blooms. Sampling undertaken in the months following these exceedances shows that the concentrations in the receiving environment have returned to pre-event historical conditions. Please refer to the attached risk assessments for further information.

JKC has recently identified these exceedances during the review of monthly environmental monitoring data for the temporary WWTP. This delayed identification has been attributed to a communication oversight between responsible parties with regards to the routine review of this data, which has since been rectified by JKC. Further internal review is ongoing to provide an increased level of operational scrutiny and improved reporting procedures. JKC will contact NT EPA shortly to discuss the circumstances in more detail.

Kind regards

**Emma Gilliver**
Government Approvals Advisor

INDRA
27-SEP-2016

**Ichthys Project**
JKC Australia LNG Pty Ltd
Level 6, 66 Smith St
Darwin NT 0800
Office: +61 08 8931 8721
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gilliver.emma@jkc-lng.com




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INDRA
27-SEP-2016

| | |
|---|---|
| From: | Snyman VanStraaten |
| To: | Shoanne Labowitch |
| Subject: | FW: WDL 192-1: Notification of Non-Compliance |
| Date: | Tuesday, 7 June 2016 8:45:38 AM |

**From:** Emma Gilliver
**Sent:** Friday, 8 April 2016 1:44 PM
**To:** pollution@nt.gov.au
**Cc:** Jane Orr <Jane.Orr@nt.gov.au>; Snyman VanStraaten <vanstraaten.snyman@jkc-lng.com>
**Subject:** WDL 192-1: Notification of Non-Compliance

Good afternoon

As discussed with NT EPA on Monday 4th April 2016, in accordance with the reporting requirements of WDL 192-1 Condition 19, JKC Australia LNG Pty Ltd (JKC) hereby informs NT EPA with regards to exceedances of certain WDL parameters at impact and/or reference sites, recently detected in the 17 March 2016 surface water monitoring event associated with the outfall of the temporary Wastewater Treatment Plant (WWTP) pipeline.

In addition, following NT EPA clarification on Monday 4th April 2016 relating to the direct interpretation of WDL 192-1 and the reporting of any exceedances which occur at reference or impact sites, JKC has undertaken a review of data from August 2015 to the present and has identified additional exceedances. These were not previously considered as exceedances by JKC, as explained following the notification of the specific events below. JKC is notifying NT EPA of these exceedances in accordance with the provisions of the current WDL 192-1, however believes that the nature of the current licence has potentially triggered unnecessary reporting requirements in these instances.

Details of all exceedances as per the current provisions of WDL 192-1, commencing with the March 2016 surface water monitoring event, are outlined below.

**March 2016:**

- **Dissolved Oxygen (DO):** Median concentration of 64.7 % saturation for DO across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 exceeded the trigger value (80%), with concentrations ranging from 64.2 to 67.1 % saturation. In addition, the upstream reference site STPM-R1 value of 77.6 % saturation exceeded the trigger value [incoming tide] and the downstream site STPM-R1 value of 69 % saturation also exceeded.
- **Oxides of Nitrogen (NOx):** Median concentration of 42.5 µg/L for NOx across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 exceeded the trigger value (20 µg/L), with concentrations ranging from 42 to 47 µg/L. In addition, the upstream reference site STPM-R1 value of 38 ug/L exceeded the trigger value [incoming tide] and the downstream site STPM-R2 value of 53 ug/L exceeded.
- **Ammonia:** Median concentration of 34.5 µg/L for ammonia across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 exceeded the trigger value (20 µg/L), with concentrations ranging from 33 to 36 µg/L. In addition, while the upstream reference site STPM-R1 value of 15 ug/L did not exceed the trigger value [incoming tide], the downstream site STPM-R2 value of 33 ug/L exceeded.
- **Total Phosphorus (TP):** One impact site STPM-01 exceeded the TP trigger value (30

INDRA 27-SEP-2016

µg/L) with a value of 32 µg/L, however the median value of 21.5 µg/L across the impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 did not exceed, with values ranging from 20 to 32 ug/L. The upstream reference site STMP-R1 value of 38 ug/L exceeded the trigger value [incoming tide] however the downstream site STPM-R2 value of 19 ug/L did not exceed.

- **Enterococci:** Enterococci value of 67 cfu/100ml exceeded the trigger value (50 cfu/100ml) at the downstream reference site STMP-R2 but not at any other sites.

**General comments re March 2016 event:**

- Tide phase was incoming and 2.97 m amplitude.
- No correlation in elevated analytes present and ratios of nutrients, between the end of pipe sample and the impact sites. The end of pipe sample contains elevated levels of Total Nitrogen (TN), NOx and TP, whereas the impact sites shows only elevated levels of NOx and ammonia and TP at one site.
- The above lines of evidence indicate that the signature was not attributable to the WWTP discharge.

**February 2016:**

- **Dissolved Oxygen:** Median concentration of 45.7 % saturation for DO across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 exceeded the trigger value (80%), with concentrations ranging from 38.3 to 59.3 % saturation. In addition, the upstream reference site STPM-R1 value of 36.8 % saturation [outgoing tide] and the downstream site STPM-R2 value of 47.2 % saturation both exceeded the trigger value.
- **Ammonia:** Two impact sites STPM-03 and STPM-04 exceeded the ammonia trigger value (20 µg/L) with values of 23 and 29 µg/L respectively, however the median value of 19.5 µg/L across the impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 did not exceed the trigger value, with concentrations ranging from 16 to 29 ug/L. The upstream reference site STPM-R1 value of 26 ug/L [incoming tide] and the downstream site STPM-R2 value of 33 ug/L both exceeded the trigger value.
- **Oxides of Nitrogen:** One impact site STPM-03 exceeded the NOx trigger value (20 µg/L) with a value of 77 µg/L, however the median value of 7.5 µg/L across the impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 did not exceed, with values ranging from 5 to 77 ug/L. Neither of the two reference sites showed any exceedance.
- **Total Nitrogen:** One impact site STPM-01 exceeded the TN trigger value (10 µg/L) with a value of 400 µg/L, however the median value of 130 µg/L across the impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 did not exceed, with values ranging from 77 to 400 ug/L. Neither of the two reference sites showed any exceedance.

**General comments re February 2016 event:**

- Tide phase is incoming and 3.03 m amplitude.
- No correlation in elevated analytes present and ratios of nutrients, between the end of pipe sample and the impact sites. The end of pipe sample contains elevated levels of TN, NOx and TP, whereas only certain impact sites show elevated levels of TN, NOx and Ammonia.
- The above lines of evidence indicate that the signature was not attributable to the WWTP discharge.

INDRA
27-SEP-2016

**January 2016 -** already reported to NT EPA for an exceedance of TP (logged as NT EPA incident PRL5178) and repeated here as an amendment with additional analytes:

- **Dissolved Oxygen:** Median concentration of 58.8 % saturation for DO across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 exceeded the trigger value (80%), with concentrations ranging from 54.3 to 61.7 % saturation. In addition, the upstream reference site STPM-R1 value of 61.6 % saturation [outgoing tide] and the downstream site STPM-R2 value of 63.5 % saturation both exceeded the trigger value.
- **Oxides of Nitrogen:** Downstream reference site STPM-R2 exceeded the trigger value (20 µg/L) for NOx (70 µg/L), however no other site exceeded.
- **Total phosphorous:** Median concentration of 54 µg/L for TP across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 exceeded the trigger value (30 µg/L), with concentrations ranging from 31 to 160 µg/L. The upstream reference site STPM-R1 value of 30 µg/L [incoming tide] and the downstream site STPM-R2 value of 24 µg/L both did not exceed the trigger value.

**General comments re January 2016 event:**

- Tide phase is incoming and 3.2 m amplitude.
- No correlation in elevated analytes present and ratios of nutrients, between the end of pipe sample and the impact sites. The end of pipe sample contains elevated levels of TN, NOx, TP and ammonia, whereas only certain impact sites show elevated levels of NOx and TP.
- No change from previous assessment- the above lines of evidence indicate that the signature was not attributable to the WWTP discharge.

**December 2015**

- **Chlorophyll-a (Chl-a):** Median concentration of 0.0053-µg mg/L for Chl-a across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 exceeded the trigger value (0.004 mg/L), with concentrations ranging from <0.005 to 0.0056 µg mg /L. In addition, the upstream reference site STPM-R2 value of 0.0053 µg mg/L exceeded the trigger value [outgoing tide] while the downstream site STPM-R1 value of <0.005 µg mg/L did not.
- **Dissolved Oxygen:** Median concentration of 77.8 % saturation for DO across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04, exceeded the trigger value (80%), with concentrations ranging from 77.1 to 82.6 % saturation. The upstream reference site STPM-R2 value of 81.4 % saturation and the downstream site STPM-R1 value of 80.7 % saturation did not exceed the trigger value.
- **Oxides of Nitrogen:** Median concentration of 23 µg/L for NOx across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 exceeded the trigger value (20 µg/L), with concentrations ranging from 20 to 24 µg/L. In addition, the upstream reference site STPM-R2 value of 28 µg/L exceeded the trigger value [outgoing tide] and the downstream site STPM-R1 value of 22 µg/L also exceeded.
- **Total Phosphorous:** One impact site STPM-04 exceeded the TP trigger value (30 µg/L) with a value of 70 µg/L, however the median value of 25 µg/L across the impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 did not exceed, with values ranging from 23 to 70 ug/L. The upstream reference site STPM-R2 value of 24 µg/L [outgoing tide] and downstream reference site STPM-R1 value of 28 µg/L both did not exceed the trigger value.

INDRA
27-SEP-2016

**General comments re December 2015 event:**

- Tide phase is outgoing and 3.5 m amplitude.
- No correlation in elevated analytes present and ratios of nutrients, between the end of pipe sample and the impact sites. The end of pipe sample contains elevated levels of TN, NOx, TP, whereas impact sites show only elevated levels of NOx and TP at one site.
- The above lines of evidence indicate that the signature was not attributable to the WWTP discharge.

**September 2015** - NOx exceedances already reported to NT EPA (logged as NT EPA incident PRL5178) and no other exceedances identified.

**August 2015**

- **Oxides of Nitrogen:** Median concentration of 28 µg/L for NOx across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 exceeded the trigger value (20 µg/L), with concentrations ranging from 24 to 33 µg/L. In addition, the upstream reference site STPM-R1 value of 20 µg/L exceeded the trigger value [incoming tide] and the downstream site STPM-R2 value of 36 µg/L also exceeded.
- **Ammonia:** The upstream reference site STPM-R1 value of 110 µg/L for ammonia exceeded the trigger value (20 µg/L). Ammonia exceedances were not detected at any other sites.
- **Total Phosphorus:** The upstream reference site STPM-R1 value of 39 µg/L for TP exceeded the trigger value (30 ug/L) [incoming tide]. TP exceedances were not detected at any other sites.
- **Total Nitrogen (TN):** The upstream reference site STPM-R1 value of 310 µg/L for TN exceeded the trigger value (300 µg/L) [incoming tide]. TN exceedances were not detected at any other sites.

**General comments re August 2015 event:**

- Tide phase was incoming and 0.87 m amplitude.
- No correlation in elevated analytes present and ratios of nutrients, between the end of pipe sample and the impact sites. The end of pipe sample contains elevated levels of TN, NOx and TP, whereas impact sites show only elevated levels of NOx.
- The above lines of evidence indicate that the signature was not attributable to the WWTP discharge.

**General comments with regards to why JKC has not previously reported the exceedances noted above**

It is noted that the following items were raised with NT EPA at a recent inspection of the temporary WWTP on 17/03/2016 and are soon to be further addressed as part of proposed amendments to WDL 192-1.

The risk assessment approach applied to WDL 192-1 is the same as that applied in the NT EPA approved Project CEMP, EIMP and to WDL211-1. With regards to the identification of the reference sampling locations, the time and phase of the tide are used to determine the upstream sampling location and in all the above cases, there is no correlation in exceedance

INDRA
27-SEP-2016

patterns between the reference locations and the impact sites. The sampling is always conducted during a moving tide and thus provides certainty that one of the reference sites will not be impacted by the discharge during each monitoring event. Further, the pattern of nutrient exceedances at impact sites does not match the end of pipe samples and the ratios of the individual nutrients do not match.

In addition, Darwin Harbour conditions frequently result in exceedances of the trigger values, as per the reference below from the CEMP:

*ANZECC (2000a) confirms that trigger values are concentrations that, if exceeded, would indicate a potential environmental problem, and so 'trigger' a management response, i.e. further investigation to determine if:*

- *There is a real risk of impacts and a management response should be triggered, or*
- *The test values are inappropriately (unnecessarily) 'triggering' risk and no management response is required.*

*The Guidelines are intended to provide government, industry, consultants and community groups with a sound set of tools that will enable the assessment and management of ambient water quality in a wide range of water resource types, and according to designated environmental values. They are the recommended limits to acceptable change in water quality that will continue to protect the associated environmental values. They are not mandatory and have no formal legal status. They also do not signify threshold levels of pollution since there is no certainty that significant impacts will occur above these recommended limits, as might be required for prosecution in a court of law. Instead, the guidelines provide certainty that there will be no significant impact on water resource values if the guidelines are achieved (ANZECC, 2000).*

Please do not hesitate to contact me with any queries regarding the reported non-compliances.

Kind regards

**Emma Gilliver**
Government Approvals Advisor

**Ichthys Project**
JKC Australia LNG Pty Ltd
Level 6, 66 Smith St
Darwin NT 0800
Office: +61 08 8931 8721
Mobile: +61 427 038 089
gilliver.emma@jkc-lng.com

JKC AUSTRALIA LNG PTY LTD

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INDRA
27-SEP-2016

## Caroline French

**From:** Jane Orr <Jane.Orr@nt.gov.au> on behalf of Pollution NTEPA <Pollution.NTEPA@nt.gov.au>
**Sent:** Monday, 6 June 2016 9:49 AM
**To:** Shoanne Labowitch
**Subject:** RE: WDL 192-1: Notification of Non-Compliance (PRL5366)

**Follow Up Flag:** Follow up
**Flag Status:** Flagged

Hi Shoanne

Thank you for the report. For your records this has been logged as PRL5366. Please include investigation of the trigger exceedance in the annual report. No further action required under WDL192-1 which has been superseded by WDL192-2.

Regards
Jane

**Jane Orr** | Senior Environmental Officer | Pollution Control
**Northern Territory Environment Protection Authority**
p: (08) 8924 4049 (direct) or (08) 8924 4218 | f: (08) 8924 4053
e: jane.orr@nt.gov.au | www.ntepa.nt.gov.au

Suite 201, Level 2, 12 Salonika Street, Parap, NT 0820
GPO Box 3675, Darwin NT 0801

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From: Shoanne Labowitch [mailto:labowitch.shoanne@jkc-lng.com]
Sent: Monday, 30 May 2016 12:27 PM
To: Pollution NTEPA
Cc: Snyman VanStraaten; Suzanne Mayne
Subject: WDL 192-1: Notification of Non-Compliance

Good morning
In accordance with the reporting requirements of WDL 192-1 Condition 13, JKC Australia LNG Pty Ltd (JKC) hereby informs NT EPA with regards to exceedances of certain WDL parameters at impact site STPM-01, recently detected in the 16 May 2016 surface water monitoring event associated with the outfall of the temporary Wastewater Treatment Plant (WWTP) pipeline.

JKC is notifying NT EPA of these exceedances in accordance with the applicable provisions of the WDL 192-1 licence at the time of the incident. Please note this incident would not be reportable under the revised licence WDL 192-2, issued 25 May 2016.

INDRA 27-SEP-2016

Details of all exceedances for the May surface water monitoring event as per the previous provisions of WDL 192-1, are outlined below.

**May 2016:**

- **Oxides of Nitrogen ($NO_x$):** One impact site STPM-01 exceeded the $NO_x$ trigger value (20 µg/L) with a value of 28 µg/L, however the median value of 16.5 µg/L across the impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 did not exceed, with values ranging from 5 to 28 µg/L. The upstream reference site STMP-R1 value of 14 µg/L did not exceed the trigger value (incoming tide).
- **Total Phosphate (TP): ):** One impact site STPM-01 exceeded the TP trigger value (30 µg/L) with a value of 40 µg/L, however the median value of 23.0 µg/L across the impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 did not exceed, with values ranging from 21 to 40 µg/L. The upstream reference site STMP-R1 value of 24 µg/L did not exceed the trigger value (incoming tide).

**General comments re April 2016 event:**

- Tide phase was incoming and 2.1 m in amplitude.
- No median concentrations exceeded the trigger values.
- There were no exceedances of DOH criteria in end of pipe samples indicating that the risk of producing an exceedance at the edge of the mixing zone, attributable to WWTP discharge was low.
- The above lines of evidence indicate that the signature was not attributable to the temporary WWTP discharge.

Please do not hesitate to contact me with any queries regarding the reported non-compliances.

Kind regards

**Shoanne Labowitch**
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27-SEP-2016

| | |
|---|---|
| From: | Emma Gilliver |
| To: | Shoanne Labowitch |
| Subject: | FW: WDL 192-1: Notification of Non-Compliance (PRL5297) |
| Date: | Thursday, 12 May 2016 11:50:45 AM |

Kind regards

**Emma Gilliver**
Government Approvals Advisor

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**From:** Jane Orr [mailto:Jane.Orr@nt.gov.au] **On Behalf Of** Pollution NTEPA
**Sent:** Wednesday, 4 May 2016 2:36 PM
**To:** Emma Gilliver <gilliver.emma@jkc-lng.com>
**Subject:** RE: WDL 192-1: Notification of Non-Compliance (PRL5297)

Hi Emma

Thank you for your notification. The data in your email (below) does not provide any evidence that the results were not caused by discharge from the temporary sewage treatment plant at Bladin Point. When preparing the investigation report, please include:

- treatment plant discharge quality (STPM-T1);
- quality at the downstream reference site STPM-R1; and
- verification that the anomalies were not due to any sampling or field measurement error.

It is recommended you also consider other available water quality data for the area and other potential sources of waste water/contaminants.

Please provide your investigation report to pollution@nt.gov.au, referencing PRL 5297, by 20 May 2016.

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27-SEP-2016

Regards
Jane

**Jane Orr** | Senior Environmental Officer | Pollution Control
**Northern Territory Environment Protection Authority**
p: (08) 8924 4049 (direct) or (08) 8924 4218 | f: (08) 8924 4053
e: jane.orr@nt.gov.au | www.ntepa.nt.gov.au

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ntepa Northern Territory Environment Protection Authority

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From: Emma Gilliver [mailto:gilliver.emma@jkc-lng.com]
Sent: Wednesday, 4 May 2016 11:17 AM
To: Pollution NTEPA
Cc: Snyman VanStraaten
Subject: WDL 192-1: Notification of Non-Compliance

Good morning

In accordance with the reporting requirements of WDL 192-1 Condition 19, JKC Australia LNG Pty Ltd (JKC) hereby informs NT EPA with regards to exceedances of certain WDL parameters at impact and/or reference sites, recently detected in the 18 April 2016 surface water monitoring event associated with the outfall of the temporary Wastewater Treatment Plant (WWTP) pipeline.

JKC is notifying NT EPA of these exceedances in accordance with the provisions of the current WDL 192-1, however believes that the nature of the current licence has potentially triggered unnecessary reporting requirements in these instances. Details of all exceedances for the April surface water monitoring event as per the current provisions of WDL 192-1, are outlined below.

**April 2016:**

- **Dissolved Oxygen (DO):** Median concentration of 76.8 % saturation for DO across impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 exceeded the trigger value (80%), with concentrations ranging from 75.5 to 77.2 % saturation. In addition, the upstream reference site STPM-R2 value of 74.2 % saturation exceeded the trigger value [outgoing tide].

INDRA 27-SEP-2016

- **Ammonia:** One impact site STPM-02 exceeded the ammonia trigger value (20 µg/L) with a value of 25 µg/L, however the median value of 17.0 µg/L across the impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 did not exceed, with values ranging from <5 to 25 µg/L. In addition, the upstream reference site STPM-R2 value of 19 µg/L also did not exceed the trigger value [outgoing tide].
- **Total Phosphorus (TP):** One impact site STPM-01 exceeded the TP trigger value (30 µg/L) with a value of 42 µg/L, however the median value of 24.0 µg/L across the impact monitoring locations STPM-01, STPM-02, STPM-03 and STPM-04 did not exceed, with values ranging from 24 to 42 ug/L. The upstream reference site STMP-R2 value of 21 ug/L did not exceed the trigger value [outgoing tide].

**General comments re April 2016 event:**

- Tide phase was outgoing and 2.4 m amplitude.
- No correlation in elevated analytes present and ratios of nutrients, between the end of pipe sample and the impact sites. The end of pipe sample contains elevated levels of Total Nitrogen (TN), Oxides of Nitrogen (NOx), TP and Filterable Reactive Phosphorus (FRP), whereas only certain impact sites show elevated levels of DO, ammonia and TP.
- All parameters measured by WWTP operations on the 18 April remained lower than the end of pipe ratios needed to produce an exceedance at the edge of the mixing zone.
- The above lines of evidence indicate that the signature was not attributable to the temporary WWTP discharge.

Please do not hesitate to contact me with any queries regarding the reported non-compliances.

Kind regards

**Emma Gilliver**
Government Approvals Advisor

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## Caroline French

**From:** Snyman VanStraaten <vanstraaten.snyman@jkc-lng.com>
**Sent:** Tuesday, 7 June 2016 8:40 AM
**To:** Shoanne Labowitch
**Subject:** FW: JKC Investigation into WDL 192-1 Non Compliance: NT EPA Incident PRL5179

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**From:** Emma Gilliver
**Sent:** Monday, 9 May 2016 3:26 PM
**To:** Jane Orr <Jane.Orr@nt.gov.au>
**Cc:** Snyman VanStraaten <vanstraaten.snyman@jkc-lng.com>; Anthony Black <black.anthony@jkc-lng.com>; Suzanne Mayne <mayne.suzanne@jkc-lng.com>
**Subject:** JKC Investigation into WDL 192-1 Non Compliance: NT EPA Incident PRL5179

Good afternoon Jane

As previously discussed, please refer to the summary provided below of the JKC Investigation conducted into NT EPA Incident PRL5179 (WDL 192-1 Non-Compliance 19 - Failure to notify non-compliance within 24 hours), as reported to NT EPA on 15 March 2016.

To clarify, JKC has not investigated NT EPA incidents PRL5175 and PRL5178 reported to NT EPA at the same time and relating to the actual exceedances of certain trigger values, as the risk assessments and explanation provided at the time of notification are considered to have addressed these non-compliances.

**JKC Investigation into WDL 192-1 Non Compliance: NT EPA Incident PRL5179**

JKC Incident Report 005313 Waste Discharge Licence 192 – 1: Failure to notify noncompliance within 24 hours, was logged by JKC Environment team on 15/03/2016.

Following logging of the incident report, an incident investigation was undertaken by JKC Environment team. The purpose of the investigation was to determine the reasons behind the late reporting of the exceedances and establish appropriate mitigation measures to prevent the recurrence of late reporting and provide greater scrutiny of the operational aspects of the temporary Wastewater Treatment Plant (WWTP). A summary of the investigation findings are presented below:

**Root Cause**

Communication oversight between responsible parties JKC and appointed Sub consultant Greencap, with regards to the routine review and reporting of the compliance monitoring information and access to operational effluent data from the WWTP.

While Department of Health (DoH) parameters were being communicated by Greencap to JKC Health team for review and reporting of any non-compliances to DoH, via the JKC Approvals and Regulatory Compliance (ARC) team, there was an oversight with regards to the communication of the data being collected by Greencap for WDL-192-1. Greencap was conducting the routine monthly sampling as per the requirements of WDL 192-1 and receiving the analytical results from the NATA accredited laboratory, however these results were not being reviewed or communicated to JKC Environment team due to staff oversights. Personnel transitions within both JKC and Greencap during the last six months of 2015 contributed to a loss of knowledge around the agreed communication protocols for reporting of the WDL 192-1 monthly monitoring data and tracking of this deliverable. Accordingly, any non-compliances recorded over this period were not being detected by JKC Environment team and communicated to the JKC ARC team for reporting to NT EPA.

INDRA
27-SEP-2016

**Mitigation Measures Implemented**

The following mitigation measures have since been initiated by JKC to provide greater visibility of the operational and compliance monitoring datasets required in accordance with both NT EPA and DoH approvals and to prevent reoccurrence of late reporting:

**Ongoing Operational Monitoring:**

- Discussions have been held with WWTP operators to confirm that the daily operational monitoring data is provided to the JKC Environment team on a daily basis using the FM Environment mailbox. This FM mailbox is checked each day by the Environment Team representative, who undertakes a daily review of the operational data provided by WWTP operators. There are secondary and tertiary backup environmental personnel to undertake the assessment in the event of the primary person being unwell or absent from the office. The processes outlined in the bullet points below have been established to address any operational monitoring discrepancies.
- JKC Environment has established an 'end of pipe criteria' for each parameter (with the exception of Total Nitrogen (TN) and Total Phosphorus (TP)), to be used as an early warning system and to draw WWTP operator attention to look into the outlier result and undertake rectification works to bring the result down. These parameters have been set at a 25 fold dilution below the engineered capability of the outlet diffuser and below concentrations required to reach receiving environment criteria at the edge of the mixing zone.
- JKC Environment also calculates the TN and TP loads for the daily data received from WWTP operators and compares against load based triggers required to stimulate for algal blooms. In the event of a compliance monitoring exceedance, this data will be used to show whether the temporary WWTP is out of specification, and if so, how long the event occurred for. JKC Environment team is currently watching the process and will set the end of pipe criteria for TN and TP at a level whereby immediate action will be undertaken at the temporary WWTP when results trigger the end of pipe criteria.

**Monthly Compliance Monitoring and Reporting:**

- Communication processes between JKC and Greencap have been reviewed via discussion between both parties and documented processes have been put in place for communication of monthly compliance monitoring data. Greencap representatives provide monthly compliance monitoring data directly to the responsible JKC Environment team representative and an additional team member in order to address the potential for staff absences. In the case of identification of any non-compliances that require reporting to NT EPA, JKC Environment team members also provide this notification to at least two JKC ARC team members to address the potential for staff absences.
- Monthly compliance monitoring is undertaken by Greencap in accordance with WDL-192-1 requirements. Once results are received from the NATA accredited laboratory, Greencap prepare an excel spreadsheet comparing the data against the receiving environment criteria as per WDL192-1 . A laboratory QA/QC processes is undertaken to verify the results.
- Greencap submit the spreadsheet to JKC Environment team as per the outlined communication process, providing notification of any exceedances in the associated email correspondence. Greencap also provide the times the samples were each collected and the tide phase during sampling within the same email correspondence.
- On receipt of the Greencap data, the responsible JKC Environment team representative reviews and assesses the data and if applicable, communicates any non-compliances to the JKC ARC team to enable notification to NT EPA within 24 hours as per WDL-192-1 requirements. Notification to NT EPA includes presentation of the results and an assessment of potential environmental risks and impacts.

We trust this summary of the mitigation measures which have been reinforced and adopted by JKC since the notification to NT EPA on 15 March 2016, demonstrates that JKC has closed out this incident and has implemented measures to prevent reoccurrence for late reporting under WDL 192-1.

Please feel free to contact me with any queries you may have. Due to my maternity leave arrangements, after this Thursday 12 May please contact my manager Snyman Van Straaten with regards to this matter, copying JKC Environment team member Anthony Black.

INDRA
27-SEP-2016

Many thanks.

Kind regards

**Emma Gilliver**
Government Approvals Advisor

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INDRA
27-SEP-2016

# APPENDIX D
# Non-compliance Investigation Reports

INDRA
27-SEP-2016

# Memorandum

**Subject: WDL192-1 Non-Compliance Investigation Report, March 2016**

Waste Discharge Licence WDL192 was issued to JKC Australia LNG Pty Ltd (Contractor) in August 2013 (renewed in August 2015 as WDL192-1) pursuant to section 74 of the Water Act. The Licenced Activity is *discharge of wastewater from the Bladin Point Ichthys LNG Temporary Wastewater Treatment Plant (WwTP) to Darwin Harbour subject to this Licence*.

In accordance with Licence Condition 16, surface water monitoring is conducted in accordance with Appendix One (1) of the Licence. Monitoring conducted as per Condition 16 during March 2016 has reported a non-compliance. Condition 13 of the Licence states: "In accordance with the Declaration of Beneficial Uses for Darwin Harbour, surface water monitoring for sampling locations STPM-01, STPM-02, STPM-03 and STPM-04 and detailed in Appendix 1 must:

- Meet the water quality objectives for "upper estuary" specified in Tables 8 and 9 of the document titled *Water Quality Objectives for the Darwin Harbour Region – Background Document (NRETAS, 2010)*; and
- If particular water quality objectives relevant to a beneficial use are not specified in Tables 8 and 9, the relevant guideline values for 95% species level protection specified in Chapters 3 and 5 of the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC 2000) apply."

Samples were collected in the marine surface water environment at the edge of the WwTP outfall diffuser mixing zone on 17 March 2016. Subsequent laboratory analysis reported ammonia and oxides of nitrogen concentrations exceeding the relevant Water Quality Objectives and is therefore non-compliant with Condition 13 of the Licence. Laboratory results are presented in Table 1 and have been compared to the relevant Water Quality Objectives.

**Table 1 Laboratory Results**

| WDL192-1 Monitoring Location | Analytes | |
|---|---|---|
| | Ammonia (as N) | Oxides of Nitrogen ($NO_3$ + $NO_2$) [as N]) |
| **Water Quality Objectives** | **20 µg/L** | **20 µg/L** |
| **Monitoring locations at the edge of the WwTP outfall diffuser mixing zone** | | |
| STPM-01 | 36 µg/L | 47 µg/L |
| STPM-02 | 34 µg/L | 42 µg/L |
| STPM-03 | 35 µg/L | 42 µg/L |
| STPM-04 | 33 µg/L | 43 µg/L |
| STPM- Median | 34.5 µg/L | 42.5 µg/L |
| **Reference Sites** | | |
| STPM-R1 | 15 µg/L | 38 µg/L |
| STPM-R2 | 33 µg/L | 53 µg/L |
| STPM-R-Median | 24 µg/L | 45.5 µg/L |

Shaded cell denotes an exceedance of the Water Quality Objectives

As per a request received on 4 May 2016 from the Northern Territory Environment Protection Authority (NT EPA), this memorandum presents the results of an investigation conducted in response to the March 2016 non-compliance. The NT EPA correspondence, received in response to a non-compliance notification submitted by Contractor under Condition 19 of Licence, requests the provision of evidence that the results were not caused by WwTP discharges and that discharge and reference site quality, and sampling quality assurance and quality control measures were to be considered.



INDRA 27-SEP-2016

This information request has been addressed in this memorandum and includes lines of evidence to support the investigation and the associated outcomes. As per the risk-based application of the ANZECC Guidelines, the investigation aims to use multiple lines of evidence to determine whether:

1. There is a real risk of ecological impact and whether a management response should be triggered; or
2. The sampling results had unnecessarily triggered a risk response; and
3. Any management response was required.

**WwTP Discharge Quality**

The outfall diffuser has been designed to achieve dilutions of at least 250-fold for 90% of the time within the near field (i.e. in the vicinity of the outfall diffuser). The diffuser design has allowed for a regulatory mixing zone of approximately 50 m radius, beyond which the Water Quality Objectives apply. Monitoring data from a sample collected at the WwTP tank outlet (monitoring location STPM-T1) on 17 March reported an ammonia concentration of 33 µg/L, which is below the median ammonia concentration reported from samples collected at the edge of the mixing zone and is well within the target effluent design specifications. With a diffuser designed to achieve dilutions of at least 250-fold for 90% of the time, it would be expected that the ammonia from the WwTP discharge measured at STPM-T1 would be diluted to 0.4% at the edge of the mixing zone and this equates to 0.14 µg/L.

The WwTP discharge sample from the tank outlet was collected at 8:40 am, 20 minutes and 47 minutes prior to collection of the first and final samples collected at the edge of the mixing zone respectively. This methodology has been adopted with the aim of facilitating the comparison of treated effluent concentrations measured at the tank outlet to the concentrations measured in the receiving waters at the boundary of the regulatory mixing zone and to determine achieved dilutions of selected parameters if required. Based on the outfall length and pipe diameter and operating flow rate, preliminary calculations indicate that water would take about 35 minutes to travel from the tank to the diffuser and therefore it can be reasonably assumed that the samples collected at the edge of the mixing zone were representative of the plug of water being discharged at the time of the tank outlet sampling. Thus, from the evidence presented above it can be concluded that the WwTP discharge was not the cause of the ammonia non-compliance recorded at the edge of the near-field on 17 March 2016.

Similarly, WwTP tank outlet monitoring reported an oxides of nitrogen concentration of 1,900 µg/L and with the design dilution factor considered, it would be expected that the WwTP discharge measured at STPM-T1 would be diluted to 0.4% at the edge of the mixing zone and this equates to 7.6 µg/L. The tank outlet oxides of nitrogen concentration is also within the target effluent design specifications.

**Consideration of Reference Site Data and Other Available Water Quality Data**

Surface water monitoring was conducted as part of the Environmental Impact Monitoring Program (EIMP) on 16 and 17 March 2016. Surface water samples were collected from sites extending both upstream and downstream of the outfall diffuser, see Figure 1 in Attachment 1.

The laboratory analytical data from the samples collected as part of the EIMP monitoring and the samples collected at both at WDL192-1 reference sites reported ammonia concentrations ranging between <5 to 170 µg/L and oxides of nitrogen concentrations ranging between 29 to 54 µg/L. Isopleths were prepared using EIMP and WDL192-1 datasets which identify the distribution for ammonia (Figure 2) and oxides of nitrogen (Figure 3) during March 2016. Ammonia exceedances were recorded at reference sites and the far downstream section of Elizabeth River with no plume trend towards the diffuser. Oxides of nitrogen exceedances were widespread including sites upstream, downstream and at reference sites in the harbour and with no plume trend towards the diffuser. Following the review of the data and isopleths, no spatial patterns or trends were observed which would indicate that the exceedances were caused by WwTP and demonstrate that both ammonia and oxides of nitrogen concentrations reported from the edge of the mixing zone are within the concentration ranges detected within the ambient environment at the time of sampling.



