

# Groundwater Exceedance Investigation Report

Hopeland (PL253)

Reporting Period: 1 April 2025 to 30 June 2025

<b>Version</b>	1.0
<b>Released</b>	21/07/2025
<b>Document Owner</b>	Principal Hydrogeologist
<b>Document Author</b>	Principal Hydrogeologist
<b>Document Status</b>	Issued for Use
<b>Security Classification</b>	Restricted

Please see document administration section for more information

**Contents**

<b>1.</b>	<b>Introduction</b>	<b>6</b>
<b>1.1</b>	<b>Investigation Limits and Limits of Reporting (LOR)</b>	<b>7</b>
<b>2.</b>	<b>Site Setting</b>	<b>8</b>
<b>2.1</b>	<b>Site Location</b>	<b>8</b>
<b>2.2</b>	<b>Surrounding Land Use</b>	<b>8</b>
<b>2.3</b>	<b>Topography</b>	<b>8</b>
<b>2.4</b>	<b>Geology</b>	<b>8</b>
<b>3.</b>	<b>Groundwater Monitoring</b>	<b>10</b>
<b>3.1</b>	<b>Monitoring Completed</b>	<b>10</b>
<b>3.2</b>	<b>Groundwater Contours and Flow Direction</b>	<b>11</b>
<b>3.3</b>	<b>Groundwater Level and Reservoir Pressure</b>	<b>17</b>
<b>3.4</b>	<b>Groundwater Quality</b>	<b>23</b>
<b>4.</b>	<b>Trigger Level Exceedances and Data Assessment</b>	<b>47</b>
<b>4.1</b>	<b>Trigger Level Exceedances</b>	<b>47</b>
<b>5.</b>	<b>Conclusion</b>	<b>51</b>
<b>6.</b>	<b>Document Administration</b>	<b>53</b>
	<b>Appendix A: Laboratory Reports</b>	<b>54</b>
	<b>Appendix B: QA/QC Summary</b>	<b>55</b>

Figures

Figure 2-1: Site Location ..... 9

Figure 3-1: Wambo Seam Groundwater Contours (mAHD) in Q2 2025..... 14

Figure 3-2: Springbok Sandstone Groundwater Contours (mAHD) in Q2 2025 ..... 15

Figure 3-3: Macalister coal seam Groundwater Contours (mAHD) in Q2 2025..... 16

Figure 3-4: Wambo Coal Seam Groundwater Level and Reservoir Pressures Time Series in Q2 2025..... 17

Figure 3-5: Wambo Coal Seam Reservoir Pressure Contours (mAHD) in Q2 2025 ..... 18

Figure 3-6: Springbok Sandstone Groundwater Level and Reservoir Pressures Time Series in Q2 2025 ..... 19

Figure 3-7: Springbok Sandstone Reservoir Pressure Contours (mAHD) in Q2 2025 ..... 20

Figure 3-8: Macalister Seam Package Groundwater Level and Reservoir Pressures Time Series in Q2 2025 ..... 21

Figure 3-9: Macalister coal seam Reservoir Pressure Contours (mAHD) in Q2 2025..... 22

Figure 3-10: Phenol Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 24

Figure 3-11: Phenol Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone..... 24

Figure 3-12: Phenol Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package ..... 25

Figure 3-13: 2-Chlorophenol Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 26

Figure 3-14: 2-Chlorophenol Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone ..... 26

Figure 3-15: 2-Chlorophenol Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package..... 27

Figure 3-16: 2-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 28

Figure 3-17: 2-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone ..... 28

Figure 3-18: 2-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package..... 29

Figure 3-19: 3- & 4-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 30

Figure 3-20: 3- & 4-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone ..... 30

Figure 3-21: 3- & 4-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package..... 31

Figure 3-22: 2,4-Dimethylphenol Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 32

Figure 3-23: 2,4-Dimethylphenol Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone..... 32

Figure 3-24: 2,4-Dimethylphenol Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package..... 33

Figure 3-25: Naphthalene Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 34

Figure 3-26: Naphthalene Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone ..... 34

Figure 3-27: Naphthalene Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package ..... 35

Figure 3-28: TRH – Silica gel cleanup Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 36

Figure 3-29: TRH – Silica gel cleanup Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone ..... 36

Figure 3-30: TRH – Silica gel cleanup Time Series in the Monitoring Bores Screened Within Macalister Seam Package ..... 37

Figure 3-31: Total Cyanide Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 38

Figure 3-32: Total Cyanide Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone ..... 38

Figure 3-33: Total Cyanide Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package ..... 39

Figure 3-34: Benzene Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 40

Figure 3-35: Benzene Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone ..... 40

Figure 3-36: Benzene Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package ..... 41

Figure 3-37: Toluene Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 42

Figure 3-38: Toluene Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone ..... 42

Figure 3-39: Toluene Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package ..... 43

Figure 3-40: Ethylbenzene Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 44

Figure 3-41: Ethylbenzene Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone ..... 44

Figure 3-42: Ethylbenzene Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package ..... 45

Figure 3-43: Xylene Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam ..... 46

Figure 3-44: Xylene Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone ..... 46

Figure 3-45: Xylene Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package ..... 47

**Tables**

Table 1-1: New groundwater monitoring wells installed by Arrow in the Springbok Sandstone ..... 6

Table 1-2: Investigation Limits (EA0001401, Water Conditions, Table 3) ..... 7

Table 2-1: Summary of Surrounding Land Use ..... 8

Table 3-1: Groundwater Monitoring Locations and Sampling Dates in Q2 2025 ..... 11

Table 3-2: Summary of venting activities undertaken by Arrow during Q2 2025 ..... 13

Table 4-1: Exceedance Results ..... 50

## 1. Introduction

The Environmental Authority (number: EA0001401), authorises prescribed activities on Petroleum Licence (PL) 253, operated by Arrow CSG (Australia) Pty Ltd, hereinafter referred to as Arrow.

Underground coal gasification (UCG) was historically conducted by others on Lot 40 DY85, which is located within the extent of PL253. As a result of the legacy UCG activities, EA0001401, taking effect from 1 November 2023, requires quarterly groundwater monitoring of all bores listed in “*Water conditions, Table 1 – Groundwater Monitoring Locations*” (refer to Table 3-1) for the quality characteristics identified in “*Water Conditions, Table 3 – Investigation Limits*” (refer to Table 1-2). According to condition Water 14, “*if groundwater quality monitoring results exceed any of the investigation limits specified in Water Conditions, Table 3 – Investigation Limits, the holder must notify the administering authority within 48 hours of receiving the results and complete an investigation in accordance with condition Water 15*”.

Additionally, condition Water 5 of EA0001401 requires Arrow to fulfill the following requirements:

*“Within 12 months, 4 new groundwater monitoring wells must be drilled in the Springbok Sandstone at locations informed by particle tracking (travel times, distances and trajectories), and in the vicinity of: 1) south of HSMB1S; 2) east of HSMB2S; 3) west of HSMB4S; and 4) north of HSMB3S2”.*

To fulfill the condition Water 5, Arrow Energy installed 4 new groundwater monitoring wells (Hopeland 34, Hopeland 35, Hopeland 36, and Hopeland 37) in the Springbok Sandstone (Table 1-1) in 2024. EA0001401 requires Arrow to obtain 12 months’ worth of monitoring results for these newly installed groundwater monitoring wells in accordance with condition Water 12 prior to commencement of drilling for Stage 1 Activities as described in condition Water 1.

**Table 1-1: New groundwater monitoring wells installed by Arrow in the Springbok Sandstone**

Monitoring Bore	Coordinate (GDA 94)		Target Formation	Depth (mbgl)	Sampling Date
	Latitude	Longitude			
Off-site Lot 40 DY85					
Hopeland 34	-26.927532	150.668071	Springbok Sandstone	120.08	20/06/2025
Hopeland 35	-26.925055	150.682825	Springbok Sandstone	96.51	28/06/2025
Hopeland 36	-26.932359	150.682883	Springbok Sandstone	97.04	28/06/2025
Hopeland 37	- 26.921135	150.671578	Springbok Sandstone	101.00	24/06/2025

Following the completion of the first quarterly sampling round of 2025 (Q1 2025), Arrow has recently completed the second quarterly sampling round of 2025 (Q2 2025) from 19/06/2025 to 30/06/2025. The laboratory results for this sampling event have been received in three batches on 2/07/2025, 9/07/2025, and 11/07/2025. In accordance with Condition Water 14, Arrow provided the Department of Environment, Tourism, Science and Innovation (DETSI) notification of the exceedance of investigation limits within 48 hours of receiving the results. These notifications were provided through two emails sent on 4/07/2025 and 11/07/2025.

Conditions Water 15 and Water 15A mandate Arrow to complete an investigation report and submit it to the administering authority within 10 business days of receiving the result, if such an investigation is required by condition Water 14. This report, therefore, presents groundwater quality monitoring results exceeding any of the investigation limits specified in Table 1-2, and provides an investigation into the potential for environmental harm, outlining:

- Results, analysis, and interpretation of the samples taken;
- An analysis of the trends in groundwater quality and groundwater contours, and the direction of groundwater flow;
- An analysis of the holder's contribution to changes in groundwater conditions;
- Outcomes of actions taken at the time to prevent or minimise environmental harm; and
- Proposed actions to prevent a recurrence of the exceedance.

It should be noted that Arrow has not conducted any production activity on PL253 since October 2019 when the wells associated with the Hopeland pilot operated for 25 days to undertake testing. The pilot wells were converted (administratively) to production wells following the grant of PL253. The Hopeland pilot consists of six coal seam gas (CSG) wells within an area of approximately 0.1 km<sup>2</sup>, located approximately 6.9 km to the southwest of Lot 40 DY85 on PL253. Arrow also has not commenced any drilling for Stage 1 Activities under the EA. Therefore, the current monitoring provides the characterisation of the existing contaminant status of the bores listed in Table 1-1 and Table 3-1 as Arrow has not undertaken activities contributing to changes in groundwater conditions or environmental harm on Lot 40 DY85.

## 1.1 Investigation Limits and Limits of Reporting (LOR)

Investigation limits are specified in *Water Conditions, Table 3 – Investigation Limits* of the EA, and are presented in Table 1-2. The limit of reporting (LOR) is the practical quantification limit (PQL), which is the lowest concentration of an analyte that can be determined with acceptable precision (repeatability) and accuracy under the stated conditions of a test (NEPM B3).

**Table 1-2: Investigation Limits (EA0001401, Water Conditions, Table 3)**

Chemical Group	Investigation Limits (mg/L)
Phenolic compounds	> Limit of Reporting (LOR)
Polynuclear aromatic hydrocarbons (PAHs) including Naphthalene	> LOR
Total recoverable hydrocarbons (TRH) (Silica Gel cleanup)	> LOR
Cyanide	0.08
Benzene	0.001
Toluene	0.8
Ethylbenzene	0.3
Xylene	0.6

## 2. Site Setting

### 2.1 Site Location

Lot 40 DY85 is located approximately 20 km southeast of Chinchilla on Kummerows Road, Hopeland. The location of Lot 40 DY85 and the bores monitored in this quarter are shown in Figure 2-1.

Monitoring bores (Figure 2-1, Table 3-1, and Table 1-1) comprise on-site (on Lot 40 DY85) bores which also include 4 new monitoring bores installed by Arrow, off-site bores, as well as two existing landholder bores located in the vicinity of Lot 40 DY85.

### 2.2 Surrounding Land Use

Table 2-1 summarises the surrounding land uses, focusing on properties located immediately adjacent to Lot 40 DY85.

**Table 2-1: Summary of Surrounding Land Use**

Direction	Descriptions
North	Cropping land, pasture production
East	Cropping land, livestock, and woodland
South	Livestock, cropping land
West	Livestock, cropping land

### 2.3 Topography

The regional area surrounding the bores and Lot 40 DY85 is generally flat, with elevations ranging from 310 metres Australian Height Datum (mAHD) in the west up to 320 mAHD in the east.

### 2.4 Geology

Regional geological mapping extracted from the State of Queensland, QLD Globe (2020) indicates that the Hopeland region comprises Cenozoic-aged sediments, including flood and sheet sand (sand, red sandy soil, silt and some gravel). These sediments were deposited as materials moved from higher ground in the east to lower ground in the west, toward the Condamine River and Wambo Creek. Subcropping beneath these Cenozoic sediments are the Jurassic-aged Kumbarilla Beds, which include the Westbourne Formation and Springbok Sandstone.

Based on the bore reports from QLD Globe (2020), drilling logs from within Lot 40 DY85 and from Arrow's monitoring bores, and Arrow's geological model, the typical subsurface strata profile encountered consists of unconsolidated sediments between 0 and 10 to 20 meters below ground level (mbgl), with underlying Westbourne Formation to approximately 43 mbgl.

Below the Westbourne Formation, the Springbok Sandstone extends to depths between 77 and 133 mbgl. This is followed by underlying Walloon Coal Measures (WCM), with the uppermost Macalister seam package of the WCM generally commencing between 87 to 136 mbgl and extending to a depth of 171 mbgl, underlain by the Wambo coal seam package.



Figure 2-1: Site Location

### 3. Groundwater Monitoring

#### 3.1 Monitoring Completed

As required by EA0001401, Arrow recently completed the Q2 2025 monitoring event for all bores listed in “*Water conditions, Table 1 – Groundwater Monitoring Locations*” (Table 3-1), as well as for four new groundwater monitoring wells (Table 1-1) installed in Springbok Sandstone (Hopeland 34, Hopeland 35, Hopeland 36, and Hopeland 37) in accordance with EA condition Water 1(1), Water 6, and Water 12.

Q2 2025 marks the fourth quarter of collecting 12 months of monitoring results from the new groundwater monitoring wells, as required prior to the commencement of drilling for Stage 1 Activities under conditions Water 1(1) and Water 5. The first three monitoring quarters were completed in Q3 and Q4 2024, and Q1 2025.

The monitoring was conducted in accordance with EA0001401 and included gauging (where feasible) and sampling. Samples were analysed at Australian Laboratory Services (ALS) and SGS, both of which are NATA accredited for the respective analyses.

It should be noted that one monitoring bore, Hopeland 20 – which is constructed into the Macalister coal seam in an upgradient area where this seam is shallower – contained insufficient water for sample collection during this monitoring event, as was the case in previous monitoring events.

During the Q2 2025 monitoring event, similar to Q1 2025 monitoring event, the groundwater level in monitoring bores NB01D, HSMB2D, HSMB3D2, HSMB4D, HSMB5D, Hopeland 20, and Hopeland 26 were too low. Therefore, a controlled short-term venting of these bores was conducted to raise the water level and enable sampling. Summary of venting activities undertaken by Arrow during Q2 2025 is provided in Table 3-2.

### 3.2 Groundwater Contours and Flow Direction

Regionally, groundwater flows from east to west in all aquifers and coal seams following the overall dip direction of the strata as documented in the Underground Water Impact Report (UWIR 2021) for the Surat Cumulative Management Area (OGIA, 2021). The coal seams are bedded between aquitards (e.g., siltstone), which limits the vertical movement of groundwater between each aquifer unit.

Groundwater contours calculated from gauge data for Wambo seam monitoring bores Hopeland 21, Hopeland 24 and Hopeland 27 for Q2 2025 indicate a local gradient toward the south and west as shown in Figure 3-1.

Groundwater contours in the Springbok Sandstone (Figure 3-2) indicate a depression in the northern portion of the former UCG area.

The Macalister seam retains a groundwater depression in the former UCG site, around the UCG gasifiers (Figure 3-3) which are likely dry. This suggests that any existing site contamination in this area is not currently migrating off-site via groundwater.