INDRA 27-SEP-2016

**Potential for Environmental Harm**

A literature review conducted to support this investigation suggests that Darwin Harbour is characterised by low concentrations of dissolved nutrients which almost invariably meet the water quality objectives (Padovan 1997, 2003; Fortune 2015; Duggan, 2006; Drewry et al 2010). It is important to note that nutrient data collected as part of both the WDL192-1 and EIMP monitoring programs are representative of total nutrient concentrations and not dissolved nutrients.

The nutrient samples collected for the studies presented in the aforementioned literature are representative of dissolved nutrients, with samples filtered in the field through 0.45 µm filters prior to analysis. As nutrients exist in the environment as both dissolved and particulate forms, and therefore a direct comparison of the WDL192-1 and EIMP data to historical ambient data contained within the literature is not facilitated, instead this section of the investigation is focused on total nitrogen as the key environmental indicator, which is representative of the total amount of nitrogen present in all its forms.

The Water Quality Objectives aim to maintain total nitrogen at concentrations less than 300 µg/L and and both WDL192-1 and EIMP monitoring results for March 2016 show that total nitrogen complied with the Water Quality Objectives.

Nutrient concentrations are responsible (together with other factors) for stimulating algal growth but it is the total load of the key nutrients in the ecosystem that regulates the biomass of aquatic plants within a system. Diffuse source loads from catchment runoff during the wet season also contribute nutrients to the Darwin Harbour. Skinner et al (2009) determined catchment total nitrogen loads into Darwin Harbour for a typical wet season (1.7 m rainfall) were 722 tonnes. On a more local scale, Schult (2012) determined total nitrogen loads specific to the Elizabeth River catchment during the 2008/09, 2010/11 and 2011/12 wet seasons, the average of which is 69 tonnes per wet season and equates to 325 kg/day based on the Australian Bureau of Meteorology defined wet season (October to April). Monitoring data from a sample collected at the WwTP tank outlet (monitoring location STPM-T1) on 17 March reported a total nitrogen concentration of 2,500 µg/L, which is considered representative of the total nitrogen concentration load being discharged from the tank on the day. The discharge output of the WwTP on 17 March was 217.9 KL which equates to an estimated total nitrogen load discharge of 0.545 kg/day and 0.17% of the average daily wet season load.

Although nitrogen is the primary limiting nutrient in Darwin Harbour (Butler et al, 2013), the WwTP contribution is considered negligible when compared to typical total nitrogen loads and this is evidenced by low microalgal biomass, with chlorophyll-a concentrations reported below detection at all WDL192-1 locations and all but one (BPSW34) EIMP locations in March 2016. It should be noted that monitoring location BPSW34 is located in a separate arm of Darwin Harbour and is not considered relevant to this investigation. In addition, total nitrogen in Darwin Harbour is generally in the range of 100 to 600 µg/L (Butler et al, 2013; Padovan, 2003) and all WDL192-1 and EIMP monitoring data for March 2016 falls well below this upper range. Thus, the residual risk of the nutrients resulting in environmental harm via an algal bloom is considered to be low.

Monitoring field observations collected on 16 and 17 March 2016 did not report discharges containing any visible matter, sheen or scum. There were no observations of unusual fish activity, such as surface gasping, rubbing or other signs of stress and no fish mortality.

From the evidence presented above, the potential for environmental harm resulting as a consequence of the non-compliance is considered to be low.



INDRA
27-SEP-2016

**Quality Assurance and Quality Control**

All monitoring requirements conducted by the EIMP and WDL192-1 consultancy subcontractor are subject to strict quality assurance and quality control (QA/QC) procedures. Surface water monitoring is conducted in strict accordance with recognised Australian Standards and guidelines including:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council [ANZECC] and the Agriculture and Resource Management Council of Australia and New Zealand [ARMCANZ], 2000a) (ANZECC Guidelines);
- AS/NZS 5667:1:1998 Water Quality Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples (AS/NZS 5667.1);
- AS/NZS 5667.6.1998 Water Quality Sampling – Guidance on sampling of rivers and streams (AS/NZS 5667.6); and
- AS/NZS 5667.9.1998 Water Quality Sampling – Guidance on sampling from marine waters (AS/NZS 5667.9).

For marine surface water sampling, the sampling team used a shallow draft vessel. Samples were collected as grab samples upstream of the boat, using an extension pole mounted with a sampling bottle. Samples were taken 0.25 to 0.5 m below the water surface. The key procedures undertaken in the field were:

- Visual inspection of surface water collection points and onsite basins to determine the presence or absence of oil, grease, iron floc or floating matter;
- In-situ quality measurements for pH, total dissolved solids (TDS), EC, DO, temperature, turbidity and ORP undertaken prior to sample collection using a multi-parameter instrument. All field equipment was calibrated in accordance with the manufacturer's recommendations prior to use;
- Collection of surface water samples and field QA/QC samples for laboratory analysis after field quality parameter measurement;
- Decontamination of all non-dedicated sampling equipment between sample locations; and
- Proper disposal of used disposable sampling equipment.

A review of field monitoring protocols has confirmed the methods of sampling has provided data of sufficient quality for the purpose of the WDL192-1 monitoring program in March 2016. The subcontractor is satisfied that non-compliances were not due to any sampling or field measurement error.

**Investigation Conclusions**

The investigation conducted in response to a non-compliance of Condition 13 of WDL192-1 in March 2016 has concluded the exceedances reported for ammonia and oxides of nitrogen were not caused by the WwTP discharge and the potential of environmental harm as a result of the exceedances is low. The lines of evidence evaluated demonstrate:

1. The contribution of the ammonia and oxides of nitrogen concentrations from the WwTP is considered insignificant with consideration of the diffuser design and dilution factor.
2. Results reported from concurrent surface monitoring conducted as part of the EIMP and results reported from the WDL1192-1 reference sites demonstrate that both the ammonia and oxides of nitrogen concentrations reported from the edge of the discharge mixing zone were within the concentration ranges detected within the ambient environment at reference sites at the time of sampling.
3. The ammonia and oxides of nitrogen concentrations that triggered the non-compliance are representative of total (dissolved + particulate) concentrations as opposed to dissolved



INDRA
27-SEP-2016

concentrations. Thus, they represent a worst case scenario and it would be expected that the dissolved fractions of these nutrients would be less than the total concentrations reported.

4. The total nitrogen contribution from the WwTP to Darwin Harbour and the Elizabeth River estuary is negligible in comparison to the total nitrogen load from diffuse and other point sources in Darwin Harbour. Furthermore, total nitrogen concentrations at the edge of the mixing zone were within concentration ranges considered as ambient and complied with the water quality objectives.
5. There was no evidence of environmental harm resulting from the non-compliances and the residual risk of the nutrients resulting in environmental harm via an algal bloom is considered low, as evidenced by low chlorophyll results.

It can be concluded that given the multiple lines of evidence outlined in this investigation report, the March 2016 exceedances of ammonia and oxides of nitrogen unnecessarily triggered regulatory reporting, and no further management response is required.

**Attachments**

1. Figure 1 – EIMP Monitoring Locations
2. Figure 2 – March 2016 Ammonia Isopleth
3. Figure 3 – March 2016 Oxides of Nitrogen Isopleth

INDRA 27-SEP-2016

**References**

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Australian Bureau of Meteorology. (2014). Northern Territory in October to April 2013-14: high rainfall for central NT. Retrieved from http://www.bom.gov.au/climate/current/season/nt/summary.shtml.

Butler, E.C.V., Streten-Joyce, C., Tsang, J.J., Williams, D.K., Alongi, D.M., Furnas, M.J. and McKinnon, A.D. (2013) A procedure for evaluating the nutrient assimilative capacity of Darwin Harbour. Report for Aquatic Health Unit, NT Department of Land Resource Management. Australian Institute of Marine Science, Darwin. (41 pp. plus appendices).

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Duggan, S. (2006). The water quality of Darwin Harbour: December 2002-December 2004. AIMS Report 37. Australian Institute of Marine Science. Townsville.

Fortune, J. (2010). Water Quality Objectives for the Darwin Harbour region – background document. Department of Natural Resources, Environment, The Arts and Sport. Palmerston NT.

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Padovan, A. (2003). Darwin Harbour water and sediment quality. Proceedings of the Darwin Harbour Public Presentations – February 2003, Darwin Harbour Regional Plan of Management.

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Skinner, L., Townsend, S., Fortune, J. (2009). The impact of urban land-use on total pollutant loads entering Darwin Harbour. Department of Natural Resources, Environment, The Arts and Sport, Report 06/2008D, Darwin.



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## Legend

- Site Boundary
- Gas Export Pipeline

**Surface Water Monitoring Locations**

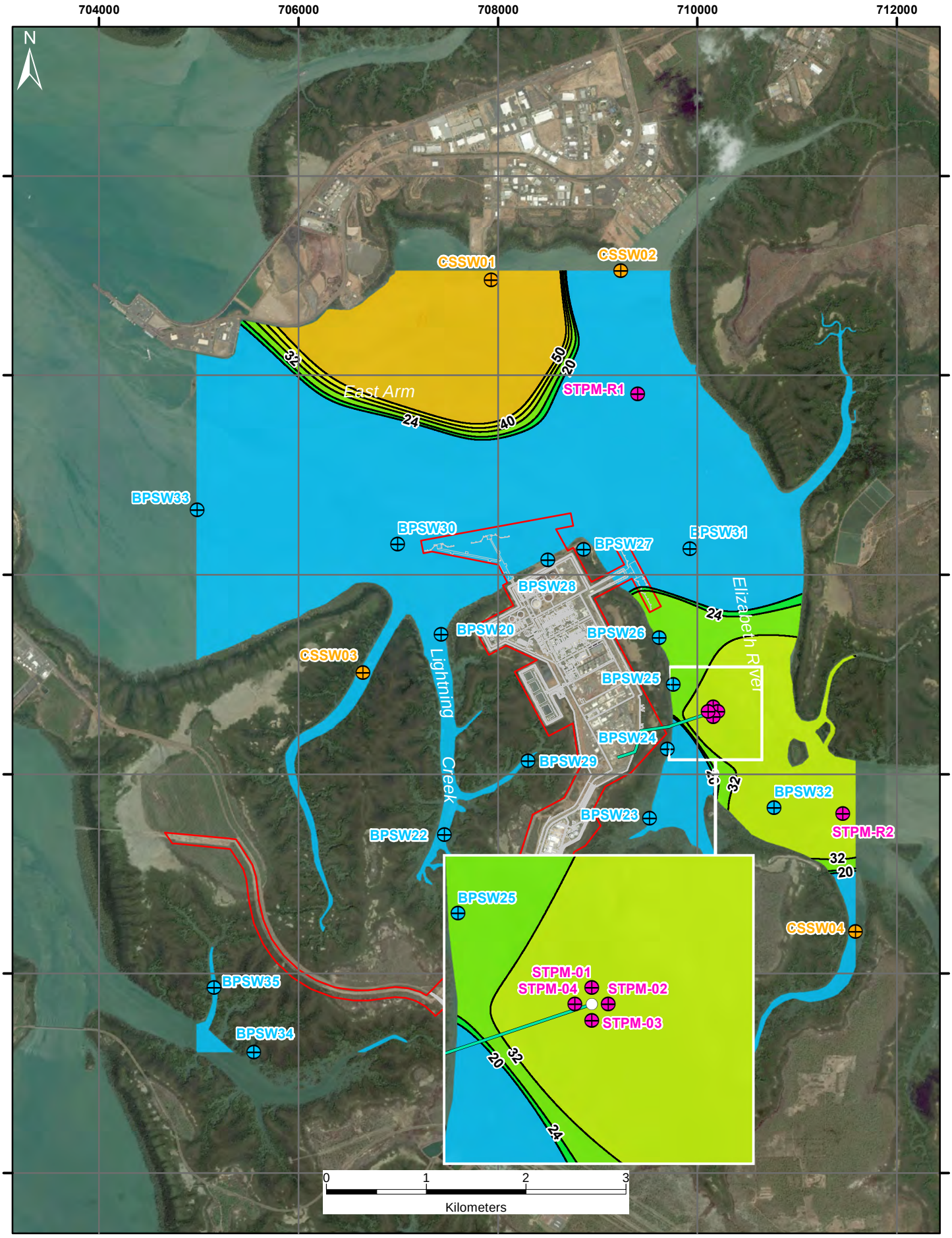
- Reference Sites
- Off-site Marine Sampling Locations

# Offsite Surface Water Sampling Locations, March 2016

| | | |
|---|---|---|
| **Figure 1** | **INPEX Bladin Point** | GREENCAP |
| ***Date:*** *20/05/2016* | **Author:** malcolm.nunn | |
| | **Map Scale:** 1:50,000 | |
| **Revision:** A | **Coordinate System:** GDA 1994 MGA Zone 52 | |
| R:_Projects\C110043_Inpex\GIS\Maps\other\BP_WDL_NonCompliance Report\FIG_1_OffsiteSurfaceWater_160520.mxd | | |

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**Legend**

- Site Boundary
- Construction Footprint
- Ammonia Level Contours (µg/L)
- Indicative Outfall Point
- Temporary WwTP Outfall Pipeline Alignment

**Surface Water Monitoring Locations**

- Off-site Marine Sampling Locations
- Reference Sites
- Wastewater Monitoring Sites

**Ammonia Level (µg/L)**

- 0.0 - 20.0
- 20.0 - 24.0
- 24.0 - 32.0
- 32.0 - 40.0
- 40.0 - 50.0
- >50.0

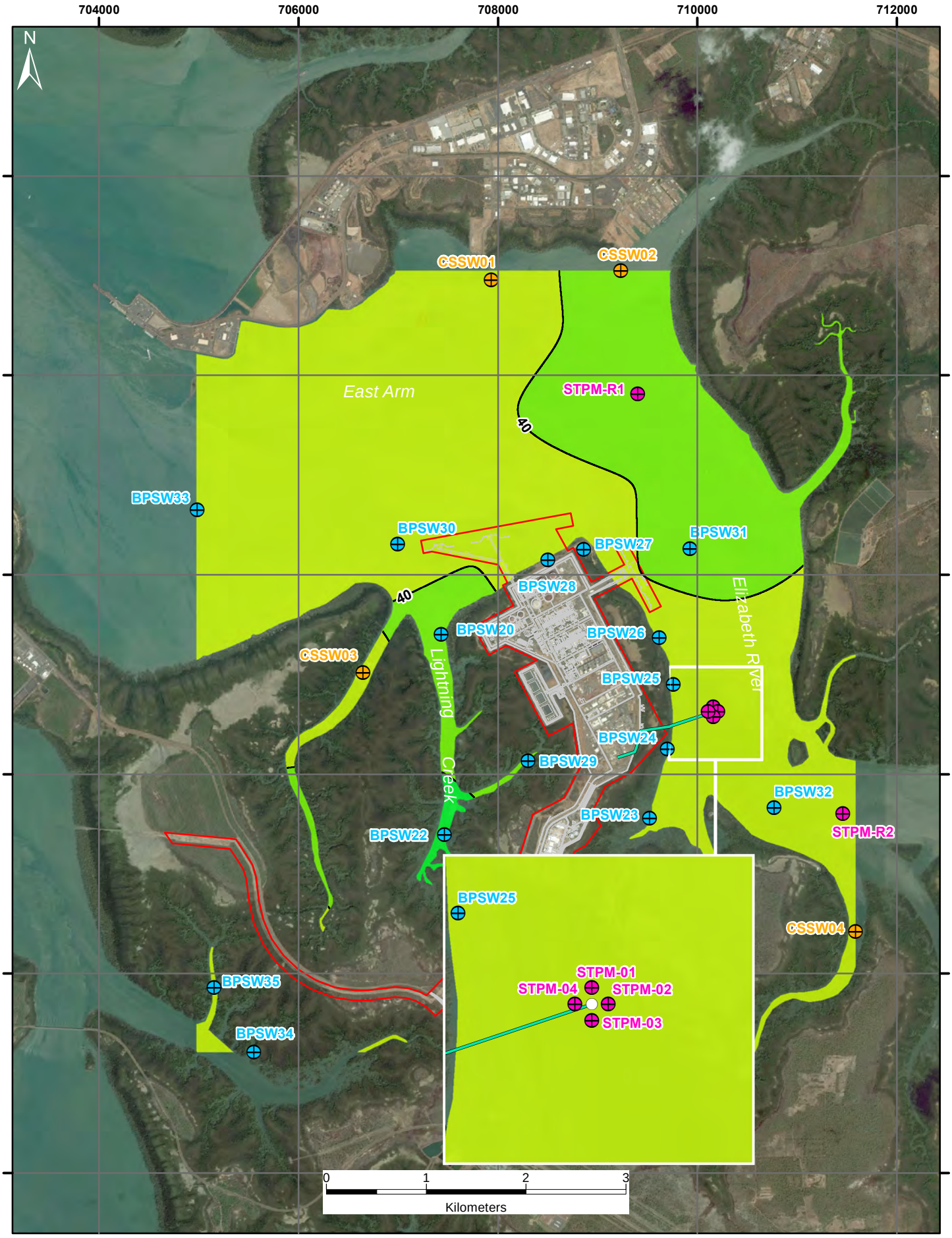
# Ammonia Distribution, March 2016

| Figure 2 | INPEX Bladin Point | GREENCAP |
|---|---|---|
| **Date:** 20/05/2016 | **Author:** malcolm.nunn | |
| | **Map Scale:** 1:50,000 | |
| **Revision:** A | **Coordinate System:** GDA 1994 MGA Zone 52 | |

R:_Projects\C110043_Inpex\GIS\Maps\BP_Quarterly_Monitoring\2016_01_03\2016_03_isopleths\incl_WDL192\FIG_2_BP_2016_03_March_Amm_160519.mxd

INDRA 27 SEP 2016

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**Legend**

- Site Boundary
- Construction Footprint
- Oxides of Nitrogen Level Contours (µg/L)
- Indicative Outfall Point
- Temporary WwTP Outfall Pipeline Alignment

**Surface Water Monitoring Locations**

- Off-site Marine Sampling Locations
- Reference Sites
- Wastewater Monitoring Sites

**Oxides of Nitrogen Level (µg/L)**

- 20.0 - 30.0
- 30.0 - 40.0
- 40.0 - 80.0

# Oxides of Nitrogen Distribution, March 2016

| Figure 3 | INPEX Bladin Point | GREENCAP |
|---|---|---|
| **Date:** 20/05/2016 | **Author:** malcolm.nunn | |
| | **Map Scale:** 1:50,000 | |
| **Revision:** A | **Coordinate System:** GDA 1994 MGA Zone 52 | |

R:_Projects\C110043_Inpex\GIS\Maps\BP_Quarterly_Monitoring\2016_01_03\2016_03_isopleths\incl_WDL192\FIG_3_BP_2016_03_March_NOX_160519.mxd

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# Memorandum

**Subject: WDL192-1 Non-Compliance Investigation Report, April 2016**

Waste Discharge Licence WDL192 was issued to JKC Australia LNG Pty Ltd (Contractor) in August 2013 (renewed in August 2015 as WDL192-1) pursuant to section 74 of the Water Act. The Licenced Activity is *discharge of wastewater from the Bladin Point Ichthys LNG Temporary Wastewater Treatment Plant (WwTP) to Darwin Harbour subject to this Licence*.

In accordance with Licence Condition 16, surface water monitoring is conducted in accordance with Appendix One (1) of the Licence. Monitoring conducted as per Condition 16 during April 2016 has reported a non-compliance. Condition 13 of the Licence states: "In accordance with the Declaration of Beneficial Uses for Darwin Harbour, surface water monitoring for sampling locations STPM-01, STPM-02, STPM-03 and STPM-04 and detailed in Appendix 1 must:

- Meet the water quality objectives for "upper estuary" specified in Tables 8 and 9 of the document titled *Water Quality Objectives for the Darwin Harbour Region – Background Document (NRETAS, 2010)*; and
- If particular water quality objectives relevant to a beneficial use are not specified in Tables 8 and 9, the relevant guideline values for 95% species level protection specified in Chapters 3 and 5 of the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC 2000) apply."

Samples were collected in the marine surface water environment at the edge of the WwTP outfall diffuser mixing zone on 18 April 2016. Subsequent laboratory analysis reported ammonia (as N) and total phosphate concentrations exceeding the relevant Water Quality Objectives and is therefore non-compliant with Condition 13 of the Licence. Laboratory results are presented in Table 1 and have been compared to the relevant Water Quality Objectives.

**Table 1 Laboratory Results**

| WDL192-1 Monitoring Location | Analytes | |
|---|---|---|
| | Ammonia (as N) | Total Phosphate (as P) |
| **Water Quality Objectives** | **20 µg/L** | **30 µg/L** |
| **Monitoring locations at the edge of the WwTP outfall diffuser mixing zone** | | |
| STPM-01 | <5 µg/L | 42 µg/L |
| STPM-02 | 25 µg/L | 24 µg/L |
| STPM-03 | <5 µg/L | 24 µg/L |
| STPM-04 | 9 µg/L | 24 µg/L |
| STPM- Median | 5.8 µg/L | 24 µg/L |
| **Reference Sites** | | |
| STPM-R1 | 20 µg/L | 28 µg/L |
| STPM-R2 | 19 µg/L | 21 µg/L |
| STPM-R-Median | 19.5 µg/L | 24.5 µg/L |

Shaded cell denotes an exceedance of the Water Quality Objectives

As per a request received on 4 May 2016 from the Northern Territory Environment Protection Authority (NT EPA), this memorandum presents the results of an investigation conducted in response to the April 2016 non-compliance. The NT EPA correspondence, received in response to a non-compliance notification submitted by Contractor under Condition 19 of Licence, requests the provision of evidence that the results were not caused by WwTP discharges and that discharge and reference site quality and sampling quality assurance and quality control measures were to be considered.



INDRA 27-SEP-2016

This information request has been addressed in this memorandum and includes lines of evidence to support the investigation and the associated outcomes. As per the risk-based application of the ANZECC Guidelines, the investigation aims to use multiple lines of evidence to determine whether:

1. There is a real risk of ecological impact and whether a management response should be triggered; or
2. The sampling results had unnecessarily triggered a risk response; and
3. Any management response was required.

**WwTP Discharge Quality**

The outfall diffuser has been designed to achieve dilutions of at least 250-fold for 90% of the time within the near field (i.e. in the vicinity of the outfall diffuser). The diffuser design has allowed for a regulatory mixing zone of approximately 50 m radius, beyond which the Water Quality Objectives apply. Monitoring data from a sample collected at the WwTP tank outlet (monitoring location STPM-T1) on 18 April reported an ammonia concentration of 17 µg/L, which is below the ammonia concentration reported from location STPM-02 that triggered the non-compliance and is within the target effluent design specifications. With a diffuser designed to achieve dilutions of at least 250-fold for 90% of the time, it would be expected that the ammonia from the WwTP discharge measured at STPM-T1 would be diluted to 0.4% at the edge of the mixing zone and this equates to 0.07 µg/L.

The WwTP discharge sample from the tank outlet was collected at 8:46 am, 9 minutes and 33 minutes prior to collection of the first and final samples collected at the edge of the mixing zone respectively. This methodology has been adopted with the aim of facilitating the comparison of treated effluent concentrations measured at the tank outlet to the concentrations measured in the receiving waters at the boundary of the regulatory mixing zone and to determine achieved dilutions of selected parameters if required. Based on the outfall length and pipe diameter and operating flow rate, preliminary calculations indicate that water would take about 35 minutes to travel from the tank to the diffuser and therefore it can be reasonably assumed that the samples collected at the edge of the mixing zone were representative of the plug of water being discharged at the time of the tank outlet sampling. As the tank outlet ammonia concentration was within the target design criteria and through subsequent dilution from the diffuser in the marine environment it can reasonably be concluded that the WwTP discharge was not the cause of the ammonia non-compliance recorded at the edge of the near-field on 18 April 2016. Thus, the detection of ammonia above the WDL192 criteria at STPM-02 appears to be an isolated event, not indicative of an ammonia plume and the residual risk of ammonia discharge from the WwTP resulting in environmental harm via an algal bloom is considered to be low.

Similarly, WwTP tank outlet monitoring reported a total phosphate concentration of 1,100 µg/L and with the design dilution factor considered, it would be expected that the total phosphate from the WwTP discharge measured at STPM-T1 would be diluted to 0.4% at the edge of the mixing zone and this equates to 4.4 µg/L. The tank outlet total phosphate concentration is also within the target effluent design specification (of 2,000 µg/L).

Phosphorus in its raw state is an element that exists in several allotropic forms. In the marine environment phosphorous is generally found in its soluble and bioavailable form as phosphate salts. Therefore it is considered that total phosphate results are representative of total phosphorous and as such the terms phosphorus and phosphate are considered interchangeable for the purposes of impact and compliance monitoring.

**Consideration of Reference Site Data and Other Available Water Quality Data**

Surface water monitoring was conducted as part of the Environmental Impact Monitoring Program (EIMP) on 18 and 19 April 2016. Surface water samples were collected from sites extending both upstream and downstream of the outfall diffuser, see Figure 1 in Attachment 1.

The laboratory analytical data from the samples collected as part of the EIMP monitoring and the samples collected at both WDL192-1 reference sites reported total phosphate concentrations ranging between 12 to 53 µg/L. An isopleth was prepared using EIMP and WDL192-1 datasets which identify



INDRA 27-SEP-2016

the distribution for total phosphate (Figure 2) during April 2016. Total phosphate exceedances were recorded at EIMP monitoring locations BPSW24, BPSW25 and BPSW26, which represent the closest locations both north and south of the diffuser. The isopleth also depicts a total phosphate plume trend towards the diffuser. However, it should also be noted that a trigger value exceedance at EIMP control site location CSSW04 of 34 µg/L was recorded further up the Elizabeth River and may indicate another point source of total phosphate to the local environment. Following the review of the data and isopleths, spatial patterns and trends were observed which could potentially indicate that the total phosphate exceedance was caused by WwTP discharge.

**Potential for Environmental Harm**

A literature review conducted to support this investigation suggests that Darwin Harbour is characterised by low concentrations of dissolved nutrients which almost invariably meet the water quality objectives (Padovan 1997, 2003; Fortune 2015; Duggan, 2006; Drewry et al 2010). It is important to note that nutrient data collected as part of both the WDL192-1 and EIMP monitoring programs are representative of total nutrient concentrations and not dissolved nutrients.

The nutrient samples collected for the studies presented in the aforementioned literature are representative of dissolved nutrients, with samples filtered in the field through 0.45 µm filters prior to analysis. As nutrients exist in the environment as both dissolved and particulate forms, and therefore a direct comparison of the WDL192-1 and EIMP data to historical ambient data contained within the literature is not facilitated, this section of the investigation is focused on total phosphorous as a key environmental indicator, which is representative of total amount of phosphorous present in all forms.

Skinner et al (2009) determined catchment total phosphorous loads into Darwin Harbour for a typical wet season (1.7 m rainfall) were 42.0 tonnes. On a more local scale, Schult (2012) determined total phosphorous loads specific to the Elizabeth River catchment during the 2008/09, 2010/11 and 2011/12 wet seasons, the average of which is 2.43 tonnes per wet season and equates to 11.5 kg/day based on the Australian Bureau of Meteorology defined wet season (October to April). Monitoring data from a sample collected at the WwTP tank outlet (monitoring location STPM-T1) on 18 April reported a total phosphorous concentration of 1,100 µg/L, which is considered representative of the total phosphorous concentration load being discharged from the tank on the day. The discharge output of the WwTP on 18 April was 243.8 KL which equates to an estimated total phosphorous load discharge of 0.268 kg/day and 2.33% of the average daily (wet season) load. The WwTP contribution of phosphorous is low and this is evidenced by low microalgal biomass, with chlorophyll-a concentrations reported below detection at all WDL192-1 locations and all EIMP locations in April 2016. Thus, the residual risk of phosphorous discharge from the WwTP resulting in environmental harm via an algal bloom is considered to be low.

**Quality Assurance and Quality Control**

All monitoring requirements conducted by the EIMP and WDL192-1 consultancy subcontractor are subject to strict quality assurance and quality control (QA/QC) procedures. Surface water monitoring is conducted in strict accordance with recognised Australian Standards and guidelines including:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Environment and Conservation Council [ANZECC] and the Agriculture and Resource Management Council of Australia and New Zealand [ARMCANZ], 2000a) (ANZECC Guidelines);
- AS/NZS 5667:1:1998 Water Quality Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples (AS/NZS 5667.1);
- AS/NZS 5667.6.1998 Water Quality Sampling – Guidance on sampling of rivers and streams (AS/NZS 5667.6); and
- AS/NZS 5667.9.1998 Water Quality Sampling – Guidance on sampling from marine waters (AS/NZS 5667.9).



INDRA
27-SEP-2016

For marine surface water sampling, the sampling team used a shallow draft vessel. Samples were collected as grab samples upstream of the boat, using an extension pole mounted with a sampling bottle. Samples were taken 0.25 to 0.5 m below the water surface. The key procedures undertaken in the field were:

- Visual inspection of surface water collection points and onsite basins to determine the presence or absence of oil, grease, iron floc or floating matter;
- In-situ quality measurements for pH, total dissolved solids (TDS), EC, DO, temperature, turbidity and ORP undertaken prior to sample collection using a multi-parameter instrument. All field equipment was calibrated in accordance with the manufacturer's recommendations prior to use;
- Collection of surface water samples and field QA/QC samples for laboratory analysis after field quality parameter measurement;
- Decontamination of all non-dedicated sampling equipment between sample locations; and
- Proper disposal of used disposable sampling equipment.

A review of field monitoring protocols has confirmed the methods of sampling has provided data of sufficient quality for the purpose of the WDL192-1 monitoring program in April 2016. The subcontractor is satisfied that non-compliances were not due to any sampling or field measurement error.

**Investigation Conclusions**

The investigation conducted in response to a non-compliance of Condition 13 of WDL192-1 in April 2016 has concluded the exceedance reported for ammonia was not caused by the WwTP discharge and the potential of environmental harm as a result of the exceedance is low. The lines of evidence evaluated demonstrate:

1. The contribution of the ammonia concentrations from the WwTP is considered insignificant with consideration of the diffuser design and dilution factor.
2. Results reported from concurrent surface monitoring conducted as part of the EIMP and results reported from the WDL192-1 reference sites demonstrate that ammonia concentrations reported from the edge of the discharge mixing zone were generally within the concentration ranges detected within the ambient environment at reference sites at the time of sampling.
3. The ammonia concentration that triggered the non-compliance is representative of total (dissolved + particulate) concentration as opposed to dissolved concentration. Thus, this represents a worst case scenario and it would be expected that the dissolved fraction of would be less than the total concentration reported.
4. The total nitrogen contribution from the WwTP to Darwin Harbour and the Elizabeth River estuary is negligible in comparison to the total nitrogen load from diffuse and other point sources in Darwin Harbour. Furthermore, total nitrogen concentrations at the edge of the mixing zone were within concentration ranges considered as ambient and complied with the water quality objectives.

There was no evidence of environmental harm resulting from the non-compliance and the residual risk of the nutrients resulting in environmental harm via an algal bloom is considered low, as evidenced by low chlorophyll-a results. The investigation conducted in response to a non-compliance of Condition 13 of WDL192-1 in April 2016 has concluded the exceedance reported for total phosphorous may have been caused by the WwTP discharge; however, the potential for environmental harm as a result of the exceedance is low. The lines of evidence evaluated demonstrate:



INDRA 27-SEP-2016

1. The contribution of total phosphorous concentrations from the WwTP is considered low when taking the diffuser design and dilution factor into account.
2. The total phosphorous contribution from the WwTP to Darwin Harbour and the Elizabeth River estuary is low in comparison to the total phosphorous load from diffuse and other point sources in Darwin Harbour.
3. There was no evidence of environmental harm resulting from the non-compliance and the residual risk of nutrients resulting in environmental harm via an algal bloom is considered low, again, as evidenced by low chlorophyll-a results.

It can be concluded that given the multiple lines of evidence outlined in this investigation report, the April 2016 exceedances of ammonia and total phosphorous unnecessarily triggered regulatory reporting, and no further management response is required.

**Attachments**

1. Figure 1 – EIMP Monitoring Locations
2. Figure 2 – April 2016 Ammonia Isopleth
3. Figure 3 – April 2016 Total Phosphate Isopleth

INDRA 27-SEP-2016

**References**

ANZECC (2000). Australian guidelines for water quality monitoring and reporting. ANZECC/ARMCANZ, Australia.

Butler, E.C.V., Streten-Joyce, C., Tsang, J.J., Williams, D.K., Alongi, D.M., Furnas, M.J. and McKinnon, A.D. (2013) A procedure for evaluating the nutrient assimilative capacity of Darwin Harbour. Report for Aquatic Health Unit, NT Department of Land Resource Management. Australian Institute of Marine Science, Darwin. (41 pp. plus appendices).

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Fortune, J. (2015). Spatial variability of Darwin Harbour water quality during the dry season neap tides of 2012 and 2013. Report No. 16/2015D. Department of Land Resource Management, Aquatic Health Unit. Palmerston, NT.

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Padovan, A. (2003). Darwin Harbour water and sediment quality. Proceedings of the Darwin Harbour Public Presentations – February 2003, Darwin Harbour Regional Plan of Management.

Schult, J. (2012). Pollutant loads to Darwin Harbour from selected catchments, 2008-2012. Report No. 12/2012D. Department of Land Resource Management, Darwin, NT.

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## Legend

- Site Boundary
- Gas Export Pipeline

**Surface Water Monitoring Locations**

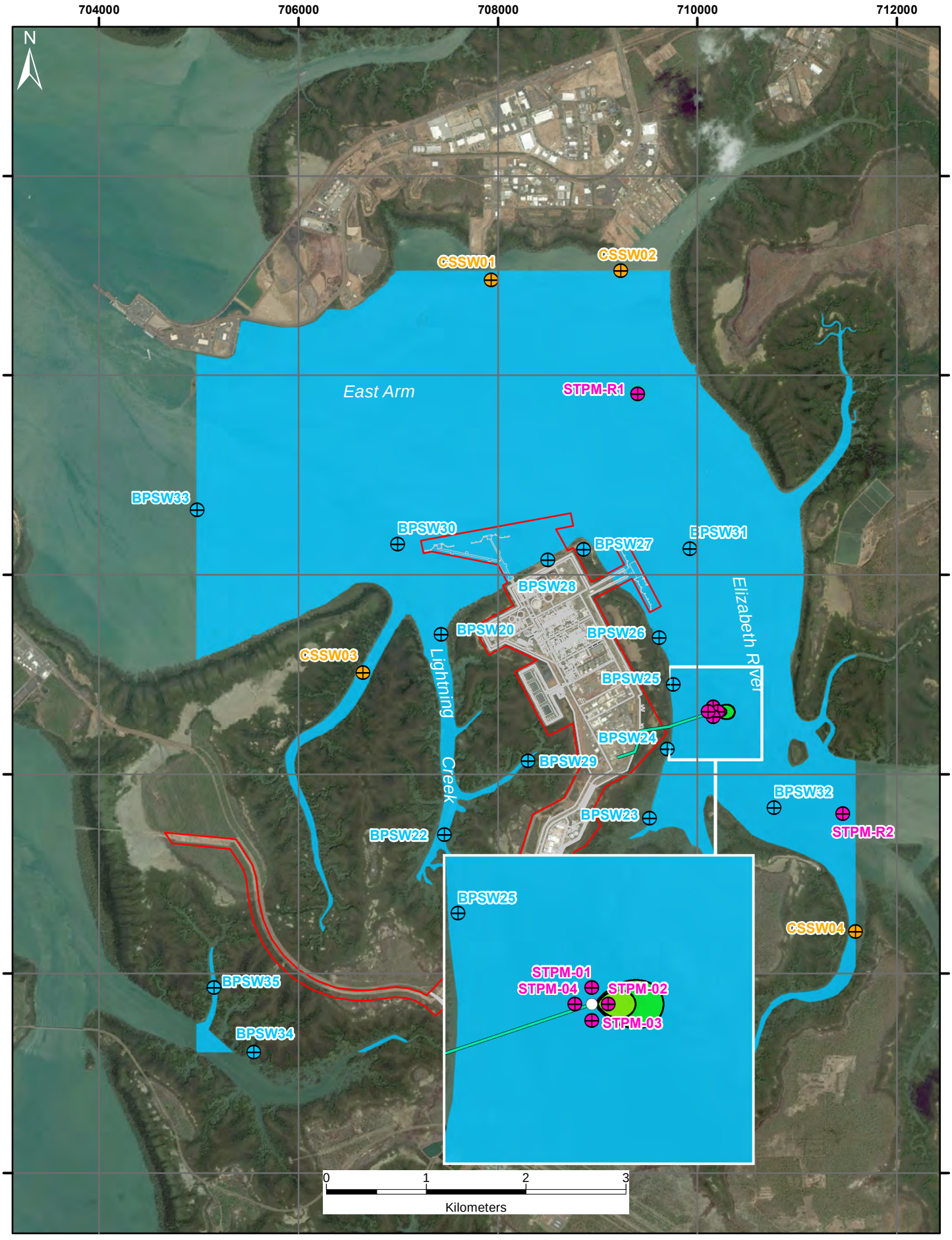
- Reference Sites
- Off-site Marine Sampling Locations

# Offsite Surface Water Sampling Locations, March 2016

| | | |
|---|---|---|
| **Figure 1** | **INPEX Bladin Point** | GREENCAP |
| ***Date:*** *20/05/2016* | **Author:** malcolm.nunn | |
| | **Map Scale:** 1:50,000 | |
| **Revision:** A | **Coordinate System:** GDA 1994 MGA Zone 52 | |
| R:_Projects\C110043_Inpex\GIS\Maps\other\BP_WDL_NonCompliance Report\FIG_1_OffsiteSurfaceWater_160520.mxd | | |

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**Legend**

- Site Boundary
- Construction Footprint
- Ammonia Level Contours (µg/L)
- Indicative Outfall Point
- Temporary WwTP Outfall Pipeline Alignment

**Surface Water Monitoring Locations**

- Off-site Marine Sampling Locations
- Reference Sites
- Wastewater Monitoring Sites

**Ammonia Level (µg/L)**

- 0.0 - 20.0
- 20.0 - 24.0
- 24.0 - 32.0

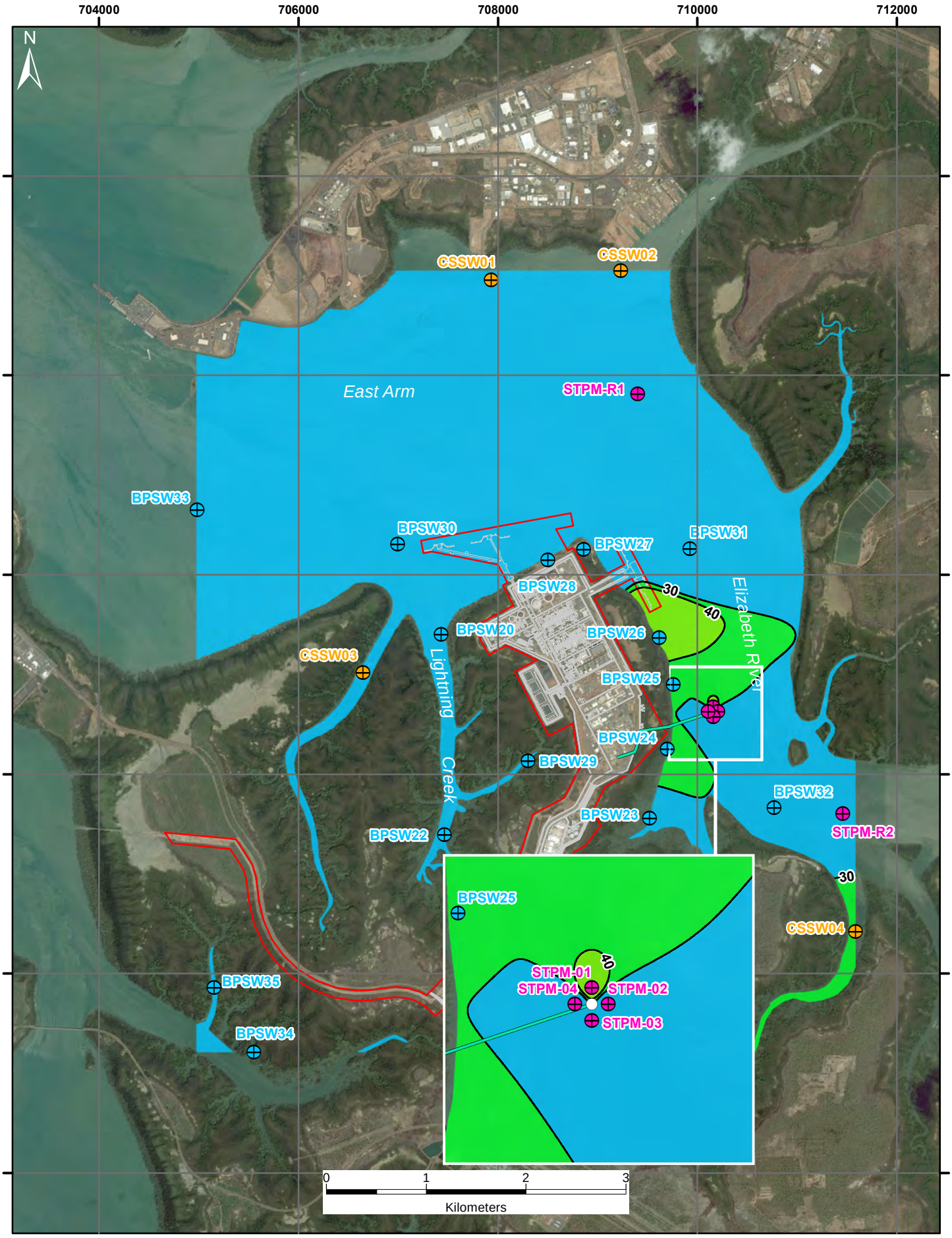
# Ammonia Distribution, April 2016

| Figure 2 | INPEX Bladin Point | GREENCAP |
|---|---|---|
| **Date:** 20/05/2016 | **Author:** malcolm.nunn | |
| | **Map Scale:** 1:50,000 | |
| **Revision:** A | **Coordinate System:** GDA 1994 MGA Zone 52 | |

R:_Projects\C110043_Inpex\GIS\Maps\BP_Quarterly_Monitoring\2016_04_06\2016_04_isopleths\incl_WDL192\FIG_2_BP_2016_04_April_Am_60519.mxd

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**Legend**

- Site Boundary
- Construction Footprint
- Total Phosphorus Level Contours (µg/L)
- Indicative Outfall Point
- Temporary WwTP Outfall Pipeline Alignment

**Surface Water Monitoring Locations**

- Off-site Marine Sampling Locations
- Reference Sites
- Wastewater Monitoring Sites

**Total Phosphorus Level (µg/L)**

- 0.0 - 30.0
- 30.0 - 40.0
- 40.0 - 60.0

# Total Phosphorus Distribution, April 2016

| Figure 3 | INPEX Bladin Point | GREENCAP |
|---|---|---|
| **Date:** 20/05/2016 | **Author:** malcolm.nunn | |
| | **Map Scale:** 1:50,000 | |
| **Revision:** A | **Coordinate System:** GDA 1994 MGA Zone 52 | |

R:_Projects\C110043_Inpex\GIS\Maps\BP_Quarterly_Monitoring\2016_04_06\2016_04_isopleths\incl_WDL192\FIG_3_BP_2016_04_April_T_P_160519.mxd

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# APPENDIX E
# Monitoring Field Records

INDRA
27-SEP-2016

GREENCAP/AEC Environmental
Waste Discharge Sampling Record

greencap
AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | Kait + Sarah. |
| **location:** | Bladin Point | **Date:** | 25.08.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPm-01 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>medium.<br>Neap tide. | **Sampling device** | Bucket. |
| | | **Water meter ID#** | Smartab |
| | | **Turbidity Meter ID#** | TM2 |
| **Time:** | 09:54 | | |
| **Turbidity (NTU)** | 1.69 | **TDS (ppm)** | 35321.34 |
| **Temperature (°C)** | 26.77 | **ORP (mV)** | 145.6 |
| **Salinity (PSU)** | 36.5 | **DO (% sat )** | 96.9 |
| **Sp. Conductivity (µS)** | 54340.5 | **pH (pH units)** | 7.83. |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

QA 1 + 2.

Weather; overcast, humid, slight breeze.

No floating debris, sheen or visable contaminants.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

Low turbidity.
no sheen
no odour.
clear water.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | 1 | 1 |
| Preserved inorganics (250mL) | 1 | 1 | | 2 |
| Light green 60mL | | | 1 | |
| Teal 60mL | | | 1 | |
| Solid Plastic 1L | | | 1 | |
| Microbiological (250mL) | 1 | 1 | 1 | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD/LAB)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| K. Partridge. | Sarah Joyce. |

INDRA
SEP-2016

greencap
AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | Kat + Sarah. |
| **location:** | Bladin Point | **Date:** | 25.03.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-02 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Medium - Neap tide. | **Sampling device** | Bucket - metal. |
| | | **Water meter ID#** | Smartlab. |
| | | **Turbidity Meter ID#** | TM2 |
| **Time:** | 10:01 | | |
| **Turbidity (NTU)** | 2.75 | **TDS (ppm)** | 35508.95 |
| **Temperature (°C)** | 26.59 | **ORP (mV)** | 141.0 |
| **Salinity (PSU)** | 36.8 | **DO (% sat )** | 96.9 |
| **Sp. Conductivity (µS)** | 54629.0 | **pH (pH units)** | 7.83 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather; Sunny, overcast, warm, slight breeze.

no floating debris, no visable contaminants on surface.

No odour or dead fish.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?
Low turbidity
No odours, not sheens.
clear water.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 3 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD/LAB)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kat Partridge | Sarah Joyce. |

INDRA
SEP-2016

GREENCAP/AEC Environmental
Waste Discharge Sampling Record

greencap
AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | Kat + Sarah. |
| **location:** | Bladin Point | **Date:** | 25.08.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-03 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Neap tide, Medium. | **Sampling device** | Bucket. |
| | | **Water meter ID#** | Smartrob. |
| | | **Turbidity Meter ID#** | TM2. |
| **Time:** | 10:05 | | |
| **Turbidity (NTU)** | 1.52 | **TDS (ppm)** ✓ | 35393.11 |
| **Temperature (°C)** | 26.64 | **ORP (mV)** | 144.0 |
| **Salinity (PSU)** | 36.7 | **DO (% sat )** | 96.9 |
| **Sp. Conductivity (µS)** ✓ | 54505.8 | **pH (pH units)** | 7.83 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather; overcast, light breeze, sunny, warm.

No visable contaminants / pollution.

No floating debris or visable impacts from discharge.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?
Low turbidity. No odours, no sheen. Clear.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD/LAB)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kat Partridge | Sarah Joyce. |

INDRA 1 SEP-2016

GREENCAP/AEC Environmental
Waste Discharge Sampling Record

greencap
AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | Kerr + Sarah. |
| **location:** | Bladin Point | **Date:** | 25.08.15. |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPm-04 | Tidal Level (i.e low, medium, high) Discharge Flow Rate<br>medium<br>neap tide. | **Sampling device** | Bucket |
| | | **Water meter ID#** | Smartcab. |
| | | **Turbidity Meter ID#** | Tm2. |
| | | | |
| **Time:** | 10:12 | | |
| **Turbidity (NTU)** | 2.81 | **TDS (ppm)** ✓ | 35343.47 |
| **Temperature (°C)** | 26.73 | **ORP (mV)** | 137.1 |
| **Salinity (PSU)** | 36.6 | **DO (% sat )** | 96.4 |
| **Sp. Conductivity (µS)** ✓ | 54419.3 | **pH (pH units)** | 7.83 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather; Sunny, warm, light breeze, humid.
No visable impacts from discharge. no floating debris.
No odours or contaminants present.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?
low turbidity.
no odours or sheens.
clear water.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD/LAB)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kerr Pawsey | Sarah Joyce. |

INDRA
27-SEP-2016

GREENCAP/AEC Environmental
Waste Discharge Sampling Record

greencap
AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | Kate & Sarah. |
| **location:** | Bladin Point | **Date:** | 25.08.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R1 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>medium<br>VCAP tide. | **Sampling device** | Bucket - metal. |
| | | **Water meter ID#** | Smartlab |
| | | **Turbidity Meter ID#** | TM3. |
| **Time:** | 10:49 | | |
| **Turbidity (NTU)** | 2.40 | **TDS (ppm)** | 34466.12 |
| **Temperature (°C)** | 27.21 | **ORP (mV)** | 164.0 |
| **Salinity (PSU)** | 35.5 | **DO (% sat )** | 98.7 |
| **Sp. Conductivity (µS)** | 52852.2 | **pH (pH units)** | 7.85 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

weather; scattered cloud, no breeze, humid.

no floating debris or visable contaminants.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?
low turbidity.
No odours,
no sheen.
clear water.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | NA | X N/A | 2 |
| Preserved inorganics (250mL) | 1 | | X N/A | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | X | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD/LAB)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kate Partridge | Sarah Joyce. |

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SEP-2016

GREENCAP/AEC Environmental
Waste Discharge Sampling Record

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| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | KP, SJ |
| **location:** | Bladin Point | **Date:** | 25.08.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-RZ | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Medium - Outgoing | **Sampling device** | SMARTAB |
| | | **Water meter ID#** | |
| | | **Turbidity Meter ID#** | TM2 |
| **Time:** | 0752 | | |
| **Turbidity (NTU)** | 1.95 | **TDS (ppm)** | 34920.28 |
| **Temperature (°C)** | 26.32 | **ORP (mV)** | 130.5 |
| **Salinity (PSU)** | 36.2 | **DO (% sat )** | 94.7 |
| **Sp. Conductivity (µS)** | 53800.5 | **pH (pH units)** | 7.77 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER - Overcast, light breeze, warm air temp.

No debris, leaf litter or signs of pollution on surface.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour, No sheen. Water colour clear. Low turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD/LAB)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kat Partridge | Sarah Joyce |

INDRA 2 SEP 2016

GREENCAP/AEC Environmental
Waste Discharge Sampling Record

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| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | RB, SR |
| **location:** | Bladin Point | **Date:** | 25.08.2015 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STP M-T1 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>med tide.<br>Med discharge | **Sampling device** | TPS units & turbidity meter |
| | | **Water meter ID#** | 90 FLUTAB, TM3 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 09.10 | | |
| **Turbidity (NTU)** | 0.88 | **TDS (ppm)** | 962.0 ppm |
| **Temperature (°C)** | 31.0°C | **ORP (mV)** | 142 |
| **Salinity (PSU)** | 0.7 | **DO (% sat )** | 85.6 |
| **Sp. Conductivity (µs/cm)** | 1466 µS/cm | **pH (pH units)** | 7.71 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

~~Wat~~ ~~waste~~ ~~waste~~ (treated) ~~was discharged through a pump. Discharged @ 0915.~~
clear water, no scum or debris present in water.
The ~~sampling~~ treated waste water tank was empty at our arrival. OPSI operator pumped into the tank; then samples were collected. water was purged prior to sampling.
~~20L~~ of treated waste water
OPSI operator told us "they discharge treated waste water as soon as it fills up ~~the~~ discharge tank (treated)

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N y.

Decontamination procedures followed Y/N y

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?
Low turbidity.
Slight foul odour
no sheen.
clear water

| **Samples Taken** | Number | QA 1 | QA 2 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | | 2 |
| Preserved inorganics (250mL) | 1 | 1 | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | 1 | 1 | 3 |
| plastic unpreserved 500mL | ✓ | | 1 | 4 |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birua | Sam Keppetipola. |

Raining
Weather - cloudy, overcast, slight breeze.

INDRA 2 SEP 2016

**GREENCAP/AEC Environmental**
**Offshore Surface Water Sampling Field Record**

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| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore Environmental Impact Monitoring Program | **Sampled by:** | CM, KP |
| **Location:** | Bladin Point WDL | **Date:** | 24.09.15 |

| SAMPLING LOCATION | TIDE DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-01 | Tidal Level (i.e low, medium, high) Low Neap | **Sampling device:** | SmarTROLL / ~~Aquaread~~ / TPS |
| | | **Water meter ID#** | SMARTAB |
| | | **iPod ID#** | 2 |
| **Time:** | 09:48 | **Turbidity Meter ID#** | 2 |

| | | | |
|---|---|---|---|
| **pH (pH units)** | 7.80 | **ORP (mV)** | 186.0 |
| **Temperature (°C)** | 29.23 | **DO (% sat)** | 94.6 |
| **TDS (ppm)** | 36944.03 | **Salinity (PSU)** | 38.6 |
| **Sp. Conductivity (µS/cm)** | 56922.0 | **Turbidity (NTU)** | 1.15 |

**Field observations:** e.g. nearby activities, weather, floating debris/scum etc.

Weather- Sunny, warm, fine, Some clouds. Recent rain last night.
Boat moored at MOF and a tug boat approx 30m away No floating debris or scum. QA01, QA02

Have water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? YES / ~~NO~~

Have decontamination procedures been followed? YES / ~~NO~~

**Observations during Sampling:**
e.g. odours, sheens, turbidity, water colour

No odour
No sheen
Turbidity Low
clear.
No discharge at time of sampling.

| Samples Taken | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Standard Metals Plastic* | 2 | | | |
| Cr (III & VI)* | 2 | | | |
| As (speciation)* | 1 | | | |
| Plastic unpreserved inorganics (1L) | 1 1 | 1 | | 7 |
| Plastic unpreserved inorganics (500mL) | 1 | | 1 | |
| Preserved inorganics (250mL) | 1 1 | 1 | | 2 |
| Microbiological (500mL) | 1 1 | 1 | | 1 |
| Glass vials (40mL) | 2 | | | |
| Glass amber unpreserved (250mL) | 1 | | | |
| Plastic nutrients* 60mL green/white | | | 1 | 3 |
| Plastic nutrients 60mL light green | | | 1 | 4 |
| UltraTrace Metals* (60mL) | | | | |
| Glass amber unpreserved (100mL) | | | | |
| Microbiological (200mL) | | | 1 | 5 |
| Solid Plastic (1L) | | | 1 | 6 |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| | |
|---|---|
| **Field Technician #1** Christina Maloney | **Field Technician #2** Kat Partridge. |

INDRA 27-SEP-2016

**GREENCAP/AEC Environmental**
**Offshore Surface Water Sampling Field Record**

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| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore Environmental Impact Monitoring Program | **Sampled by:** | CM, KP |
| **Location:** | Bladin Point WDL | **Date:** | 24.09.15 |

| SAMPLING LOCATION | TIDE DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-02 | Tidal Level (i.e low, medium, high) Low Incoming Neap. | **Sampling device:** | SmarTROLL / ~~Aquaread / TPS~~ |
| | | **Water meter ID#** | SMARTAB |
| | | **iPod ID#** | 2 |
| **Time:** | 10:02 | **Turbidity Meter ID#** | 2 |

| | | | |
|---|---|---|---|
| **pH (pH units)** | 7.77 | **ORP (mV)** | 191.8 |
| **Temperature (°C)** | 29.64 | **DO (% sat)** | 99.3 |
| **TDS (ppm)** | 36250.35 | **Salinity (PSU)** | 37.8 |
| **Sp. Conductivity (µS/cm)** | 55808.8 | **Turbidity (NTU)** | 1.51 |

**Field observations:** e.g. nearby activities, weather, floating debris/scum etc.

Weather — Sunny, hot, Slight breeze, water calm. Recent rain.
No major activities nearby.
No floating debris or scum

Have water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? YES / ~~NO~~

Have decontamination procedures been followed? YES / ~~NO~~

**Observations during Sampling:**
e.g. odours, sheens, turbidity, water colour

No odour
No sheen
Water colour clear
Low turbidity.
No discharge at time of sampling.

| **Samples Taken** | Number | QA___ | QA___ | Order |
|---|---|---|---|---|
| Standard Metals Plastic* | 2 | | | |
| Cr (III & VI)* | 2 | | | |
| As (speciation)* | 1 | | | |
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Plastic unpreserved inorganics (500mL) | 1 | | | |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Microbiological (500mL) | 1 | | | 1 |
| Glass vials (40mL) | 2 | | | |
| Glass amber unpreserved (250mL) | 1 | | | |
| Plastic nutrients* 60mL green/white | | | | |
| Plastic nutrients 60mL light green | | | | |
| UltraTrace Metals* (60mL) | | | | |
| Glass amber unpreserved (100mL) | | | | |
| Microbiological (200mL) | | | | |
| Solid Plastic (1L) | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Christina Maloney | Kat Partridge. |

INDRA 27-SEP-2016

**GREENCAP/AEC Environmental**
**Offshore Surface Water Sampling Field Record**

WDL

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| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore Environmental Impact Monitoring Program | **Sampled by:** | CM, KP |
| **Location:** | Bladin Point WDL | **Date:** | 24.09.15 |

| SAMPLING LOCATION | TIDE DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-03 | Tidal Level (i.e low, medium, high) Low - incoming. Neap. | **Sampling device:** | SmarTROLL / ~~Aquaread / TPS~~ |
| | | **Water meter ID#** | SMARTAB |
| | | **iPod ID#** | 2 |
| **Time:** | 10:08 | **Turbidity Meter ID#** | 2 |

| | | | |
|---|---|---|---|
| **pH (pH units)** | 7.80 | **ORP (mV)** | 186.9 |
| **Temperature (°C)** | 29.23 | **DO (% sat)** | 100.0 |
| **TDS (ppm)** | 36843.64 | **Salinity (PSU)** | 38.4 |
| **Sp. Conductivity (µS/cm)** | 56720.4 | **Turbidity (NTU)** | 1.51 |

**Field observations:** e.g. nearby activities, weather, floating debris/scum etc.

Weather — Sunny, hot. Slight breeze, few clouds, water calm.
No nearby activities - Ship at MOF + tug boat nearby.
No floating debris or scum.

Have water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? YES / ~~NO~~

Have decontamination procedures been followed? YES / ~~NO~~

**Observations during Sampling:**
e.g. odours, sheens, turbidity, water colour

No odour
No sheen.
Low turbidity
Clear.
No discharge at time of sampling due to problem operating discharge pipe on site

| Samples Taken | Number | QA___ | QA___ | Order |
|---|---|---|---|---|
| Standard Metals Plastic* | 2 | | | |
| Cr (III & VI)* | 2 | ✓ | ✓ | |
| As (speciation)* | 1 | ✓ | ✓ | |
| Plastic unpreserved inorganics (1L) | 1 1 | ✓ | ✓ | 3 |
| Plastic unpreserved inorganics (500mL) | 1 | | | |
| Preserved inorganics (250mL) | 1 1 | | | 2 |
| Microbiological (500mL) | 1 1 | | | 1 |
| Glass vials (40mL) | 2 | | | |
| Glass amber unpreserved (250mL) | 1 | | | |
| Plastic nutrients* 60mL green/white | | | | |
| Plastic nutrients 60mL light green | | | | |
| UltraTrace Metals* (60mL) | | | | |
| Glass amber unpreserved (100mL) | | | | |
| Microbiological (200mL) | | | | |
| Solid Plastic (1L) | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| | |
|---|---|
| **Field Technician #1** Christina Maloney | **Field Technician #2** Kat Partridge |

INDRA
27-SEP-2016

**GREENCAP/AEC Environmental**
**Offshore Surface Water Sampling Field Record**

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AEC Environmental

| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore Environmental Impact Monitoring Program | **Sampled by:** | CM, KP |
| **Location:** | Bladin Point WDL | **Date:** | 24.09.15 |

| SAMPLING LOCATION | TIDE DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-04 | Tidal Level (i.e low, medium, high) Low - incoming, Neap | **Sampling device:** | SmarTROLL / ~~Aquaread~~ / TPS |
| | | **Water meter ID#** | SMARTAB |
| | | **iPod ID#** | 2 |
| **Time:** | 10:15 | **Turbidity Meter ID#** | 2 |

| | | | |
|---|---|---|---|
| **pH (pH units)** | 7.80 | **ORP (mV)** | 176.8 |
| **Temperature (°C)** | 29.14 | **DO (% sat)** | 96.3 |
| **TDS (ppm)** | 36907.58 | **Salinity (PSU)** | 38.4 |
| **Sp. Conductivity (µS/cm)** | 56593.80 | **Turbidity (NTU)** | 1.11 |

**Field observations:** e.g. nearby activities, weather, floating debris/scum etc.

weather — Sunny, partly cloudy, warm. Slight breeze, A few floating bubbles on surface rain last night. No floating debris or scum.

Have water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? YES / ~~NO~~

Have decontamination procedures been followed? YES / ~~NO~~

**Observations during Sampling:**
e.g. odours, sheens, turbidity, water colour

No odour
No sheen
Low turbidity
Water clear.
No discharge at time of Sampling.

| Samples Taken | Number | QA___ | QA___ | Order |
|---|---|---|---|---|
| Standard Metals Plastic* | 2 | | | |
| Cr (III & VI)* | 2 | | | |
| As (speciation)* | 1 | | | |
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Plastic unpreserved inorganics (500mL) | 1 | | | |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Microbiological (500mL) | 1 | | | 1 |
| Glass vials (40mL) | 2 | | | |
| Glass amber unpreserved (250mL) | 1 | | | |
| Plastic nutrients* 60mL green/white | | | | |
| Plastic nutrients 60mL light green | | | | |
| UltraTrace Metals* (60mL) | | | | |
| Glass amber unpreserved (100mL) | | | | |
| Microbiological (200mL) | | | | |
| Solid Plastic (1L) | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| Field Technician #1 | Field Technician #2 |
|---|---|
| Christina Maloney | Kat Partridge |

INDRA
27-SEP-2016

**GREENCAP/AEC Environmental**
**Offshore Surface Water Sampling Field Record**

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| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore Environmental Impact Monitoring Program | **Sampled by:** | CM, KP |
| **Location:** | Bladin Point WDL | **Date:** | 24.09.15 |

| SAMPLING LOCATION | TIDE DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| | Tidal Level (i.e low, medium, high) | **Sampling device:** | SmarTROLL / ~~Aquaread / TPS~~ |
| STPM-R1 | Low/med incoming Neap. | **Water meter ID#** | SMARTAB |
| | | **iPod ID#** | 2 |
| **Time:** | 11:26 | **Turbidity Meter ID#** | 2 |

| | | | |
|---|---|---|---|
| **pH (pH units)** | 7.85 | **ORP (mV)** | 185.6 |
| **Temperature (°C)** | 30.26 | **DO (% sat)** | 99.3 |
| **TDS (ppm)** | 36475.15 | **Salinity (PSU)** | 37.9 |
| **Sp. Conductivity (µS/cm)** | 56095.2 | **Turbidity (NTU)** | 8.16 |

**Field observations:** e.g. nearby activities, weather, floating debris/scum etc.

Weather- Sunny, Slight breeze, part cloud cover.
No nearby activities,
No floating debris or scum.

Have water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? YES ~~/ NO~~

Have decontamination procedures been followed? YES ~~/ NO~~

**Observations during Sampling:**
e.g. odours, sheens, turbidity, water colour

No odours
No sheen
Turbidity low
Slight brown/green colour.

| **Samples Taken** | Number | QA___ | QA___ | Order |
|---|---|---|---|---|
| Standard Metals Plastic* | 2 | | | |
| Cr (III & VI)* | 2 | A | A | |
| As (speciation)* | 1 | 1 | 1 | |
| Plastic unpreserved inorganics (1L) | 1 1 | 2 | 2 | 3 |
| Plastic unpreserved inorganics (500mL) | 1 | | | |
| Preserved inorganics (250mL) | 1 1 | | | 2 |
| Microbiological (500mL) | 1 1 | | | 1 |
| Glass vials (40mL) | 2 | | | |
| Glass amber unpreserved (250mL) | 1 | | | |
| Plastic nutrients* 60mL green/white | | | | |
| Plastic nutrients 60mL light green | | | | |
| UltraTrace Metals* (60mL) | | | | |
| Glass amber unpreserved (100mL) | | | | |
| Microbiological (200mL) | | | | |
| Solid Plastic (1L) | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| | |
|---|---|
| **Field Technician #1** Christina Maloney | **Field Technician #2** Kat Partridge |

INDRA 2 SEP-2016

## GREENCAP/AEC Environmental
## ~~Offshore~~ Surface Water Sampling Field Record

WDL

greencap AEC Environmental

| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore Environmental Impact Monitoring Program | **Sampled by:** | kat + christina |
| **Location:** | Bladin Point WDL | **Date:** | 24.09.15 |

| SAMPLING LOCATION | TIDE DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| | Tidal Level (i.e low, medium, high) | **Sampling device:** | SmarTROLL / ~~Aquaread / TPS~~ |
| STPM-R2 | low | **Water meter ID#** | Smartroll 6 |
| | Neap tide | **iPod ID#** | 1 |
| **Time:** | 8:52 | **Turbidity Meter ID#** | 2 |

| | | | |
|---|---|---|---|
| **pH (pH units)** | 7.74 | **ORP (mV)** | 176.6 |
| **Temperature (°C)** | 29.31 | **DO (% sat)** | 94.8 |
| **TDS (ppm)** | 36863.16 | **Salinity (PSU)** | 38.3 |
| **Sp. Conductivity (µS/cm)** | 56650.10 | **Turbidity (NTU)** | 1.41 |

**Field observations:** e.g. nearby activities, weather, floating debris/scum etc.

weather; sunny, light breeze, approx 30°c
no visable contaminats or floating matter.

Have water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? ~~YES~~ / NO

Have decontamination procedures been followed? ~~YES~~ / NO

**Observations during Sampling:**
e.g. odours, sheens, turbidity, water colour

no odours, no sheens.
clear water.

| Samples Taken | Number | QA____ | QA____ | Order |
|---|---|---|---|---|
| Standard Metals Plastic* | ~~2~~ | | | |
| Cr (III & VI)* | ~~2~~ | — | — | |
| As (speciation)* | ~~1~~ | | | |
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Plastic unpreserved inorganics (500mL) | ~~1~~ | | | |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Microbiological (500mL) | 1 | | | ~~3~~ |
| Glass vials (40mL) | ~~2~~ | | | |
| Glass amber unpreserved (250mL) | ~~1~~ | | | |
| Plastic nutrients* 60mL green/white | | | | |
| Plastic nutrients 60mL light green | | | | |
| UltraTrace Metals* (60mL) | | | | |
| Glass amber unpreserved (100mL) | | | | |
| Microbiological (200mL) | | | | |
| Solid Plastic (1L) | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| Field Technician #1 | Field Technician #2 |
|---|---|
| kat Partridge | christina Maloney. |

INDRA 7 SEP-2016

GREENCAP/AEC Environmental
Waste Discharge Sampling Record

greencap
AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | KP, SJ, SC |
| **location:** | Bladin Point | **Date:** | 28.09.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-T1 | Tidal Level (i.e low, medium, high) Discharge Flow Rate DISCHARGING HIGH TIDE | **Sampling device** | SMARTROLL + IPOD |
| | | **Water meter ID#** | SMARTAC |
| | | **Turbidity Meter ID#** | TM1 |
| **Time:** | 0844 | | |
| **Turbidity (NTU)** | 0.76 | **TDS (ppm)** | 898.58 |
| **Temperature (°C)** | 30.28 | **ORP (mV)** | 262.0 |
| **Salinity (PSU)** | 0.7 | **DO (% sat )** | 95.7 |
| **Sp. Conductivity (µs/cm)** | 1382.3 | **pH (pH units)** | 7.11 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

VOLUME PURGED = 32L

PUMP RUNNING – DISCHARGING

WEATHER – SUNNY, FINE, CLEAR SKY, WARM, V. LIGHT BREEZE.