**Table 3-1: Groundwater Monitoring Locations and Sampling Dates in Q2 2025**

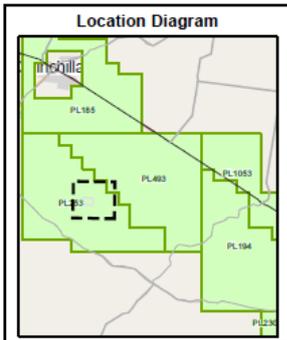
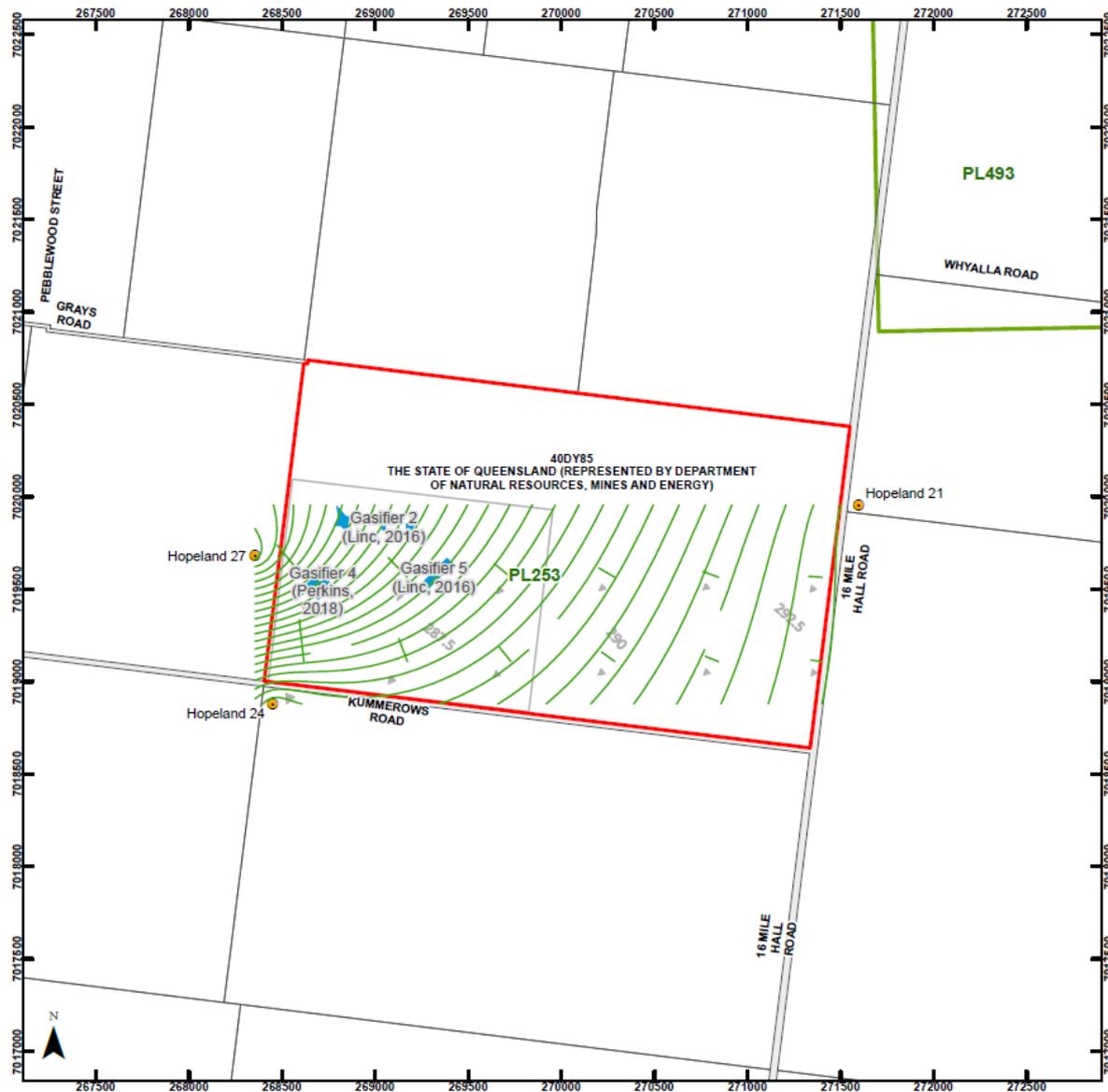
Monitoring Bore	Coordinate (GDA 94)		Target Formation	Depth (mbgl)	Sampling Date
	Latitude	Longitude			
<b>On-site Lot 40 DY85</b>					
HSMB1S (RN 172597)	-26.924816	150.6820187	Springbok Sandstone	123.5	30/06/2025
HSMB1D (RN 172598)	-26.925169	150.6821122	Macalister coal seam	162.1	30/06/2025
HSMB2S (RN 172596)	-26.931904	150.6822362	Springbok Sandstone	127.54	30/06/2025
HSMB2D (RN 172604)	-26.933119	150.6820402	Macalister coal seam	164.47	30/06/2025
HSMB3S1 (RN 172600)	-26.922058	150.674575	Springbok Sandstone	133.46	27/06/2025
HSMB3D1 (RN 172599)	-26.922195	150.6757702	Macalister coal seam	148.25	25/06/2025
HSMB3S2 (RN 172605)	-26.921774	150.6715506	Springbok Sandstone	139.54	27/06/2025
HSMB3D2 (RN 172601)	-26.921848	150.6722437	Macalister coal seam	163.22	24/06/2025
HSMB4S (RN 172595)	-26.927766	150.6682864	Springbok Sandstone	124.39	25/06/2025
HSMB4D (RN 172602)	-26.926596	150.6684917	Macalister coal seam	156.34	30/06/2025
HSMB5D (RN 172603)	-26.931938	150.6711606	Macalister coal seam	162.3	25/06/2025
NB01D	-26.923095	150.673392	Macalister coal seam	155.06	25/06/2025
NB01S	-26.922951	150.673411	Springbok Sandstone	120.1	27/06/2025
NB02D	-26.923822	150.6710016	Macalister coal seam	139.4	26/06/2025
NB02S	-26.923966	150.670969	Springbok Sandstone	120.9	26/06/2025
HSMB6D2 (RN 180099)	-26.917717	150.671382	Macalister coal Seam	187	27/06/2025
HSMB6S (RN 180101)	-26.917535	150.671403	Springbok Sandstone	126.55	26/06/2025
NB04D(S)	-26.929356	150.6764144	Springbok Sandstone	167.4	23/06/2025
NB05S	-26.932081	150.6745252	Springbok Sandstone	123.4	26/06/2025
<b>Off-site Lot 40 DY85</b>					

HSMB7D (RN 180100)	-26.931049	150.661133	Macalister coal seam	187.25	24/06/2025
HSMB7S (RN 180102)	-26.931019	150.660937	Springbok Sandstone	128.75	24/06/2025
Hopeland 20 (RN 180107)	-26.923571	150.699995	Macalister coal seam	115.3	Dry*
Hopeland 21 (RN 180108)	-26.92355	150.699838	Wambo Seam Package	148.36	29/06/2025
Hopeland 22 (RN 108109)	-26.932776	150.668254	Springbok Sandstone Lower	104.03	20/06/2025
Hopeland 23 (RN 180110)	-26.932756	150.668104	Macalister coal seam	148.71	22/06/2025
Hopeland 24 (RN 180111)	-26.932735	150.667954	Wambo Seam Package	176.2	21/06/2025
Hopeland 25 (RN 180112)	-26.925521	150.667447	Springbok Sandstone Lower	99.04	22/06/2025
Hopeland 26 (RN 180113)	-26.925507	150.667296	Macalister coal seam	138.93	19/06/2025
Hopeland 27 (RN 180114)	-26.925493	150.667145	Wambo Seam Package	162.83	22/06/2025
<b>Existing Landholder Bores</b>					
RN 147004	-26.930542	150.70826	Springbok Sandstone	80.5	28/06/2025
RN 160158	-26.944361	150.71829	Macalister coal seam	154	29/06/2025

\*Hopeland 20 contained insufficient water for collection of a sample during this monitoring event as per previous monitoring events.

**Table 3-2: Summary of venting activities undertaken by Arrow during Q2 2025**

Bore ID	Venting start date & time	Venting shut off date & time	Venting duration	Pump intake depth (mbgl)	Initial SWL (mbgl)	Water above intake (m)	Initial WHP (kPag)	Initial DHP (kPaa)	SWL post venting (mbgl)	SWL increase (m)
NB01D	25/06/2025 11:18	25/06/2025 14:00	2 hrs and 42 minutes	127.40	125.6	1.8	701.8	819.07	107.3	18.3
HSMB2D	23/06/2025 12:52	30/06/2025 08:31	164 hrs and 21 minutes	123.04	122.5	0.5	828	832.42	93.3	29.2
HSMB3D2	23/06/2025 12:32	24/06/2025 14:46	26 hrs and 14 minutes	133.54	129.4	4.1	654.6	787.96	118	11.4
HSMB4D	23/06/2025 13:15	30/06/2025 10:15	165 hrs	133.23	133.9	-0.7	845.3	845.34	132	1.9
HSMB5D	24/06/2025 16:46	25/06/2025 07:25	14 hrs and 39 minutes	137.60	109.7	27.9	694.6	1074.09	106	3.7
Hopeland 20	29/06/2024 07:05	29/06/2025 11:20	4 hrs and 15 minutes	112.00	106.86	5.1	840	955.32	106.86	N/A
Hopeland 26	19/06/2025 07:45	19/06/2025 13:18	5 hrs and 33 minutes	134.57	127.4	7.17	760	882.17	90.47	36.93



Tenement: PL253  
 LotPlan/s: 40DY85  
 Project Name: Hopeland 253 Development  
**Figure 3-1: Wambo Coal Seam Groundwater Contours (mAHd) Q2 2024**

Metres 0 250 500 750 1,000  
 Coordinate System: GDA 1994 MGA Zone 56  
 Scale @ A4: 1:30,000

**Legend**

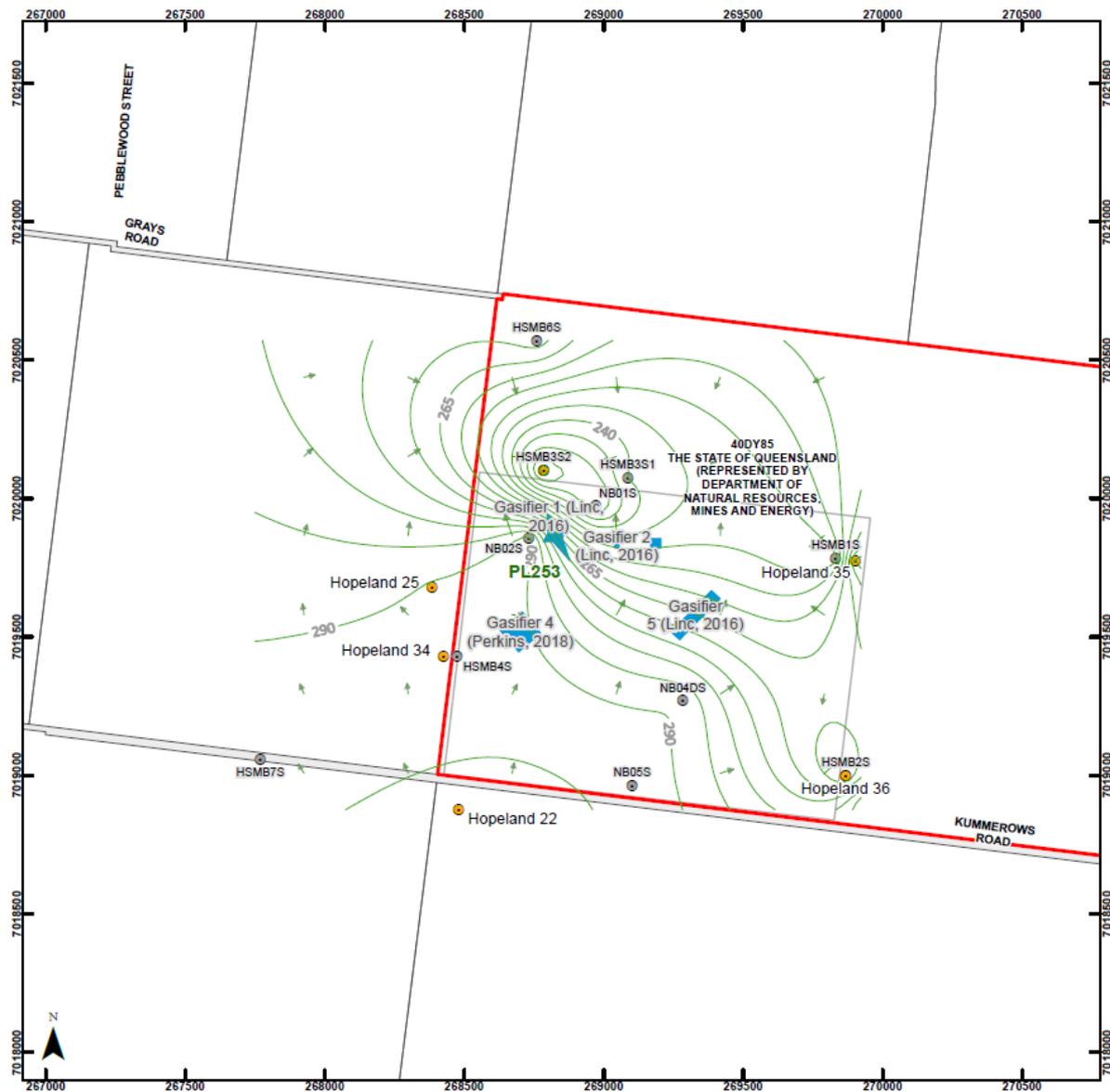
- Arrow Monitoring Bores
- ▭ Subject Property
- Gasifiers (1 to 5)
- ▭ Former UCG mining lease area
- ▭ Property Boundary
- ▭ Road
- ▭ PL (Arrow Granted)
- ▭ WAM DTW Q225
- ▭ WAM DTW Q225Poly

<p>Based on or combine data provided by the State of Queensland. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including its date and accuracy, no warranty is given that the accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) resulting to any use of the data.</p> <p>© Commonwealth of Australia (Queensland Australia), 2025. This material is released under the Creative Commons Attribution 4.0 Australia License. <a href="https://creativecommons.org/licenses/by/4.0/au/">https://creativecommons.org/licenses/by/4.0/au/</a> The abbreviation, name, number of this site &amp; location of similar information are approximate only and may vary.</p> <p>Note: The information shown on this map is a copyright of Arrow Energy Limited and, where applicable, its affiliates and co-venturers.</p>		<p>Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no warranty is given that the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it.</p> <p>Date Source: Arrow Energy Limited, QSP/261</p>					
2	01/05/2024	Update contour lines	MM				
1	15/10/2022	Remove wells, add track	TS	MM			
0	21/09/2022	Issued for Information	CD	MM			
REV	Date	Revision Description					

Document: \\na.aocmet.com\its\APAC\Brisbane-AUBNET1\Secure\Projects\607\60727821\_Hopeland\_2024\_MP\900\_CAD\_GIS\920\_GIS\Work\Arrow\_GWContourFigures\_JA\_20240715\GWContours\_Q424\_20250718.aprx

Print Date: 18/07/2025

Figure 3-1: Wambo Seam Groundwater Contours (mAHd) in Q2 2025



**Location Diagram**

**Tenement: PL253**

**LotPlan/s: 40DY85**

**Project Name: Hopeland 253 Development**

**Figure 3-2: Springbok Sandstone Groundwater Contours (mAHD) Q2 2024**

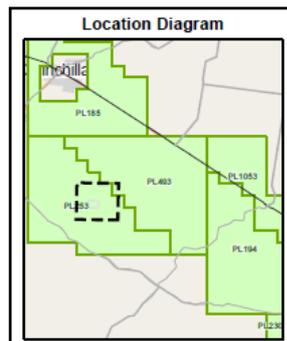
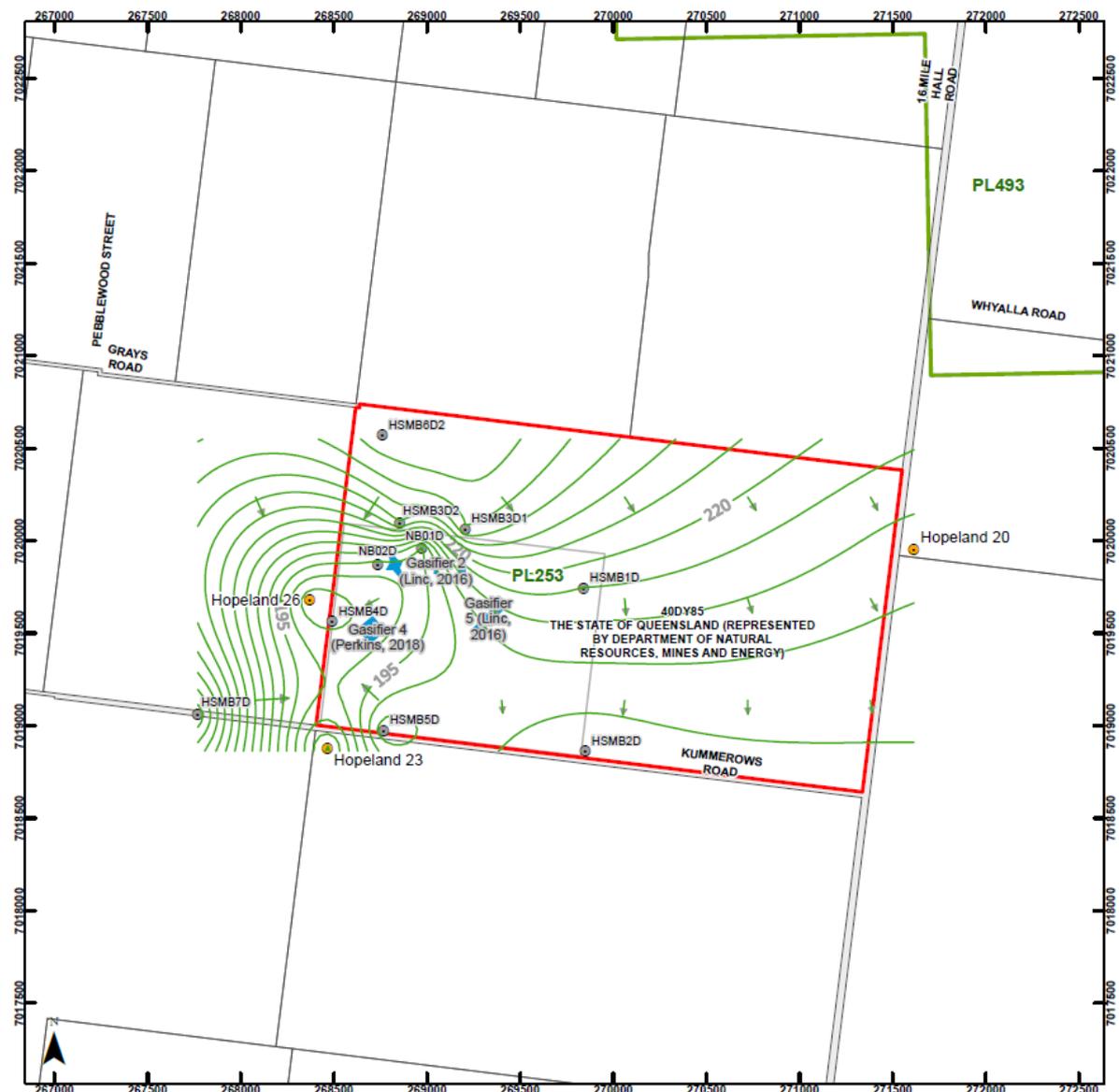
Coordinate System: GDA 1994 MGA Zone 56  
Scale @ A4: 1:20,000

**Legend**

- Arrow Monitoring Bores
- On-site Monitoring Locations
- Subject Property
- Gasifiers (1 to 5)
- Former UCG mining lease area
- Property Boundary
- Road
- PL (Arrow Granted)
- SS DTW Q225
- SS DTW Q225Poly

	Based on on/combine data provided by the State of Queensland. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.	Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is as accurate, reliable, complete, current or suitable as possible, the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it.												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Rev</th> <th>Date</th> <th>Revision Description</th> </tr> <tr> <td>2</td> <td>01/05/2024</td> <td>Update contour lines</td> </tr> <tr> <td>1</td> <td>11/10/2022</td> <td>Remove wells, add track</td> </tr> <tr> <td>0</td> <td>21/09/2022</td> <td>Issued for information</td> </tr> </table>	Rev	Date	Revision Description	2	01/05/2024	Update contour lines	1	11/10/2022	Remove wells, add track	0	21/09/2022	Issued for information	© Commonwealth of Australia (Geoscience Australia) 2020. This material is released under the Creative Commons Attribution 4.0 Australia License. <a href="https://creativecommons.org/licenses/by/4.0/">https://creativecommons.org/licenses/by/4.0/</a> . The creation, reuse, number of uses, size & location of similar information are approximate only and may vary.	Date Source: Arrow Energy Limited, GSPalib <b>Status: IFI</b> <b>Issued To: S. Herbert</b> <b>Author:</b>
Rev	Date	Revision Description												
2	01/05/2024	Update contour lines												
1	11/10/2022	Remove wells, add track												
0	21/09/2022	Issued for information												
Document: \\na.ia.comnet.com/ifs/APAC/Brisbane-AUBNE1/Secure/Projects/607x/60727821_Hopeland_2024_MIP/900_CAD_GIS/920_GIS/Work/Arrow_GW/Contour/figures_JA_2024/0715/GWContours_Q424_2025/0716.aprx		Print Date: 18/07/2025												

Figure 3-2: Springbok Sandstone Groundwater Contours (mAHD) in Q2 2025



Tenement: PL253  
 LotPlan/s: 40DY85  
 Project Name: Hopland 253 Development  
**Figure 3-3: Macalister Coal Seam Groundwater Contours (mAHd) Q2 2025**

Metres 0 300 600 900 1,200  
 Coordinate System: GDA 1994 MGA Zone 56  
 Scale @ A4: 1:30,000

**Legend**

- Arrow Monitoring Bores
- On-site Monitoring Locations
- ▭ Subject Property
- ▭ Gasifiers (1 to 5)
- ▭ Former UCG mining lease area
- ▭ PL (Arrow Granted)
- ▭ Property Boundary
- ▭ Road
- ▭ Water
- ▭ MAC DTW Q225
- ▭ MAC DTW Q225 Poly

REV	Date	Revision Description	BY	CHKD	APPD
2	01/05/2024	Update contour lines	HM	CS	HM
1	11/10/2022	Remove wells, add track	TS	SH	TS
0	21/06/2022	Issued for information	CO	SH	CO

Document: I:\na.aecomnet.com\ifs\APAC\Brisbane-AUBNE\1\Secure\Projects\607\60727821\_Hopland\_2024\_MP\900\_CAD\_GIS\900\_GIS\Work\Arrow\_GW\ContourFigures\_JA\_20240715\GWContours\_Q424\_20250718.aprx

Print Date: 18/07/2025

Figure 3-3: Macalister coal seam Groundwater Contours (mAHd) in Q2 2025

### 3.3 Groundwater Level and Reservoir Pressure

Groundwater level and reservoir pressure time series (combined water level and formation gas pressure), and reservoir pressure contours plotted using monitoring bores' data (refer to Table 3-1) screened within Wambo coal seam, Springbok Sandstone, Macalister seam package are provided from Figure 3-4 to Figure 3-9.