OFFSHORE SAMPLING ON 24.09.15 & 23.09.15

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

NO SHEEN
ODOUR (WASTE)
PALE YELLOW
NO VISIBLE PARTICLES

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | 1 | 1 |
| Preserved inorganics (250mL) | 1 | 1 | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | 1 | 1 | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| SARAH JOYCE | STU CARROLL |

INDRA
29-SEP-2016

greencap
AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CM, SK |
| **location:** | Bladin Point | **Date:** | 22.10.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-1 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>~~Low~~ Med Tide<br>Incoming. Neap Tide. | **Sampling device** | smartroll |
| | | **Water meter ID#** | SMARTAB |
| | | **Turbidity Meter ID#** | TM2 |
| | | | |
| **Time:** | 9:54 | | |
| **Turbidity (NTU)** | 1.79 | **TDS (ppm)** | 30454.1 |
| **Temperature (°C)** | 30.28 | **ORP (mV)** | 160.5 |
| **Salinity (PSU)** | 31.0 | **DO (% sat )** | 93.0 |
| **Sp. Conductivity (µs/cm)** | 46758.9 | **pH (pH units)** | 7.83 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WDL onsite discharge at 9am. QA01, QA02

No nearby activities.

Some floating bubbles/scum and few leaves. water calm/flat.

weather- fine, sunny, clear sky.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes.

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour, low turbidity
No sheen, clear.

| **Samples Taken** | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | | 6 |
| Preserved inorganics (250mL) | 1 | 1 | | 5 |
| Light green 60mL | | | 1 | 4 |
| Teal 60mL | | | 1 | 3 |
| Solid Plastic 1L | | | 1 | 2 |
| Microbiological (250mL) 500mL | 1 | 1 | 2 | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | Christina Maloney | **Field Technician #2** | Sam Koppetipola. |
|---|---|---|---|

INDRA
27 SEP-2016

GREENCAP/AEC Environmental
Waste Discharge Sampling Record

greencap
AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CM, SK |
| **location:** | Bladin Point | **Date:** | 22.10.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-2 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>med/high<br>Incoming (high@12pm) | **Sampling device** | SMARTROLL |
| | | **Water meter ID#** | SMARTAB |
| | | **Turbidity Meter ID#** | TM2 |
| **Time:** | 10:01 | | |
| **Turbidity (NTU)** | 1.83 | **TDS (ppm)** | 30467.19 |
| **Temperature (°C)** | 30.37 | **ORP (mV)** | 174.4 |
| **Salinity (PSU)** | 31.0 | **DO (% sat )** | 92.9 |
| **Sp. Conductivity (µs/cm)** | 46838.3 | **pH (pH units)** | 7.83 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WDL Discharge @ 9am.

weather - Sunny, hot, fine.
Calm water.

Some floating bubbles/scum + few leaves.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour
No Sheen
Turbidity - Low
Clear.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | N | N | 2 |
| Light green 60mL | | N | | |
| Teal 60mL | | | N | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | ✗ | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | Christina Maloney | **Field Technician #2** | Sam Keppetipola |
|---|---|---|---|

INDRA
27 SEP 2016

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AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CM, SK |
| **location:** | Bladin Point | **Date:** | 22-10-15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-3 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>med/high<br>High @ 12pm<br>Incoming. | **Sampling device** | Smartroll |
| | | **Water meter ID#** | SMARTAB |
| | | **Turbidity Meter ID#** | TM2 |
| **Time:** | 10:06 | | |
| **Turbidity (NTU)** | 3.96 | **TDS (ppm)** | 30436.11 |
| **Temperature (°C)** | 30.37 | **ORP (mV)** | 179.5 |
| **Salinity (PSU)** | 31.0 | **DO (% sat )** | 92.3 |
| **Sp. Conductivity (µs/cm)** | 46740.8 | **pH (pH units)** | 7.83 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WDL discharge @ 9AM.

weather Sunny, fine, clear sky.

calm water.

Some floating bubbles/scum. Light/moderate. few floating leaves.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour
No sheen
Turbidity low
clear.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | N/A | N/A | 2 |
| Light green 60mL | | N/A | N/A | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | Christina Maloney | **Field Technician #2** | Sam Kepreotpola. |
|---|---|---|---|

INDRA 27 SEP 2016

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| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CM, SK |
| **location:** | Bladin Point | **Date:** | 22.10.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-4 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: High/med incoming. | **Sampling device** | Smartroll |
| | | **Water meter ID#** | SMART AB |
| | | **Turbidity Meter ID#** | TM2 |
| **Time:** | 10:10 | | |
| **Turbidity (NTU)** | 2.08 | **TDS (ppm)** | 30362.39 |
| **Temperature (°C)** | 30.41 | **ORP (mV)** | 193.4 |
| **Salinity (PSU)** | 30.9 | **DO (% sat )** | 93.9 |
| **Sp. Conductivity (µs/cm)** | 46639.5 | **pH (pH units)** | 7.84 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WDL discharge @ 9am

weather - Sunny, fine, clear sky.

Some light floating scum/debris, few leaves.

no nearby activities

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N yes

Decontamination procedures followed Y/N yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour
No Sheen
Low turbidity
Clear.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | // | // | 2 |
| Light green 60mL | | // | // | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | Christina Maloney | **Field Technician #2** | Sam Koppetipola |
|---|---|---|---|

INDRA
27-SEP-2016

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AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CM, SK |
| **location:** | Bladin Point | **Date:** | 22.10.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R1 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: low/med Incoming. | **Sampling device** | Smartroll |
| | | **Water meter ID#** | Smartab |
| | | **Turbidity Meter ID#** | TM2 |
| **Time:** | 9:45 | | |
| **Turbidity (NTU)** | 4.64 | **TDS (ppm)** | 30096.47 |
| **Temperature (°C)** | 30.13 | **ORP (mV)** | 141.1 |
| **Salinity (PSU)** | 30.7 | **DO (% sat )** | 94.8 |
| **Sp. Conductivity (µs/cm)** | 46494.71 | **pH (pH units)** | 7.83 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

NDL Discharge at 9am.

No nearby activities

No floating debris or scum.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odours
no sheen
Turbidity low
clear

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | Christina Maloney | **Field Technician #2** | Sam Keppetipola. |
|---|---|---|---|

INDRA
27 SEP 2016

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AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CM, SK |
| **location:** | Bladin Point | **Date:** | 22.10.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R2 | Tidal Level (i.e low, medium, high) med<br>Discharge Flow Rate Incoming. | **Sampling device** | SMARTAB - SMARTROLL |
| | | **Water meter ID#** | — |
| | | **Turbidity Meter ID#** | TM2 |
| **Time:** | 9:35 | | |
| **Turbidity (NTU)** | 3.40 | **TDS (ppm)** | 30395.17 |
| **Temperature (°C)** | 30.18 | **ORP (mV)** | 153.7 |
| **Salinity (PSU)** | 31.0 | **DO (% sat )** | 91.7 |
| **Sp. Conductivity (µs/cm)** | 46679.6 | **pH (pH units)** | 7.79 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WDL discharge at 9am.

Weather- Sunny, clear sky, slight breeze.

No nearby activity

No floating debris or scum

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes.

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour
No sheen
Turbidity Low
clear.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | N/A | N/A | 2 |
| Light green 60mL | | ✓ | | |
| Teal 60mL | | | ✓ | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | Christina Maloney CM | **Field Technician #2** | Sam Coppetipola SK |
|---|---|---|---|

INDRA
27 SEP 2016

GREENCAP/AEC Environmental
Waste Discharge Sampling Record

SCANNED TO FILE

greencap
AEC Environmental

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J119486 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SO & CF |
| **location:** | Bladin Point | **Date:** | 22.10.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-T1 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>Regular flow rate | **Sampling device** | 90 FLV TAB |
| | | **Water meter ID#** | TPS |
| | | **Turbidity Meter ID#** | 3 |
| **Time:** | 09:07 | | |
| **Turbidity (NTU)** | 1.67 | **TDS (ppm)** | 754. |
| **Temperature (°C)** | 33.9 | **ORP (mV)** | 206 |
| **Salinity (PSU)** | 0.6 | **DO (% sat )** | 71.6 |
| **Sp. Conductivity (µs/cm)** | 1161. | **pH (pH units)** | 6.24 |

***Field observations:*** *eg. Discharging status, pump operation status, volume purged, weather*

Discharging into harbour ceased a few minutes prior to sampling. - started up again ~~after~~ for sampling.

20L purged prior to sampling.

weather: hot, sunny, blue skies, light breeze.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)N

Decontamination procedures followed (Y)N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

no odour
no sheen
no floating debris or scum.

| **Samples Taken** | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | 1 | 3 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | 1 | 1 | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sally-Anne Orchard | Caroline French |

INDRA
21-SEP-2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SC & RB |
| **location:** | Bladin Point | **Date:** | 19/11/15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM 01 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>High | **Sampling device** | ~~451~~ Grab pole |
| | | **Water meter ID#** | 4512 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 09:35 | | |
| **Turbidity (NTU)** | 2.26 | **TDS (ppm)** | 35784 |
| **Temperature (°C)** | 31.6 | **ORP (mV)** | 183.0 |
| **Salinity (PSU)** | 35.02 | **DO (% sat )** | 87.6 |
| **Sp. Conductivity (µs/cm)** | 53308.0 | **pH (pH units)** | 7.90 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather: Clear skies, hot, humid, slight breeze

No floating scum debris

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? (Y)/N

Decontamination procedures followed? (Y)N

| **Observations during Sampling:-** eg. Odours, sheens, turbidity, water colour, floating debris/scum? | **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|---|
| No odours/sheen<br>Clear water<br>Low turbidity. | Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| | Preserved inorganics (250mL) | 1 | | | 1 |
| | Light green 60mL | | | | |
| | Teal 60mL | | | | |
| | Solid Plastic 1L | | | | |
| | Microbiological (250mL) | 1 | | | 2 |
| | | | | | |
| | (* DESIGNATES SAMPLES FILTERED IN FIELD) | | | | |

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Brocas | S. Carroll |

INDRA 2 SEP 2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SC & RB |
| **location:** | Bladin Point | **Date:** | 19/11/15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM02 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: 1-High | **Sampling device** | 45L Grab pole |
| | | **Water meter ID#** | 4512 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 09:10 | | |
| **Turbidity (NTU)** | 2.87 | **TDS (ppm)** | 36195 |
| **Temperature (°C)** | 31.7 | **ORP (mV)** | 201 |
| **Salinity (PSU)** | 35.3 | **DO (% sat )** | 91.4 |
| **Sp. Conductivity (µs/cm)** | 53716.0 | **pH (pH units)** | 7.92 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather: Clear skies, hot, humid, slight breeze

No floating scum/debris

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)N Yes

Decontamination procedures followed (Y)N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odours/sheen
Low turbidity
Clear water.

| **Samples Taken** | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | | 5 |
| Preserved inorganics (250mL) | 1 | 1 | | 1 |
| Light green 60mL | | | 1 | 3 |
| Teal 60mL | | | 1 | 4 |
| Solid Plastic 1L | | | 1 | 6 |
| Microbiological (250mL) | 1 | 1 | 1 | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Bircea | J. Carroll |

Bircea

INDRA
27-SEP-2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SC & RB |
| **location:** | Bladin Point | **Date:** | 19/11/15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM03 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: High | **Sampling device** | 4ST Grab pole |
| | | **Water meter ID#** | 4512 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 09:21 | | |
| **Turbidity (NTU)** | 2.45 | **TDS (ppm)** | 36343.0 |
| **Temperature (°C)** | 31.6 | **ORP (mV)** | 181 |
| **Salinity (PSU)** | 35.36 | **DO (% sat )** | 84.1 |
| **Sp. Conductivity (µs/cm)** | 53770.0 | **pH (pH units)** | 7.93 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather: Sunny, hot, humid, slight breeze, clear sky

No floating scum/debris

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odours/sheen
Clear water
Low turbidity

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Bocca | S. Carroll |

INDRA
27-SEP-2016
GREENCAP

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SC & RB |
| **location:** | Bladin Point | **Date:** | 19/11/15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM04 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: High | **Sampling device** | YSI Grab pole |
| | | **Water meter ID#** | 4512 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 09:33 | | |
| **Turbidity (NTU)** | 2.80 | **TDS (ppm)** | 36045.1 |
| **Temperature (°C)** | 31.5 | **ORP (mV)** | 179.0 |
| **Salinity (PSU)** | 35.27 | **DO (% sat )** | 85.0 |
| **Sp. Conductivity (µs/cm)** | 53702.0 | **pH (pH units)** | 7.92 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather: Sunny, hot, humid, clear skies

No floating scum / debris

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?
No odours / sheen
Clear water
Low turbidity

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birrell | S. Carroll |

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GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SC & RB |
| **location:** | Bladin Point | **Date:** | 19/11/15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R1 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: High tide | **Sampling device** | 45t Grab pole |
| | | **Water meter ID#** | 4512 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 10:13 | | |
| **Turbidity (NTU)** | 2.42 | **TDS (ppm)** | 36287.2 |
| **Temperature (°C)** | 31.8 | **ORP (mV)** | 176.0 |
| **Salinity (PSU)** | 35.36 | **DO (% sat )** | 81.6 |
| **Sp. Conductivity (µs/cm)** | 53810.0 | **pH (pH units)** | 7.93 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather: Sunny, hot, humid, no breeze, some cloud

No floating scum/debris

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No Odours/sheen
Clear water
Low turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birrer | J. Carroll |

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27-SEP-2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SC&RB |
| **location:** | Bladin Point | **Date:** | 19/11/15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R2 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>High | **Sampling device** | YSI Grab pole |
| | | **Water meter ID#** | 4512 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 09:46 | | |
| **Turbidity (NTU)** | 3.41 | **TDS (ppm)** | 36549.3 |
| **Temperature (°C)** | 31.6 | **ORP (mV)** | 190 |
| **Salinity (PSU)** | 35.40 | **DO (% sat )** | 83.0 |
| **Sp. Conductivity (µs/cm)** | 53886.4 | **pH (pH units)** | 7.87 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather: Sunny, hot, humid, clear sky, light breeze

No floating scum/debris

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odours/sheen
Clear Water
Low turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Bireeg | S. Carroll |

INDRA
2 SEP-2016

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CF + KP |
| **location:** | Bladin Point | **Date:** | 19.11.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM - T | Tidal Level (i.e low, medium, high) Discharge Flow Rate 6.85 L / sec | **Sampling device** | NA |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM 2 |
| **Time:** | 09:10 | | |
| **Turbidity (NTU)** | 0.82 | **TDS (ppm)** | 899 |
| **Temperature (°C)** | 34.1 | **ORP (mV)** | 194.5 |
| **Salinity (PSU)** | 0.69 | **DO (% sat )** | 52.3 |
| **Sp. Conductivity (µs/cm)** | 1405 | **pH (pH units)** | 7.81 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

volume purged : 18.0L
started discharging 5 mins before sampling.
Tank not full.
weather : hot, sunny, light breeze, some scattered cloud, humid.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour
No sheens
Low turbidity
Pale yellow water

| **Samples Taken** | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | | 4 |
| Preserved inorganics (250mL) | 1 | 1 | | 3 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | 1 | 1 | 1 |
| Plastic unpreserved (500mL) | | | 1 | 2 |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kat Partridge | Caroline French |

INDRA
21-SEP-2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | Caroline French + Sarah Joyce |
| **location:** | Bladin Point | **Date:** | 08.10.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-01 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Low outgoing | **Sampling device** | Grab pole |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM1 |
| **Time:** | 0929 | | |
| **Turbidity (NTU)** | 5.39 | **TDS (ppm)** | 35295 |
| **Temperature (°C)** | 32.1 | **ORP (mV)** | 217.8 |
| **Salinity (PSU)** | 35.71 | **DO (% sat )** | 78.4 |
| **Sp. Conductivity (µs/cm)** | 54307 | **pH (pH units)** | 7.80 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER - Partly cloudy, Sun breaking through. moderate breeze. Low - medium humidity.

No leaf litter on surface.
No other visible signs of pollution.
Discharging at time of sampling.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour,
No sheen.
Water colour clear
Low turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Caroline French | Sarah Joyce |

INDRA
27 SEP 2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CAROLINE FRENCH + SARAH JOYCE |
| **location:** | Bladin Point | **Date:** | 08.12.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-02 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Medium - Outgoing | **Sampling device** | Grab pole |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | 1 |
| **Time:** | 0921 | | |
| **Turbidity (NTU)** | 5.16 | **TDS (ppm)** | 35295 |
| **Temperature (°C)** | 32.1 | **ORP (mV)** | 219.1 |
| **Salinity (PSU)** | 35.71 | **DO (% sat )** | 77.1 |
| **Sp. Conductivity (µs/cm)** | 54315 | **pH (pH units)** | 7.80 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER – Partly cloudy, sun breaking through, moderate breeze. Low humidity.

No leaf litter on surface.
No visible signs of pollution.
Discharging at time of sample collection.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour,
No sheen.
Water colour
Clear
Low turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Caroline French | Sarah Joyce |

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27 SEP-2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CAROLINE FRENCH + SARAH JOYCE |
| **location:** | Bladin Point | **Date:** | 08.12.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-03 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Medium Outgoing | **Sampling device** | Grab pole |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | 1 |
| **Time:** | 0900 | | |
| **Turbidity (NTU)** | 4.60 | **TDS (ppm)** | 35295 |
| **Temperature (°C)** | 32.1 | **ORP (mV)** | 214.3 |
| **Salinity (PSU)** | 35.68 | **DO (% sat )** | 80.7 |
| **Sp. Conductivity (µs/cm)** | 54287 | **pH (pH units)** | 7.80 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER – Overcast, moderate breeze, low humidity.
No leaf litter on surface.
No other visible signs of pollution
Tide outgoing water surface slightly choppy.
Discharging at time of sample collection.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour.
No sheen
water colour
Clear. Low turbidity.

| **Samples Taken** | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | 1 | 6 |
| Preserved inorganics (250mL) | 1 | 1 | | 1 |
| Light green 60mL | | | 1 | 2 |
| Teal 60mL | | | 1 | 3 |
| Solid Plastic 1L | | | 1 | 4 |
| Microbiological (250mL) | 1 | 1 | 1 | 5 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Caroline French | Sarah Joyce |

INDRA 2 SEP 2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CAROLINE FRENCH + SARAH JOYCE |
| **location:** | Bladin Point | **Date:** | 08.12.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-04 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>Low<br>Outgoing | **Sampling device** | Grab pole |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM1 |
| **Time:** | 0938 | | |
| **Turbidity (NTU)** | 4.93 | **TDS (ppm)** | 35295 |
| **Temperature (°C)** | 32.1 | **ORP (mV)** | 215.6 |
| **Salinity (PSU)** | 35.64 | **DO (% sat )** | 81.4 |
| **Sp. Conductivity (µs/cm)** | 54292 | **pH (pH units)** | 7.80 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER – Partly cloudy, sun breaking through
Light to moderate breeze. Low to medium
humidity.

No leaf litter on surface of water.
No other visible signs of pollution.
Discharging at time of sampling.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour, No sheen. Water colour clear. Low turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 1 |
| Preserved inorganics (250mL) | 1 | # | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | # | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Caroline French | Sarah Joyce |

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15 SEP 2016
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| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CAROLINE FRENCH + SARAH JOYCE |
| **location:** | Bladin Point | **Date:** | 08.10.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R1 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Low | **Sampling device** | Grab pole |
| | | **Water meter ID#** | YSI1 |
| | | **Turbidity Meter ID#** | TM1 |
| **Time:** | 1021 | | |
| **Turbidity (NTU)** | 3.41 | **TDS (ppm)** | 35490 |
| **Temperature (°C)** | 32.1 | **ORP (mV)** | 221.4 |
| **Salinity (PSU)** | 35.90 | **DO (% sat )** | 82.6 |
| **Sp. Conductivity (µs/cm)** | 54573 | **pH (pH units)** | 7.88 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER - Partly cloudy, sun breaking through
Light breeze. Humid.
No leaf litter on surface.
No other visible signs of pollution.
Crew working on a stationary barge ~50m from sampling location. (maintenance work).

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?
No odour,
No sheens,
Water colour clear, Low turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 3 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Caroline French | Sarah Joyce |

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27-SEP-2016
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GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CAROLINE FRENCH + SARAH JOYCE |
| **location:** | Bladin Point | **Date:** | 08.12.15 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R2 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Medium Outgoing | **Sampling device** | YSI + Grab pole |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | 1 |
| **Time:** | 0844 | | |
| **Turbidity (NTU)** | 4.88 | **TDS (ppm)** | 35230 |
| **Temperature (°C)** | 32.2 | **ORP (mV)** | 211.0 |
| **Salinity (PSU)** | 35.59 | **DO (% sat )** | 76.3 |
| **Sp. Conductivity (µs/cm)** | 54157 | **pH (pH units)** | 7.75 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather - Overcast, light breeze, low humidity.
No leaf litter on surface.
No other visible signs of pollution.
Discharging from onshore WTP at time of sampling.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?
Low NTU.
No odours.
No sheens.
Water colour clear.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Caroline French | Sarah Joyce |

INDRA 2 SEP-2016

**GREENCAP/AEC Environmental**
**Offshore Surface Water Sampling Field Record**

GREENCAP

| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore Environmental Impact Monitoring Program | **Sampled by:** | RB + SK |
| **Location:** | Bladin Point | **Date:** | 08. 12. 2015 |

| SAMPLING LOCATION | TIDE DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| | Tidal Level (i.e low, medium, high) | **Sampling device:** | SmarTROLL / YSI / TPS |
| STPM1 - T1 | discharging @ 8.30 | **Water meter ID#** | YSI |
| | | **iPod ID#** | N/A |
| **Time:** | 8.40 | **Turbidity Meter ID#** | |

| | | | |
|---|---|---|---|
| **pH (pH units)** | 8.19 | **ORP (mV)** | 95.5 |
| **Temperature (°C)** | 33.5 | **DO (% sat)** | 86.3 |
| **TDS (ppm)** | 1079.0 | **Salinity (PSU)** | 0.82 |
| **Sp. Conductivity (µS/cm)** | 1658.0 | **Turbidity (NTU)** | 0.75 |

**Field observations:** e.g. nearby activities, weather, floating debris/scum etc.

overcast, no breeze, humid.
no nearby activities during sampling
QA1 + QA02 collected.

Have water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? (YES) / NO

Have decontamination procedures been followed? (YES) / NO

**Observations during Sampling:**
e.g. odours, sheens, turbidity, water colour

no sheens
low turbidity
pale yellow water

| Samples Taken | Number | QA 01 | QA 02 | Order |
|---|---|---|---|---|
| Standard Metals Plastic* | 2 | | | |
| Cr (III & VI)* | 2 | | | |
| As (speciation)* | 1 | | | |
| Plastic unpreserved inorganics (1L) | 1 | 1 | 1 | 1 |
| Plastic unpreserved inorganics (500mL) | 1 | | 1 | 2 |
| Preserved inorganics (250mL) | 1 | 1 | | 4 |
| Microbiological (500mL) | 1 | 1 | | 3 |
| Glass vials (40mL) | 2 | | | |
| Glass amber unpreserved (250mL) | 1 | | | |
| Plastic nutrients* 60mL green/white | | | | |
| Plastic nutrients 60mL light green | | | | |
| UltraTrace Metals* (60mL) | | | | |
| Glass amber unpreserved (100mL) | | | | |
| Microbiological (200mL) | | | 2 | 5 |
| Solid Plastic (1L) | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD) ~~n/a~~

| Field Technician #1 | Field Technician #2 |
|---|---|
| SM. K. | Robin. B. |

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27-SEP-2016

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| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | RB, CF |
| **location:** | Bladin Point | **Date:** | 19-01-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-01 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>Neap tide<br>Low - incoming | **Sampling device** sample Grab pole | |
| | | **Water meter ID#** YSI-3 | |
| | | **Turbidity Meter ID#** TM1 | |
| **Time:** | 09:13 | | |
| **Turbidity (NTU)** | 4.19 | **TDS (ppm)** | 31785 |
| **Temperature (°C)** | 31.7 | **ORP (mV)** | 117.4 |
| **Salinity (PSU)** | 31.8 | **DO (% sat )** | 61.7 |
| **Sp. Conductivity (µs/cm)** | 48961 | **pH (pH units)** | 7.83 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

weather : hot, sunny, light breeze, blue skies, scattered cloud
No nearby activities at time of sampling.
No floating leaf litter / scum / debris etc. on water surface

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/~~N~~ yes

Decontamination procedures followed Y/~~N~~ yes.

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

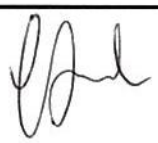
NO odours
NO sheens
Low turbidity
Clear water

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | NA | NA | 3 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birca | Caroline French |





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27-SEP-2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | RB, CF |
| **location:** | Bladin Point | **Date:** | 19-01-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-02 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Neap tide. Low - incoming | **Sampling device** | sample Grab pole. |
| | | **Water meter ID#** | YSI-3 |
| | | **Turbidity Meter ID#** | TM1 |
| **Time:** | 09:17 | | |
| **Turbidity (NTU)** | 3.60 | **TDS (ppm)** | 31135 |
| **Temperature (°C)** | 31.7 | **ORP (mV)** | 119 |
| **Salinity (PSU)** | 30.99 | **DO (% sat )** | 58.4 |
| **Sp. Conductivity (µs/cm)** | 47864 | **pH (pH units)** | 7.80 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

weather: hot, sunny, light breeze, blue skies, scattered cloud.
No nearby activities at time of sampling.
No floating leaf litter / scum / debris etc. on water surface

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/~~N~~ yes

Decontamination procedures followed Y/~~N~~ yes.

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?
No odours
No sheens
Low turbidity
Clear water

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | NA | NA | 3 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | |
| | | | | 1 |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birces | Caroline French. |

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27-SEP-2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | RB, CF |
| **location:** | Bladin Point | **Date:** | 19-01-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-03 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>Neap tide<br>Low - incoming | **Sampling device** | Sample grab pole. |
| | | **Water meter ID#** | YSI-3 |
| | | **Turbidity Meter ID#** | TM-1 |
| **Time:** | 09:23 | | |
| **Turbidity (NTU)** | 3.61 | **TDS (ppm)** | 31395 |
| **Temperature (°C)** | 31.7 | **ORP (mV)** | 118.6 |
| **Salinity (PSU)** | 31.33 | **DO (% sat )** | 61.6 |
| **Sp. Conductivity (µs/cm)** | 48358 | **pH (pH units)** | 7.81 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

weather: hot, sunny, light breeze, blue skies, scattered cloud.
No nearby activities at time of sampling.
No floating leaf litter / scum / debris on water surface.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/~~N~~ Yes

Decontamination procedures followed Y/~~N~~ Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odours
No sheens
Low turbidity
Clear water

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | NA | NA | 3 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birrell | Caroline French. |





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27-SEP-2016

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | RB, CF |
| **location:** | Bladin Point | **Date:** | 19-01-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-04 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>Neap tide.<br>Low - incoming | **Sampling device** | sample grab pole |
| | | **Water meter ID#** | YSI-3 |
| | | **Turbidity Meter ID#** | TM1 |
| **Time:** | 09:00 | | |
| **Turbidity (NTU)** | 4.43 | **TDS (ppm)** | 31460 |
| **Temperature (°C)** | 31.6 | **ORP (mV)** | 117.3 |
| **Salinity (PSU)** | 31.38 | **DO (% sat )** | 63.5 |
| **Sp. Conductivity (µs/cm)** | 48375 | **pH (pH units)** | 7.81 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

weather: hot, sunny, light breeze, blue skies, scattered cloud
No nearby activities at time of sampling.
No floating leaf litter / scum / debris etc. on water surface.
Onshore WDL sample collected at 08:30am.
QA01 + QA02 samples collected here.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded ~~Y/N~~ yes

Decontamination procedures followed Y/~~N~~ yes.

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odours
No sheens
Low turbidity
Clear water

| **Samples Taken** | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | | 3 |
| Preserved inorganics (250mL) | 1 | 1 | | 2 |
| Light green 60mL | | | 1 | 4 |
| Teal 60mL | | | 1 | 5 |
| Solid Plastic 1L | | | 1 | 6 |
| Microbiological (250mL) | 1 | 1 | 1 | 1 |
| Unpresered green (500mL) | | | 1 | 7 |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birsea | Caroline Firench. |





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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | RB, CF |
| **location:** | Bladin Point | **Date:** | 19-01-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R1 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>Neap tide<br>~~Low~~ Medium - incoming | **Sampling device** | Sample Grab pole |
| | | **Water meter ID#** | XSI-3 |
| | | **Turbidity Meter ID#** | TM1 |
| **Time:** | 10:42 | | |
| **Turbidity (NTU)** | 2.07 | **TDS (ppm)** | 32825 |
| **Temperature (°C)** | 32.1 | **ORP (mV)** | 99.3 |
| **Salinity (PSU)** | 32.91 | **DO (% sat )** | 54.3 |
| **Sp. Conductivity (µs/cm)** | 50547 | **pH (pH units)** | 7.94 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

weather: hot, sunny, light breeze, blue skies.
Some yellow scum floating on water surface.
No leaf litter / debris.
No nearby activities occurring at time of sampling
Green turtle spotted.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/~~N~~ yes

Decontamination procedures followed Y/~~N~~ yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odours
No sheens
Low turbidity
Clear water

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | NA | NA | 3 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birrell | Caroline French |

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27-SEP-2016

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | RB, CF |
| **location:** | Bladin Point | **Date:** | 19-01-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R2 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>Neap tide<br>Low - incoming | **Sampling device** | Sample Crab Pole |
| | | **Water meter ID#** | YSI 3 |
| | | **Turbidity Meter ID#** | TM1 |
| **Time:** | 09:33 | | |
| **Turbidity (NTU)** | 3.05 | **TDS (ppm)** | 30680 |
| **Temperature (°C)** | 31.8 | **ORP (mV)** | 119.9 |
| **Salinity (PSU)** | 30.47 | **DO (% sat )** | 59.2 |
| **Sp. Conductivity (µs/cm)** | 47171 | **pH (pH units)** | 7.76 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

weather: hot, sunny, light breeze, blue skies, scattered cloud
No nearby activities at time of sampling.
No floating leaf litter / scum / debris on water surface.
Dumb barge "CUSTER" moored approx 15m from sample site.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/~~N~~ YES

Decontamination procedures followed Y/~~N~~ YES.

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odours
No sheens
Low turbidity
Clear water

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | NA | NA | 1 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Biroca | Caroline French |

INDRA
27-SEP-2016

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | kah. |
| **location:** | Bladin Point | **Date:** | 19.01.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-T1 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>Discharging. | **Sampling device** | |
| | | **Water meter ID#** | YSI 2. |
| | | **Turbidity Meter ID#** | TM2. |
| **Time:** | 8:32 | | |
| **Turbidity (NTU)** | 0.75 | **TDS (ppm)** | 942.50 |
| **Temperature (°C)** | 33.1 | **ORP (mV)** | 47.0 |
| **Salinity (PSU)** | 0.72. | **DO (% sat )** | 76.4 |
| **Sp. Conductivity (µs/cm)** | 1458 | **pH (pH units)** | 8.01 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather; Scattered clouds, still, very humid, approx 34°C.

Purged 30L prior to Sampling

QA1 + 2 taken.

Discharge started 2mins prior to sampling.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No sheen.
Slight sewage odour
light yellow.

| **Samples Taken** | Number | QA 1 | QA 2 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | 2 | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | 1 | 1 | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| kah Fairweather. | |

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21 SEP 2016

REENCAP
'aste Discharge Sampling Record

GREENCAP

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|---|---|---|---|
| lient: | JKC | Job No: | J140153 |
| roject: | Ichthys Onshore, Environmental Impact Monitoring Program | Sampled by | CHRISTINA MALONEY + SARAH JOYCE |
| location: | Bladin Point | Date: | 17.02.16 |

| WDL: | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-01 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Low Incoming | Sampling device | |
| | | Water meter ID# | YSI 1 |
| | | Turbidity Meter ID# | TM3 |
| Time: | 0858 | | |
| Turbidity (NTU) | 4.63 | TDS (ppm) | 24628.50 |
| Temperature (°C) | 31.2 | ORP (mV) | 200.6 |
| Salinity (PSU) | 23.88 | DO (% sat ) | 47.6 |
| Sp. Conductivity (µs/cm) | 37883 | pH (pH units) | 7.62 |

**Field observations:** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER – Partly cloudy, cloud forming, moderate breeze, mild humidity.

No visible signs of pollution i.e - floating debris, leaf litter, scum, fish kills etc.

Discharging commenced onsite at 0830.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour
No sheen.
water colour
Low turbidity.

| Samples Taken | Number | QA N/A | QA N/A | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | 3 |
| Microbiological (250mL) | 1 | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

**Field Technician #1**
Christina Maloney

**Field Technician #2**
Sarah Joyce.

INDRA
27-SEP-2016
GREENCAP

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CHRISTINA MALONEY + SARAH JOYCE |
| **location:** | Bladin Point | **Date:** | 17-09.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-02 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Low incoming | **Sampling device** | |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 0847 | | |
| **Turbidity (NTU)** | 4.63 | **TDS (ppm)** | 24641.50 |
| **Temperature (°C)** | 31.6 | **ORP (mV)** | 203.3 |
| **Salinity (PSU)** | 23.89 | **DO (% sat )** | 38.3 |
| **Sp. Conductivity (µs/cm)** | 37913 | **pH (pH units)** | 7.59 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER – Partly cloudy, sun breaking through at times, moderate breeze, mild humidity.

No visible signs of pollution – leaf litter/debris, scum, fish kills etc. on surface.

Discharging onsite commenced at 0830.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour, No sheen. Low turbidity clear water colour.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 3 |
| Preserved inorganics (250mL) | 1 | | | |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Christina Maloney | Sarah Joyce. |

INDRA 27-SEP-2016 GREENCAP

GREENCAP
Waste Discharge Sampling Record

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CM, SJ |
| **location:** | Bladin Point | **Date:** | 17.02.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-03 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Low Incoming | **Sampling device** | |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 0838 | | |
| **Turbidity (NTU)** | 5.44 | **TDS (ppm)** | 24537.50 |
| **Temperature (°C)** | 31.3 | **ORP (mV)** | 215.6 |
| **Salinity (PSU)** | 23.78 | **DO (% sat )** | 36.8 |
| **Sp. Conductivity (µs/cm)** | 37751 | **pH (pH units)** | 7.58 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER – Partly cloudy, cloud building, moderate breeze, mild humidity.

No visible signs of pollution - floating debris, scum, fish kills etc. on surface.

Discharging onsite commenced at 0830.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour, No sheen. Water colour clear. Low Turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 1 |
| Preserved inorganics (250mL) | 1 | | | 3 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Christina Maloney | Sarah Joyce. |

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27 SEP 2016
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GREENCAP
Waste Discharge Sampling Record

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| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CHRISTINA MALONEY + SARAH JOYCE |
| **location:** | Bladin Point | **Date:** | 17.09.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-04 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Low Incoming | **Sampling device** | |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 0905 | | |
| **Turbidity (NTU)** | 5.44 | **TDS (ppm)** | 25200.50 |
| **Temperature (°C)** | 31.7 | **ORP (mV)** | 198.6 |
| **Salinity (PSU)** | 24.48 | **DO (% sat )** | 47.2 |
| **Sp. Conductivity (µs/cm)** | 38774 | **pH (pH units)** | 7.65 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER - Sunny, partly cloudy, moderate breeze, mild humidity.

No visible signs of pollution - no floating debris, scum, leaf litter, fish kills etc.

Discharging commenced onsite at 0830.

QA01 & QA02 collected at this location.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour,
No sheen.
Water colour clear.

| **Samples Taken** | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | 1 | |
| Preserved inorganics (250mL) | 1 | 1 | | |
| Light green 60mL | | | 1 | |
| Teal 60mL | | | 1 | |
| Solid Plastic 1L | | | 1 | |
| Microbiological (250mL) | 1 | 1 | 1 | |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Christina Maloney | Sarah Joyce. |

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27-SEP-2016
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Waste Discharge Sampling Record

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| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CHRISTINA MALONEY + SARAH JOYCE |
| **location:** | Bladin Point | **Date:** | 17.02.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R1 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Medium | **Sampling device** | |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 1012 | | |
| **Turbidity (NTU)** | 4.65 | **TDS (ppm)** | 31980.0 |
| **Temperature (°C)** | 31.8 | **ORP (mV)** | 164.7 |
| **Salinity (PSU)** | 31.92 | **DO (% sat )** | 59.3 |
| **Sp. Conductivity (µs/cm)** | 49167.0 | **pH (pH units)** | 7.83 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

WEATHER - Sunny, partly cloudy, moderate breeze, mild humidity. cloud building.

No visible signs of pollution - scum, leaf litter, debris, fish kills etc. on surface.

Discharging commenced onsite at 0830.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour, No sheen. Water colour clear. Slight turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 1 |
| Preserved inorganics (250mL) | 1 | | | 3 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Christina Maloney | Sarah Joyce |

INDRA 27 SEP-2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | CM, SJ |
| **location:** | Bladin Point | **Date:** | 17.02.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM- RZ | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Low tide | **Sampling device** | YSI 8 |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 07:54 | | |
| **Turbidity (NTU)** | 5.73 | **TDS (ppm)** | 17764 |
| **Temperature (°C)** | 30.4 | **ORP (mV)** | 305.3 |
| **Salinity (PSU)** | 16.59 | **DO (% sat )** | 43.8 |
| **Sp. Conductivity (µs/cm)** | 27265 | **pH (pH units)** | 7.09 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Weather- Sunny, hot, mild humidity, breeze.

No visible signs of pollution.

Turbidity low - slight greenish-brown colour.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded ~~Y/N~~ Yes

Decontamination procedures followed ~~Y/N~~ Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour
No sheen
No floating debris or scum.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | N/A | | 2 |
| Light green 60mL | | | N/A | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 1 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Christina Maloney | Sarah Joyce |

INDRA
27-SEP-2016

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SO, CF |
| **location:** | Bladin Point | **Date:** | 17.02.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-T1 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>6.8815 L/sec | **Sampling device** | YSI |
| | | **Water meter ID#** | YSI 2 |
| | | **Turbidity Meter ID#** | TM 1 |
| **Time:** | 08:30 | | |
| **Turbidity (NTU)** | 3.98 | **TDS (ppm)** | 1085.50 |
| **Temperature (°C)** | 33.1 | **ORP (mV)** | 83.5 |
| **Salinity (PSU)** | 0.83 | **DO (% sat )** | 47.6 |
| **Sp. Conductivity (µs/cm)** | 1666 | **pH (pH units)** | 7.84 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Started discharge @ 08:29am. Approx 5mins prior to sampling.

Weather: hot, humid, blue skies, partly cloudy

volume purged: 20L

Sewrage odour in air.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odour
No sheen
Low turbidity
Light yellow water
No floating scum.

| **Samples Taken** | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | | 3 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | 1 | 1 | 1 |
| 500mL physicals (unpreserved) | | | 1 | 4 |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sally-Anne Orchard | Caroline French |

INDRA
21 SEP 2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SJ, SC |
| **location:** | Bladin Point | **Date:** | 17.03.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-01 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Low-medium | **Sampling device** | YSI |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM 3 |
| **Time:** | 0900 | | |
| **Turbidity (NTU)** | 4.09. | **TDS (ppm)** | 27456.0 |
| **Temperature (°C)** | 31.2 | **ORP (mV)** | 154.7 |
| **Salinity (PSU)** | 26.88 | **DO (% sat )** | 67.1 |
| **Sp. Conductivity (µs/cm)** | 42168.0 | **pH (pH units)** | 7.28 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Discharged commenced at 0830
No visible signs of pollution on surface
No scum / sheens
Low turbidity

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?
No odours
No sheens
clear water

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | — | 3 |
| Preserved inorganics (250mL) | 1 | | NA | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sarah Joyce | Stewart Carroll |

INDRA
07 SEP 2016
GREENCAP

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SJ, SC |
| **location:** | Bladin Point | **Date:** | 17.03.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-02 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: low - medium | **Sampling device** | YSI |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM 3 |
| **Time:** | 09:15 | | |
| **Turbidity (NTU)** | 4.43 | **TDS (ppm)** | 26390.0 |
| **Temperature (°C)** | 31.0 | **ORP (mV)** | 149.0 |
| **Salinity (PSU)** | 25.86 | **DO (% sat )** | 64.2 |
| **Sp. Conductivity (µs/cm)** | 38292.0 | **pH (pH units)** | 7.26 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Discharge commenced at 08:30

No ~~Sheens~~/scum

clear water

No visible signs of pollution on surface.

~~Low~~ QA01 & QA02 collected.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No odours
clear water.
No sheens
low turbidity

| **Samples Taken** | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | 1 | 3 |
| Preserved inorganics (250mL) | 1 | 1 | 1 | 1 |
| Light green 60mL | | | 1 | |
| Teal 60mL | | | 1 | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | 1 | 1 | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sarah Joyce | Stewart Carroll. |

INDRA 12 SEP 2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SJ, SC |
| **location:** | Bladin Point | **Date:** | 17.03.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM 03 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: low - medium | **Sampling device** | YSI |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM 3 |
| **Time:** | 09:21 | | |
| **Turbidity (NTU)** | 4.10 | **TDS (ppm)** | 26923.0 |
| **Temperature (°C)** | 31.3 | **ORP (mV)** | 145.3 |
| **Salinity (PSU)** | 26.42 | **DO (% sat )** | 64.5 |
| **Sp. Conductivity (µs/cm)** | 42603.0 | **pH (pH units)** | 7.31 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Discharge commenced at 08:30

No visible pollution
low turbidity

moderate breeze, scattered showers, sunny, relatively hot, relative humidity

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No sheens
No scum
No odours
clear water

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | NA | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sarah Joyce | Stewart Carroll |

INDRA
SEP-2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SJ, SC |
| **location:** | Bladin Point | **Date:** | 17.03.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPm - 04 | Tidal Level (i.e low, medium, high) Discharge Flow Rate: Low - medium | **Sampling device** | YSI |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 09:27. | | |
| **Turbidity (NTU)** | 4.60 | **TDS (ppm)** | 25668.0 |
| **Temperature (°C)** | 31.2 | **ORP (mV)** | 141.8. |
| **Salinity (PSU)** | 24.69 | **DO (% sat )** | 64.9 |
| **Sp. Conductivity (µs/cm)** | 42469.0 | **pH (pH units)** | 7.39 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather*

Discharge commenced at 08:30
No visible signs of pollution.
low turbidity

moderate breeze, Scattered showers, Sunny, hot, mod. humidity

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour, floating debris/scum?

No sheens
No scum / debris.
clear water
No odours.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 3 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | NA | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 2 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sarah Joyce | Stuart carrol |

INDRA
SEP-2016

Waste Discharge

# ~~Water~~ Sampling Field Record

GREENCAP

| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | SJ, SC |
| **Location:** | BP | **Date:** | 17.06.2016 |

| **Site ID:** | **DETAILS** | **SAMPLING EQUIPMENT** | |
|---|---|---|---|
| STPM-R1 ~~BP000 31~~ | **Water/Tidal Level:** (e.g. low, med, high) | **Sampling device:** | YSI |
| **Location:** (e.g. basin, creek, harbour) | medium | **Water meter ID #:** | YSI 1 |
| Harbour | | **Turbidity Meter ID #:** | TM3 |

| | | | |
|---|---|---|---|
| **Time:** (24 hr format) | 10:23. | | |
| **pH:** (pH units) | 7.50 | **Sp. Conductivity:** (µS) | 44479 |
| **DO:** (% sat ) | 77.6. | **TDS:** (ppm) | 28892.5 |
| **Turbidity:** (NTU) | 2.81 | **ORP:** (mV) | 138.3 |
| **Temperature:** (°C) | 30.90 | | |
| **Salinity:** (PSU) | 28.53 | | |

**Field observations:**

| | |
|---|---|
| **Weather:** | Partly cloudy, hot, humid, slight breeze, |
| **Observations during sampling:** (e.g. nearby activities, turbidity comments, odours, sheens, etc.) | low turbidity, No odours, no sheen, no nearby activities, few leaf litter, some foam/bubbles on surf |

Have water quality and turbidity meters been calibrated in accordance with operating manual and recorded? (Y/N)

Decontamination procedures followed? (Y/N)

| Samples Taken | Number | QA1 Date | QA1 Initials | QA2 Date | QA2 Initials | Order |
|---|---|---|---|---|---|---|
| Metals Plastic* | 2 | | | | | 1 |
| Cr (III & VI)* | 2 | | | | | 2 |
| As (speciation) (Field filtered)* | 1 | | | | | 3 |
| Plastic unpreserved inorganics (1L) | 1 | | | | | 9 |
| Plastic unpreserved inorganics (500mL) | 1 | | | | | 7 |
| Preserved inorganics (250mL) | 1 | | | | | 8 |
| Microbiological (500mL) | 1 | | NA | | | 4 |
| Glass vials (40mL) | 2 | | | | | 5 |
| Glass amber unpreserved (250mL) | 1 | | | | | 6 |
| Plastic nutrients 60mL green/white | | | | | | |
| Plastic nutrients 60mL light green | | | | | | |
| Glass amber unpreserved (100mL) | | | | | | |
| Microbiological (200mL) | | | | | | |
| Solid Plastic (1L) | | | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sarah Joyce | Stuart Carroll |

INDRA 27 SEP 2016

Waste Discharge

# ~~Water~~ Sampling Field Record

GREENCAP

| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | SJ, SC |
| **Location:** | Darwin Harbour | **Date:** | 17.03.16 |

| **Site ID:** | **DETAILS** | **SAMPLING EQUIPMENT** | |
|---|---|---|---|
| STPM - R2 | **Water/Tidal Level:** (e.g. low, med, high) | **Sampling device:** | YSI |
| **Location:** (e.g. basin, creek, harbour) | low tide | **Water meter ID #:** | YSI 1 |
| Creek mouth | | **Turbidity Meter ID #:** | TM 3 |

| | | | |
|---|---|---|---|
| **Time:** (24 hr format) | 0754 | | |
| **pH:** (pH units) | 7.13 | **Sp. Conductivity:** (µS) | ~~39~~ 40571.0 |
| **DO:** (% sat ) | 69.0 | **TDS:** (ppm) | 26586.0 |
| **Turbidity:** (NTU) | 5.64 | **ORP:** (mV) | 165.0 |
| **Temperature:** (°C) | 30.60 | | |
| **Salinity:** (PSU) | 26.52 | | |

**Field observations:**

| | |
|---|---|
| **Weather:** | Hot, relative humidity, scattered cloud, Scatt Showers, Sunny |
| **Observations during sampling:** (e.g. nearby activities, turbidity comments, odours, sheens, etc.) | no leaf litter/drains, turbidity low, no scum, no pollution, no odours, no nearby activities. |

Have water quality and turbidity meters been calibrated in accordance with operating manual and recorded? (Y/N)

Decontamination procedures followed? (Y/N)

| Samples Taken | Number | QA1 Date | QA1 Initials | QA2 Date | QA2 Initials | Order |
|---|---|---|---|---|---|---|
| Metals Plastic* | 2 | | | | | |
| Cr (III & VI)* | 2 | | | | | |
| As (speciation) (Field filtered)* | 1 | | | | | |
| Plastic unpreserved inorganics (1L) | 1 | | | | | 3 |
| Plastic unpreserved inorganics (500mL) | 1 | | | | | |
| Preserved inorganics (250mL) | 1 | | | | | 1 |
| Microbiological (500mL) | 1 | | | | | 2 |
| Glass vials (40mL) | 2 | | | | | |
| Glass amber unpreserved (250mL) | 1 | | | | | |
| Plastic nutrients 60mL green/white | | | | | | |
| Plastic nutrients 60mL light green | | | | | | |
| Glass amber unpreserved (100mL) | | | | | | |
| Microbiological (200mL) | | | | | | |
| Solid Plastic (1L) | | | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sarah Jayne | Stuart Carroll |

INDRA 21-SEP-2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by** | SK |
| **location:** | Bladin Point | **Date:** | 17.03.2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM1-T1 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate<br>Discharging. | **Sampling device** | |
| | | **Water meter ID#** | PSI 2 |
| | | **Turbidity Meter ID#** | 943728 (Backup) |
| **Time:** | 9.40 | | |
| **Turbidity (NTU)** | 0.70 | **TDS (ppm)** | 1319.5 |
| **Temperature (°C)** | 32.3 | **ORP (mV)** | 50.3 |
| **Salinity (PSU)** | 1.02 | **DO (% sat )** | 55.0 |
| **Sp. Conductivity (µs/cm)** | 2035 | **pH (pH units)** | 7.78 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Volume purged 20L,
Sewerage odour in air
Started discharge @ 8.30, sample collected @ 8.35
Hot & humid. partly cloudy.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?
No sheen
Low turbidity
pale yellow water

| **Samples Taken** | Number | QA 01 | QA 02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | 2 (500ml) | 2 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 (500m | 1 (500m) | 2 | 3 |
| glass 500ml | 3 | 3 | | 4 |

(* DESIGNATES SAMPLES FILTERED IN FIELD) .

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sam. K | |

INDRA
21 SEP 2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | KP SJ. |
| **location:** | Bladin Point | **Date:** | 18.04.16. |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-01 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; med - outgoing. | **Sampling device** | Grab Pole. |
| | | **Water meter ID#** | WSI 1 |
| | | **Turbidity Meter ID#** | TM3. |
| **Time:** | 8:55. | | |
| **Turbidity (NTU)** | 5.22. | **TDS (ppm)** | 33830 |
| **Temperature (°C)** | 31.6 | **ORP (mV)** | 135.4 |
| **Salinity (PSU)** | 34.11 | **DO (% sat )** | 75.5. |
| **Sp. Conductivity (µs/cm)** | 52142 | **pH (pH units)** | 7.60 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

weather; ~~Previously~~, overcast, slight breeze, humid, approx 30°C.

Some scattered leaf litter. No pollution that is visable.

Sewage odour on the air; not in water.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

| **Observations during Sampling:-** eg. Odours, sheens, turbidity, water colour? | **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|---|
| no sheens. | Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| no odours. | Preserved inorganics (250mL) | 1 | | | 2 |
| clear. | Light green 60mL | | | | |
| | Teal 60mL | | | | |
| | Solid Plastic 1L | | | | |
| | Microbiological (250mL) | 1 | | | 3. |
| | | | | | |
| | (* DESIGNATES SAMPLES FILTERED IN FIELD) | | | | |

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kate Partridge. | Sarah Joyce. |

INDRA
29-SEP-2016

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | KP SJ. |
| **location:** | Bladin Point | **Date:** | 18.04.16. |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPm-02. | Tidal Level (i.e low, medium, high) Discharge Flow Rate; med-low outgoing. | **Sampling device** | Grab Pole. |
| | | **Water meter ID#** | 451 1 |
| | | **Turbidity Meter ID#** | TM3. |
| **Time:** | 9:02. | | |
| **Turbidity (NTU)** | 4.54 | **TDS (ppm)** | 33865 |
| **Temperature (°C)** | 31.6 | **ORP (mV)** | 132.8 |
| **Salinity (PSU)** | 34.10 | **DO (% sat )** | 77.1 |
| **Sp. Conductivity (µs/cm)** | 52138 | **pH (pH units)** | 7.62 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Weather; Overcast, slight breeze, warm approx 30°c.

no visable pollution.

no debris on boats nearby.

Slight sewage odour on the air, not in water.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

Clear water
no odours or
Sheens Present.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | P | P | 2 |
| Light green 60mL | | D | D | |
| Teal 60mL | | O | O | |
| Solid Plastic 1L | | – | N | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kate Partridge. | Sarah Joyce. |

INDRA
21 SEP 2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | KP SJ. |
| **location:** | Bladin Point | **Date:** | 18.04.16. |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-03. | Tidal Level (i.e low, medium, high) Discharge Flow Rate; med-low outgoing. | **Sampling device** | Grab Pole. |
| | | **Water meter ID#** | 451 1 |
| | | **Turbidity Meter ID#** | TM3. |
| **Time:** | 19:15 | | |
| **Turbidity (NTU)** | 5.05 | **TDS (ppm)** | 33865 |
| **Temperature (°C)** | 31.6 | **ORP (mV)** | 130.1 |
| **Salinity (PSU)** | 34.04 | **DO (% sat )** | 76.5 |
| **Sp. Conductivity (µs/cm)** | 52053 | **pH (pH units)** | 7.63 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

weather; overcast, slight breeze, approx 31°c.

no floating debris, no visable pollution.

slight sewage odour on the air, not in water.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

clear water

no odours / sheens.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | — | — | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | |
| | | | | 3 |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kate Partridge | Sarah Joyce. |

INDRA
27 SEP 2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | KP SJ. |
| **location:** | Bladin Point | **Date:** | 18.04.16. |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-04 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; med-low Outgoing. | **Sampling device** | Crab Pole. |
| | | **Water meter ID#** | 451) |
| | | **Turbidity Meter ID#** | TM3. |
| | | | |
| **Time:** | 9:19 | | |
| **Turbidity (NTU)** | 5.35 | **TDS (ppm)** | 33930 |
| **Temperature (°C)** | 31.6 | **ORP (mV)** | 124.7 |
| **Salinity (PSU)** | 34.16 | **DO (% sat )** | 77.2. |
| **Sp. Conductivity (µs/cm)** | 52212 | **pH (pH units)** | 7.61 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Weather; Overcast, humid, approx 32°c.

no visable pollution, no debris / scum.

Sewage odour on the air, not in water.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Ⓨ/N

Decontamination procedures followed Ⓨ/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

no odours, no sheens. Clear water.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | – | – | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sarah Joyce. | Kat Partridge. |

INDRA
21-SEP-2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | KP, SJ |
| **location:** | Bladin Point | **Date:** | 18.04.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R1 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; Low | **Sampling device** | |
| | | **Water meter ID#** | YSI 1 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 1115 | | |
| **Turbidity (NTU)** | 4.09 | **TDS (ppm)** | 34190 |
| **Temperature (°C)** | 31.6 | **ORP (mV)** | 113.5 |
| **Salinity (PSU)** | 34.46 | **DO (% sat )** | 84.7 |
| **Sp. Conductivity (µs/cm)** | 52623 | **pH (pH units)** | 7.71 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

WEATHER – mostly cloudy, light breeze, medium humidity.
No nearby activities. No floating debris or leaf litter. No other visible signs of pollution.
Discharging at 0830 am.
Water surface calm.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

No odour, No sheen Watercolour clear.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | N/A | N/A | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kat Partridge | Sarah Joyce |

INDRA 21 SEP-2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | KP SJ. |
| **location:** | Bladin Point | **Date:** | 18.04.16. |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R2. | Tidal Level (i.e low, medium, high) Discharge Flow Rate; med - Outgoing. | **Sampling device** | Grab Pole. |
| | | **Water meter ID#** | 451 1 |
| | | **Turbidity Meter ID#** | 3. |
| **Time:** | 8:11 | | |
| **Turbidity (NTU)** | 5.21 | **TDS (ppm)** | 33670 |
| **Temperature (°C)** | 31.4 | **ORP (mV)** | 134.80 |
| **Salinity (PSU)** | 33.9 | **DO (% sat )** | 74.2. |
| **Sp. Conductivity (µs/cm)** | 51848 | **pH (pH units)** | 7.51 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

weather; Overcast, no breeze, humid.
calm surface in current location.
no debris on boats nearby.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

clear to very slight turbidity.
no odours / sheens.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Kat Partridge. | Sarah Joyce. |

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27-SEP-2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | RB, SO |
| **location:** | Bladin Point | **Date:** | 18-04-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STP M-T | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate; | **Sampling device** | sample collected from tap on toilets. |
| | | **Water meter ID#** | 4513 |
| | | **Turbidity Meter ID#** | TM |
| | | | |

| | | | |
|---|---|---|---|
| **Time:** | 0846 | | |
| **Turbidity (NTU)** | 0.15 | **TDS (ppm)** | ~~910~~ 910.0 |
| **Temperature (°C)** | 32.6 | **ORP (mV)** | 163.0 |
| **Salinity (PSU)** | 0.69 | **DO (% sat )** | 82.0 |
| **Sp. Conductivity (µs/cm)** | 1402 | **pH (pH units)** | 8.46 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

QA1 + QA2 - Sample Collected.
20.0L Purged Prior to Sample.
Discharging Water during Sampling.
NO floating debris/scum in Water

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?
NO odour/sheen
Slight light - yellowish colour Water. ~~No~~ Ver. Low turbidity.
NO Sheen.

| **Samples Taken** | Number | QA 1 | QA 2 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | | 2 |
| Preserved inorganics (250mL) | 1 | 1 | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | 1 | 1 | 3 |
| Plastic unpreserved 500mL | | | 1 | 4 |
| (* DESIGNATES SAMPLES FILTERED IN FIELD) | | | | |

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birch | Sally-Anne |

INDRA 27 SEP 2016

## Water Sampling Field Record

GREENCAP

WDL-192 Outfall Pipe

| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | SK, SJ |
| **Location:** | Darwin Harbour | **Date:** | 16.05.16 |

| **Site ID:** | **DETAILS** | **SAMPLING EQUIPMENT** |
|---|---|---|
| STPM-b | **Water/Tidal Level:** (e.g. low, med, high) Low - Incoming | **Sampling device:** Grab Pole |
| **Location:** (e.g. basin, creek, harbour) Harbour | | **Water meter ID #:** YSI#2 |
| | 01 \| 02 \| 03 \| 04 | **Turbidity Meter ID #:** TM#4 |

| | 01 | 02 | 03 | 04 | | 01 | 02 | 03 | 04 |
|---|---|---|---|---|---|---|---|---|---|
| **Time:** (24 hr format) | 0924 | 0930 | 0941 | 0946 | | | | | |
| **pH:** (pH units) | 8.14 | 8.14 | 8.14 | 8.16 | **Sp. Conductivity:** (µS/cm) | 51877 | 51880 | 51876 | 51882 |
| **DO:** (% sat ) | 83.1 | 89.1 | 90.3 | 87.1 | **TDS:** (ppm) | 33735 | 33735 | 33735 | 33735 |
| **Turbidity:** (NTU) | 3.58 | 1.33 | 1.38 | 1.15 | **ORP:** (mV) | 187.5 | 186.6 | 196.1 | 190.4 |
| **Temperature:** (°C) | 29.2 | 29.2 | 29.2 | 29.2 | | | | | |
| **Salinity:** (PSU) | 34.0 | 34.0 | 33.9 | 34.0 | | | | | |

**Field observations:**

| | |
|---|---|
| **Weather:** | Sunny, clear, moderate breeze, low humidity. |
| **Observations during sampling:** (e.g. nearby activities, turbidity comments, odours, sheens, etc.) | No floating debris/leaf litter/scum or pollution. No odour, no sheen. |

Have water quality and turbidity meters been calibrated in accordance with operating manual and recorded? (Y/N) Y

Decontamination procedures followed? (Y/N) Y

| Samples Taken | Number | QA1 Date | QA1 Initials | QA2 Date | QA2 Initials | Order |
|---|---|---|---|---|---|---|
| Metals Plastic* | ~~2~~ | | | | | |
| Cr (III & VI)* | ~~2~~ | | | | | |
| As (speciation) (Field filtered)* | ~~1~~ | | QA01+QA02 | | | |
| Plastic unpreserved inorganics (1L) | 1 ✓ | | Collected at | | | 1 |
| Plastic unpreserved inorganics (500mL) | ~~1~~ | | | | | |
| Preserved inorganics (250mL) | 1 ✓ | | | | | 3 |
| Microbiological (500mL) | 1 ✓ | | STPM-02 | | | 2 |
| Glass vials (40mL) | ~~2~~ | | | | | |
| Glass amber unpreserved (250mL) | ~~1~~ | | | | | |
| Plastic nutrients 60mL green/white | | | | | | |
| Plastic nutrients 60mL light green | | | | | | |
| Glass amber unpreserved (100mL) | | | | | | |
| Microbiological (200mL) | | | | | | |
| Solid Plastic (1L) | | | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sam Keppetipola | Sarah Joyce |

INDRA 27 SEP 2016

## Water Sampling Field Record

GREENCAP

WDL-192

| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | SK, SJ |
| **Location:** | Darwin Harbour. | **Date:** | 16.05.16 |

| **Site ID:** | **DETAILS** | **SAMPLING EQUIPMENT** | |
|---|---|---|---|
| STPM-R1 | **Water/Tidal Level:** (e.g. low, med, high) | **Sampling device:** | Grab Pole |
| **Location:** (e.g. basin, creek, harbour) | Low - Medium Incoming | **Water meter ID #:** | YSI#1 |
| Harbour | | **Turbidity Meter ID #:** | TM#4 |

| | | | |
|---|---|---|---|
| **Time:** (24 hr format) | 1005 | | |
| **pH:** (pH units) | 8.20 | **Sp. Conductivity:** (µS/cm) | 51863 |
| **DO:** (% sat ) | 94.7 | **TDS:** (ppm) | 33735 |
| **Turbidity:** (NTU) | 3.64 | **ORP:** (mV) | 209.4 |
| **Temperature:** (°C) | 29.1 | | |
| **Salinity:** (PSU) | 33.95 | | |

| **Field observations:** | |
|---|---|
| **Weather:** | Sunny, clear sky, moderate breeze, low humidity. |
| **Observations during sampling:** (e.g. nearby activities, turbidity comments, odours, sheens, etc.) | No floating debris/ leaf litter or scum/pollution. No odour, no sheen. |

Have water quality and turbidity meters been calibrated in accordance with operating manual and recorded? (Y/N)

Decontamination procedures followed? (Y/N)

| **Samples Taken** | **Number** | **QA1 Date** | **QA1 Initials** | **QA2 Date** | **QA2 Initials** | **Order** |
|---|---|---|---|---|---|---|
| Metals Plastic* | ~~2~~ | | | | | |
| Cr (III & VI)* | ~~2~~ | | | | | |
| As (speciation) (Field filtered)* | ~~1~~ | | | | | |
| Plastic unpreserved inorganics (1L) | 1 | | | | | 1 |
| Plastic unpreserved inorganics (500mL) | ~~1~~ | | | | | |
| Preserved inorganics (250mL) | 1 | | | | | 3 |
| Microbiological (500mL) | 1 | | | | | 2 |
| Glass vials (40mL) | ~~2~~ | | | | | |
| Glass amber unpreserved (250mL) | ~~1~~ | | | | | |
| Plastic nutrients 60mL green/white | | | | | | |
| Plastic nutrients 60mL light green | | | | | | |
| Glass amber unpreserved (100mL) | | | | | | |
| Microbiological (200mL) | | | | | | |
| Solid Plastic (1L) | | | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sam Keppetipola | Sarah Joyce |

INDRA 27-SEP-2016

## Water Sampling Field Record

WDL192

GREENCAP

| | | | |
|---|---|---|---|
| **Client:** | JKC | **Job No:** | J140153 |
| **Project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | SK, SJ |
| **Location:** | Darwin Harbour. | **Date:** | 16.05.16 |

| **Site ID:** | **DETAILS** | **SAMPLING EQUIPMENT** |
|---|---|---|
| STPM-R2 | **Water/Tidal Level:** (e.g. low, med, high) Low - Incoming | **Sampling device:** Grab pole |
| **Location:** (e.g. basin, creek, harbour) Harbour | | **Water meter ID #:** YSI #2 |
| | | **Turbidity Meter ID #:** TM#4 |

| | | | |
|---|---|---|---|
| **Time:** (24 hr format) | 0912 | | |
| **pH:** (pH units) | 8.06 | **Sp. Conductivity:** (µS/cm) | 51692 |
| **DO:** (% sat ) | 82.7 | **TDS:** (ppm) | 33605 |
| **Turbidity:** (NTU) | 1.44 | **ORP:** (mV) | 186.3 |
| **Temperature:** (°C) | 28.9 | | |
| **Salinity:** (PSU) | 33.87 | | |

**Field observations:**

| | |
|---|---|
| **Weather:** | Sunny, moderate breeze, low humidity. |
| **Observations during sampling:** (e.g. nearby activities, turbidity comments, odours, sheens, etc.) | No floating debris / leaf litter / pollution. No odour, no sheen. |

Have water quality and turbidity meters been calibrated in accordance with operating manual and recorded? (Y/N) Y

Decontamination procedures followed? (Y/N) Y

| Samples Taken | Number | QA1 Date | QA1 Initials | QA2 Date | QA2 Initials | Order |
|---|---|---|---|---|---|---|
| Metals Plastic* | ~~2~~ | | | | | |
| Cr (III & VI)* | ~~2~~ | | | | | |
| As (speciation) (Field filtered)* | ~~1~~ | | | | | |
| Plastic unpreserved inorganics (1L) | 1 | | | | | 3 |
| Plastic unpreserved inorganics (500mL) | ~~1~~ | | | | | |
| Preserved inorganics (250mL) | 1 | | | | | 1 |
| Microbiological (500mL) | 1 | | | | | 2 |
| Glass vials (40mL) | ~~2~~ | | | | | |
| Glass amber unpreserved (250mL) | ~~1~~ | | | | | |
| Plastic nutrients 60mL green/white | | | | | | |
| Plastic nutrients 60mL light green | | | | | | |
| Glass amber unpreserved (100mL) | | | | | | |
| Microbiological (200mL) | | | | | | DW |
| Solid Plastic (1L) | | | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sam Keppetipola | Sarah Joyce |

INDRA 27 SEP 2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | RB, |
| **location:** | Bladin Point | **Date:** | 16.05.2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-T1 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate;<br>Discharging during Sampling. | **Sampling device** | Sample collected from outlet bottles. |
| | | **Water meter ID#** | YS-4 |
| | | **Turbidity Meter ID#** | TM3 |
| | | | |
| **Time:** | 0831 | | |
| **Turbidity (NTU)** | 0.14 | **TDS (ppm)** | 1150.50 |
| **Temperature (°C)** | 31.2 | **ORP (mV)** | 203.9 |
| **Salinity (PSU)** | 0.89 | **DO (% sat )** | 91.1 |
| **Sp. Conductivity (µs/cm)** | 1768 | **pH (pH units)** | 8.29 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Discharging during Sampling.
30 L - Initial discharge.
Sunny, warm, slight breeze. clear sky.
QA1 + QA02 also collected.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes

Decontamination procedures followed Y/N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?
No odour/sheen
faint yellow
colour water
Very low turbidity

| **Samples Taken** | Number | TQA01 | TQA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | | 1 |
| Preserved inorganics (250mL) | 1 | ‡ | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | 1 | 1 | 3 |
| Plastic unpreserved (500mL) | | | 1 | 4 |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Bisca | |

Bisca

INDRA
27-SEP-2016

GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | LP SK. |
| **location:** | Bladin Point | **Date:** | 14.06.16. |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-01 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; med - Incoming. | **Sampling device** | Grab Pole. |
| | | **Water meter ID#** | 451 2. |
| | | **Turbidity Meter ID#** | TM 2. |
| **Time:** | 9:01. | | |
| **Turbidity (NTU)** | 2.61. | **TDS (ppm)** | ~~Manual~~ 36710.0 |
| **Temperature (°C)** | 28.1 | **ORP (mV)** | 152.8 |
| **Salinity (PSU)** | ~~Manual~~ 34.14. | **DO (% sat )** | 88.7. |
| **Sp. Conductivity (µs/cm)** | ~~Manual~~ 53423 | **pH (pH units)** | 7.93. |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Discharge commenced at 8:30am.