It can be observed that groundwater level, in general, fluctuates in tandem with the corresponding reservoir pressure at the monitoring locations.

Pressures in the Wambo seam (Figure 3-4 and Figure 3-5) are higher than those in the shallower Macalister seam (Figure 3-8 and Figure 3-9), indicating an upward vertical pressure gradient between these coal packages. Consequently, groundwater cannot move from the Macalister to the Wambo seam.

Reservoir pressures in Springbok Sandstone (Figure 3-6 and Figure 3-7) are higher than those in the underlying Macalister seam, indicating a downward vertical pressure gradient between these two units.

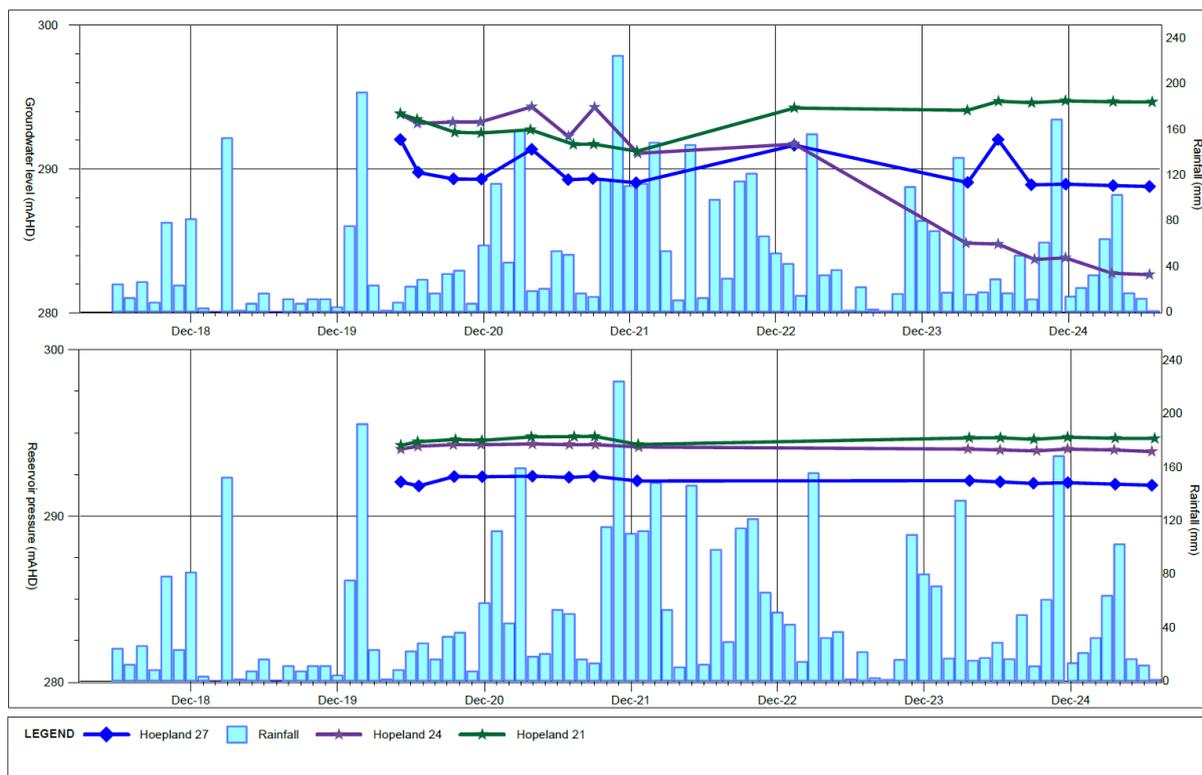


Figure 3-4: Wambo Coal Seam Groundwater Level and Reservoir Pressures Time Series in Q2 2025



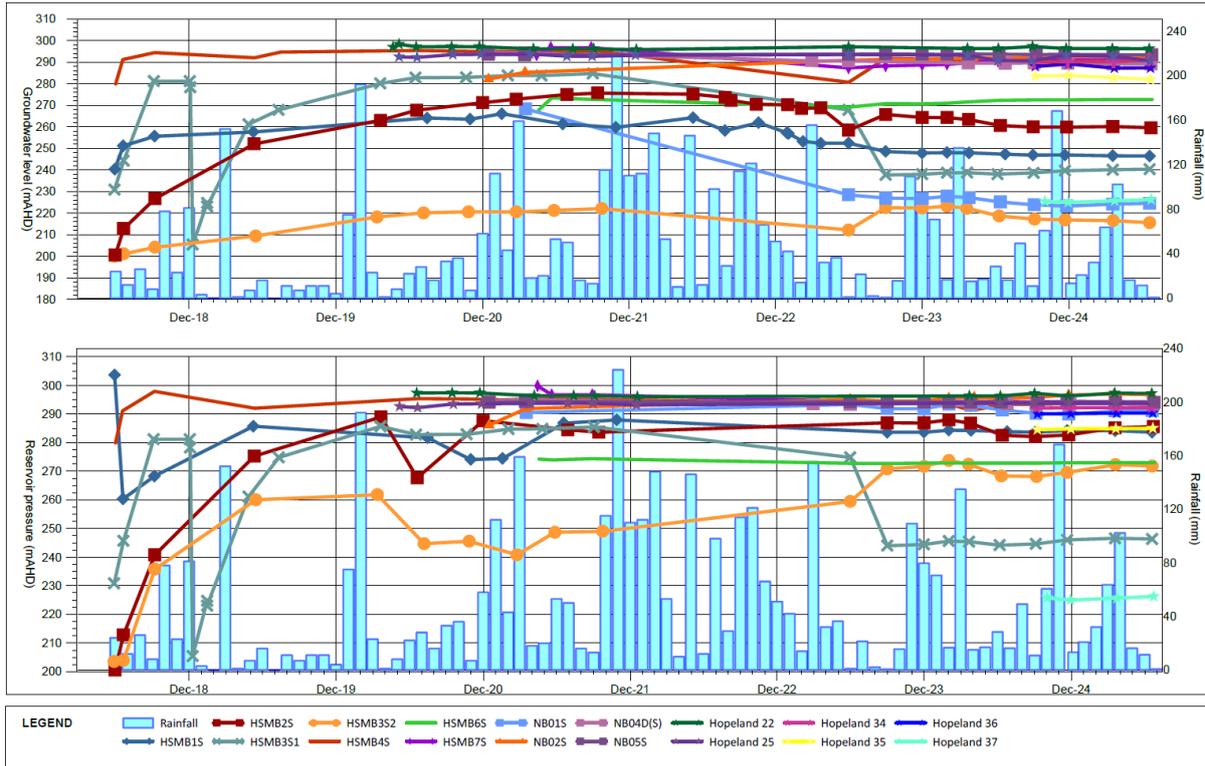
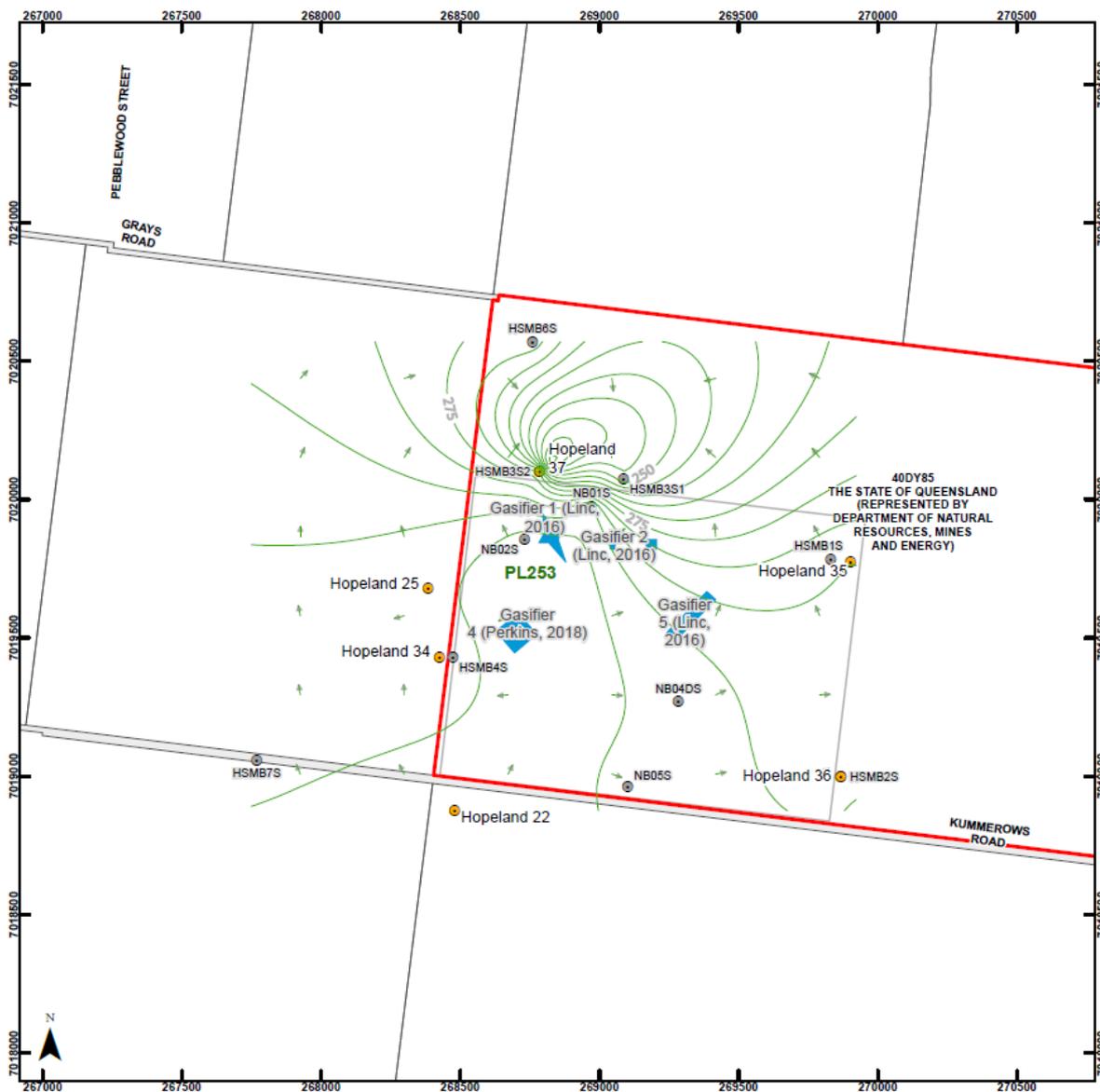


Figure 3-6: Springbok Sandstone Groundwater Level and Reservoir Pressures Time Series in Q2 2025



**Location Diagram**

**Tenement: PL253**  
**LotPlan/s: 40DY85**  
**Project Name: Hopeland 253 Development**  
**Figure 3-7: Springbok Sandstone Reservoir Pressure Contours (mAHd) Q2 2025**

Coordinate System: GDA 1994 MGA Zone 56  
 Scale @ A4: 1:20,000

**Legend**

- Arrow Monitoring Bores
- On-site Monitoring Locations
- Subject Property
- ▶ Gasifiers (1 to 5)
- Former UCG mining lease area
- Property Boundary
- Road
- PL (Arrow Granted)
- SS RP Q225
- SS RP Q125Poly

Rev	Date	Revision Description	By	Check	Appr
2	01/05/2024	Update contour lines	HM	—	HM
1	11/10/2022	Remove wells, add track	TS	SH	SH
0	21/06/2022	Issued for information	CD	SH	SH

Based on or combine data provided by the State of Queensland. In consideration of the State permitting use of the data you acknowledge and agree that the State gives no warranty in relation to the data (including its accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Commonwealth of Australia (Geoscience Australia) 2020. This material is released under the Creative Commons Attribution 4.0 International License. <https://creativecommons.org/licenses/by/4.0/>. The dimensions, areas, number of cells, size & location of contour information are approximate only and may vary.

Note: The information shown on this map is a copyright of Arrow Energy Limited and, where applicable, its affiliates and co-venturers.

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no warranty is given that the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it.

Date Source: Arrow Energy Limited, QGspace

**arrowenergy** Status: IFI  
 Issued To: S.Herbert  
 Author: **(1)**

Figure 3-7: Springbok Sandstone Reservoir Pressure Contours (mAHd) in Q2 2025

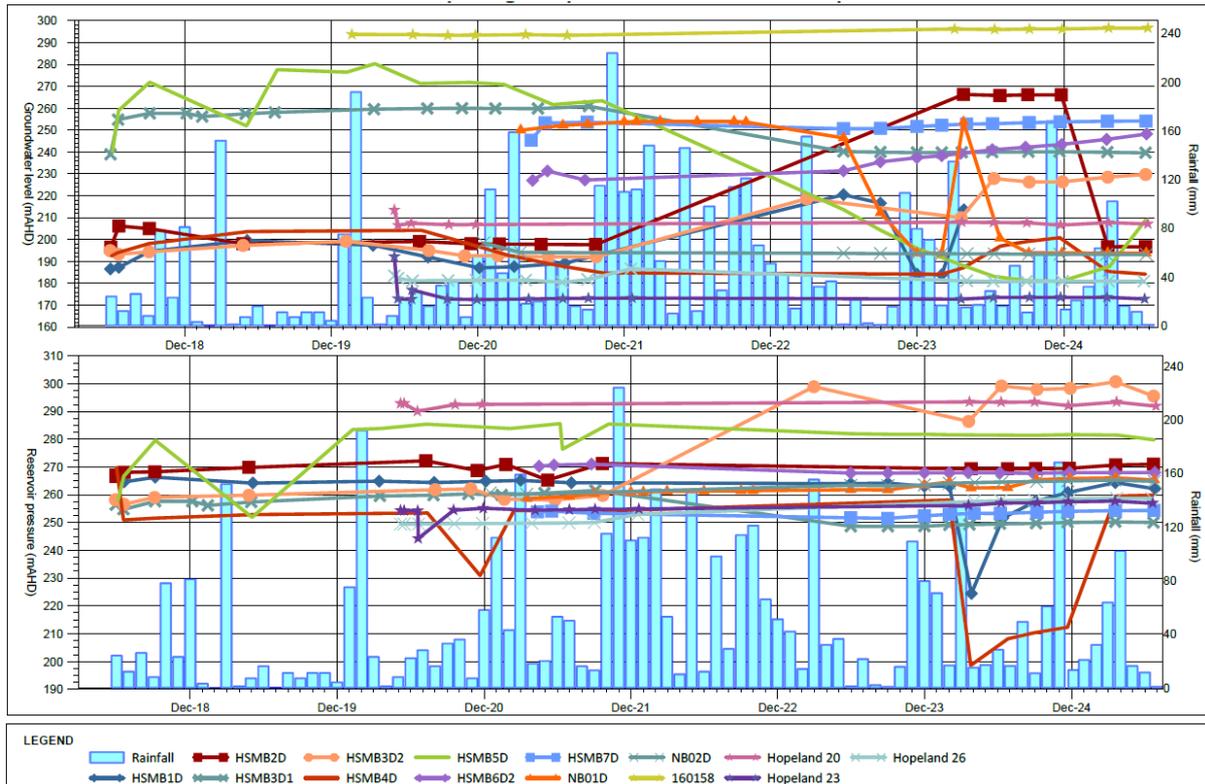
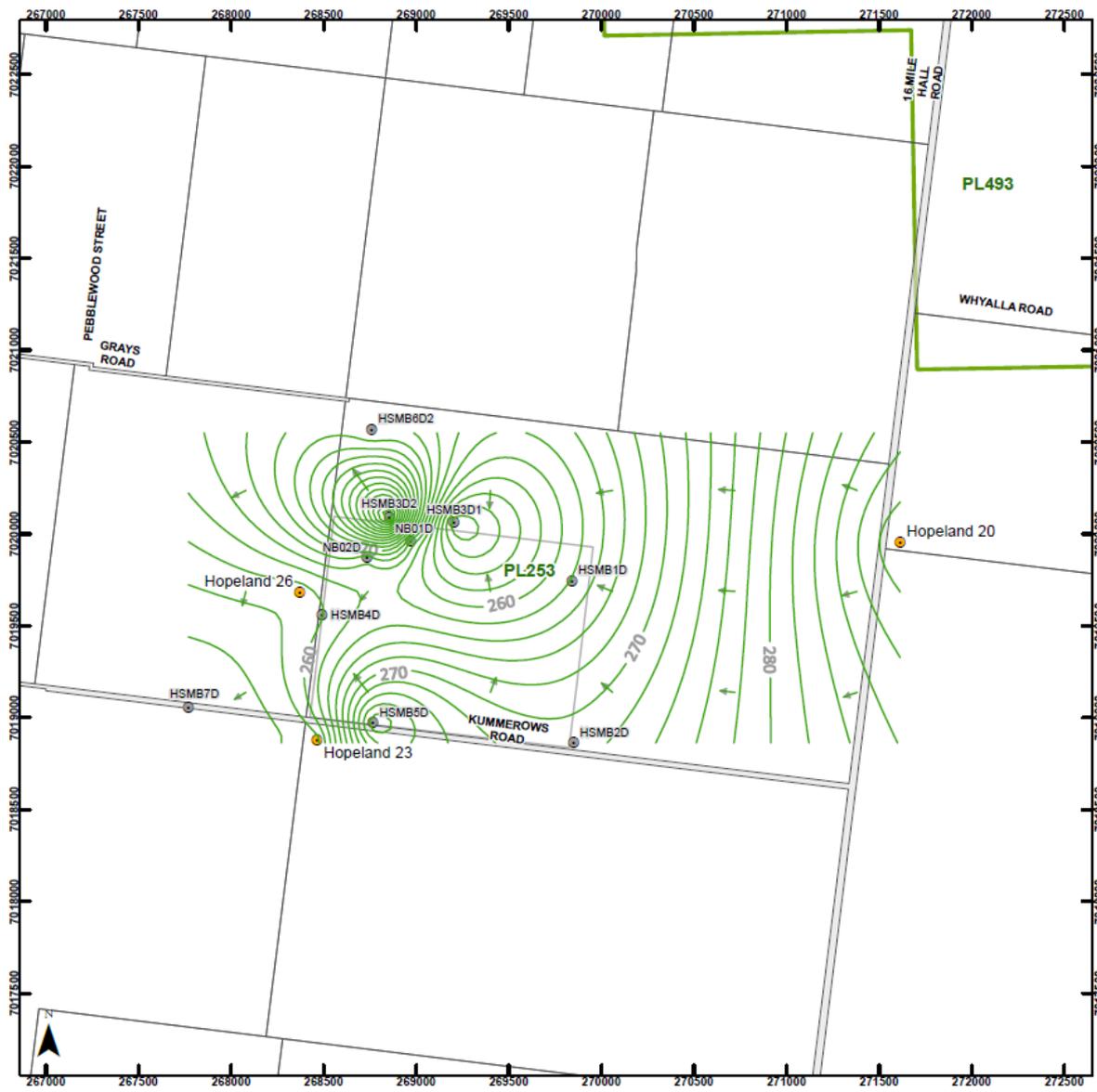