Strong breeze, choppy surface, clear sky.

No floating debris, no visable contaminants.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

Clear

No odour / sheen.

| **Samples Taken** | Number | QA 1 | QA 2 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | | | 2 |
| Light green 60mL | | QA01 | QA02 | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | |
| | | | | 3 |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Ian | Sam. |

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27-SEP-2016

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | HP SH. |
| **location:** | Bladin Point | **Date:** | 24.06.16. |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| SIPMO2. | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate;<br>mod - incoming | **Sampling device** | Grab Pole. |
| | | **Water meter ID#** | 7512. |
| | | **Turbidity Meter ID#** | TM2. |
| **Time:** | 9:16. | | |
| **Turbidity (NTU)** | 2.88. | **TDS (ppm)** | 34775.0 |
| **Temperature (°C)** | 28-2. | **ORP (mV)** | 146.8 |
| **Salinity (PSU)** | 35.19. | **DO (% sat )** | 82.4 |
| **Sp. Conductivity (µs/cm)** | 53446.0 | **pH (pH units)** | 7.96. |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

weather: choppy, strong breeze, clear sky.

no debris, contaminats, algae, nothing strange.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

clear

no odour / sheen.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | — | — | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| | |

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27-SEP-2016

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | HP SL. |
| **location:** | Bladin Point | **Date:** | 14.06.16. |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-03 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; med - Incoming. | **Sampling device** | Crab Pole. |
| | | **Water meter ID#** | 4512. |
| | | **Turbidity Meter ID#** | TM2 |
| **Time:** | 9:20 | | |
| **Turbidity (NTU)** | 3.27. | **TDS (ppm)** | 34710.0 |
| **Temperature (ºC)** | 28.1 | **ORP (mV)** | 145.0 |
| **Salinity (PSU)** | 35.12 | **DO (% sat )** | 91.8 |
| **Sp. Conductivity (µs/cm)** | 53431.0 | **pH (pH units)** | 7.94. |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Weather: Shag breeze, clear skies, choppy surface.

No visable contaminants or anything strange.

No debris.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

No odour

No sheen.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | – | – | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Hat | Sam |

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GREENCAP
Waste Discharge Sampling Record

GREENCAP

| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | KP SH. |
| **location:** | Bladin Point | **Date:** | 14.06.16. |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-04 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; med | **Sampling device** | Grab Pole. |
| | | **Water meter ID#** | TM2 |
| | | **Turbidity Meter ID#** | YSI2 |
| **Time:** | 9:10 | | |
| **Turbidity (NTU)** | 3.95. | **TDS (ppm)** | 34710.0 |
| **Temperature (°C)** | 28.1 | **ORP (mV)** | 148.5 |
| **Salinity (PSU)** | 35.14. | **DO (% sat )** | 90.4. |
| **Sp. Conductivity (µs/cm)** | 53424.0 | **pH (pH units)** | 7.94. |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

No floating debris or contaminants.

Weather: See other FR sheets.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

No odour / no sheen.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | — | — | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3. |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| | Sam. |

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| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | |
| **location:** | Bladin Point | **Date:** | |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPm - R1 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate;<br>med - incoming. | **Sampling device** | Grab Pole. |
| | | **Water meter ID#** | YSI 2. |
| | | **Turbidity Meter ID#** | TM2. |
| | | | |
| **Time:** | 8:54. | | |
| **Turbidity (NTU)** | 3.73. | **TDS (ppm)** | 34710.0 |
| **Temperature (°C)** | 28.2. | **ORP (mV)** | 1426.3. |
| **Salinity (PSU)** | 35.18 | **DO (% sat )** | 90.2. |
| **Sp. Conductivity (µs/cm)** | 53420 | **pH (pH units)** | 7.91. |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

No floating debris or visable contaminants.

Shwy breeze / choppy.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

No odour / sheen.

Clear.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | — | — | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Leah | Sam. |

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| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | KP SL. |
| **location:** | Bladin Point | **Date:** | 14.06.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPW-R2 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; Med | **Sampling device** | Grab Pole. |
| | | **Water meter ID#** | 4512. |
| | | **Turbidity Meter ID#** | TM2. |
| | | | |

| | | | |
|---|---|---|---|
| **Time:** | 8:42. | | |
| **Turbidity (NTU)** | 2.34. | **TDS (ppm)** | 34775.0 |
| **Temperature (°C)** | 28.0 | **ORP (mV)** | 138.2. |
| **Salinity (PSU)** | 35.22. | **DO (% sat )** | 90.3. |
| **Sp. Conductivity (µs/cm)** | 53384 | **pH (pH units)** | 7.88. |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Discharge commenced at 8:30 am.
strong breeze, clear skies.
No floating debris or visable contaminants.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

No odour / sheen. clear water.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 1 |
| Preserved inorganics (250mL) | 1 | — | — | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| | Sam. |

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| | | | |
|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | RB, SJ |
| **location:** | Bladin Point | **Date:** | 14.06.16 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-T1 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; Tide - Low incoming Discharging | **Sampling device** | |
| | | **Water meter ID#** | YSI-5 |
| | | **Turbidity Meter ID#** | TM3 |
| **Time:** | 0840 | | |
| **Turbidity (NTU)** | 3.98 | **TDS (ppm)** | 1001.00 |
| **Temperature (°C)** | 29.4 | **ORP (mV)** | 149.2 |
| **Salinity (PSU)** | 0.77 | **DO (% sat )** | 77.1 |
| **Sp. Conductivity (µs/cm)** | 1543 | **pH (pH units)** | 8.36 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Weather - Sunny, clear sky, light winds.
started purging at 8:35. 30L total purged.
Turbidity value higher than normal (5.25)
Tested multiple times & used OPS1 turbidity meter. Final value 3.98. Slight yellow tinge affecting water clarity. No visible particles.
Team collecting offshore sample.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?

Slight odour
No sheen.
Slight yellow colour.
Low turbidity

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | 1 | |
| Preserved inorganics (250mL) | 1 | 1 | | |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | 1 | 1 | |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Bunn | Sarah Joyce |

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | RB, RP |
| **location:** | Bladin Point | **Date:** | 12-07-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-01 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; Med. sample collected on site @ 0900 | **Sampling device** | Grab pole sampler |
| | | **Water meter ID#** | YSI-3 |
| | | **Turbidity Meter ID#** | TM 1 |
| **Time:** | 0932 | | |
| **Turbidity (NTU)** | 1.42 | **TDS (ppm)** | 35165.0 |
| **Temperature (°C)** | 27.0 | **ORP (mV)** | 104.2 |
| **Salinity (PSU)** | 35.72 | **DO (% sat )** | 89.0 |
| **Sp. Conductivity (µs/cm)** | ~~35~~ 54060 | **pH (pH units)** | 8.00 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Discharge sample collected @ 900.
Clear water. No floating scum/debris. Low turbidity.
No activities nearby.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N yes.

Decontamination procedures followed Y/N Yes

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?
No odour/sheen.
Clear water
Very low turb.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | NA | NA | 2 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3. |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birrell | Rob P. |

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | RB, RD |
| **location:** | Bladin Point | **Date:** | 12.07.2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| ST PM-02 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate;<br>Med tide. | **Sampling device** | Grab pole sampler. |
| | | **Water meter ID#** | YSI-3 |
| | | **Turbidity Meter ID#** | TM1 |
| **Time:** | 0953 | | |
| **Turbidity (NTU)** | 1.26 | **TDS (ppm)** | 35165.0 |
| **Temperature (°C)** | 27.0 | **ORP (mV)** | 100.2 |
| **Salinity (PSU)** | 35.73 | **DO (% sat )** | 90.2 |
| **Sp. Conductivity (µs/cm)** | 54116.0 | **pH (pH units)** | 8.01 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Sunny, clear sky, slight breeze.
No floating debris/ scum on water.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?
No odour/sheen.
Clear water.
Very low turb.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | MA | MA | 2 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birrell | Rob. P. |

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | RB, RP |
| **location:** | Bladin Point | **Date:** | 12-07-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| ST PM-03 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate;<br>Med tide.<br>Discharge sample collected @ 0900. | **Sampling device** Grab pole Sampler | |
| | | **Water meter ID#** YSI-3 | |
| | | **Turbidity Meter ID#** TM-1 | |
| | | | |
| **Time:** | 0955 | | |
| **Turbidity (NTU)** | 1.52 | **TDS (ppm)** | 35165.0 |
| **Temperature (°C)** | 27.0 | **ORP (mV)** | 97.0 |
| **Salinity (PSU)** | 35.73 | **DO (% sat )** | 89.5 |
| **Sp. Conductivity (µs/cm)** | 54130 | **pH (pH units)** | 8.01 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Sunny, clear sky, slight breeze.
No floating debris/scum in water.
QA01 + QA02 also collected.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?
No odour/sheen.
Clear & water
Very low turb.

| **Samples Taken** | Number | QA01 | QA02 | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | 1 | | 2 |
| Preserved inorganics (250mL) | 1 | 1 | | 1 |
| Light green 60mL | | | 1 | 4 |
| Teal 60mL | | | 1 | 3 |
| Solid Plastic 1L | | | 1 | 6 |
| Microbiological (250mL) | 1 | 1 | 1 | 5 |
| | | | | |
| (* DESIGNATES SAMPLES FILTERED IN FIELD) | | | | |
| plastic unpreserved (0.5L) | | | 1 | 7 |

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birtles | Rob P. |

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | RB, RP |
| **location:** | Bladin Point | **Date:** | 12.07.2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-04 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate;<br>Med.<br>Discharge sample collected @ 0950 | **Sampling device** | Grab pole Sampler |
| | | **Water meter ID#** | YSI-3 |
| | | **Turbidity Meter ID#** | TM1 |
| **Time:** | 0950 | | |
| **Turbidity (NTU)** | 1.31 | **TDS (ppm)** | 35165.0 |
| **Temperature (°C)** | 27.0 | **ORP (mV)** | 103.9 |
| **Salinity (PSU)** | 35.72 | **DO (% sat )** | 90.0 |
| **Sp. Conductivity (µs/cm)** | 54102 | **pH (pH units)** | 8.00 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Sunny, clear sky. No breeze.
No floating debris/ scum in water. No land litter.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N Yes.

Decontamination procedures followed Y/N Yes.

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?
No odour/sheen.
Very low turb.
Clear waters

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | | | 2 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birch | Rob. P. |

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | RB, RP |
| **location:** | Bladin Point | **Date:** | 12-07-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R1 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; Med. | **Sampling device** | Grab Pole Sampler |
| | | **Water meter ID#** | YSI-3 |
| | | **Turbidity Meter ID#** | TM-1 |
| **Time:** | 10.15 | | |
| **Turbidity (NTU)** | 1.91 | **TDS (ppm)** | 35165.0 |
| **Temperature (°C)** | 26.9 | **ORP (mV)** | 116.3 |
| **Salinity (PSU)** | 35.75 | **DO (% sat )** | 89.6. |
| **Sp. Conductivity (µs/cm)** | 54145 | **pH (pH units)** | 8.01 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Overcast, slight breeze.
No floating debris/scum in water

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded (Y)/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?
No odour/sheen
Clear water.
Very Low turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | NA | NA | 2 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birlea | Rob P. |

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | RB, RP |
| **location:** | Bladin Point | **Date:** | 12-07-2016 |

| **WDL:** | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM-R2 | Tidal Level (i.e low, medium, high)<br>Discharge Flow Rate;<br>High tide. | **Sampling device** | Grab pole sampler |
| | | **Water meter ID#** | YSI-3 |
| | | **Turbidity Meter ID#** | TM1 |
| | | | |
| **Time:** | 1045 | | |
| **Turbidity (NTU)** | 1.81 | **TDS (ppm)** | 35230.0 |
| **Temperature (°C)** | 26.8 | **ORP (mV)** | 126.4 |
| **Salinity (PSU)** | 35.83 | **DO (% sat )** | 88.2 |
| **Sp. Conductivity (µs/cm)** | 54243 | **pH (pH units)** | 8.01 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Overcast, slight breeze.
Sample collected near ~50m from a barge.
No floating debris/scum in water.
No leaf litter in water.

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed (Y)/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?
No odour/sheen
Clear water
Low turbidity.

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | NA | NA | 2 |
| Preserved inorganics (250mL) | 1 | | | 1 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | | | 3 |
| | | | | |

(* DESIGNATES SAMPLES FILTERED IN FIELD)

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Robin Birua | Rob P. |

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|---|---|---|---|
| **client:** | JKC | **Job No:** | J140153 |
| **project:** | Ichthys Onshore, Environmental Impact Monitoring Program | **Sampled by:** | SK |
| **location:** | Bladin Point | **Date:** | 17.07.2016 |

| **WDL:** 192 | WATER DETAILS | SAMPLING EQUIPMENT | |
|---|---|---|---|
| STPM – T1 | Tidal Level (i.e low, medium, high) Discharge Flow Rate; Med - incoming Discharging | **Sampling device** | |
| | | **Water meter ID#** | YSI - 4 |
| | | **Turbidity Meter ID#** | New TM |
| **Time:** | 8.59 ~~Completion~~ | | |
| **Turbidity (NTU)** | 2.08 | **TDS (ppm)** | 871 |
| **Temperature (°C)** | 29.9 | **ORP (mV)** | 39.8 |
| **Salinity (PSU)** | 0.66 | **DO (% sat )** | 58.9 |
| **Sp. Conductivity (µs/cm)** | 1342 | **pH (pH units)** | 7.75 |

***Field observations:*** *eg. Discharge status, pump operation status, volume purged, weather, nearby activities, floating debris/scum etc.*

Weather - Sunny, partly cloudy, light breeze
Started purging at 8.50, 30 L total purged
- Started discharging at 8.44 Sample collected 8.50am
Sewerage odour in air

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded Y/N

Decontamination procedures followed Y/N

**Observations during Sampling:-**
eg. Odours, sheens, turbidity, water colour?
Slight odour
No sheen
Very low turbidity
Slight yellowish - colour water

| **Samples Taken** | Number | QA | QA | Order |
|---|---|---|---|---|
| Plastic unpreserved inorganics (1L) | 1 | ✓ | ✓ | 1 |
| Preserved inorganics (250mL) | 1 | ✓ | | 2 |
| Light green 60mL | | | | |
| Teal 60mL | | | | |
| Solid Plastic 1L | | | | |
| Microbiological (250mL) | 1 | ✓ | ✓ | 3 |
| | | | | |

(* ~~DESIGNATES SAMPLES FILTERED IN FIELD~~) ,

| **Field Technician #1** | **Field Technician #2** |
|---|---|
| Sam K | |

INDRA
27-SEP-2016

# APPENDIX F
# Ichthys Onshore LNG Facilities Community Relations Plan

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INPEX

INPEX Operations Australia Pty Ltd

# ICHTHYS ONSHORE LNG FACILITIES

# COMMUNITY RELATIONS PLAN

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INDRA
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## Contents

**1. INTRODUCTION ..... 3**

1.1 Scope ..... 3
1.2 Definitions ..... 3
1.3 Applicable documents ..... 4
1.4 Abbreviations ..... 4

**2. OBJECTIVES ..... 6**

**3. ORGANISATION AND STAKEHOLDERS ..... 7**

3.1 Key Stakeholders ..... 7
3.2 Contractor Community Relations Team ..... 7
3.3 Roles and responsibilities ..... 10

**4. ENGAGEMENT MODEL ..... 11**

4.1 Top-down engagement model during construction ..... 12
4.2 Regular, open and personal contact ..... 12

**5. OVERVIEW OF COMMUNITIES AND KEY STAKEHOLDERS ..... 12**

5.1 Key stakeholder groups by external affairs function ..... 12
5.2 Communities in areas of construction and operation ..... 13

**6. COMMUNITY RELATIONS PROCEDURES ..... 14**

6.1 General ..... 14
6.2 Aboriginal and Torres Strait Islander (ATSI) relations ..... 14
6.3 Media protocols ..... 14
6.4 Government relations ..... 15
6.5 Complaints management ..... 15
6.6 Crisis management ..... 15
6.7 Howard Springs Accommodation Village ..... 15
6.8 Identifying key community issues ..... 15
6.9 Communication channels ..... 17
6.10 Promoting the joint venture ..... 19
6.11 Community grievance management procedure ..... 20
6.12 Public risk and incident communications ..... 20
6.13 Lessons learned ..... 5

**7. CONTRACTOR ENGAGEMENT ..... 21**

7.1 Community Relations Working Group ..... 21
7.2 Public communication protocols ..... 21

**8. SUBCONTRACTOR ENGAGEMENT ..... 22**

**APPENDIX A** JKC JV ADVICE TO SUBCONTRACTORS: PART 1 ..... 23
**APPENDIX B** JKC JV ADVICE TO SUBCONTRACTORS: PART 2 ..... 26
**APPENDIX C** JKC JV ADVICE TO SUBCONTRACTORS: PART 3 ..... 29

INDRA
27-SEP-2016

# 1. INTRODUCTION

## 1.1 Scope

This Community Relations Plan describes the management controls and processes Contractor will have in place to manage Community Relations during the execution/construction and commissioning phase of the Ichthys Gas Field Development Project. Contractor will work closely with Company to ensure community and stakeholder communications protocols are followed and the community engagement approach is consistent across Company, Contractor and Subcontractor personnel. As a consequence, this Plan is aligned to, and builds upon, the Company Plan in those areas under the direct control of Contractor.

The construction phase will represent the height of activity for the Project and will be the phase most likely to have a direct impact on the community, through issues such as:

- housing and rental market pressure
- local infrastructure (roads, services)
- labour market pressure
- Australian content and jobs
- environmental impacts
- public safety.

Effective community engagement during this critical period is essential to enhance Company and Contractor reputation. Engagement also helps achieve mutually beneficial outcomes for specific aspects of the Project.

Implementation of this Plan will assist in achieving both the regulatory and social licences to operate, while delivering on the Project schedule and protecting and enhancing the reputation of Company and Contractor.

This plan outlines:

- The management framework which will govern the Project's community engagement program during construction
- The range of community stakeholders requiring engagement
- The processes for identifying and managing issues of potential interest or concern to the community
- communication methods for engaging with community
- methods Company will use for measuring the effectiveness of Contractor's community engagement program
- how Contractor will coordinate activities to ensure consistency and clear lines of responsibility in community relations.

This Plan is informed by other existing management plans and will be supported by detailed existing and proposed detailed construction communication action plans which will be developed for specific activities in line with Project timelines.

The timeframe of this plan includes pre-mobilisation, construction, and commissioning under the direct control of Contractor.

## 1.2 Definitions

| | |
|---|---|
| Company | INPEX Operations Australia Pty Ltd acting as agent for Ichthys LNG Pty Ltd |

INDRA 27-SEP-2016

| | |
|---|---|
| Contractor | JKC Australia LNG Pty Ltd—the Joint Venture between JGC Corporation, KBR (Kellogg Brown & Root Pty Ltd) and Chiyoda Corporation |
| Ichthys Project | Ichthys Gas Field Development Project |
| Site | Location where the plant is to be constructed and the vicinity thereof |
| Subcontractor | Any company to whom Contractor has subcontracted any part of the works |
| Worksite | Any location where work for the site is carried out |

## 1.3 Applicable documents

### 1.3.1 Contractor documents

S-0290-11N0-0001: The Aboriginal and Torres Straight Islander Affairs Plan

S-0290-1190-0002: Howard Springs Accommodation Village – Communications Action Plan

S-0290-1190-0003: Road Transport – Communications Action Plan

S-0290-11Z0-3001: Howard Springs Accommodation Village Simultaneous Operations Phase – Communications Action Plan

### 1.3.2 Company documents

C025-AG-PLN-0026: External Stakeholder Engagement Plan

C025-AG-POL-0002: Community Grievance Management Procedure

C025-AG-POL-0002: Transport Management Communications Plan—Roads

C025-AG-POL-0002: Transport Management Communications Plan—Marine

## 1.4 Abbreviations

| | |
|---|---|
| ALARP | as low as reasonably practicable |
| ATSI | Aboriginal and Torres Strait Islander |
| CLO | Community Liaison Officer |
| CRC | Community Relations Coordinator |
| MCO | Media & Communications Officer |
| CRM | Community Relations Manager |
| CRWG | Community Relations Working Group |
| EAM | External Affairs Manager |
| EIS | Environmental Impact Statement |
| EPC | Engineering, Procurement and Construction |
| HSES | health, safety, environment and security |
| KBR | Kellogg Brown & Root Pty Ltd |
| MHF | Major Hazard Facility |

INDRA 27-SEP-2016

| | |
|---|---|
| NGO | Non Government Organisation |
| PPE | Personal Protective Equipment |
| RTMP | Road Transport Management Plan |
| SRM | Stakeholder Relationship Management |

INDRA
27-SEP-2016

## 2. OBJECTIVES

The key objectives of this Plan are to:

- provide an outline of the management framework and guidelines which will govern the Contractor community engagement program during construction
- assist with the identification and management of issues of interest to community
- support the achievement of government approvals to meet the Project schedule
- plan and implement communication plans
- identify the range of materials for release to external stakeholders in a timely manner, consistent with Company and Contractor requirements
- ensure regular and consistent messaging to the community.

Achievement of these objectives will help protect and enhance the reputation of Company, Contractor and Subcontractor during construction.

INDRA
27-SEP-2016

## 3. ORGANISATION AND STAKEHOLDERS

### 3.1 Key Stakeholders

External stakeholders in the project include:

- elected government representatives
- government staff
- non-government organisations (NGOs)
- media organisations
- general community.

Company has developed a External Stakeholder Engagement Plan (C025-AG-PLN-0026), along with other associated management plans detailing the protocols for communicating with stakeholders for a wide range of issues. Contractor will comply with the requirements of these plans. Subcontractors must also comply through input into Subcontractor Community Relations Plans. Contractor has provided documented advice to Subcontractors in relation to community engagement, communications protocols and branding policies.

In conjunction with Company and Subcontractors, Contractor will manage and implement community and stakeholder plans with a team of professional Community Relations personnel which includes:

- Community Relations Manager
- Media & Communications Officer
- Two Community Relations Coordinators.

### 3.2 Contractor Community Relations Team

The Contractor Community Relations team is made up of a Community Relations Manager (CRM), a Media & Communications Officer and two Community Relations Coordinators. This team will facilitate all communications with support and guidance from the Contractor External Affairs Manager (EAM).

The CRM reports directly to the EAM. The CRM and MCO will be located in the Darwin Contractor office, while the CRC's during the construction phase.

The CRM will guide the Subcontractor community relations personnel, and will be responsible for the day-to-day community relations and communications functions for all activities associated with the Contractor construction impacts across the community. This will include the two significant locations: Howard Springs Accommodation Village and the Blaydin Point Ichthys LNG Facility.

The CRM is Contractor's single point of contact for all community relations and is responsible for the following:

- provision of Contractor project information to Company External Affairs and Public Affairs personnel
- participation in regular meetings with Company to discuss community feedback and other community relations issues, in particular the coordinating body—the Community Relations Working Group (CRWG)
- assisting Company with the resolution of community complaints and public protests in conjunction with the Company Grievance Management Procedure and with oversight from the Community Relations Working Group (CRWG)
- directing public feedback to relevant Company and Subcontractor personnel

INDRA 27-SEP-2016

- scheduling, attending and assisting with site tours, as required by Company, Contractor and Subcontractor
- identifying, coordinating and managing community events on behalf of Contractor
- identifying, coordinating and managing community sponsorship opportunities on behalf of Company and Contractor
- communicating Project activities in regular newspaper advertisements and in other forums, as requested by Company and Contractor
- other community engagement tasks, as requested by Company and Contractor
- formal and informal monitoring and recording of site work, scheduling, logistics, milestones and other project activities for community information purposes
- generating and maintaining periodic photographic records of construction progress and key milestones for internal and external use, and in accordance with agreed protocols
- liaising with the HSES Manager for the development, implementation and evaluation of community management procedures during crisis situations.

Reporting to the CRM are two Community Relations Coordinators who will be located in the Darwin Contractor office during the construction phase. Their role is to:

- provide assistance to the CRM to implement the Community Relations Plan and supplementary plans
- to provide advice to the CRM and other Project personnel regarding community relations issues
- research, design and generate communications materials for target audiences as directed by the CRM
- organise and facilitate community events and Contractor milestone functions
- manage the 1300 724 795 community feedback freecall number on a rostered basis to ensure the timely and accurate answering, logging, response, and/or potential escalation of community enquiries and complaints in accordance with the Company Community Grievance Management Procedure
- support other Contractor function areas where required.

The Contractor external affairs organisation chart is provided in

Figure 3.1

INDRA
27-SEP-2016

External Affairs Manager

**Figure 3.1: Contractor external affairs organisation chart**

INDRA
27-SEP-2016

## 3.3 Roles and responsibilities

### 3.3.1 Construction Site Manager

The Construction Site Manager may be required to attend and/or lead site tours for dignitaries and Company representatives, as requested by Company. Site visits for Contractor representatives may also be conducted by the Construction Site Manager, in the event that the Project Director is unavailable.

The Construction Site Manager will assist and support the CRM in monitoring the works and providing advice on proposed project activities, or issues of community interest or concern.

### 3.3.2 Project officers

Project officers in all locations are required to adhere to the community relations principles and communications protocols outlined in this Plan. No Contractor personnel are authorised to have any contact with stakeholders unless specifically granted by Company in writing.

Contractor may request Company permission to publish Project information (i.e. for newsletters with distribution outside the Project team) through the Contractor Community Relations Coordinator in accordance with the Contractor's Advice for Subcontractors Part 3 (Protocols).

### 3.3.3 Package Manager

Package Managers will assist and support the CRM and CRCs in provision of timely and accurate information, monitoring of the works and advising of other project activities.

### 3.3.4 Contractor and Subcontractor personnel

No Contractor and Subcontractor personnel are authorised to have any contact with stakeholders unless otherwise specifically granted by Company in writing, in accordance to the Contractor's Advice for Subcontractors Part 1 (Engagement).

### 3.3.5 Communications

The CRM and EAM work together with Company Public Affairs and External Affairs teams in Perth and Darwin to manage stakeholder relations during the construction execution phase. All Contractor and Subcontractor communications to stakeholders are guided by the management plans listed in Section 1.3. The majority of pro-active stakeholder engagement activity as well as reactive escalated grievances will be managed through the CRWG, while daily management of routine enquiries will be managed at the point of contact by the Contractor community relations team.

INDRA
27-SEP-2016

## 4. ENGAGEMENT MODEL

Since the announcement in 2008 that Darwin would be the location for the Ichthys LNG plant and associated onshore facilities, Company has undertaken extensive consultation with community (and other) stakeholders in Darwin and in the wider Australian context. The overarching objectives of this engagement have been to:

- protect and enhance the reputation of Company, and of the Ichthys Project
- provide a framework of positive engagement to facilitate government approvals associated with the Project.

The top-down engagement model typically adopted by Company, as Operator of the Project, for major disclosures of information to government and the community has resulted in positive outcomes for Company and the Project across all functional areas. This model is shown in Figure 4.1.

The engagement model is summarised as “top-down”, by which it is meant that significant public announcements are typically advised to the Head of Government first. Under this model, the information is then communicated down to key elected representatives (relevant ministers, Members of Parliament, local government representatives) and then to the broader community.

Messages are communicated to these stakeholder groups using various communication channels.

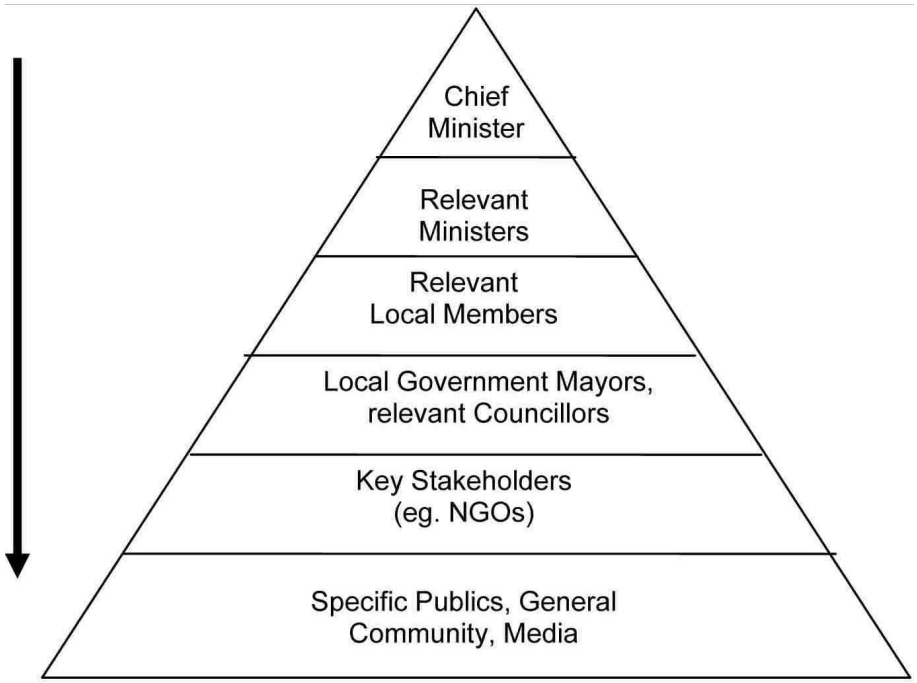



**Figure 4.1: Top-Down stakeholder engagement model (Northern Territory)**

*Note: Certain Project disclosures will not follow this model; for example, disclosures that relate strictly to approvals processes which will originate at the working level of government.*

Company personnel across the key functional areas of Darwin Office, Government Affairs, Public Affairs, Environment, Government Approvals and Contracts have regular contact with departmental counterparts on an ongoing basis. This occurs both in formal meetings, such as the regular High Level Group meetings of NT Government departmental heads with the Director Corporate Co-ordination and GM Darwin, and in meetings at the working level to maintain relationships and generate bilateral understanding pending approvals requirements.

INDRA 27-SEP-2016

Departmental personnel are, therefore, likely to be communicating upwards to their ministers in some cases.

This Plan follows the top-down model that has been developed and is considered to have functioned successfully to date.

4.1 Top-down engagement model during construction

While major announcements are likely to continue to be delivered to key stakeholders and the community using the top-down model described above, much of the day-to-day information required to be communicated to the community during the construction phase will be undertaken by Contractor direct to the community.

Information of this nature particularly relates to issues of public safety associated with construction activities that have the potential to highly impact the community, such as activities within the Howard Springs Accommodation Village site and rock transport to Blaydin Point and East Arm Wharf from the quarries

During the construction phase, Contractor will work in conjunction with Company in coordinating community communication activities to ensure communications are consistent with the expectations of Company.

4.2 Regular, open and personal contact

While Contractor will manage and document day-to-day community interaction associated with construction activities, regular, open and personal contact with key stakeholders will be managed by the Company according to the top-down engagement model. Contractor will build on the level of trust and two-way communication process during a transitional phase into the construction period where Company will monitor, but not continue to lead, the broader community engagement activities.

## 5. OVERVIEW OF COMMUNITIES AND KEY STAKEHOLDERS

5.1 Key stakeholder groups by external affairs function

5.1.1 Community

The Project's key community stakeholders include the following:

- local government authorities
- businesses and business associations
- non-government organisations
- media
- local residents in our areas of operation (listed below)
- sponsorship partners.

Contractor will be provided with access to, and will refer to the Company Stakeholder Database for full details of all stakeholders.

5.1.2 Government

Company will continue to instigate and manage engagement with Federal, Territory and State government stakeholders, with support from Contractor where requested. Contractor engagement will not include Federal communications unless necessary.

5.1.3 Aboriginal and Torres Strait Islander peoples

Targeted engagement with ATSI stakeholders is referred to separately in the following plans:

- Ichthys Project Aboriginal and Torres Strait Islander Business Engagement Plan (C015-AG-PLN-0003)

INDRA 27-SEP-2016

- JKC Aboriginal and Torres Strait Islander Affairs Plan (S-0290-11NO-0001).

5.2 Communities in areas of construction and operation

Contractor will concentrate its community engagement in the following key areas during construction.

5.2.1 Darwin

The proposed onshore gas processing facilities for the Project will be located 13 km from Darwin's central business district (CBD). The Project's impact on Darwin CBD is expected to be largely economic, in terms of upward pressure on rents and decreased availability of apartments and commercial premises. Small businesses and the entertainment precinct along Mitchell Street will benefit from increased custom. This may also lead to upward pressure on prices.

5.2.2 Palmerston

The proposed onshore gas processing facilities will be located 8 km from the centre of Palmerston. Palmerston is also close to the location of the construction workforce accommodation facility—the Howard Springs Accommodation Village. It is proposed to use suburban roads within Palmerston for the workforce bus route to and from Blaydin Point and for materials transport to the Village and Blaydin Point.

5.2.3 Howard Springs

Howard Springs is on the fringe of Darwin's expanding residential areas south along Stuart Highway. It is the location of the construction workforce accommodation village—Howard Springs Accommodation Village. Howard Springs is characterised by large "rural" blocks (1–2 hectares) in contrast to the high-density village design.

INDRA
27-SEP-2016

## 6. COMMUNITY RELATIONS PROCEDURES

### 6.1 General

The CRM and/or EAM will participate in public forums, government meetings and other official events as Contractor representative, at the request of Company. The CRCs and other Contractor representatives will also be involved in community events and stakeholder liaison, as required.

Where community issues are not able to be resolved in the first instance by Contractor via the community feedback mechanisms, Company and Contractor will discuss and resolve community issues through the Community Relations Working Group. Contractor will document all community interaction in a customised community consultation database that is similar to the Company system.

Contractor, with the approval of Company, will organise community events throughout the execution phase of the project. The CRM will submit event proposal(s) to Company for consideration, as required. Contractor and Company will evaluate, discuss and agree resources required for community events and stakeholder liaison on a case-by-case basis.

Contractor will engage the services of a local professional photographer to take images of regular construction progress and milestones for Contractor and Company purposes.

### 6.2 Aboriginal and Torres Strait Islander (ATSI) relations

The Aboriginal and Torres Strait Islander Affairs Plan (S-0290-11N0-0001) details the stakeholder engagement and business engagement strategies for these specific stakeholder group(s). Contractor ATSI community relations is managed by the Cultural Affairs Supervisor with support from the Community Relations team. The CRM will work together with the Supervisor to ensure information communicated to all stakeholders is consistent with Contractor and Company expectations.

### 6.3 Media protocols

Only Company-authorised personnel are permitted to make public statements on Project issues, unless otherwise agreed by Company External Affairs and Darwin General Manager. Contractor and Subcontractors are not permitted to comment about the Project to the media and will refer all enquiries to Company representatives.

Company will arrange media training for Contractor personnel where required.

Contractor Advice to Subcontractors Part 3 (Protocols) outlines the Company and Contractor agreed method of publicly releasing all types of communication.

Contractor will advertise project activities in the local *NT News* newspaper each Saturday, as well as the respective community newspapers where appropriate. The advertisement will appear in the Contractor standard template and will include information about the following project impacts on the community:

- major traffic movements and disruptions
- major vessel movements and disruptions
- other project activities likely to impact stakeholders
- Project milestones and achievements
- community events
- community feedback opportunities
- where to find additional information about the Project.

This information will also be provided to Company for inclusion in other Project communications.

INDRA 27-SEP-2016

6.4 Government relations

All Contractor and Subcontractor communications with elected Government Representatives is to be carried out through the Contractor Community Relations Managers, or delegate, to Company representatives, unless otherwise approved by Company in writing, or by direction through the Community Relations Working Group.

Likewise, all Contractor and Subcontractor communications to government personnel will be made through the Community Relations Manager to Company representatives, unless otherwise directed by Company.

Contractor and Subcontractor regulatory compliance personnel will be required to liaise directly with government personnel to organise approvals and licences to undertake portions of work. Contractor will seek formal approval from Company to directly contact the relevant government agencies upon commencement of the execution phase, and will document all instances of interaction with these stakeholders.

6.5 Complaints management

All community feedback will be managed on a case-by-case basis.

The majority of feedback will be managed as close to the point of contact as possible and will be documented in the stakeholder consultation management database.

Where feedback cannot be resolved in the first instance, it will be managed in accordance with the Company Community Grievance Procedure (doc number) aligned with the Community Relations Working Group's (CRWG's) Terms of Reference.

The CRWG will regularly meet to discuss issues raised by stakeholders. Contractor will assist with the resolution of complaints, as required, and will agree on the appropriate actions required to communicate the resolution to the community member.

6.6 Crisis management

Contractor will assist Company with the management of stakeholder crises, as required.

The CRM will work together with the HSES Manager to develop specific community crisis management procedures for the site, including:

- civil unrest at site boundaries, Contractor office(s) and Accommodation Village
- protestor management.

6.7 Howard Springs Accommodation Village

The Howard Springs Accommodation Village Subcontractor will appoint a Community Relations Coordinator who will be guided by the CRM and will be responsible for the resolution and communications of community relations issues regarding the construction of the Accommodation Village.

When occupation commences the Howard Springs Accommodation Village Operator will have a Village Liaison Officer to manage internal village community relations issues and report to the CRM for issues relating to interface management between the Village and the broader community.

The Coordinator and Officer will attend regular meetings between Contractor and Company to discuss community relations matters, resolve complaints and facilitate project information to the relevant stakeholders.

6.8 Identifying key community issues

6.8.1 Identified issues

Extensive community engagement and formal consultation has identified the following key issues as areas of concern for the wider Darwin community:

INDRA 27-SEP-2016

- housing and rental market pressure
- local infrastructure (roads, services) pressure
- increased harbour traffic
- labour market pressure
- local content, jobs and training opportunities
- environmental impacts
- public safety
- social impacts such as workforce integration and impact on health services
- recreational fishing impacts, including creek access adjacent to Blaydin Point.

Issues of concern to the community are captured in an Issues Register managed by Company External Affairs.

Issues relating specifically to ATSI peoples will be detailed in the Contractor Aboriginal and Torres Strait Islander Affairs Plan (S-0290-11N0-0001).

6.8.2 Prioritising issues

Issues of interest to community stakeholders generally have two broad impacts:

- reputation
- project schedule/cost.

Reputation issues may or may not have a direct impact on the Project schedule. Community issues that do have the potential to impact both the Project schedule and the reputation of Company and Contractor are considered a priority. The level of priority and associated impacts are outlined in Table 6.1

**Table 6.1: Issues priority matrix**

| Priority Level | Impact on External Reputation | | Impact on Project Schedule/Costs | |
|---|---|---|---|---|
| | Yes | No | Likely | Unlikely |
| No Action (low) | | x | | x |
| Level 1 | x | | | x |
| Level 2 | | x | x | |
| Level 3 (high) | x | | x | |

*Issues register*

An issues register will be maintained within the broader stakeholder consultation management system by the EAM and CRM to document key areas of community and media interest to Project stakeholders. The register is maintained and updated after milestone community engagement events and includes the issues raised by stakeholders, the Company response, and details of briefings with stakeholders.

*Stakeholder database*

Contractor maintains a comprehensive database of community stakeholders across all jurisdictions. The stakeholder database is reviewed regularly to ensure the data is valid, particularly ahead of key milestone events. The database includes the Issues Register where all areas of concern and interest can be tracked over time, evaluated and fed back into planning future activities and mitigation measures.

INDRA 27-SEP-2016

*Community grievance management procedure*

The Company Community Grievance Management Procedure provides a standard process for responding to and resolving grievances raised by the community, which assists with the identification and management of issues. The procedure includes how Company will work with Contractor to identify and resolve issues as early as possible to reduce the potential for community concerns to escalate to the media or to the political level.

## 6.9 Communication channels

The key methods and tools of communication used to engage with the community are set out below:

### 6.9.1 Communication plans and Q&As

Communication plans are prepared for specific Project milestones and activities. Q&As and key messages are prepared for a wide range of activities and issues. A general Project Q&A is maintained by Company and Contractor and used to guide all communications with community stakeholders. This is aligned to similar Company documents.

### 6.9.2 Briefings (formal and informal)

Both formal (minuted) and informal briefings (in person or by phone) are used as regular forms of engagement with community stakeholders. Details of formal stakeholder briefings are recorded in minutes of the meeting and distributed to relevant staff. These are also entered into the database. Issues of community concern may also be detailed within the issues register.

### 6.9.3 Website and feedback numbers

Company will oversee an Ichthys Project web site which will be populated by Company and Contractor. Company will continue to manage an 1800 community general enquiry phone number. During the construction phase Contractor will also manage a community feedback number (1300 724 795), specifically for issues regarding construction impacts.

### 6.9.4 Media

Will be managed in liaison between the Contractor Media & Communications Officer and the Company Communications Manager. Media releases are prepared for Project milestones and other events or issues. These are distributed to key media contacts and uploaded to the Company and Ichthys Project web sites as appropriate. Media interviews may be considered for Company and Contactor personnel who have received media training, as required. The releases must be generated, approved and issued following the agreed public communications protocols.

### 6.9.5 Fact sheets

Fact sheets are developed for particular Project issues and activities. These can be distributed at community forums and events, uploaded to the Company and/or Ichthys Project web sites, or distributed in person at briefings. All fact sheets must be generated, approved and distributed as per the agreed public communications protocols.

### 6.9.6 Electronic newsletter

Contractor, in conjunction with Company, will produce an electronic newsletter in html format. This will be distributed to subscribers registered through the Ichthys Project web site. The newsletter will provide periodic Project updates and will communicate information regarding particular Project activities. All content must be generated, approved and included as per the agreed communications protocols.

### 6.9.7 Advertising

INDRA 27-SEP-2016

Advertising can help communicate key messages to the community, particularly during key Project milestones such as the completion of large packages of work. The majority of advertising will be centred around regular Contractor Community Bulletins and recruitment. Articles will be generated for specific interest publications where content has been approved as per the agreed communications protocols to support community awareness activities for targeted audiences and reputation management.

6.9.8 Community forums

Contractor community forums will take place at the direction of Company as a means of direct consultation with the community during key construction activities to determine the understanding of issues of importance to the community.

6.9.9 Public displays

Public displays will be used to engage directly with the community to help identify and communicate issues of importance to specific audiences; for example, shopping centre displays in Howard Springs will be set up to engage with the community about the Howard Springs Accommodation Village.

6.9.10 Phone surveys

Where directed by Company, Contractor will undertake phone surveys in line with key milestones to gauge the level of general community support or to gather feedback on a particular issue.

6.9.11 Sponsorship

Where Contractor determines a community need, or where directed by Company, some sponsorship opportunities may provide Contractor with the ability to make a contribution above the usual scope of construction activity. This may support Company and Contactor to fulfil corporate social responsibility obligations and help to achieve broader business goals.

Where deemed appropriate and timely, Contractor may participate in sponsorship of community events to further engage with the community at a grassroots level and provide direct consultation opportunities.

6.9.12 Industry events

Some Industry events and conferences may be considered as further opportunities to engage with particular interest groups such as industry colleagues, government representatives and some community members, in particular from the business community.

6.9.13 Site visits

Visits to Project construction sites and facilities may be arranged for key community stakeholders, although health and safety concerns must always remain the top priority when determining whether these activities are appropriate. Contractor will support Company with construction site visits which may be popular with Australian and Japanese Government, business and community representatives. This may require high levels of resourcing and liaison during the construction period. Safety issues, such as site inductions and PPE will need to be identified and protocols defined to ensure minimal impact to the construction schedule.

6.9.14 Media

Media commentary about the Ichthys Project can significantly influence public opinion. For this reason media is a key Project stakeholder, particularly in regional communities such as Darwin where the Project has a very high profile.

INDRA
27-SEP-2016

While Company engages media as an important tool to manage Project issues and favourably influence community perceptions, Contractor will not actively engage the media without the direction and support of Company, as per the agreed communications protocols.

Contractor CRM will advise Company in a timely and accurate manner where potential media interaction is anticipated.

The CRWG will meet on a weekly basis to identify and manage any community issues. Media risks and opportunities will be discussed and communicated upward if required. This group will help identify issues that could potentially attract media attention.

In conjunction with Company, Contractor will generate communications plans on which Company may base media engagement plans. Contractor will provide briefing notes to Company for significant events and Project milestones, as required.

6.9.15 Advertising

Advertising is an effective means of communicating key messages to the community, in a controlled manner.. Advertising can be used to correct misinformation, educate and reinforce messages, or communicate important information to the community such as roadworks, traffic haulage routes, or community events.

Advertising across a diverse range of channels can support the promotion of the Ichthys Project and assist with recruitment. Contractor will advertise for recruitment and general information in the key local media outlets, to support Company advertising efforts throughout the construction phase.

6.9.16 Construction card—letterbox drops

Letterbox drops of professionally designed construction cards will take place as required. The content will change as construction activities change. The cards will be placed into letterboxes or tied to fences where appropriate to provide specific information to communities in discreet locations who are most highly impacted. The content will include the same advice provided to the broader community but with more detail. The content will be provided by Contractor and Subcontractor construction personnel and a copy will be provided to Company.

6.10 Promoting the joint venture

JKC Australia LNG is a joint venture between JGC Corporation, KBR (Kellogg Brown & Root Pty Ltd), and Chiyoda Corporation.

Each joint venture partner provides a high level of technical and strategic input in their participation in the Ichthys Project onshore LNG facilities construction phase.

All construction phase public communications generated by Contractor should include the logo in Figure 6.1:

JKC AUSTRALIA LNG PTY LTD

**Figure 6.1: JKC Australia LNG Logo**

INDRA 27-SEP-2016

6.11 Community grievance management procedure

The Company Community Grievance Management Procedure provides the guiding standard process for Contractor to respond to and resolve grievances raised by the community that cannot be resolved by Contractor in the first instance, or by the CRWG. The procedure covers grievances linked to the direct or indirect consequences of activities carried out by Contractor and will also be used to record positive feedback and acknowledgements by the community and stakeholders.

The procedure provides the community with a mechanism to give feedback and raise grievances related to the impact of the construction of the Project. It enables Company and Contractor to respond to and to manage grievances in an efficient and timely manner.

Providing the community with an opportunity and process to communicate directly with Contractor and Company will help protect and potentially enhance reputations and reduce the potential risk of issues being elevated to a media or political level.

The Contractor stakeholder management database system will enable community relations to log complaints and responses; will allow the issues to be tracked, evaluated and reported, and will provide a tool for integration with the Company Stakeholder Relationship Management System within the SAP system. The database system will incorporate:

- Community Grievance Register
- Stakeholder Issues Register
- Stakeholder Database
- SRM+ data and analysis reports
- media analysis reports
- phone poling results.

*Note: The Community Grievance Management Procedure is an internal term only and is consistent with the terminology within the International Finance Council guidelines. In external communications the procedure will be known as "community feedback" and will include the feedback options of info@ichthysproject.com and the community feedback line (1300 724 795).*

6.12 Public risk and incident communications

Activities such as increased traffic volumes for materials and equipment transport and increased marine traffic in Darwin Harbour may pose risks to the community.

Company and Contractor will work together to alert the community to any potential risks that may be present during this period.

The CRWG will meet regularly to identify and manage public communications around potential risks to the community during the construction phase.

In the case of specific incidents, Contractor will be responsible for communication with the community and will do so in close liaison with Company.

The EAM and CRM will support and/or participate in activities associated with Contractor crisis management where appropriate.

6.13 Lessons Learned

Contractor will establish a register to capture opportunities for improvement for Community Relations activities during the course of the construction phase, to be known as Lessons Learned.

INDRA 27-SEP-2016

## 7. THIS WILL INCLUDE IDEAS THAT MINIMISE COST AND IMPACTS TO CONSTRUCTION SCHEDULE, INCREASE PRODUCTIVITY, STREAMLINE MANAGEMENT OF ISSUES, STAKEHOLDERS AND EVENTS, AND GENERALLY HEIGHTEN THE AWARENESS OF THE IMPORTANCE OF GOOD COMMUNITY RELATIONS ACROSS THE PROJECT.CONTRACTOR ENGAGEMENT

### 7.1 Community Relations Working Group

The Community Relations Working Group (CRWG) will meet regularly to identify, discuss, resolve and monitor community issues and communications for the day-to-day construction activities.

Permanent members of the working group will include:

- Company External Relations Manager
- Company community relations coordinator (Darwin)
- Company key communications and externalaffairs personnel (Perth)Contractor key community relations/external affairs personnel (Darwin).

Other Company and Contractor personnel may be asked to attend meetings as required.

The CRWG will review planned public communications for upcoming activities to determine appropriate channels and volume.

Company External Affairs Manager (and/or delegate) is a member of the Transport and Ports and Harbour subcommittees to ensure construction activities likely to impact on the community are captured and appropriate communication actions planned.

A Contractor community relations representative will also have membership of these committees during construction.

Company External Affairs personnel will also be in regular communication with the Director of Communications at the Department of the Chief Minister to ensure project–government communications are aligned and that existing departmental communication channels are utilised in support of this Plan. This information will be communicated to Contractor.

### 7.2 Public communication protocols

Company and Contractor have agreed to a set of overarching principles which guide communication protocols surrounding public engagement with media, government departmental staff, politicians, NGOs, and the wider community. These protocols are still being defined for various anticipated communication activities, setting out roles and responsibilities and identifying which actions are delegated to Contractor community relations personnel during the construction phase and which require approval from Company.

In summary, these protocols are brought together in a comprehensive matrix provided in the Contractor Advice to Subcontractor Part 3 and include the communication protocols and objectives for Company, Contractor and Subcontractor.

These protocols include the following:

- Contractor may engage directly with external key stakeholders only with the prior approval of Company and in accordance with agreed communication plans and protocols.
- Only Company-authorised personnel are able to make public statements on Project issues, unless otherwise agreed by Company External Affairs in conjunction with appropriate Contractor personnel.
- All public complaints received by Project personnel shall be managed in accordance with the guiding principles in this Plan, the Company Community Grievance Management Procedure, and the Community Relations Working Group and its terms of reference.

INDRA
27-SEP-2016

## SUBCONTRACTOR ENGAGEMENT

Contractor engagement with Subcontractors during the construction phase will include close management and guidance of key Subcontractor personnel to ensure timely and accurate delivery of information about construction activities and associated impacts. This will also the adequate provision of guidance to ensure risk to reputation of all organisations is minimised wherever possible.

Contractor has three key areas for guidance that are included in Subcontractor contractual documents and required to be taken into account before mobilisation to all construction sites across the Project. These are included in Appendices A, B and C.

INDRA
27-SEP-2016

## APPENDIX A JKC JV ADVICE TO SUBCONTRACTORS: PART 1

## COMMUNITY AND STAKEHOLDER ENGAGEMENT GUIDELINES

### Media

If approached by the media:

- Do not consent to an interview or make a comment (remember that journalists believe that everything is on the record, and you are not an authority to speak on behalf of the project).
- Refer media to the 1300 community hotline immediately (use provided business cards where possible).
- If media trespass or interfere with work, stop work immediately and contact:
  - your supervisor who will then contact the Site Construction Manager
  - the community hotline.
- Be polite and courteous at all times.
- If media are present but are not trespassing nor interfering, then continue to work normally.
- Be aware of listening devices and radios being monitored.
- Be aware of the use of long-lensed cameras.
- Ensure compliance at all times with all PPE and other HSE work requirements.
- Do not do anything that may be used against your employer, Contractor, Company, or the Ichthys Project.
- Do not react to being filmed if the media are on public land.
- Do not react to media persistence or harassment off site.

### Protestors

If you encounter protestors in the field:

- Ignore them and continue to work normally.
- Do not respond to taunts, criticism or abuse.
- Do not comment or engage in conversation.
- Be polite and courteous at all times.
- If protestors trespass onto the site, immediately contact:
  - your supervisor
  - the community hotline
- If protestors interfere with personnel or equipment, contact:
  - security who should then contact police where appropriate
  - your supervisor
  - the community hotline.
- Do not try to prevent damage being done to equipment or the worksite; simply contact security.
- Engage in passive resistance if touched; stop work and leave the site, if necessary.
- If the protestors become aggressive, leave the area immediately, if possible, and contact security.
- Do not abandon a vehicle or equipment unless remaining with it could result in personal injury.

INDRA 27-SEP-2016

- Ensure that equipment is secured overnight.
- Be aware that your UHF or VHF radios may be monitored.
- Do not engage with protestors off site.

If a road is blocked, or access to site is denied by protestors:

- Stop the vehicle.
- Do not proceed through blockade, even slowly.
- Ask politely to be let through.
- Do not engage in an argument or become aggressive or abusive.
- Ignore taunts, criticism or abuse.
- Contact site security, who will attend the site.
- If the protestors become aggressive, leave the area immediately, if possible.
- Do not abandon a vehicle or equipment unless remaining with it could result in personal injury.
- Do not do anything that may provoke the protestors (e.g. taking pictures).

### Landholders/Neighbours

Personnel must make every effort to maintain good relations with the community, particularly those who are directly or highly impacted by our work. The following protocols must also be followed:

- The most senior construction officer on site must be sure that appropriate notifications have been made to potentially the most directly impacted members of the community—this should be a line item in the pre-start activity.

  *Note: This notification must have included, in some detail, what work is proposed, when it will start, when it is most likely to finish (always be conservative where estimating), what will be seen, any other impacts, remedial works, subsequent timeframes for other notifications.*
- Contact the community hotline if there is notable pushback from any community members which may impact the construction schedule and incur costs, or provide potential for damage to reputation of Company, Contractor or Subcontractor.
- Show respect to the landholder and any family, neighbours or associated property which may be highly impacted.
- Be polite and courteous at all times.
- Be aware of any lifestyle, business or community activities that may conflict with the scheduled work, and plan work accordingly. Negotiate arrangements where appropriate. Where there is potential for conflict, escalate concerns to the Community Relations Working Group in a timely manner, providing options for mitigation at the location.
- Do not block any access to properties in proximity of the construction activity at any time, day or night, without appropriate and timely notification processes in place.
- Ensure that all workers on the site understand that improper behaviour will have serious consequences.
- Always keep members of the public well clear of worksites, particularly children.
- Ensure that all HSES requirements are met, particularly public safety, noise, dust and vehicle use.
- Keep vehicle movements near neighbouring properties to a minimum, whenever possible.
- Understand the traffic routes for access to and from worksites as detailed in the site Traffic Management Plans and always use existing roads and tracks where possible.

INDRA 27-SEP-2018

- Take care to close gates, repair fences, repair roads or driveways and take all precautions to protect community interests.
- Ensure that remedial work is done properly and in an agreed schedule with impacted community members.
- Ensure that equipment and the work area are secure and safe before any construction site is left unattended.
- Take the time to thank community members for their cooperation and advise them of any future work which may be required in the same location.
-

**WHEN APPROACHED BY MEDIA, PROTESTORS AND/OR COMMUNITY MEMBERS ALWAYS CALL THE COMMUNITY FEEDBACK LINE: 1300 724 795**

INDRA
27-SEP-2016

## APPENDIX B JKC JV ADVICE TO SUBCONTRACTORS: PART 2

## PUBLIC IMAGE AND BRANDING OF ICHTHYS PROJECT DURING CONSTRUCTION PHASE

### External Branding

All external branding for the Ichthys Project during the construction phase, for construction related activities, will carry the JKC Australia LNG (JKC) logo (Fig 1) and implemented in conjunction with this document. This construction phase for JKC in Australia shall be referred to as the "Ichthys Project onshore LNG facilities".

All the information contained herewith applies only to JKC Australia LNG branding that occurs on Australian soil.

The JKC branding structure and use of logo must be approved first by the JKC External Affairs Manager and then by the JKC Project Director, prior to any external use by the Subcontractor, lower tier subcontractors and all suppliers to the Ichthys Project onshore LNG facilities.

The branding structure and logo (Fig 2) associated with the preparatory stage of the Ichthys Project is the property of INPEX and Total and should not be used in an external (public) environment without the written permission of the Company External Affairs Department (Communications Manager). Without permission the logo should not be used on contractor or sub-contractor:

- PPE
- Vehicles
- Equipment
- Websites
- Media releases
- Publications

It is important to INPEX and Total that the brand value of the "fish" logo be protected during the high-risk construction phase as it will play an important ongoing role during operations at a later stage, from a gas marketing perspective. Likewise the words "Ichthys Project" and Ichthys LNG Project" – these are production brands, not to be confused with the construction phase.

The use of the "fish" logo will be reserved only for INPEX signage, PPE, and other INPEX approved requirements.

JKC
JKC AUSTRALIA LNG PTY LTD

**Figure 1: JKC Australia LNG Pty Ltd logo**

INPEX
Ichthys
PROJECT

**Figure 2: INPEX Ichthys Project logo**

INDRA
27-SEP-2016

All requests from third parties to use either the INPEX name or logo must be reviewed and approved by External Affairs, and items that could be included are:

- List of customers for marketing purposes
- Articles about their work for INPEX in internal publications
- Case studies for marketing purposes (generally would require INPEX to be referred to in an generic manner)
- Media releases that mirror INPEX generated releases

However, generally INPEX does not allow its name or logo to be used externally by other companies, nor does it endorse any equipment, product or service. This supports the belief that such endorsement may give the supplier an advantage, thus contrary to the corporation's philosophy of fair and equal opportunity for all.

## Construction Signage

In special circumstances and with appropriate INPEX approvals in place, the INPEX "fish" logo (Fig 2) may be used on Ichthys Project signage, for example, at Blaydin Point and the Accommodation Village entrance statement signs, in accordance with the INPEX style guide.

For temporary signage during construction, for example, at Blaydin Point and the Accommodation Village, the term "Ichthys Project onshore LNG facilities" in text only, should be used, along with the JKC logo and any other logos as approved by the JKC External Affairs Manager, then Project Director.

Permanent entrance statement signage at the Accommodation Village and Blaydin Point will be determined by INPEX.

## PPE

JKC PPE can include **Ichthys Project onshore LNG facilities** text only, in the appropriate 'mangrove' green, which represents the colour of the tail of the fish in the INPEX "fish" logo.

The green colour codes are: PMS 348 C, CMYK C100M0Y85K24, RG B R 0G136B82.

The correct font can also appear in black if colour use on some items does not meet objectives.

Ideally the PPE logo structure would be applied to JKC, Subcontractors, and also lower tier subcontractors who have specific personnel working on the Ichthys Project onshore LNG facilities who require PPE over a lengthy period of time.

The Ichthys Project PPE logo structure would look similar to these two examples:

INDRA
27-SEP-2016

JKC Australia LNG
Ichthys Project
onshore LNG facilities

LAING O'ROURKE
Ichthys Project
onshore LNG facilities

The **Ichthys Project onshore LNG facilities** should always include both upper and lower case letters and should never appear in capitals only. Subcontractors and suppliers can determine for themselves if this rule applies to their text sitting above the **Ichthys Project onshore LNG facilities**, however, it is preferred that symbols or larger graphics are not included on the PPE. All PPE logos must be approved by JKC External Affairs Manager, then JKC Project Director.

It is expected that all Subcontractors and appropriate suppliers, conform to this guideline for PPE for consistency across the Project construction phase.

INDRA
27-SEP-2016

JKC JV ADVICE TO SUBCONTRACTORS: PART 3

## COMMUNICATION MATERIAL APPROVALS PROTOCOL

### Criteria

- **Group 1 (Ichthys Joint Venture):** Must have Ichthys Joint Venture approval
- **Group 2 (JKC JV partners: JGC, KBR & Chiyoda):** Must have JKC JV partners' approval and cc to INPEX
- **Group 3 (Operational – Community Relations Working Group):** Requires Ichthys Project Community Relations Working Group approval only, but cc INPEX

*Note: The protocols for communication material approvals for the JKC Ichthys LNG Joint Venture for offshore activities must always be distinguished by its name and separate logo/branding, and then be managed in the same way as for Group 2. Therefore, the applicable protocols must cascade down to all subcontractors and suppliers associated with these activities.*

### Protocol

All **Group 3** materials prepared by Contractor and/or Subcontractor (with input as required from INPEX):

- Regardless of author, forward draft materials to JKC External Affairs Manager for checking.
- Forward to JKC Project Director for approval:
  - Each JV partner is responsible for seeking internal approvals – JGC, KBR, Chiyoda
- Forward to JKC External Affairs Manager for returning to author for distribution to the appropriate channels, copying Community Relations Coordinator responsible for managing public materials.
- Provide Company with a copy of the approved materials and plan for distribution and timing.
- Coordinator to ensure materials appropriately filed in JKC system.
- Approval time by Project Directors is a maximum of 24 hours.

All **Group 2** materials prepared by JKC JV and/or Subcontractor:

- Forward to JKC JV Community Relations Manager for QA check.
- Forward to JKC JV External Affairs Manager for progressing to JKC Project Director.
- JKC Project Director to seek internal approvals from JGC and Chiyoda. JKC External Affairs Manager to seek internal approvals from KBR and integrate all JV responses
- External Affairs Manager forwards to Company for further approval.
- Company returns approved document along with Total's approval to JKC External Affairs Manager in the agreed timeframe.
- External Affairs Manager forwards to Community Relations Coordinator with responsibility for managing and distributing all approved JKC JV public communications materials.
- Materials are filed appropriately in JKC JV system.
- The approval time for JKC JV Partners to JKC JV personnel is 24 hours.
- The approval time for Company back to JKC JV is 24 hours.

If materials are not returned in the agreed timeframe, the JKC JV personnel will liaise with Company and/or JKC JV Partners to determine the reason for delay and to revise the date.

The Approvals Register is updated by JKC JV Community Relations Coordinator.

All **Group 1** materials generated by JKC JV Partners, JKC JV, the Ichthys Project Community

INDRA 27-SEP-2016

Relations Working Group, Subcontractor, or any lower tier subcontractors and suppliers will be forwarded to Company as Operator for the Ichthys Project. All materials must be filed appropriately in the JKC JV system and distributed as for Group 2 materials.

**Approval times for Companyare as per Ichthys Joint Venture approval protocols.**

Any items for publication will be discussed at the weekly Community Relations Working Group meeting.

It is understood that sensitive, complex and lengthy documents will require additional time to review. As these are normally long-lead items, they will be flagged well in advance and reasonable approval times will be agreed well ahead.

INDRA
27-SEP-2016

## COMMUNICATION MATERIALS PROTOCOL—TABLE OF DETAIL

The following table lists the types of communication materials anticipated on the Ichthys Project during the construction phase, along with the required levels of approval and input as outlined in the criteria and protocols above.

| Group 1 | Communication | Ichthys Joint Venture | JKC JV & JV Partners | Community Relations WG | Subcon-tractor / Supplier | INPEX FYI |
|---|---|---|---|---|---|---|
| | Media releases about INPEX matters (not Project-related) | ✓ | ✓ | | | ✓ |
| | Briefings and briefing notes for elected representatives | ✓ | ✓ | ✓ | ✓ | |
| | Letters to residents/stakeholders about actions being taken on behalf of the Ichthys Joint Venture where work is not yet contracted to JKC JV or Subcontractor | ✓ | ✓ | ✓ | ✓ | |
| | Newsletters for general public distribution regarding project/progress | ✓ | ✓ | ✓ | ✓ | |
| | Project display materials, e.g. posters for public information sessions | ✓ | ✓ | ✓ | ✓ | |
| | Invitations to public events | ✓ | ✓ | ✓ | ✓ | |
| | Project fact sheets | ✓ | ✓ | ✓ | ✓ | |
| | Advertisements; advertorials and general articles about the project | ✓ | ✓ | ✓ | ✓ | |
| | Logos/branding | ✓ | ✓ | ✓ | ✓ | |
| | Key messages | ✓ | ✓ | ✓ | ✓ | |
| | Media opportunities/milestones/media releases | ✓ | ✓ | ✓ | ✓ | |
| **Group 2** | **Communication/Activity** | **Ichthys Joint Venture** | **JKC JV & JV Partners** | **Community Relations WG** | **Subcon-tractor / Supplier** | **INPEX FYI** |
| | Invitations to events, including those initiated by JKC JV, Community Relations Working Group or Subcontractors/Suppliers | | ✓ | ✓ | ✓ | ✓ |
| **Group 3** | **Communication/Activity** | **Ichthys Joint Venture** | **JKC JV & JV Partners** | **Community Relations WG** | **Subcon-tractor / Supplier** | **INPEX FYI** |
| | Letters to residents about work being undertaken in relation to construction activity in their area | | | ✓ | ✓ | |
| | E-mail updates for stakeholders | | | ✓ | ✓ | |
| | Contributions to school newsletters | | | ✓ | ✓ | |

INDRA 27-SEP-2016

| | | | | | | |
|---|---|---|---|---|---|---|
| | Flyers regarding information sessions | | | ✓ | ✓ | |
| | Advertisements in local/regional papers relating to traffic changes or specific construction activity, e.g. road closures | | | ✓ | ✓ | |
| | Fact sheets, for specific activities/concerns such as construction, blasting, environment | | | ✓ | ✓ | |
| | Q&A sheet, e.g. for construction in a sensitive area | | | ✓ | ✓ | |
| | Construction cards | | | ✓ | ✓ | |
| | Ichthys Project web site | ✓ | ✓ | ✓ | ✓ | |
| | Response to 1300 “hotline” or web site inquiries | | | ✓ | ✓ | |
| | PowerPoint presentations | | | ✓ | ✓ | |
| | Reports and templates reporting requested by the Ichthys Joint Venture | | | ✓ | ✓ | |

## MEDIA AND ADVERTISING

| Group 1 | INPEX logos and branding | Ichthys Joint Venture | JKC JV & JV Partners | Community Relations WG | Subcon-tractor / Supplier | INPEX FYI |
|---|---|---|---|---|---|---|
| | Any media requests for information or comment about the Project | ✓ | ✓ | ✓ | ✓ | |
| | Inquiries about project activities, e.g. work updates, stats | ✓ | ✓ | ✓ | ✓ | |
| | Media opportunities and photo opportunities for Chief Minister or other elected representatives | ✓ | ✓ | ✓ | ✓ | |
| | Advertisements for activities, e.g. EIS activities | ✓ | ✓ | ✓ | ✓ | |
| | Advertorials or features to mark milestone events | ✓ | ✓ | ✓ | ✓ | |
| **Group 2** | **JKC JV logo and branding** | **Ichthys Joint Venture** | **JKC JV & JV Partners** | **Community Relations WG** | **Subcon-tractor / Supplier** | **INPEX FYI** |
| | Interview or comment from JKC JV Partners regarding work of Company or JKC JV that does not fall into Group 1 | | ✓ | | ✓ | ✓ |
| | Advertising for JKC JV staff | | ✓ | | ✓ | ✓ |
| | Advertising JKC JV Partner and JKC JV achievements | | ✓ | | ✓ | ✓ |

INDRA
27-SEP-2016

| Group 3 | JKC JV logo and branding | Ichthys Joint Venture | JKC JV & JV Partners | Community Relations WG | Subcon-tractor / Supplier | INPEX FYI |
|---|---|---|---|---|---|---|
| | Provision of facts in response to a specific media inquiry on operational detail, e.g. traffic control, road closure, machinery movements | | | ✓ | ✓ | ✓ |
| | Copy and photos for industry publications in response to a direct request; a request to assist writers and photographers from technical/construction publications | | | ✓ | ✓ | ✓ |
| | Establish a working relationship with local/regional media to open communication channels for issues raised at community level needing clarification or informed comment to balance story source. | | | ✓ | | |
| | Advertisements for operational activities, e.g. road closure, resident meeting | | | ✓ | | ✓ |

Note:

- Members of the Ichthys Project Community Relations Working Group are all communication professionals experienced in dealing with the media. It must be assumed that the assessment of whether a media inquiry/response is a Group 1, 2 or 3 responsibility will be properly made and that necessary consultation will occur to ensure there is an appropriate and timely response.
- All organisations included in this Plan are regularly required to provide an updated list of names and contact details of appropriate media-trained expert personnel as potential “talent” for media opportunities where media engagement has been formally approved through the processes detailed above.