Figure 3-8: Macalister Seam Package Groundwater Level and Reservoir Pressures Time Series in Q2 2025



**Location Diagram**

Tenement: PL253  
 Lot/Plan/s: 40DY85  
 Project Name: Hopeland 253 Development  
**Figure 3-9: Macalister Coal Seam Reservoir Pressure Contours (mAH) Q2 2025**

Coordinate System: GDA 1994 MGA Zone 56  
 Scale @ A4: 1:30,000

**Legend**

- Arrow Monitoring Bores
- On-site Monitoring Locations
- Former UCG mining lease area
- PL (Arrow Granted)
- Property Boundary
- Road
- Water
- MAC RP Q225
- MAC RP Q225Poly

Rev	Date	Revision Description	By	Check	Appr
2	01/05/2024	Update contour lines	MM	SH	MM
1	11/10/2022	Remove wells, add track	TS	SH	SH
0	21/06/2022	Issued for information	CD	SH	SH

Based on or contains data provided by the State of Queensland. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including but not limited to accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Commonwealth of Australia (Geoscience Australia) 2020. This material is released under the Creative Commons Attribution 4.0 Australia license - CC-BY-NC-ND (https://creativecommons.org/licenses/by-nc-nd/4.0/au/). The dimensions, area, number of lots, size & location of similar information are approximate only and may vary.

Note: The information shown on this map is a copyright of Arrow Energy Limited and, where applicable, its affiliates and co-venturers.

Disclaimer: Whilst all reasonable care has been taken to ensure the information contained on this map is as accurate, no warranty is given that the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it.

Date Source: Arrow Energy Limited, QGIS

**Surat Basin**

Status: IFI  
 Issued To: S.Herbert  
 Author: **(1)**

Figure 3-9: Macalister coal seam Reservoir Pressure Contours (mAH) in Q2 2025

### 3.4 Groundwater Quality

The results of the groundwater quality monitoring are provided in the following sections:

- **Section 3.4.1** analyses trends observed in groundwater quality data with respect to potential contaminants listed in Table 1-2.
- **Section 4** compares analytical results against investigation limits to determine whether the results indicate contaminants from UCG operations are detected within on-site and off-site Lot 40 DY85 bores (including new monitoring bores) or landholder water bores (refer to Table 1-1 and Table 3-1).

The laboratory reports of the groundwater quality monitoring and sampling completed during Q2 2025 monitoring event are shown in Appendix A. Appendix B contains an assessment of the quality assurance and quality control (QA and QC) used during the monitoring to determine if the analytical results data set is valid.

#### 3.4.1 Groundwater Quality Trends Analysis

Groundwater quality trends analysis is conducted by plotting concentration time-series of contaminants listed in Table 1-2. These plots<sup>1</sup> (from Figure 3-10 to Figure 3-46) aid in better understanding the current status and history of these contaminants, and how their concentrations evolve with time. The following observations have been made:

##### Phenol

- In Q2 2025, consistent with previous monitoring events, Phenol concentration in the monitoring bores (Hopeland 21, Hopeland 24, and Hopeland 27) screened within Wambo coal seam (Figure 3-10) was below the investigation limit (LOR = 1 µg/L, Investigation Limits > LOR). Except for a short period in 2020, Phenol concentration in Hopeland 24 and Hopeland 27 has been always below the investigation limit (Figure 3-10).
- In Q2 2025, in the monitoring bores screened within Springbok Sandstone, Phenol concentration in HSMB6S, HSMB7S, NB04D(S), RN 147004, Hopeland 22, Hopeland 25, and Hopeland 35 was below the investigation limit (Figure 3-11), while it was above the investigation limit in NB02S, NB05S, HSMB1S, HSMB2S, HSMB3S1, HSMB3S2, HSMB4S, NB01S, Hopeland 34, Hopeland 36, and Hopeland 37. It should be noted that in Q2 2025, unlike Q1 2025, phenol concentrations in HSMB7S and Hopeland 35 were below the investigation limit. In contrast, the phenol concentration in HSMB3S2 was above the investigation limit.
- In Q2 2025, similar to previous quarters, the Phenol concentration in the monitoring bores screened within Macalister seam package, including Arrow's monitoring bores Hopeland 23, and Hopeland 26 (Figure 3-12), was below the investigation limit (except for HSMB1D and HSMB4D which their Phenol concentration was historically above the investigation limit). The Phenol concentration in HSMB7D remained below both the

<sup>1</sup> Note that where laboratory reports identify analytes have not been detected (< LOR), these have been depicted as half of the LOR on the plots for display purposes only and do not indicate an actual concentration.

investigation limit and the LOR, consistent with results from previous monitoring events in Q3 and Q4 2024, and Q1 2025. In Q2 2025, the Phenol concentration in HSMB5D fell below the investigation limit.

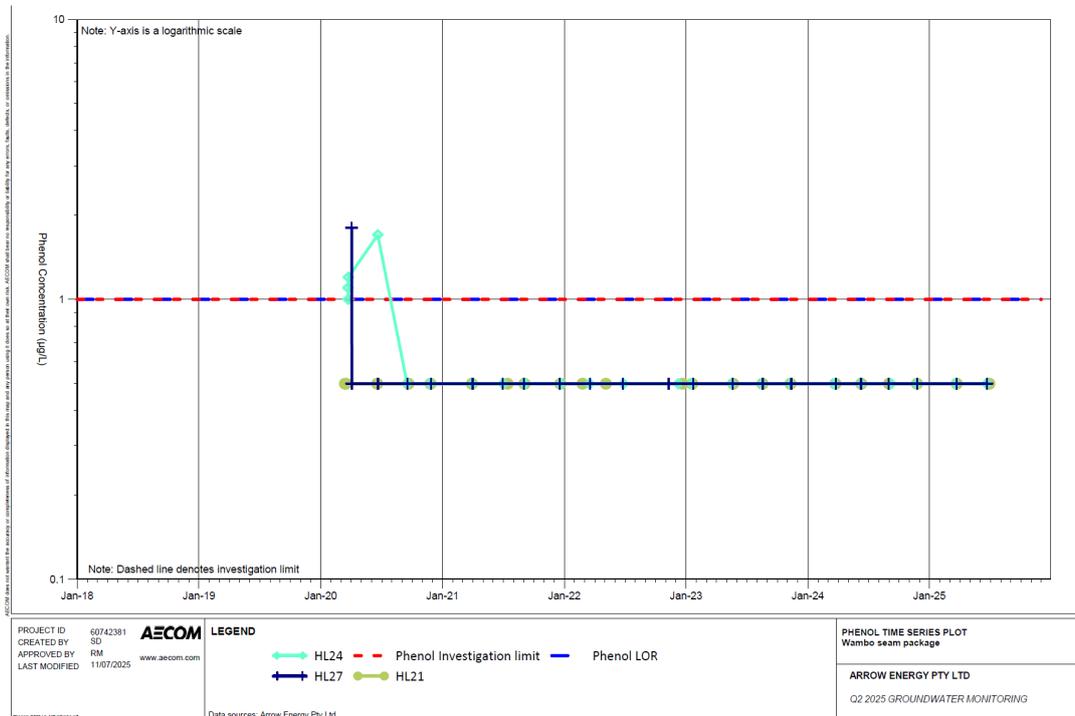


Figure 3-10: Phenol Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

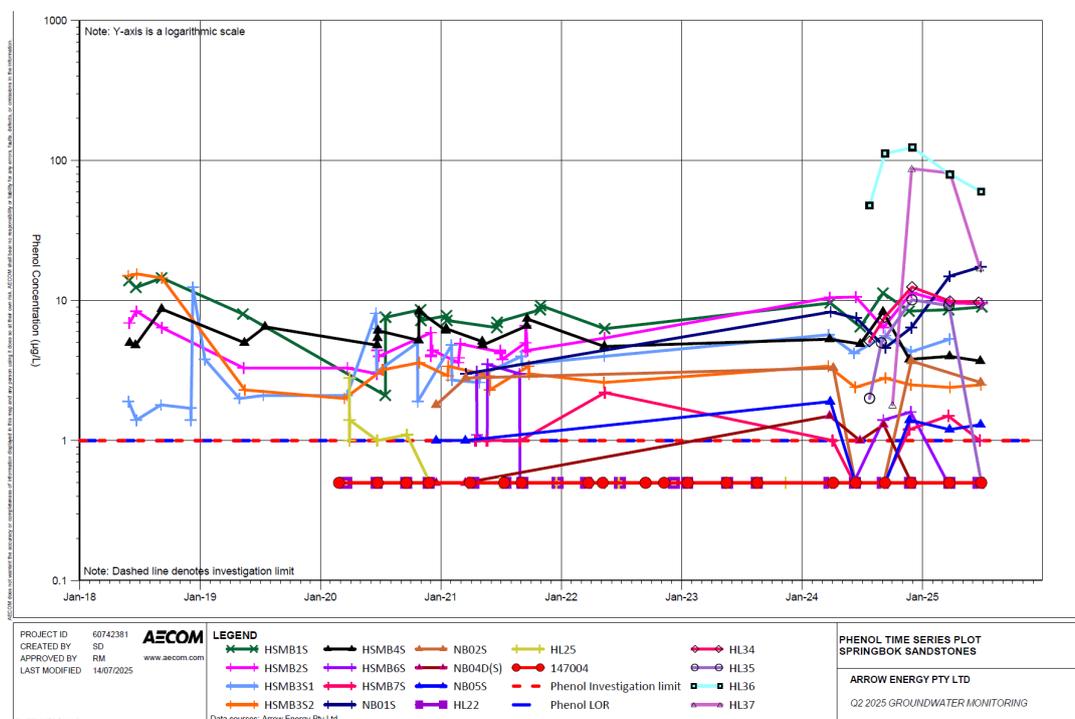
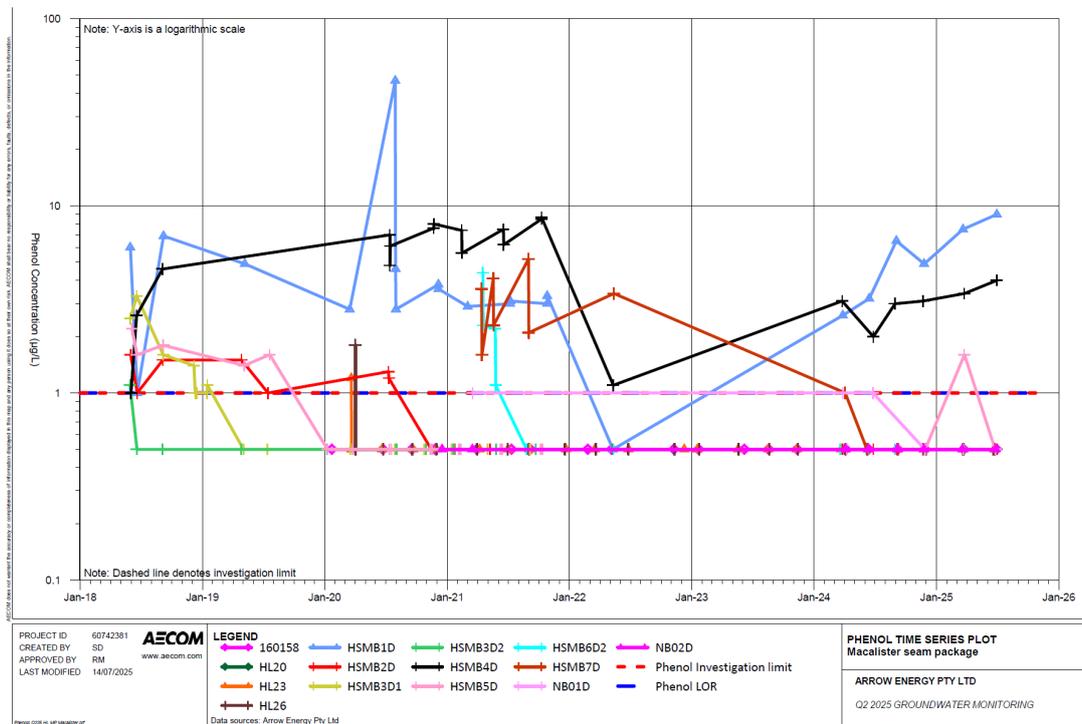


Figure 3-11: Phenol Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone



**Figure 3-12: Phenol Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package**

**2-Chlorophenol**

- In Q2 2025, consistent with previous monitoring events, no exceedances of 2-Chlorophenol above the investigation limit (LOR = 1 µg/L, Investigation Limits > LOR) was identified in the monitoring bores screened in the Wambo coal seam, Springbok Sandstone, or Macalister seam package (Figure 3-13, Figure 3-14, and Figure 3-15).

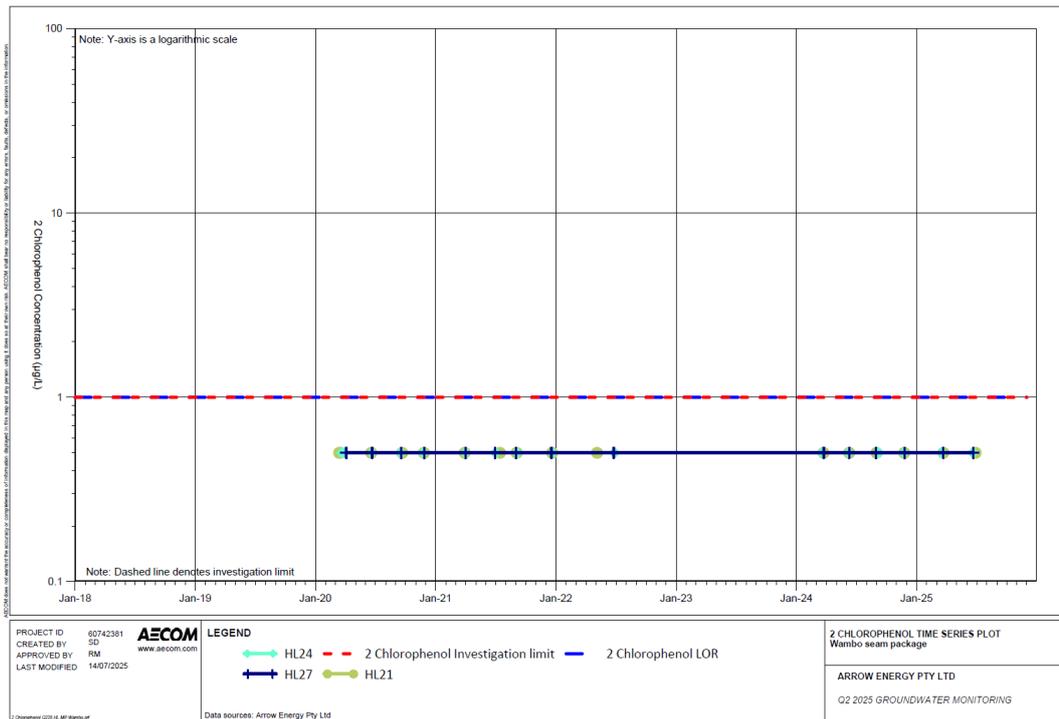


Figure 3-13: 2-Chlorophenol Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

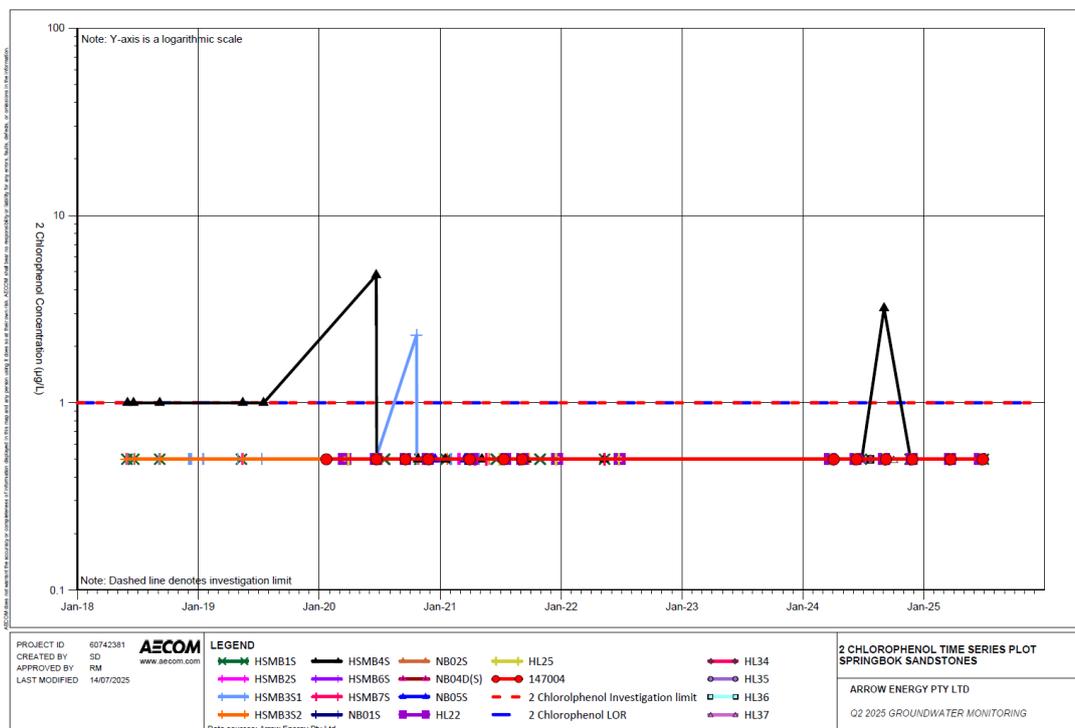


Figure 3-14: 2-Chlorophenol Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone

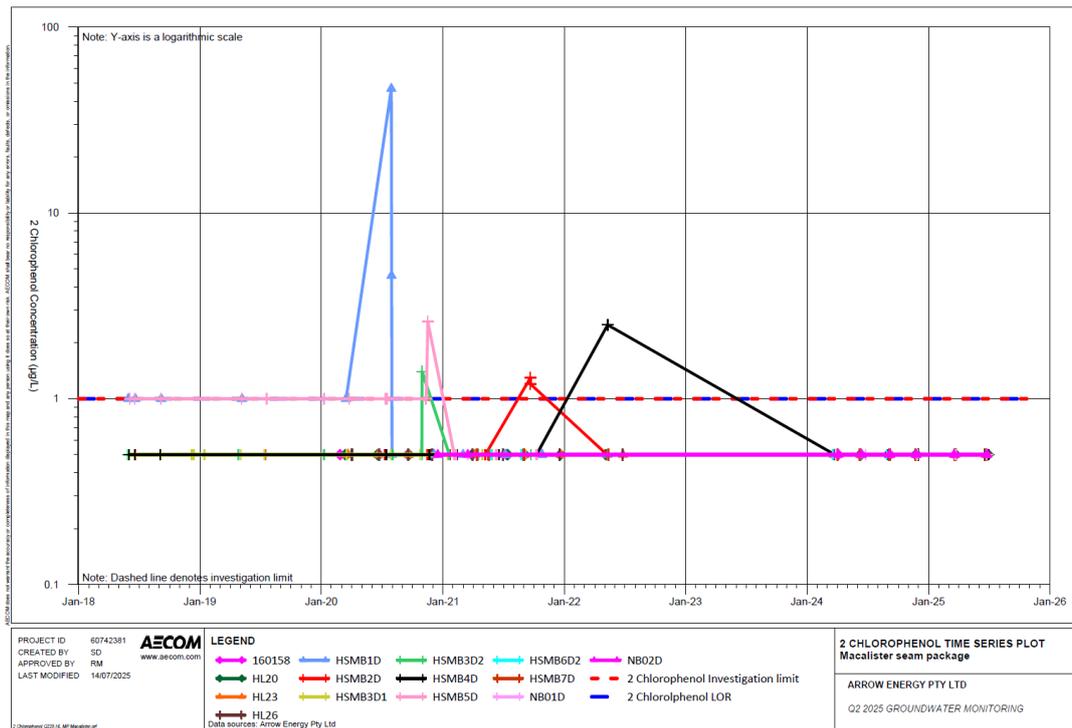


Figure 3-15: 2-Chlorophenol Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package

2-Methylphenol

- In Q2 2025, similar to Q1 2025, no exceedances of 2-Methylphenol above the investigation limit (LOR = 1 µg/L) were detected in the monitoring bores screened in the Wambo coal seam or Macalister seam package (Figure 3-16 and Figure 3-18). However, exceedances were observed in Hopeland 34 and NB01S screened in the Springbok Sandstone, consistent with the previous monitoring event (Figure 3-17). Unlike Q1 2025, in Q2 2025 no exceedances of 2-Methylphenol above the investigation limit was reported in Hopeland 37.

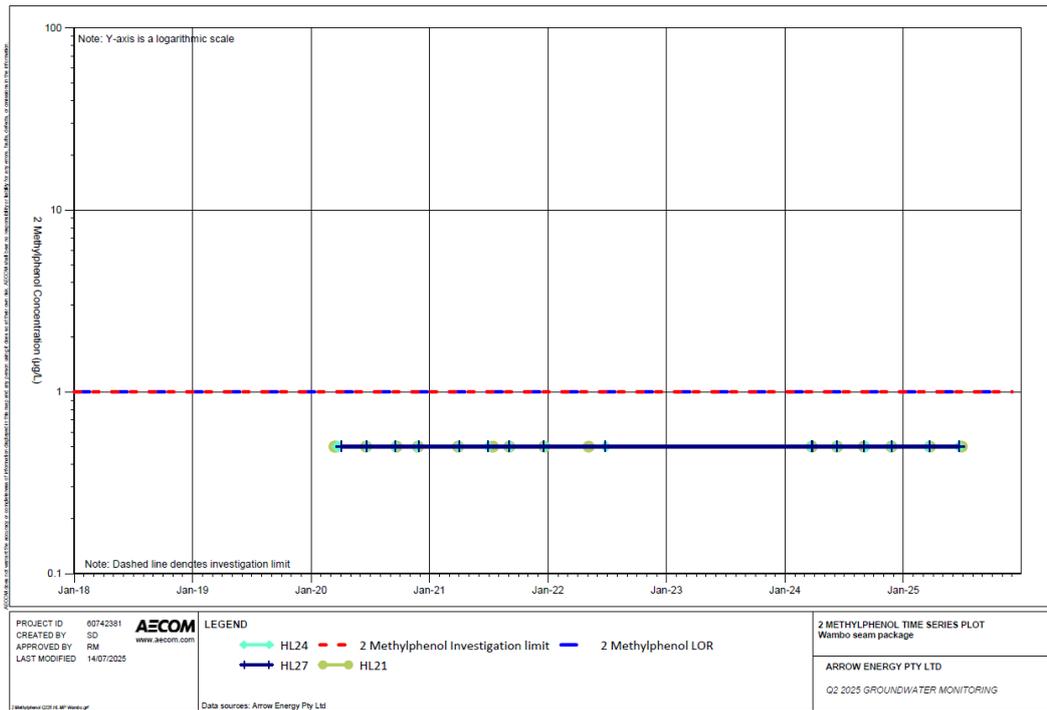


Figure 3-16: 2-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

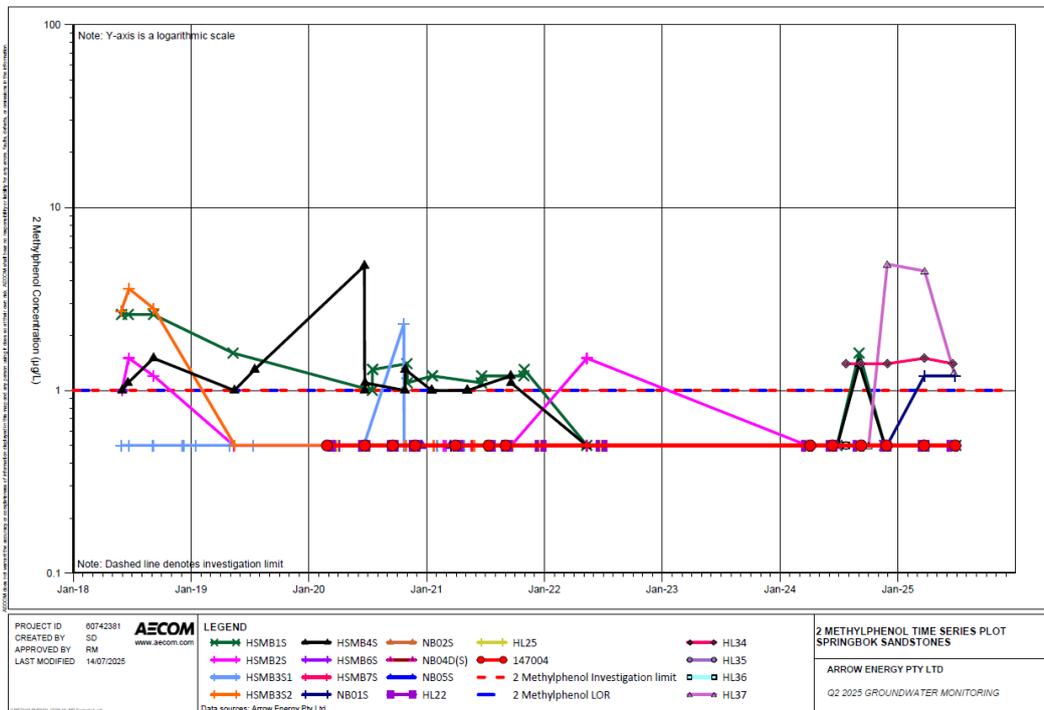
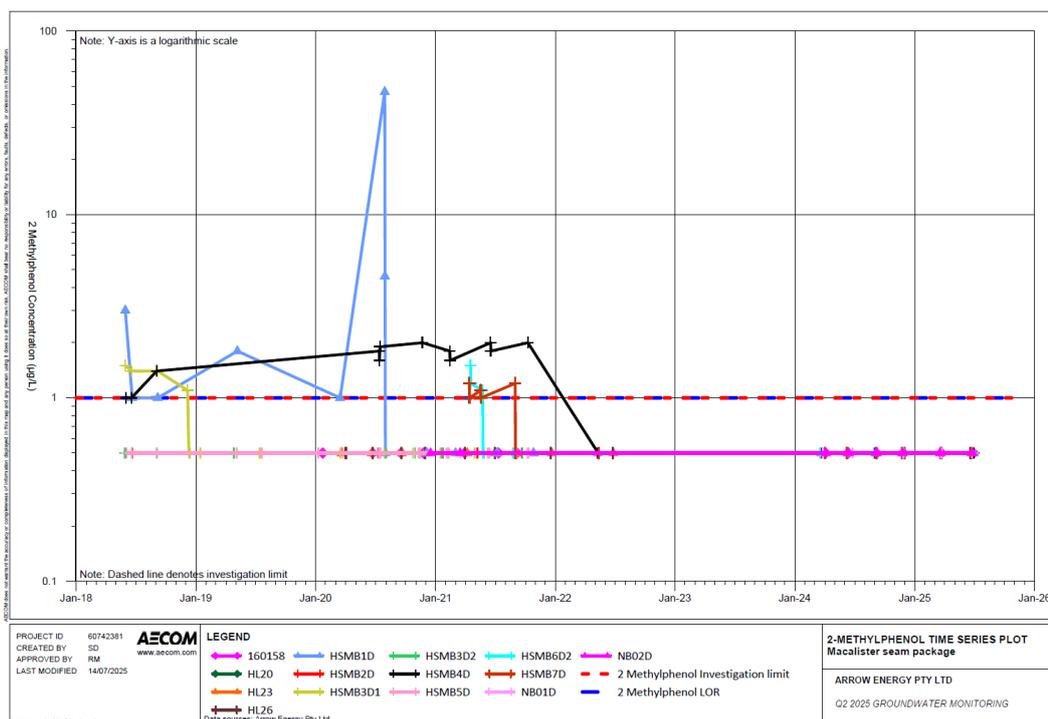


Figure 3-17: 2-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone



**Figure 3-18: 2-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package**

### 3- & 4-Methylphenol

- In Q2 2025, consistent with previous quarters, 3- & 4-Methylphenol concentration in the monitoring bores (Hopeland 21, Hopeland 24, and Hopeland 27) screened within Wambo coal seam (Figure 3-19) was below the investigation limit (LOR = 2 µg/L, Investigation Limits > LOR). It should be noted that except for a short period in 2020, 3- & 4-Methylphenol concentration in above-mentioned bores has been always below the investigation limit.
- In Q2 2025, as in previous quarters, the concentration of 3- & 4-Methylphenol in the monitoring bores screened within the Springbok Sandstone was below the investigation limit, except for NB01S, NB02S, Hopeland 34, Hopeland 36, and Hopeland 37 (Figure 3-20).
- In Q2 2025, similar to previous quarters, 3- & 4-Methylphenol concentration in the monitoring bores, including Arrow’s monitoring bores Hopeland 23 and Hopeland 26, screened within Macalister seam package (Figure 3-21) was below the investigation limit, except for HSMB1D and HSMB4D with historical records of this analyte above the investigation limit. Unlike the previous quarter, in Q2 2025, no exceedances of 3- & 4-Methylphenol above the investigation limit was reported in HSMB5D.

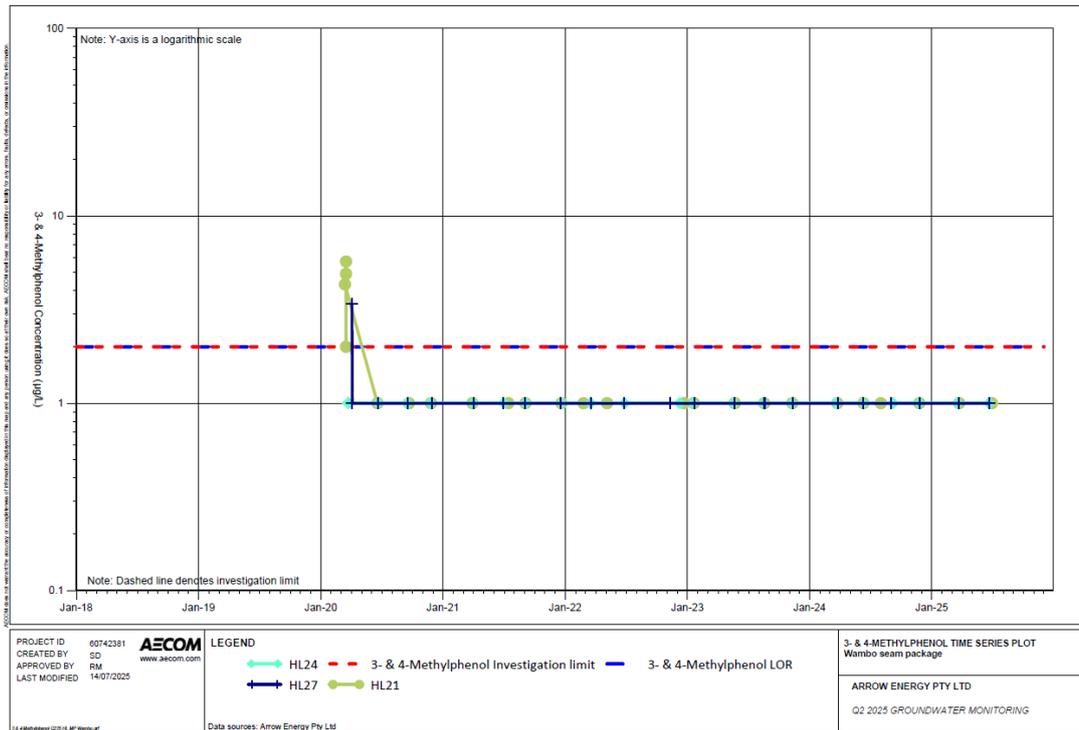


Figure 3-19: 3- & 4-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

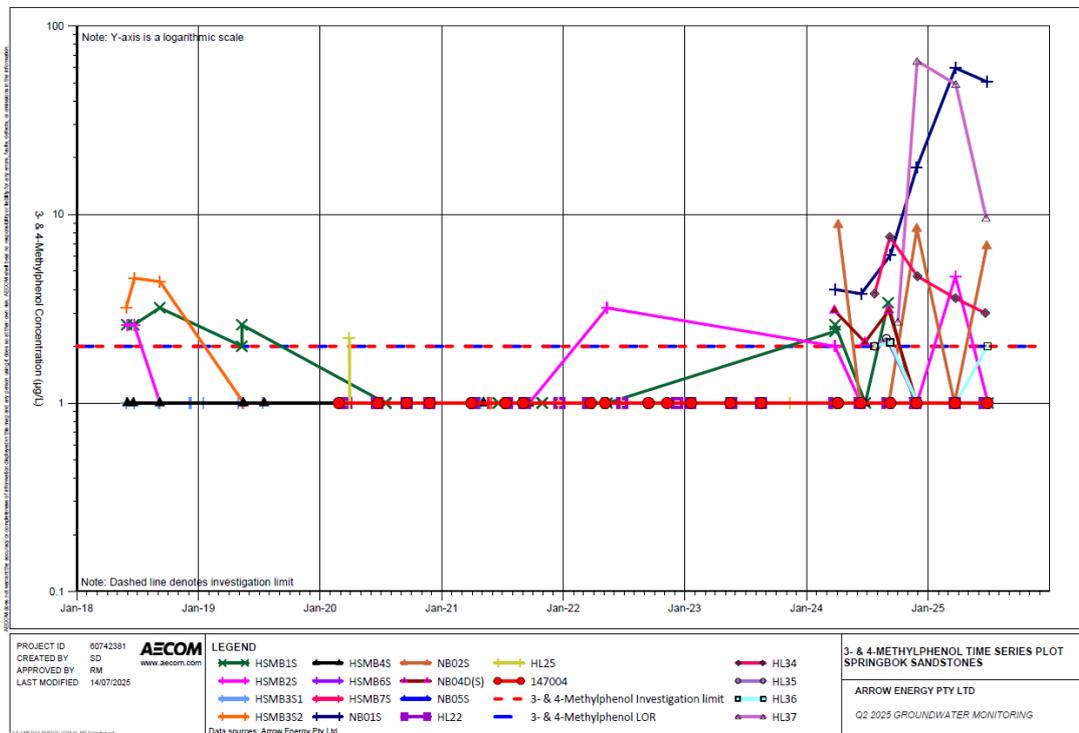
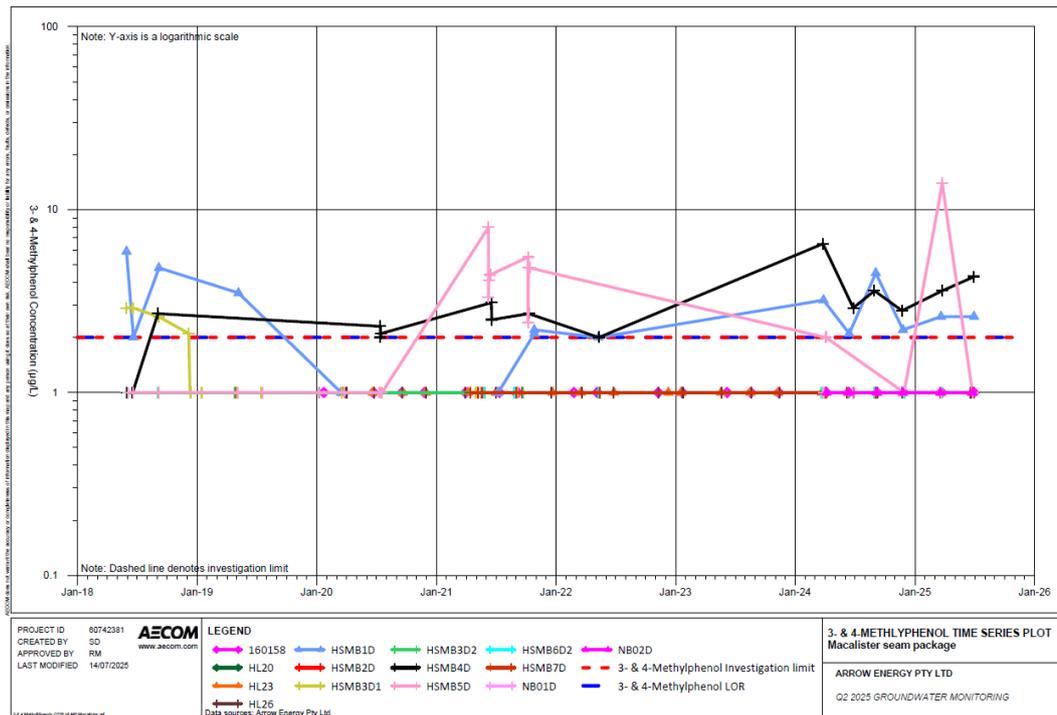


Figure 3-20: 3- & 4-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone



**Figure 3-21: 3- & 4-Methylphenol Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package**

**2.4-Dimethylphenol**

In Q2 2025, consistent with previous monitoring events, no exceedances of 2.4-Dimethylphenol above the investigation limit (LOR = 1 µg/L, Investigation Limits > LOR) was identified in the monitoring bores screened in the Wambo coal seam Springbok Sandstone, or Macalister seam package (Figure 3-22, Figure 3-23, and Figure 3-24).

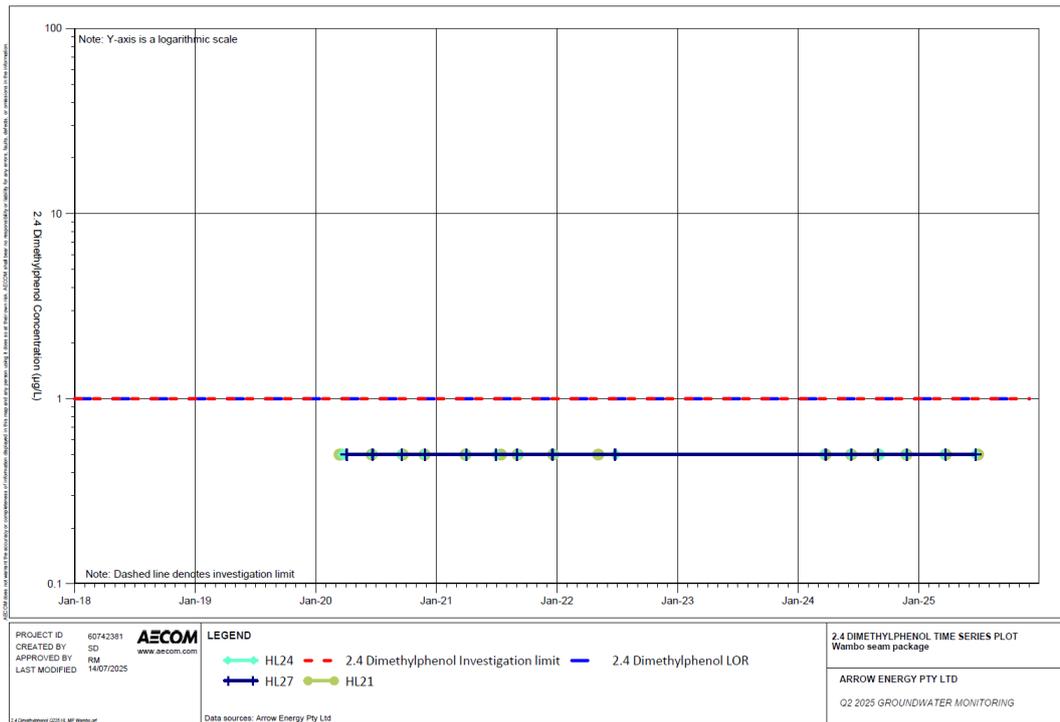


Figure 3-22: 2,4-Dimethylphenol Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

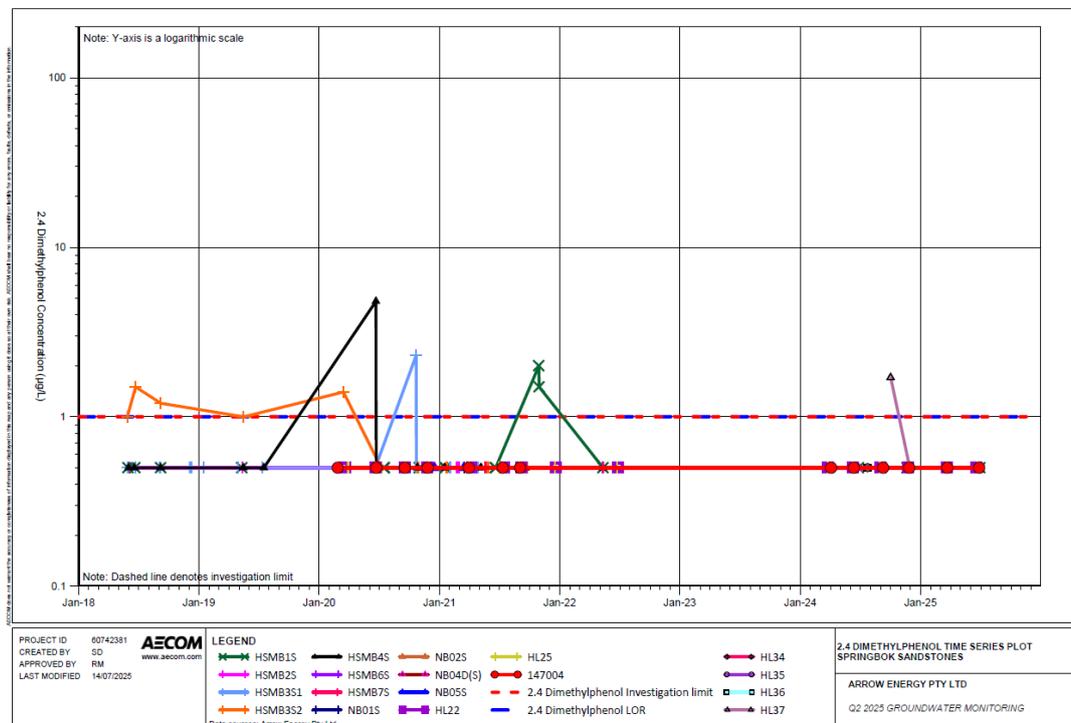
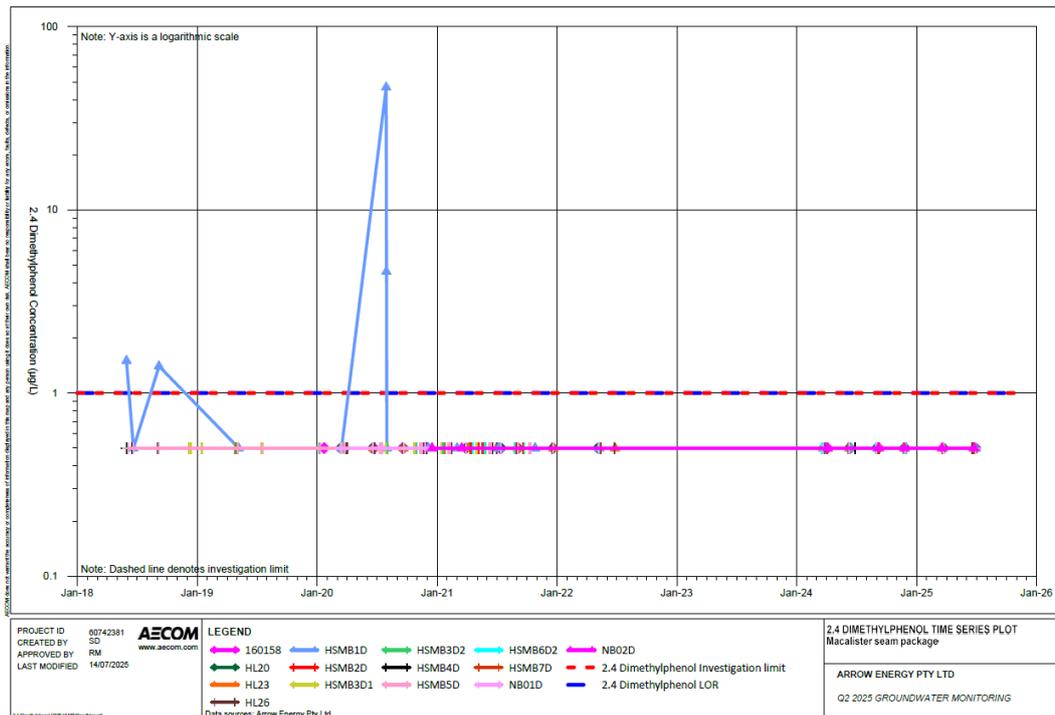


Figure 3-23: 2,4-Dimethylphenol Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone



**Figure 3-24: 2,4-Dimethylphenol Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package**

**Naphthalene**

- In Q2 2025, consistent with previous quarters and historical trends, Naphthalene concentration (Figure 3-25) in the monitoring bores (Hopeland 21, Hopeland 24, and Hopeland 27) screened within Wambo coal seam was below the investigation limit (LOR = 1 µg/L, Investigation Limits > LOR).
- In Q2 2025, consistent with previous quarters, Naphthalene concentration (Figure 3-26) in the monitoring bores HSMB1S, HSMB2S, HSMB3S2, HSMB4S, and NB04D(S) screened within Springbok Sandstone, was at or above the investigation limit. Historically Naphthalene concentration in HSMB1S, HSMB2S, and HSMB4S was also above the investigation limit. In none of Arrow’s monitoring bores screened in this formation (Hopeland 22, Hopeland 25, and Hopeland 34 to Hopeland 37) Naphthalene exceedance above the investigation limit was identified.
- In Q2 2025, consistent with previous quarters, Naphthalene concentration (Figure 3-27) did not exceed the investigation limit in any of the monitoring bores, including Arrows Hopeland 23 and Hopeland 26 screened within Macalister seam package.

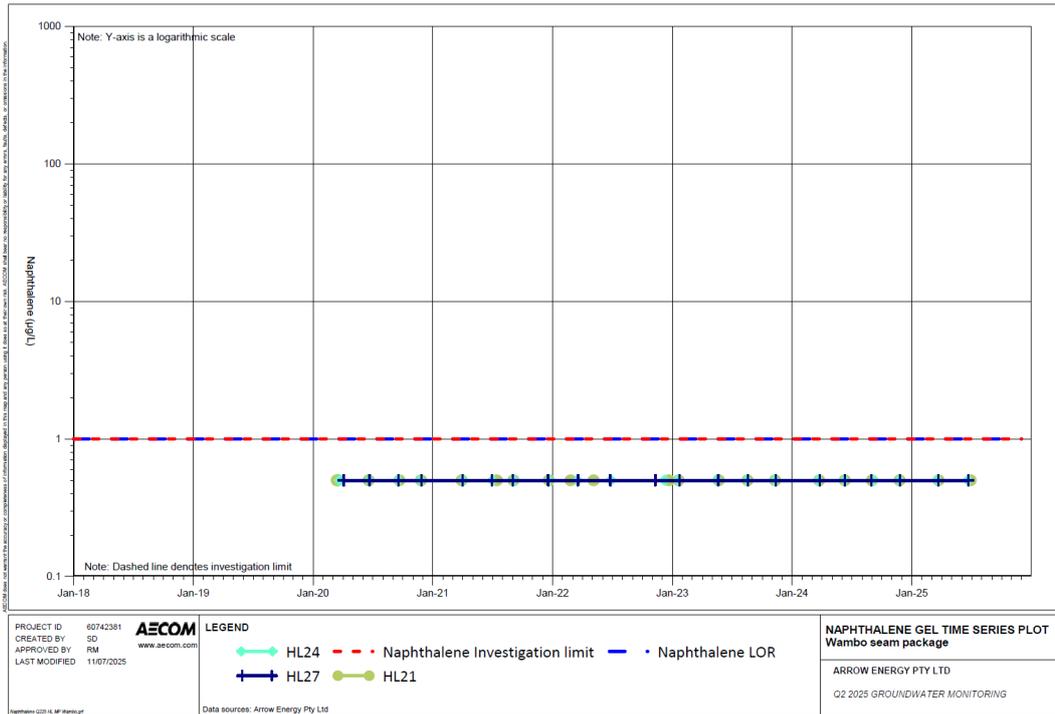


Figure 3-25: Naphthalene Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

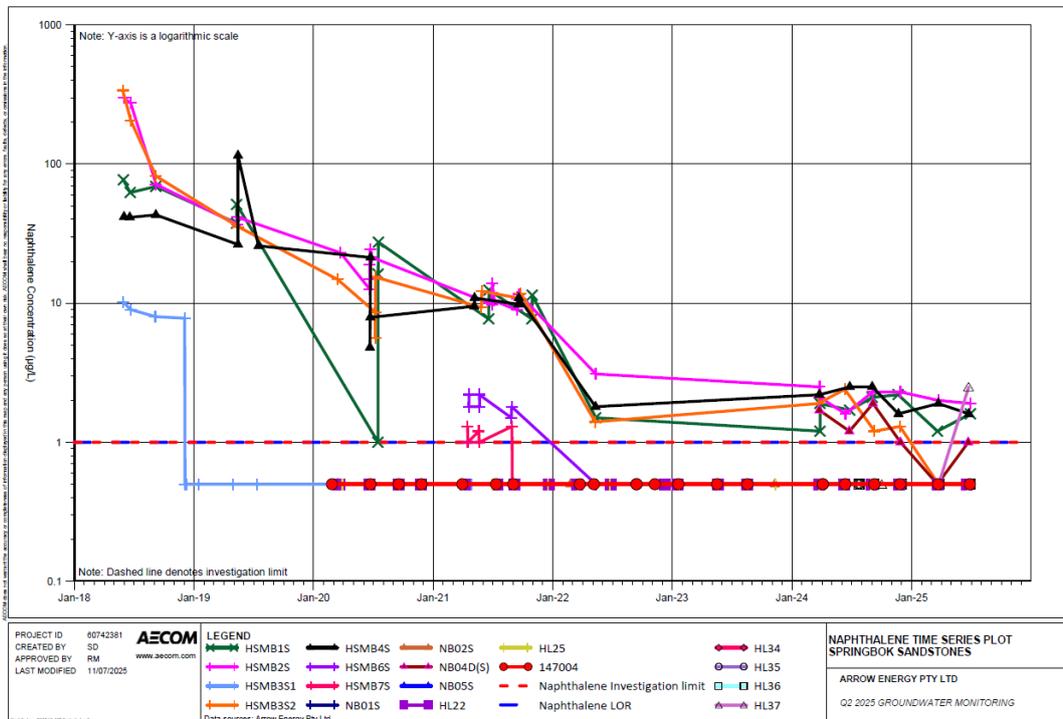


Figure 3-26: Naphthalene Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone

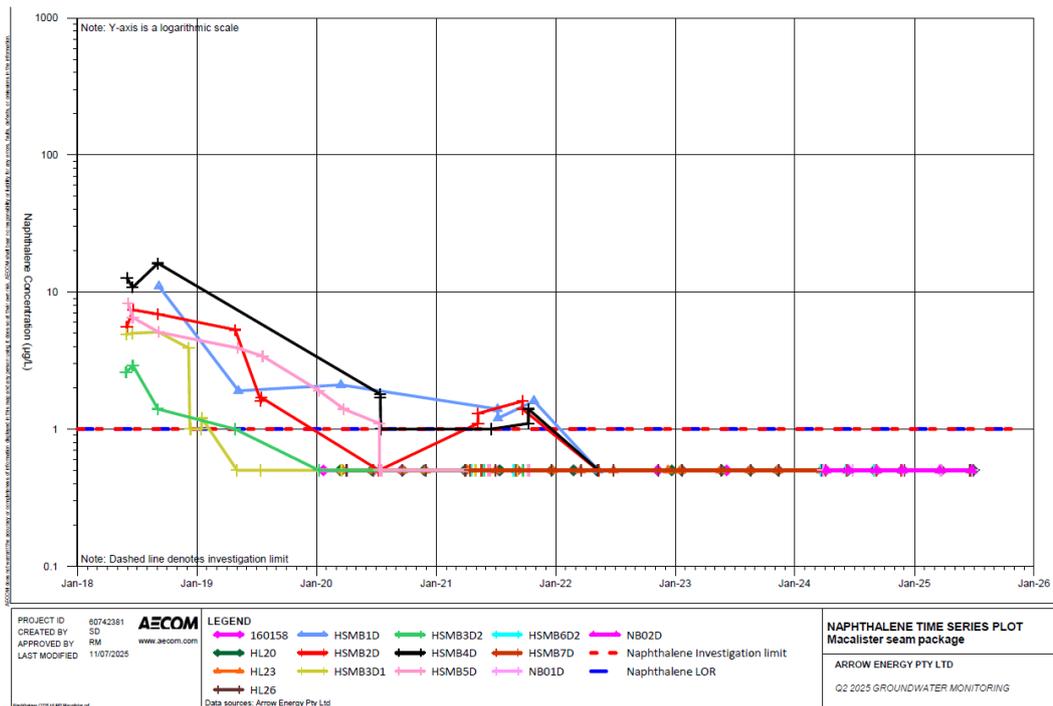


Figure 3-27: Naphthalene Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package

**Total recoverable hydrocarbons (TRH) – Silica gel cleanup**

- In Q2 2025, TRH – Silica gel cleanup concentrations were below investigation limits in all monitoring bores across the Wambo coal seam, Springbok Sandstone, and Macalister seam package (Figure 3-28, Figure 3-29, and Figure 3-30) with no exceedances detected at Hopeland 37 this quarter.