Following is an example of the Media Release process:

- A Subcontractor is awarded more work with the joint venture and wishes to announce this publicly. The following procedure would take place:
  - Contractor receives draft from Subcontractor, reviews to ensure information and messaging is accurate for Contractor requirements, and then forwards to Company.
  - Company Package Manager reviews to ensure information and messaging is accurate for INPEX/Total requirements and forwards, copying in appropriate internal personnel, to External Affairs (Bill Townsend, Tim Larcombe, Ilka Burnham-King) who review and arrange relevant approvals in Perth and Tokyo and with Total as required.
  - Company External Affairs advise changes to Company Package Manager who then advises Contractor.
  - Contractor advises Subcontractor, records timing and distribution of media release, and provides this information to Company Package Manager.
  - Company Package Manager advises timing and distribution details to Perth External Affairs.
  - External Affairs submits to KBR media group in Adelaide who submit to Houston KBR for approval. This can only occur after Company Package Manager has Total and INPEX approvals.
  - KBR media approves and External Affairs provides full approval to Subcontractor.

INDRA 27-SEP-2016

# APPENDIX G
# DPC Notification of Installation

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27-SEP-2016

JKC AUSTRALIA LNG PTY LTD
ABN 14 154 383 409
Level 50, BankWest Tower
108 St Georges Terrace
Perth WA 6000

**Darwin Port Corporation**
**GPO Box 390**
**Darwin NT, 0801**

Date: 3 April 2014

Reply required : No

**Attention:** **Captain Tony O'Malley**
**Harbourmaster**

**Reference Number: JKC-NTG-00014**

**Subject :** **Notification of Installation of Wastewater Treatment Plant Outfall Pipeline in Darwin**

Dear Captain O'Malley,

As you are aware JKC Australia LNG Pty Ltd (JKC) has completed installation of the temporary Wastewater Treatment Plant (WWTP) and associated outfall pipeline in Darwin Harbour.

In accordance with the Darwin Port Corporation (DPC) approval (dated 29 May 2013) JKC was to provide notification of the final outfall pipeline and diffuser location and characteristics of the special mark.

As-constructed co-ordinates of the outfall pipeline and diffuser and associated levels are shown in Table 1 and Attachment 1 (V-3210-TMP-1-2506_Rev 13).

Table 1: Survey co-ordinates and levels of the outfall pipeline and diffuser

| Survey Point ID | Description | Latitude | Longitude | Outfall Invert Level |
|---|---|---|---|---|
| **SOP H221** | Outfall Pipeline (above MHWS) | -12°31'35.8026" | 130°55'41.943" | 4.266 m AHD |
| **SOP H191** | Outfall Pipeline | -12°31'32.66644" | 130°55'54.54555" | 0.0 m AHD |
| **SOP H192** | Outfall Pipeline | -12°31'31.60711" | 130°55'57.69854" | -2.0 m AHD |
| **SOP H167** | Outfall Diffuser | -12°31'29.68628" | 130°56'02.54080" | -7.0 m AHD |

Characteristics of Special Mark

- Sealite SL-B1750-SM-TM Poseidon 1750mm diameter Ocean Buoy IALA Topmark & Radar Reflector - Yellow in colour
- IALA Topmark is a St Andrews Cross - Yellow in colour
- Solar Navigation Light is a Sealite SL125-1-Y-AIS, 5-7 Nautical Mile 36 LED Single Tier Marine Lantern - Yellow in colour
- Flash rate 5 seconds (0.5 seconds on / 4.5 seconds off).

In addition, Development Permit DP012/0065G (Note 7) requires notification to DPC following installation of the outfall. Please accept this letter as formal notification.

INDRA
27-SEP-2016

If you require further information please contact Nicolas Morgan, Government Approvals Advisor, on (08) 8980 9815 or email: morgan.nicolas@jkc-lng.com.

Yours sincerely,

Sten Jacobsson
Commercial Manager

NM

Attachment 1 V-3210-TMP-1-2506_Rev 13 – Outfall Alignment

INDRA
27-SEP-2016

# APPENDIX H
# Monitoring Results Summary Tables

INDRA
27-SEP-2016

## WDL 192 Results Summary Table for Physicochemical Parameters

| | | | Physicochemical Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Specific Conductivity | DO | ORP | pH | Temperature | Turbidity |
| | | | µS/cm | % sat | mV | pH units | °C | NTU |
| WDL192 Trigger Criteria | | | - | 80-100 | - | 6-8.5 | - | <20 |
| **Monitoring_Round** | **Location** | **Date Sampled** | | | | | | |
| **Impact Sites** | | | | | | | | |
| Aug-15 | STPM-01 | 25/08/2015 | 54340.5 | 96.90 | 145.60 | 7.83 | 26.77 | 1.69 |
| | STPM-02 | 25/08/2015 | 54629.0 | 96.90 | 141.00 | 7.83 | 26.59 | 2.75 |
| | STPM-03 | 25/08/2015 | 54505.8 | 96.90 | 144.00 | 7.83 | 26.64 | 1.52 |
| | STPM-04 | 25/08/2015 | 54419.3 | 96.40 | 137.10 | 7.83 | 26.73 | 2.81 |
| Sep-15 | STPM-01 | 24/09/2015 | 56922.0 | 94.60 | 186.00 | 7.8 | 29.23 | 1.15 |
| | STPM-02 | 24/09/2015 | 55808.8 | 99.30 | 191.80 | 7.77 | 29.64 | 1.51 |
| | STPM-03 | 24/09/2015 | 56720.4 | 100.00 | 186.90 | 7.8 | 29.23 | 1.51 |
| | STPM-04 | 24/09/2015 | 56593.8 | 96.30 | 176.80 | 7.8 | 29.14 | 1.11 |
| Oct-15 | STPM-01 | 22/10/2015 | 46758.9 | 93.00 | 160.50 | 7.83 | 30.28 | 1.79 |
| | STPM-02 | 22/10/2015 | 46838.3 | 92.90 | 174.40 | 7.83 | 30.37 | 1.83 |
| | STPM-03 | 22/10/2015 | 46740.8 | 92.30 | 179.50 | 7.83 | 30.37 | 3.96 |
| | STPM-04 | 22/10/2015 | 46639.5 | 93.90 | 193.40 | 7.84 | 30.41 | 2.08 |
| Nov-15 | STPM-01 | 19/11/2015 | 53308.0 | 87.60 | 183.00 | 7.9 | 31.60 | 2.26 |
| | STPM-02 | 19/11/2015 | 53716.0 | 91.40 | 201.00 | 7.92 | 31.70 | 2.87 |
| | STPM-03 | 19/11/2015 | 53770.0 | 84.10 | 181.00 | 7.93 | 31.60 | 2.45 |
| | STPM-04 | 19/11/2015 | 53702.0 | 85.00 | 179.00 | 7.92 | 31.50 | 2.80 |
| Dec-15 | STPM-01 | 8/12/2015 | 54327.0 | 78.40 | 217.80 | 7.80 | 32.10 | 5.39 |
| | STPM-02 | 8/12/2015 | 54315.0 | 77.10 | 219.10 | 7.80 | 32.10 | 5.16 |
| | STPM-03 | 8/12/2015 | 54287.0 | 80.70 | 214.30 | 7.8 | 32.10 | 4.60 |
| | STPM-04 | 8/12/2015 | 54292.0 | 81.40 | 215.60 | 7.8 | 32.10 | 4.93 |
| Jan-16 | STPM-01 | 19/01/2016 | 48961.0 | 61.70 | 117.40 | 7.83 | 31.70 | 4.19 |
| | STPM-02 | 19/01/2016 | 47864.0 | 58.40 | 119.00 | 7.8 | 31.70 | 3.60 |
| | STPM-03 | 19/01/2016 | 48358.0 | 61.60 | 118.60 | 7.81 | 31.70 | 3.61 |
| | STPM-04 | 19/01/2016 | 48375.0 | 63.50 | 117.30 | 7.81 | 31.60 | 4.43 |
| Feb-16 | STPM-01 | 17/02/2016 | 37883.0 | 47.60 | 200.60 | 7.62 | 31.20 | 4.63 |
| | STPM-02 | 17/02/2016 | 37913.0 | 38.30 | 203.30 | 7.59 | 31.60 | 4.63 |
| | STPM-03 | 17/02/2016 | 37751.0 | 36.80 | 215.60 | 7.58 | 31.30 | 5.44 |
| | STPM-04 | 17/02/2016 | 38774.0 | 47.20 | 198.60 | 7.65 | 31.70 | 5.44 |
| Mar-16 | STPM-01 | 17/03/2016 | 27456.0 | 67.10 | 154.70 | 7.28 | 31.20 | 4.09 |
| | STPM-02 | 17/03/2016 | 26390.0 | 64.20 | 149.00 | 7.26 | 31.00 | 4.43 |
| | STPM-03 | 17/03/2016 | 26923.0 | 64.50 | 145.30 | 7.31 | 31.30 | 4.10 |
| | STPM-04 | 17/03/2016 | 25668.0 | 64.90 | 141.80 | 7.39 | 31.20 | 4.60 |
| Apr-16 | STPM-01 | 18/04/2016 | 52142.0 | 75.50 | 135.40 | 7.6 | 31.60 | 5.22 |
| | STPM-02 | 18/04/2016 | 52138.0 | 77.10 | 132.80 | 7.62 | 31.60 | 4.54 |
| | STPM-03 | 18/04/2016 | 52053.0 | 76.50 | 130.10 | 7.63 | 31.60 | 5.05 |
| | STPM-04 | 18/04/2016 | 52212.0 | 77.20 | 124.70 | 7.61 | 31.60 | 5.35 |
| May-16 | STPM-01 | 1/05/2016 | 51877.0 | 83.10 | 187.50 | 8.14 | 29.20 | 3.58 |
| | STPM-02 | 1/05/2016 | 51880.0 | 89.10 | 186.60 | 8.14 | 29.20 | 1.33 |
| | STPM-03 | 1/05/2016 | 51876.0 | 90.30 | 196.10 | 8.14 | 29.20 | 1.33 |
| | STPM-04 | 1/05/2016 | 51882.0 | 87.10 | 190.40 | 8.16 | 29.20 | 1.15 |
| Jun-16 | STPM-01 | 1/06/2016 | 34710.0 | 88.70 | 152.80 | 7.93 | 28.10 | 2.61 |
| | STPM-02 | 1/06/2016 | 34775.0 | 87.40 | 146.80 | 7.94 | 28.20 | 2.88 |
| | STPM-03 | 1/06/2016 | 34710.0 | 91.80 | 145.00 | 7.94 | 28.10 | 3.27 |
| | STPM-04 | 1/06/2016 | 34710.0 | 90.40 | 148.50 | 7.94 | 28.10 | 3.95 |
| Jul-16 | STPM-01 | 12/07/2016 | 54106.0 | 89.00 | 104.20 | 8.00 | 27.00 | 1.42 |
| | STPM-02 | 12/07/2016 | 54116.0 | 90.20 | 100.20 | 8.01 | 27.00 | 1.26 |
| | STPM-03 | 12/07/2016 | 54130.0 | 89.50 | 97.00 | 8.01 | 27.00 | 1.52 |
| | STPM-04 | 12/07/2016 | 54102.0 | 90.00 | 103.90 | 8.00 | 27.00 | 1.31 |
| **Reference Sites** | | | | | | | | |
| Aug-15 | STPM-R1 | 25/08/2015 | 52852.2 | 98.70 | 164.00 | 7.85 | 27.21 | 2.40 |
| | STPM-R2 | 25/08/2015 | 53800.5 | 94.70 | 130.50 | 7.77 | 26.32 | 1.95 |
| Sep-15 | STPM-R1 | 24/09/2015 | 56095.2 | 99.30 | 185.60 | 7.85 | 30.26 | 8.16 |
| | STPM-R2 | 24/09/2015 | 56650.1 | 94.80 | 176.60 | 7.74 | 29.31 | 1.41 |
| Oct-15 | STPM-R1 | 22/10/2015 | 46494.7 | 94.80 | 141.10 | 7.83 | 30.13 | 4.64 |
| | STPM-R2 | 22/10/2015 | 46679.6 | 91.70 | 153.70 | 7.79 | 30.18 | 3.40 |
| Nov-15 | STPM-R1 | 19/11/2015 | 53810.0 | 81.60 | 176.00 | 7.93 | 31.80 | 2.42 |
| | STPM-R2 | 19/11/2015 | 53886.4 | 83.00 | 190.00 | 7.87 | 31.60 | 3.41 |
| Dec-15 | STPM-R1 | 8/12/2015 | 54573.0 | 82.60 | 221.40 | 7.88 | 32.10 | 3.41 |
| | STPM-R2 | 8/12/2015 | 54157.0 | 76.30 | 211.00 | 7.75 | 32.20 | 4.88 |
| Jan-16 | STPM-R1 | 19/01/2016 | 50547.0 | 54.30 | 99.30 | 7.94 | 32.10 | 2.07 |
| | STPM-R2 | 19/01/2016 | 47171.0 | 59.20 | 119.90 | 7.76 | 31.80 | 3.05 |
| Feb-16 | STPM-R1 | 17/02/2016 | 49167.0 | 59.30 | 164.70 | 7.83 | 31.80 | 4.65 |
| | STPM-R2 | 17/02/2016 | 27265.0 | 43.80 | 305.30 | 7.09 | 30.40 | 5.73 |
| Mar-16 | STPM-R1 | 17/03/2016 | 44479.0 | 77.60 | 138.30 | 7.50 | 30.90 | 2.81 |
| | STPM-R2 | 17/03/2016 | 40571.0 | 69.00 | 165.00 | 7.13 | 30.60 | 5.64 |
| Apr-16 | STPM-R1 | 18/04/2016 | 52623.0 | 84.70 | 113.50 | 7.71 | 31.60 | 4.09 |
| | STPM-R2 | 18/04/2016 | 51848.0 | 74.20 | 134.80 | 7.51 | 31.40 | 5.21 |
| May-16 | STPM-R1 | 16/05/2016 | 51863.0 | 94.70 | 202.40 | 8.20 | 29.10 | 3.64 |
| | STPM-R2 | 16/05/2016 | 51692.0 | 82.70 | 186.30 | 8.06 | 28.90 | 1.44 |
| Jun-16 | STPM-R1 | 14/06/2016 | 53420.0 | 90.20 | 144.30 | 7.91 | 28.20 | 3.73 |
| | STPM-R2 | 14/06/2016 | 53384.0 | 90.30 | 138.20 | 7.88 | 28.00 | 2.34 |
| Jul-16 | STPM-R1 | 12/07/2016 | 54145.0 | 83.60 | 116.30 | 8.01 | 26.90 | 1.91 |
| | STPM-R2 | 12/07/2016 | 54243.0 | 88.20 | 126.40 | 8.01 | 26.80 | 1.81 |
| **WwTP Holding Tank** | | | | | | | | |
| Aug-15 | STPM-T1 | 25/08/2015 | 1466.0 | 85.60 | 142.00 | 7.71 | 31.00 | 0.88 |
| Sep-15 | STPM-T1 | 24/09/2015 | 1382.3 | 95.70 | 262.00 | 7.11 | 30.28 | 0.76 |
| Oct-15 | STPM-T1 | 22/10/2015 | 1161.0 | 71.60 | 206.00 | 6.24 | 33.90 | 1.67 |
| Nov-15 | STPM-T1 | 19/11/2015 | 1405.0 | 52.30 | 194.50 | 7.81 | 34.10 | 0.82 |
| Dec-15 | STPM-T1 | 8/12/2015 | 1658.0 | 86.30 | 95.50 | 8.19 | 33.50 | 0.75 |
| Jan-16 | STPM-T1 | 19/01/2016 | 1458.0 | 76.40 | 47.00 | 8.01 | 33.10 | 0.75 |
| Feb-16 | STPM-T2 | 17/02/2016 | 1666.0 | 47.60 | 83.50 | 7.84 | 33.10 | 3.98 |
| Mar-16 | STPM-T1 | 17/03/2016 | 2035.0 | 55.00 | 50.30 | 7.78 | 32.30 | 0.70 |
| Apr-16 | STPM-T1 | 18/04/2016 | 1402.0 | 82.00 | 163.00 | 8.46 | 32.60 | 0.15 |
| May-16 | STPM-T1 | 16/05/2016 | 1768.0 | 91.10 | 203.90 | 8.29 | 31.20 | 0.14 |
| Jun-16 | STPM-T1 | 14/06/2016 | 1543.0 | 77.10 | 149.20 | 8.36 | 29.40 | 3.98 |
| Jul-16 | STPM-T1 | 12/07/2016 | 1342.0 | 58.90 | 39.80 | 7.75 | 29.90 | 2.08 |

INDRA
27 SEP 2016

## WDL 192 Analytical Results Summary Table

| | | | Organics | Inorganics | | | | | | | | | | | Microbiological | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Chlorophyll a | TSS | BOD | Ammonia as N | Kjeldahl Nitrogen Total | Nitrate (as N) | Nitrite (as N) | Nitrogen (Organic) | Nitrogen (Total) | Oxides of Nitrogen | Phosphate total (P) | Phosphorous filterable reactive (P) | E. Coli | Enterococci |
| | | | mg/L | mg/L | mg/L | µg/L | mg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | mg/L | cfu/100 ml | cfu/100 ml |
| EQL | | | 0.001 | 1 | 2 | 5 | 0.05 | 2 | 2 | 50 | 10 | 2 | 5 | 0.001 | 1 | 1 |
| WDL192 Trigger Criteria | | | 0.004 | 10 | | 20 | | | | | 300 | 20 | 30 | | 200 | 50 |
| **Monitoring_Round** | **Location** | **Date Sampled** | | | | | | | | | | | | | | |
| | STPM-01 | 25/08/2015 | <0.005 | - | - | 12 | 0.08 | 28 | <2 | 70 | 110 | 28 | 29 | <0.001 | - | <1 |
| | STPM-02 | 25/08/2015 | <0.005 | - | - | 16 | 0.08 | 19 | 5 | 60 | 110 | 24 | 22 | <0.001 | - | <1 |
| | STPM-03 | 25/08/2015 | <0.005 | - | - | 10 | 0.06 | 33 | <2 | 50 | 90 | 33 | 18 | 0.001 | - | <1 |
| Aug-15 | STPM-04 | 25/08/2015 | <0.005 | - | - | 9 | <0.05 | 28 | <2 | <50 | 28 | 28 | 18 | <0.001 | - | 1 |
| | STPM-R1 | 25/08/2015 | <0.005 | - | - | 110 | 0.29 | 20 | <2 | 180 | 310 | 20 | 39 | 0.01 | - | 1 |
| | STPM-R2 | 25/08/2015 | <0.005 | - | - | <5 | 0.16 | 36 | <2 | 160 | 200 | 36 | 18 | <0.001 | - | <1 |
| | STPM-T1 | 25/08/2015 | <0.005 | 1.1 | <5 | 15 | 1.1 | 1000 | <2 | 1100 | 2100 | 1000 | 1300 | 1.2 | <1 | <1 |
| | STPM-01 | 24/09/2015 | <0.005 | - | - | <5 | 0.1 | 37 | 8 | 100 | 150 | 45 | 15 | <0.001 | - | <1 |
| | STPM-02 | 24/09/2015 | <0.005 | - | - | <5 | 0.14 | 37 | 12 | 140 | 190 | 49 | 16 | <0.001 | - | <1 |
| | STPM-03 | 24/09/2015 | <0.005 | - | - | <5 | 0.1 | 24 | 3 | 100 | 130 | 28 | 14 | 0.009 | - | <1 |
| Sep-15 | STPM-04 | 24/09/2015 | <0.005 | - | - | 12 | 0.07 | 9 | 7 | 58 | 90 | 16 | 14 | <0.001 | - | <1 |
| | STPM-R1 | 24/09/2015 | <0.005 | - | - | <5 | 0.17 | 11 | 2 | 170 | 190 | 13 | 24 | <0.001 | - | 11 |
| | STPM-R2 | 24/09/2015 | <0.005 | - | - | 7 | 0.23 | 7 | 11 | 220 | 240 | 17 | 14 | <0.001 | - | <1 |
| | STPM-T1 | 28/09/2015 | <0.005 | 3.6 | <5 | 45 | 0.91 | 1600 | 20 | 870 | 2500 | 1600 | 38 | 0.006 | <1 | <1 |
| | STPM-01 | 22/10/2015 | <0.005 | - | - | 17 | 0.18 | <2 | <2 | 160 | 180 | <5 | 26 | <0.001 | - | <1 |
| | STPM-02 | 22/10/2015 | <0.005 | - | - | 9 | 0.09 | <2 | <2 | 81 | 90 | <5 | 26 | 0.001 | - | <1 |
| | STPM-03 | 22/10/2015 | <0.005 | - | - | <5 | 0.06 | <2 | <2 | 60 | 60 | <5 | 26 | 0.001 | - | <1 |
| Oct-15 | STPM-04 | 22/10/2015 | <0.005 | - | - | 5 | 0.07 | 3 | <2 | 65 | 70 | <5 | 26 | 0.001 | - | <1 |
| | STPM-R1 | 22/10/2015 | <0.005 | - | - | <5 | <0.05 | <2 | <2 | <50 | <50 | <5 | 26 | <0.001 | - | 2 |
| | STPM-R2 | 22/10/2015 | <0.005 | - | - | <5 | <0.05 | <2 | <2 | <50 | <50 | <5 | 28 | 0.001 | - | <1 |
| | STPM-T1 | 22/10/2015 | <0.005 | <1 | <5 | 49 | 1.3 | 1900 | 16 | 1300 | 3200 | 1900 | 120 | 0.024 | <1 | <1 |
| | STPM-01 | 19/11/2015 | <0.005 | - | - | <5 | 0.07 | 6 | <2 | 70 | 80 | 6 | 22 | 0.001 | - | <1 |
| | STPM-02 | 19/11/2015 | <0.005 | - | - | 20 | 0.23 | 5 | <2 | 210 | 240 | 5 | 17 | 0.001 | - | <1 |
| | STPM-03 | 19/11/2015 | <0.005 | - | - | 11 | 0.06 | 5 | <2 | 49 | 70 | 5 | 28 | 0.001 | - | <1 |
| Nov-15 | STPM-04 | 19/11/2015 | <0.005 | - | - | 10 | <0.05 | 10 | <2 | <50 | <50 | 10 | 20 | <0.001 | - | <1 |
| | STPM-R1 | 19/11/2015 | <0.005 | - | - | <5 | <0.05 | 9 | <2 | <50 | <50 | 9 | 19 | <0.001 | - | <1 |
| | STPM-R2 | 19/11/2015 | <0.005 | - | - | 7 | <0.05 | 5 | <2 | <50 | <50 | 5 | 21 | 0.001 | - | 2 |
| | STPM-T1 | 19/11/2015 | <0.005 | 3 | <5 | 74 | 1.4 | 2200 | 67 | 1300 | 3700 | 2300 | 48 | 0.008 | <1 | <1 |
| | STPM-01 | 8/12/2015 | 0.0053 | - | - | 5 | 0.14 | 19 | 4 | 140 | 160 | 23 | 26 | 0.001 | - | <1 |
| | STPM-02 | 8/12/2015 | 0.0056 | - | - | 9 | 0.2 | 9 | 11 | 190 | 220 | 20 | 24 | 0.001 | - | <1 |
| | STPM-03 | 8/12/2015 | 0.0053 | - | - | 7 | 0.12 | 20 | 4 | 110 | 150 | 24 | 23 | 0.002 | - | <1 |
| Dec-15 | STPM-04 | 8/12/2015 | <0.005 | - | - | <5 | 0.19 | 23 | <2 | 190 | 220 | 23 | 70 | 0.001 | - | <1 |
| | STPM-R1 | 8/12/2015 | <0.005 | - | - | <5 | 0.17 | 12 | 9 | 170 | 190 | 22 | 28 | 0.002 | - | <1 |
| | STPM-R2 | 8/12/2015 | 0.0053 | - | - | <5 | 0.17 | 28 | <2 | 170 | 190 | 28 | 24 | 0.001 | - | <1 |
| | STPM-T1 | 8/12/2015 | <0.005 | <1 | <5 | 17 | 1.3 | 1300 | 17 | 1300 | 2700 | 1400 | 340 | 0.24 | 1 | <1 |
| | STPM-01 | 19/01/2016 | <0.005 | - | - | 11 | 0.18 | 6 | <2 | 170 | 190 | 6 | 160 | 0.003 | - | 2 |
| | STPM-02 | 19/01/2016 | <0.005 | - | - | <5 | 0.21 | 8 | <2 | 210 | 220 | 8 | 41 | 0.002 | - | <1 |
| | STPM-03 | 19/01/2016 | <0.005 | - | - | <5 | 0.23 | 6 | <2 | 230 | 240 | 6 | 31 | 0.001 | - | <1 |
| Jan-16 | STPM-04 | 19/01/2016 | <0.005 | - | - | 8 | 0.18 | <2 | <2 | 170 | 180 | <5 | 67 | 0.002 | - | <1 |
| | STPM-R1 | 19/01/2016 | <0.005 | - | - | <5 | 0.17 | <2 | <2 | 170 | 170 | <5 | 30 | 0.002 | - | <1 |
| | STPM-R2 | 19/01/2016 | <0.005 | - | - | 10 | 0.21 | 50 | 20 | 200 | - | 70 | 24 | 0.001 | - | <1 |
| | STPM-T1 | 19/01/2016 | <0.005 | <1 | <5 | 22 | 1.3 | 770 | 17 | 1300 | 2100 | 790 | 410 | 0.22 | <1 | <1 |
| | STPM-01 | 17/02/2016 | <0.005 | - | - | 16 | 0.39 | 5 | <2 | 370 | 400 | 5 | 17 | 0.012 | - | 1 |
| | STPM-02 | 17/02/2016 | <0.005 | - | - | 18 | 0.14 | 9 | <2 | 120 | 150 | 9 | 21 | 0.002 | - | 3 |
| | STPM-03 | 17/02/2016 | <0.005 | - | - | 23 | <0.05 | 77 | <2 | <50 | 77 | 77 | 15 | 0.002 | - | 3 |
| Feb-16 | STPM-04 | 17/02/2016 | <0.005 | - | - | 29 | 0.1 | 6 | <2 | 70 | 110 | 6 | 14 | 0.002 | - | 5 |
| | STPM-R1 | 17/02/2016 | <0.005 | - | - | 26 | 0.09 | <2 | <2 | 60 | 90 | <5 | 15 | 0.002 | - | <1 |
| | STPM-R2 | 17/02/2016 | <0.005 | - | - | 28 | 0.13 | 10 | <2 | 100 | 140 | 10 | 14 | 0.002 | - | 11 |
| | STPM-T1 | 17/02/2016 | <0.005 | 1.9 | <5 | 18 | 0.92 | 750 | 6 | 900 | 1700 | 760 | 730 | 0.65 | 5 | <1 |
| | STPM-01 | 17/03/2016 | <0.005 | - | - | 36 | 0.13 | 47 | <2 | 94 | 180 | 47 | 32 | 0.003 | - | 16 |
| | STPM-02 | 17/03/2016 | <0.005 | - | - | 34 | <0.05 | 21 | 21 | <50 | <50 | 42 | 21 | 0.002 | - | 17 |
| | STPM-03 | 17/03/2016 | <0.005 | - | - | 35 | 0.08 | 23 | 19 | <50 | 120 | 42 | 22 | 0.003 | - | 12 |
| Mar-16 | STPM-04 | 17/03/2016 | <0.005 | - | - | 33 | 0.05 | 40 | 3 | <50 | 90 | 43 | 20 | 0.003 | - | 5 |
| | STPM-R1 | 17/03/2016 | <0.005 | - | - | 15 | <0.05 | 10 | 29 | <50 | <50 | 38 | 38 | 0.002 | - | <1 |
| | STPM-R2 | 17/03/2016 | <0.005 | - | - | 33 | <0.05 | 47 | 6 | <50 | 53 | 53 | 19 | 0.002 | - | 67 |
| | STPM-T1 | 17/03/2016 | <0.005 | 4.5 | <5 | 33 | 0.6 | 1800 | 24 | 570 | 2500 | 1900 | 800 | 0.61 | <1 | 1 |
| | STPM-01 | 18/04/2016 | <0.005 | - | - | <5 | 0.23 | 12 | <2 | 230 | 240 | 12 | 42 | <0.001 | - | 1 |
| | STPM-02 | 18/04/2016 | <0.005 | - | - | 25 | 0.11 | 9 | <2 | 85 | 120 | 9 | 24 | <0.001 | - | <1 |
| | STPM-03 | 18/04/2016 | <0.005 | - | - | <5 | 0.08 | 6 | 6 | 80 | 90 | 12 | 24 | <0.001 | - | <1 |
| Apr-16 | STPM-04 | 18/04/2016 | <0.005 | - | - | 9 | 0.08 | 9 | <2 | 70 | 89 | 9 | 24 | <0.001 | - | 1 |
| | STPM-R1 | 18/04/2016 | <0.005 | - | - | 20 | 0.09 | 4 | 3 | 70 | 97 | 7 | 28 | <0.001 | - | <1 |
| | STPM-R2 | 18/04/2016 | <0.005 | - | - | 19 | 0.09 | 11 | <2 | 71 | 100 | 11 | 21 | 0.002 | - | <1 |
| | STPM-T1 | 18/04/2016 | <0.005 | 8.6 | <5 | 17 | 1.1 | 1100 | 60 | 1100 | 2200 | 1100 | 1100 | 0.68 | 1 | <1 |
| | STPM-01 | 16/05/2016 | <0.005 | - | - | 7 | 0.19 | 28 | <2 | 180 | 220 | 28 | 40 | 0.003 | - | <1 |
| | STPM-02 | 16/05/2016 | <0.005 | - | - | <5 | 0.06 | 16 | <2 | 60 | 80 | 16 | 24 | 0.002 | - | <1 |
| | STPM-03 | 16/05/2016 | <0.005 | - | - | <5 | 0.05 | <2 | <2 | 50 | 50 | <5 | 22 | <0.001 | - | <1 |
| May-16 | STPM-04 | 16/05/2016 | <0.005 | - | - | <5 | 0.06 | 17 | <2 | 60 | 80 | 17 | 21 | 0.002 | - | <1 |
| | STPM-R1 | 16/05/2016 | <0.005 | - | - | <5 | 0.09 | 14 | <2 | 90 | 100 | 14 | 24 | 0.003 | - | 1 |
| | STPM-R2 | 16/05/2016 | <0.005 | - | - | <5 | 0.06 | 16 | <2 | 60 | 80 | 16 | 19 | 0.001 | - | <1 |
| | STPM-T1 | 16/05/2016 | <0.005 | 5 | <5 | 46 | 1.1 | 830 | 45 | 1100 | 2000 | 870 | 410 | 0.11 | <1 | 10 |
| | STPM-01 | 14/06/2016 | <0.005 | - | - | 10 | 0.22 | 16 | <2 | 210 | 240 | 16 | 62 | 0.003 | - | <1 |
| | STPM-02 | 14/06/2016 | <0.005 | 4.6 | - | <5 | 0.28 | 18 | <2 | 280 | 300 | 18 | 51 | 0.002 | - | <1 |
| | STPM-03 | 14/06/2016 | <0.005 | 4.7 | - | <5 | 0.44 | 10 | <2 | 440 | 450 | 10 | 55 | 0.003 | - | <1 |
| Jun-16 | STPM-04 | 14/06/2016 | <0.005 | 12 | - | <5 | 0.18 | 24 | <2 | 180 | 210 | 26 | 36 | <0.001 | - | <1 |
| | STPM-R1 | 14/06/2016 | <0.005 | 4 | - | 7 | 0.38 | 32 | <2 | 370 | 410 | 32 | 43 | 0.002 | - | <1 |
| | STPM-R2 | 14/06/2016 | <0.005 | 5.5 | - | 6 | 0.17 | 7 | <2 | 160 | 180 | 7 | 44 | <0.001 | - | <1 |
| | STPM-T1 | 14/06/2016 | <0.005 | 9.2 | <5 | 33 | 1.3 | 1500 | 430 | 1300 | 3200 | 1900 | 560 | 0.1 | 2 | 33 |
| | STPM-01 | 12/07/2016 | <0.005 | 3.3 | - | <5 | 0.24 | 31 | <2 | 240 | 270 | 31 | 160 | 0.005 | - | <1 |
| | STPM-02 | 12/07/2016 | <0.005 | 1.3 | - | <5 | <0.05 | 18 | <2 | <50 | <50 | 18 | 48 | 0.001 | - | <1 |
| | STPM-03 | 12/07/2016 | <0.005 | 2 | - | <5 | <0.05 | 14 | <2 | <50 | <50 | 14 | 42 | 0.001 | - | <1 |
| Jul-16 | STPM-04 | 12/07/2016 | <0.005 | 6.5 | - | 11 | <0.05 | 16 | <2 | <50 | <50 | 16 | 38 | 0.002 | - | <1 |
| | STPM-R1 | 12/07/2016 | <0.005 | 1.3 | - | 20 | <0.05 | 9 | <2 | <50 | <50 | 10 | 36 | 0.001 | - | <1 |
| | STPM-R2 | 12/07/2016 | <0.005 | 1.2 | - | <5 | <0.05 | 11 | <2 | <50 | <50 | 11 | 37 | 0.002 | - | <1 |
| | STPM-T1 | 12/07/2016 | <0.005 | 1.6 | <5 | 90 | 1.3 | 1000 | 46 | 1200 | 2400 | 1100 | 160 | 0.024 | <1 | 8 |



INDRA 27-SEP-2016