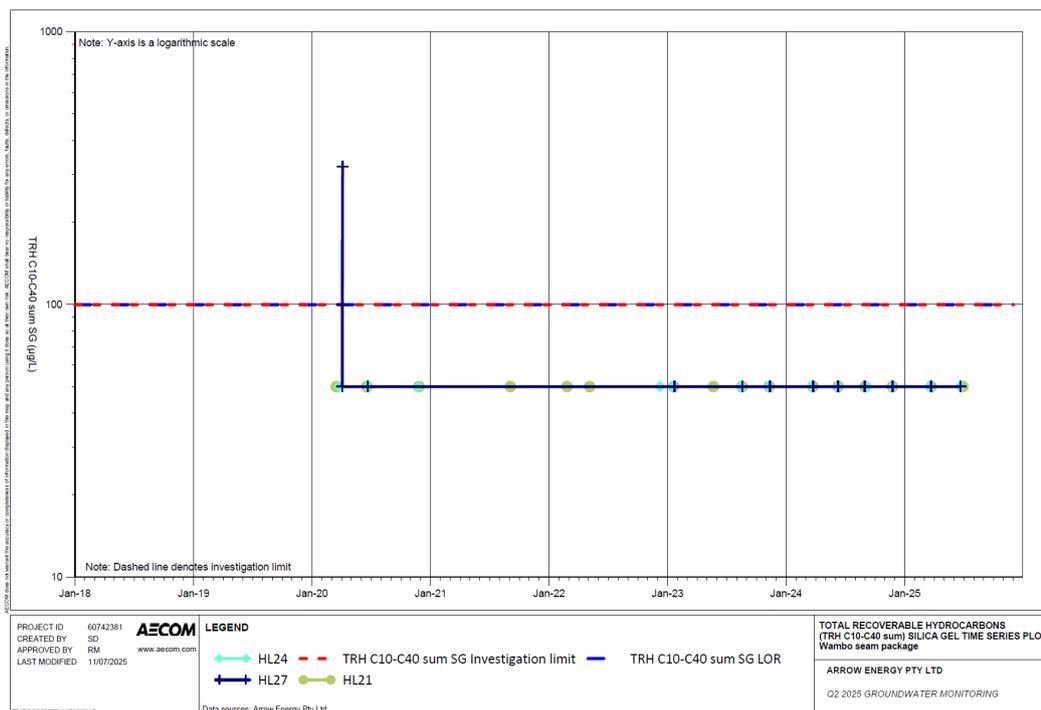


Figure 3-28: TRH – Silica gel cleanup Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

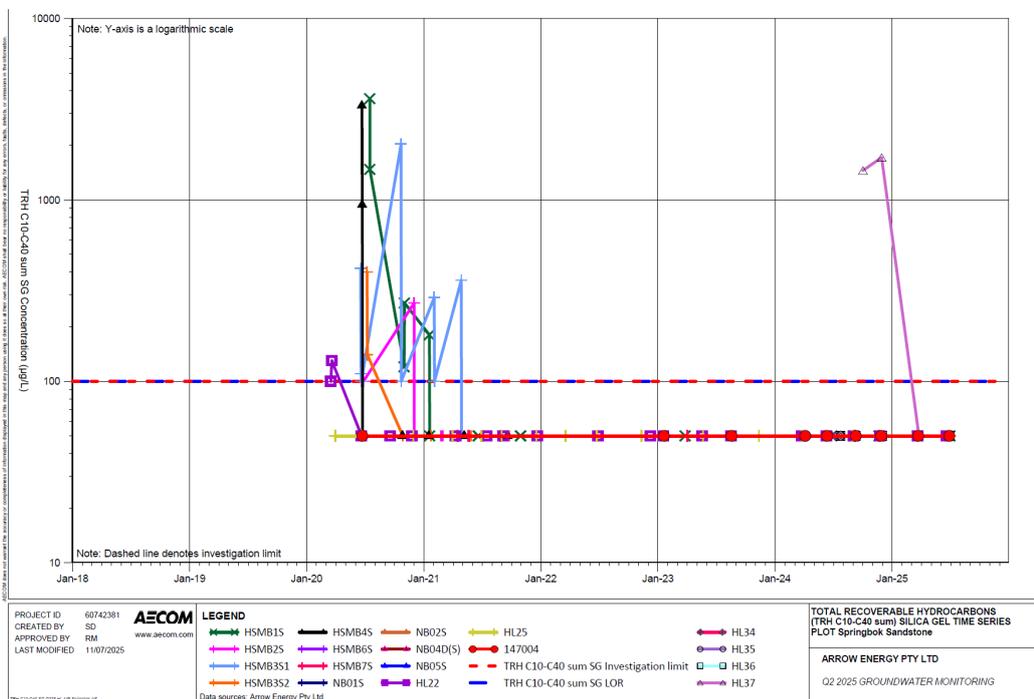
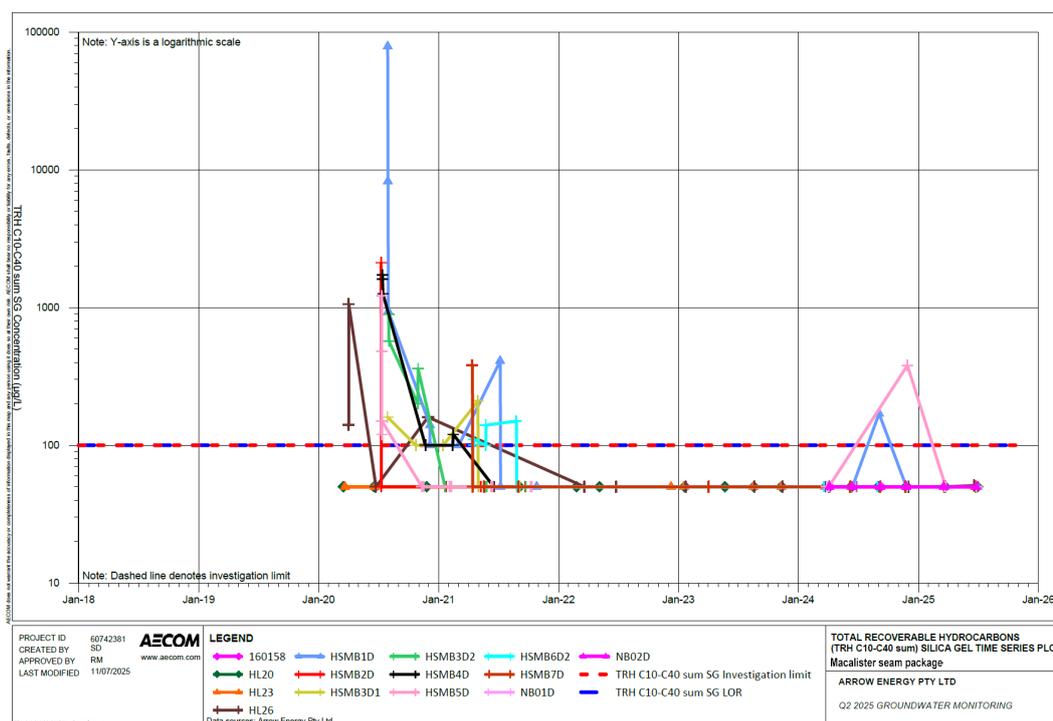


Figure 3-29: TRH – Silica gel cleanup Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone



**Figure 3-30: TRH – Silica gel cleanup Time Series in the Monitoring Bores Screened Within Macalister Seam Package**

**Total cyanide**

- In Q2 2025, consistent with historical records, total cyanide concentration (Figure 3-31) in the monitoring bores screened within Wambo coal seam (Hopeland 21, Hopeland 24, and Hopeland 27) was below the investigation limit (LOR = 0.004 mg/L, Investigation Limits = 0.08 mg/L).
- In Q2 2025, similar to previous quarters, total cyanide concentration in the monitoring bores screened within Springbok Sandstone (Figure 3-32), including Arrow’s bores Hopeland 22, Hopeland 25, and Hopeland 34 to Hopeland 37, was below the investigation limit (except for HSMB1S, HSMB2S, HSMB4S, NB02S, and NB05S). This is in alignment with historical behaviour of the cyanide in above-mentioned bores on Lot 40 DY85 with total cyanide concentration reported above the investigation limit.
- In Q2 2025, total cyanide concentration (Figure 3-33) in the monitoring bores screened within Macalister seam package, including Arrow’s bores Hopeland 23 and Hopeland 26, was below the investigation limit (except for HSMB1D, HSMB2D, HSMB3D2, HSMB4D, and HSMB7D). Historically, total cyanide concentration in HSMB1D, HSMB4D, and HSMB7D was also reported above the investigation limit.

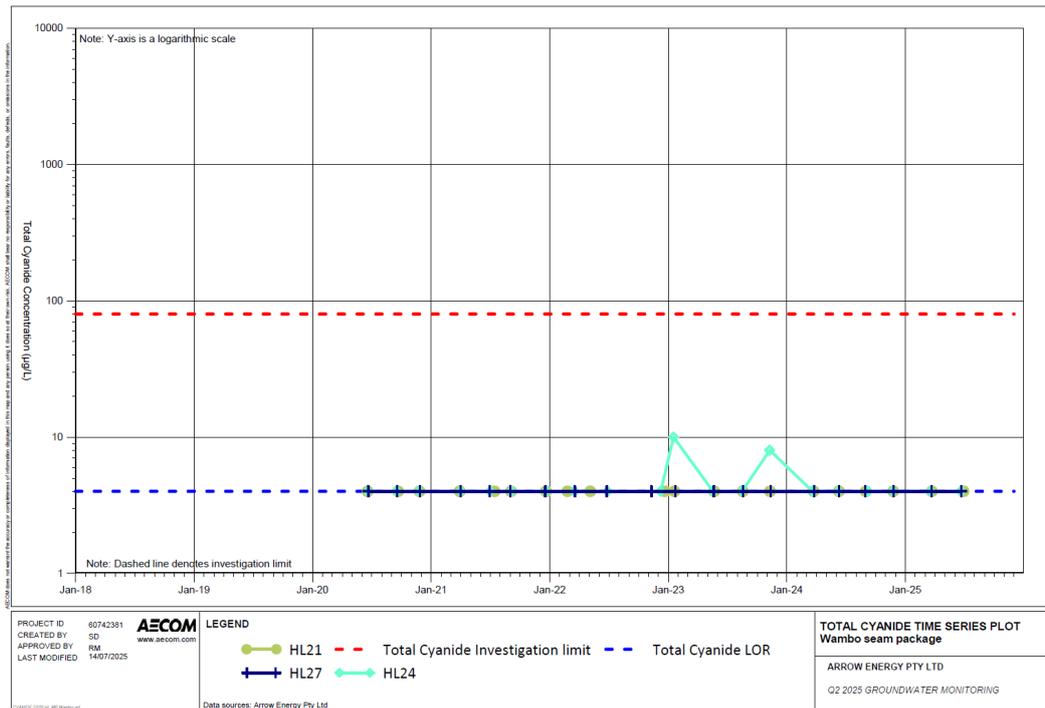


Figure 3-31: Total Cyanide Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

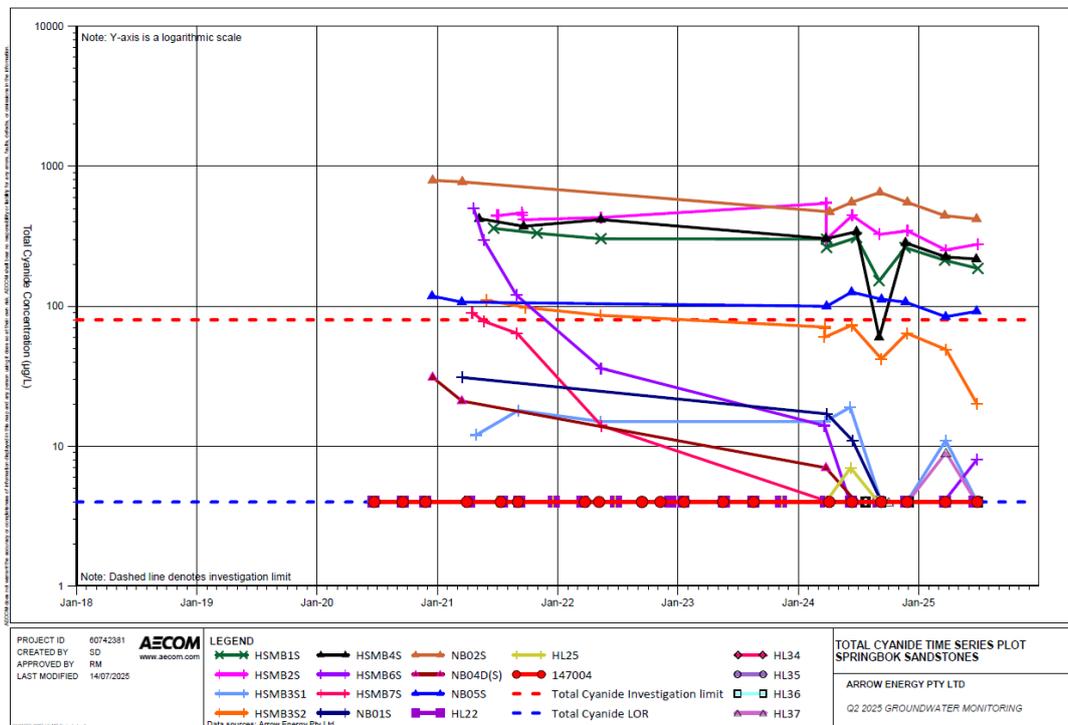
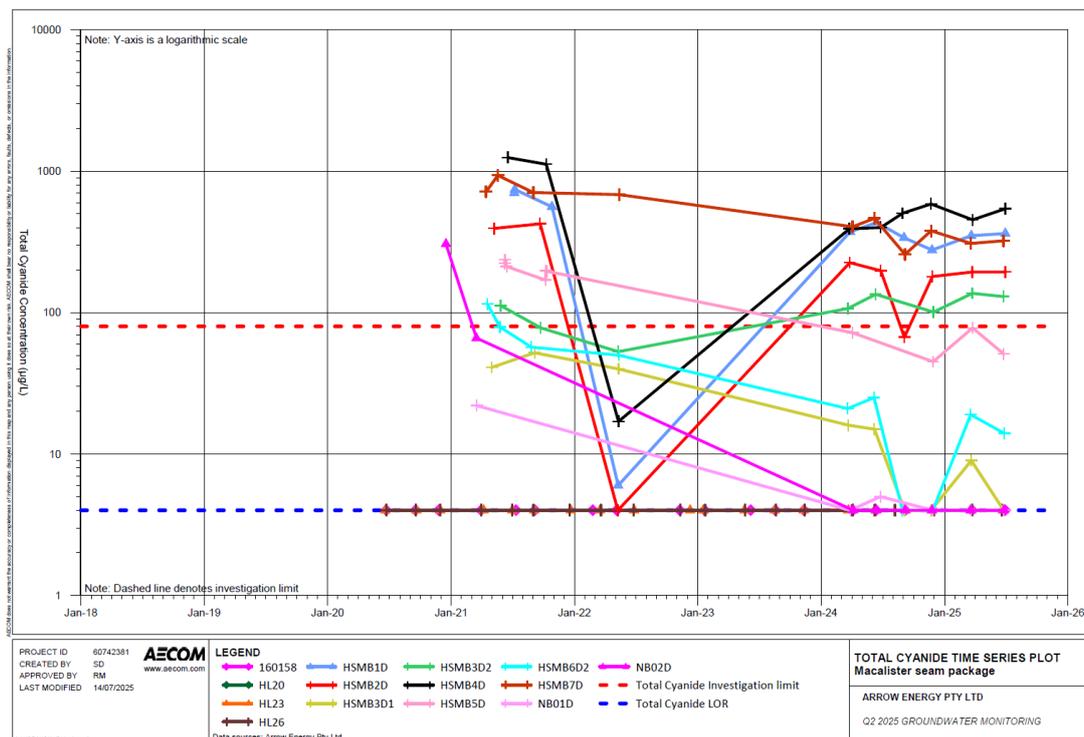


Figure 3-32: Total Cyanide Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone



**Figure 3-33: Total Cyanide Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package**

**Benzene**

- In Q2 2025, consistent with historical regime, Benzene concentration (Figure 3-34) in the monitoring bores screened within Wambo coal seam (Hopeland 21, Hopeland 24, and Hopeland 27) was below the investigation limit and LOR (LOR = 1 µg/L, Investigation Limits = 1 µg/L).
- In Q2 2025, consistent with previous quarters, Benzene concentration in HSMB1S, NB05S, NB01S, NB02S, HSMB2S, HSMB3S1, HSMB3S2, HSMB4S, HSMB6S, and Hopeland 37 (Figure 3-35) screened within Springbok Sandstone was at or above the investigation limit. Note that in Arrow’s monitoring bores (Hopeland 22, Hopeland 25, and Hopeland 34 to Hopeland 36) as well as in landholder bore RN147004 Benzene concentration was reported below the investigation limit. The general trend of Benzene analysis for samples from Springbok Sandstone monitoring bores is decreasing concentrations since commencement of monitoring.
- In Q2 2025, Benzene concentration (Figure 3-36) in the monitoring bores HSMB1D, HSMB3D1, HSMB7D, HSMB5D, and NB02D, screened within Macalister seam package was at or above the investigation limit. Note that in Arrow’s monitoring bores outside of Lot 40 DY85 screened within Macalister seam package (Hopeland 23 and Hopeland 26), Benzene concentration was reported below the investigation limit. As mentioned previously, Hopeland 20 contained insufficient water for collection of a sample during this monitoring event as per previous monitoring events. The long-term trend of Benzene analysis for samples from Macalister seam package monitoring bores is decreasing concentrations since commencement of monitoring.

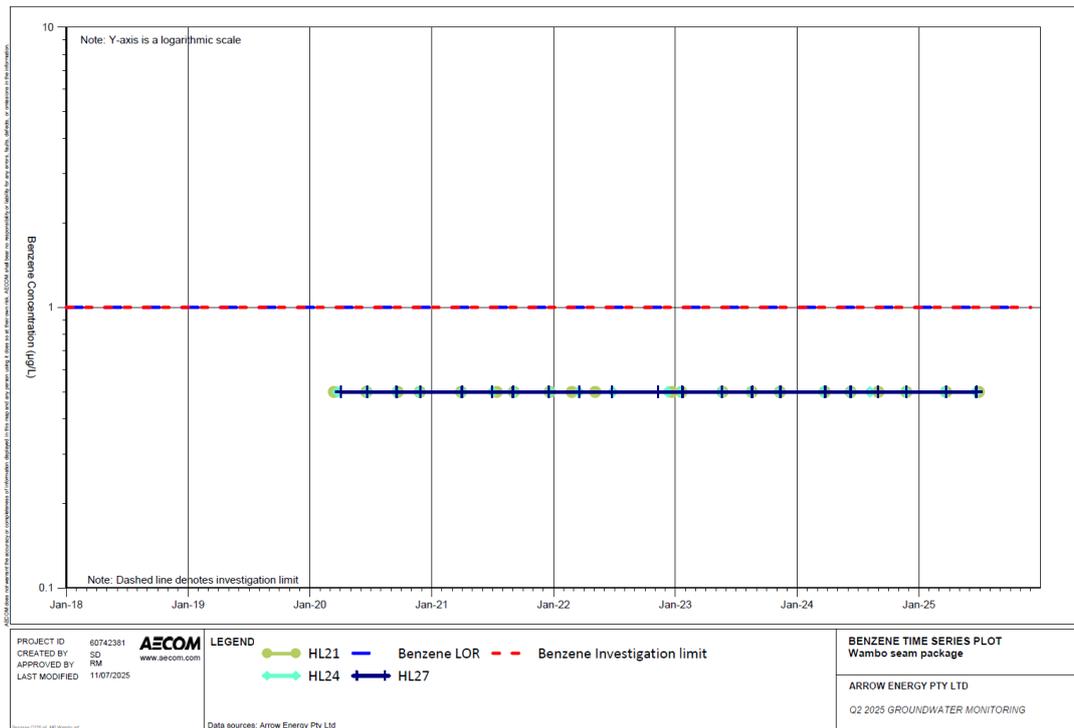


Figure 3-34: Benzene Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

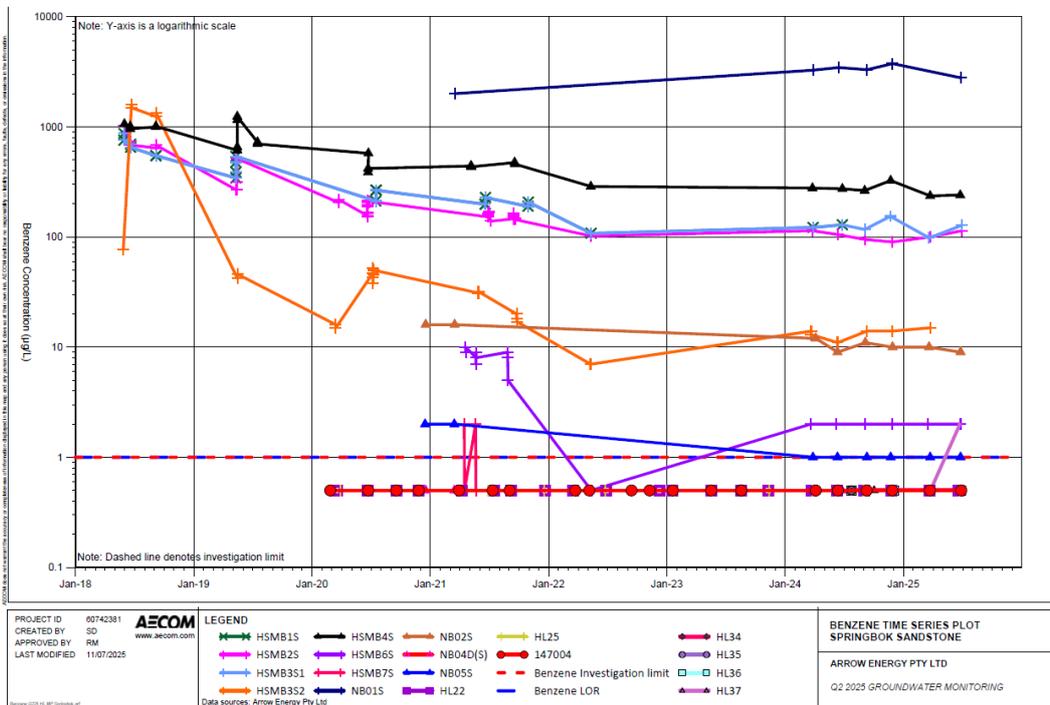
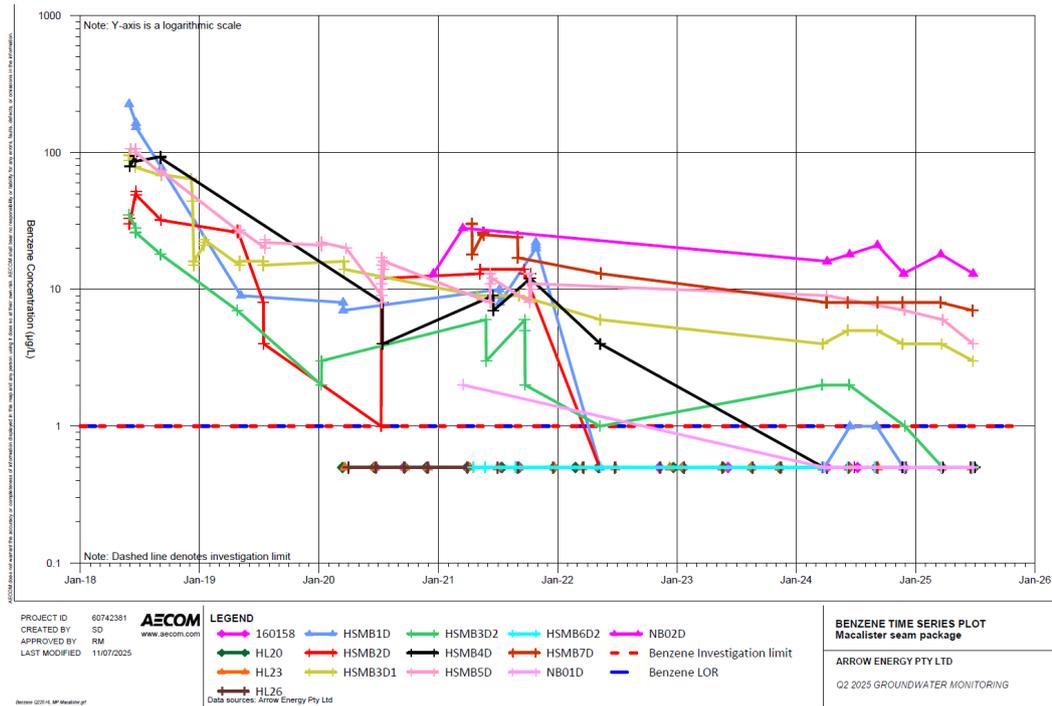


Figure 3-35: Benzene Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone



**Figure 3-36: Benzene Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package**

**Toluene**

- In Q2 2025, Toluene concentrations (LOR = 2 µg/L, Investigation Limits = 800 µg/L) were below the investigation limit in all monitoring bores across the Wambo coal seam, Springbok Sandstone (except NB01S), and Macalister seam package (Figure 3-37, Figure 3-38, and Figure 3-39), with NB01S showing a slight exceedance at 830 µg/L.

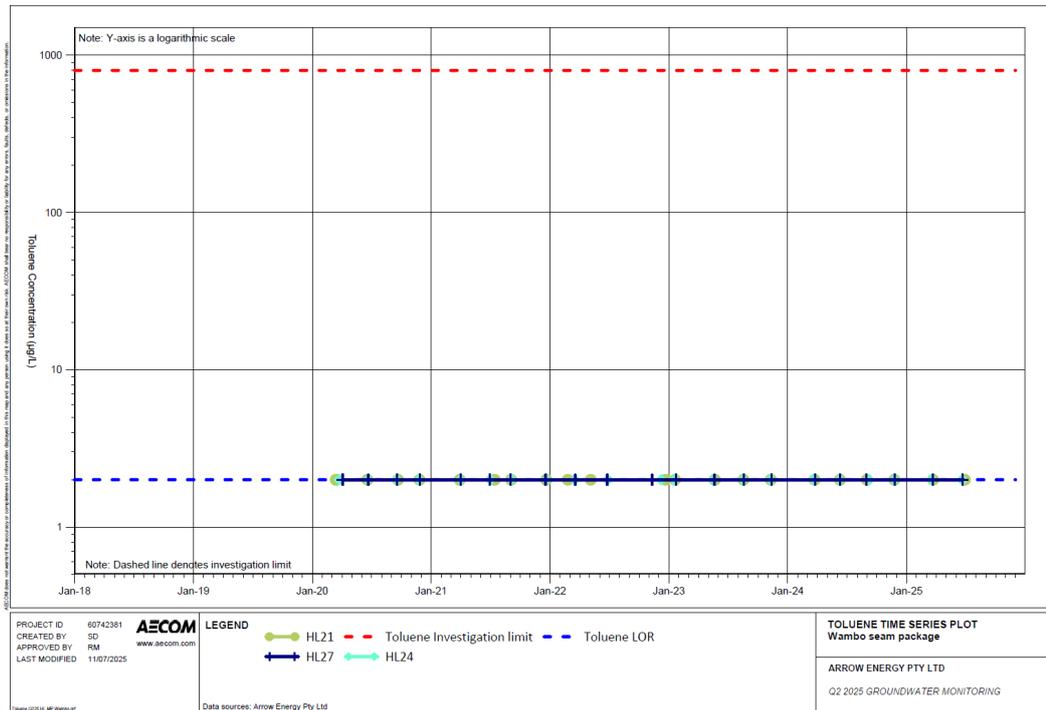


Figure 3-37: Toluene Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

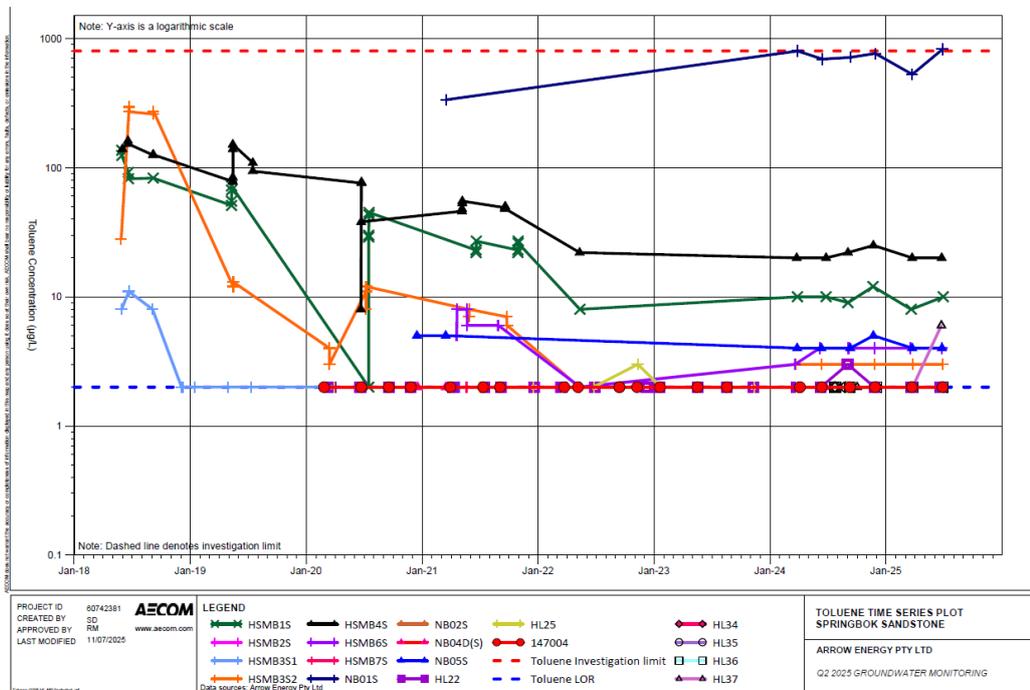
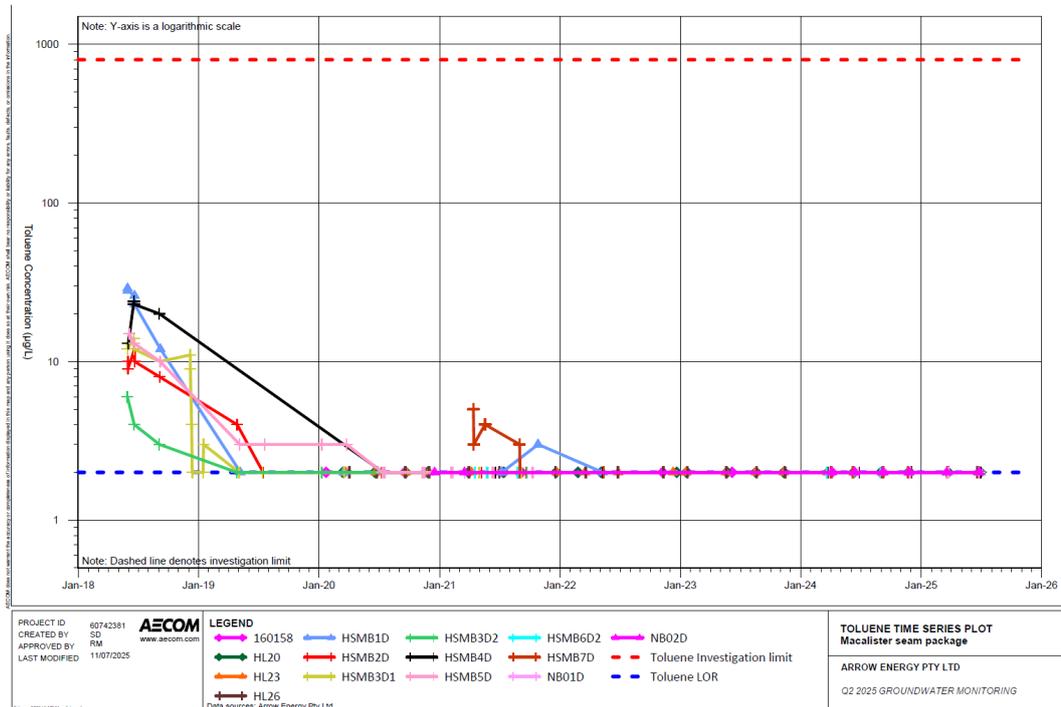


Figure 3-38: Toluene Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone



**Figure 3-39: Toluene Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package**

**Ethylbenzene**

- In Q2 2025, following historical trends, Ethylbenzene concentration in the monitoring bores screened within Wambo coal seam, Springbok Sandstone, and Macalister seam package, including Arrow’s monitoring bores, were all below the investigation limit, refer to Figure 3-40, Figure 3-41, and Figure 3-42.

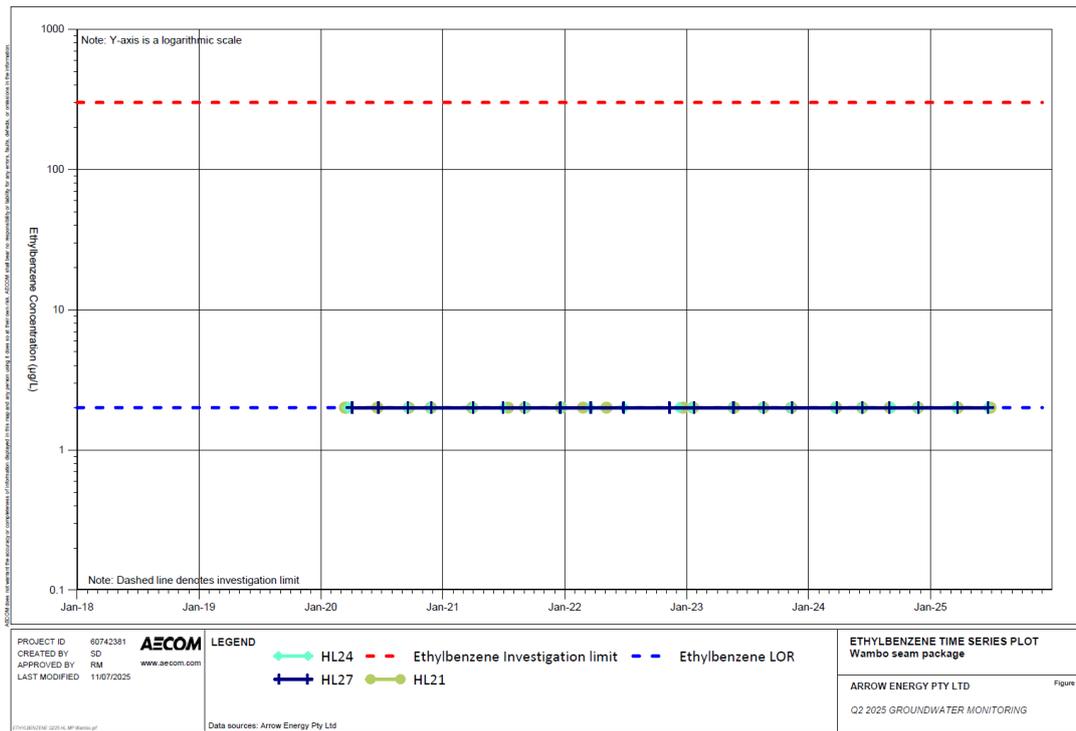


Figure 3-40: Ethylbenzene Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

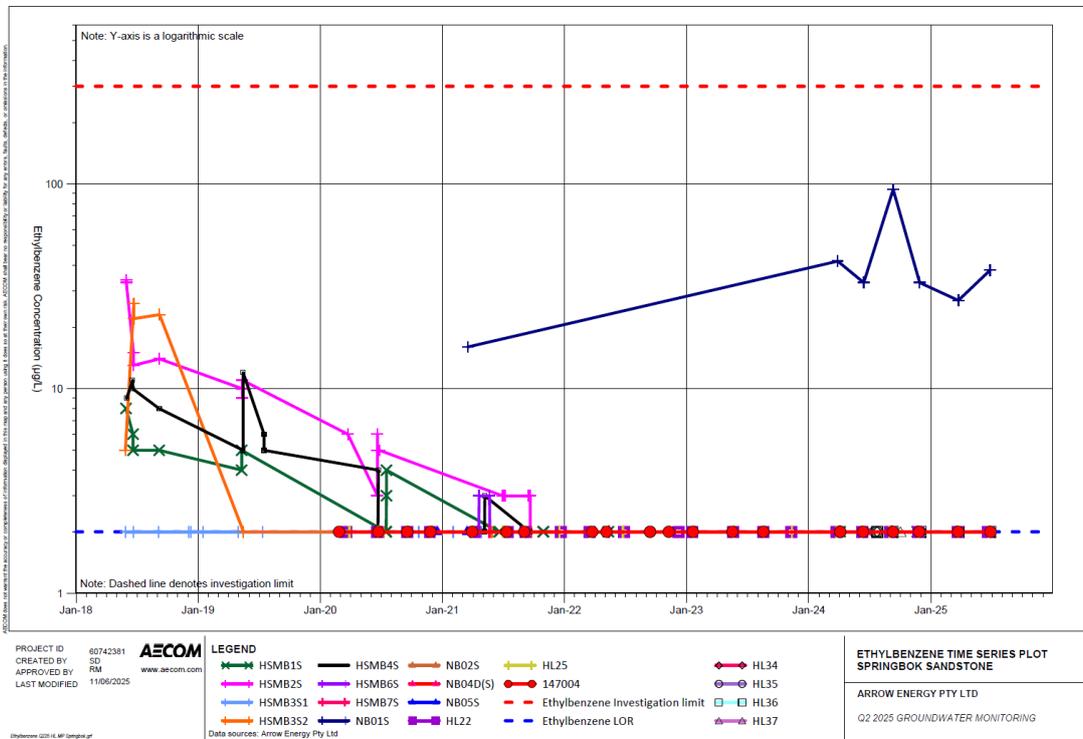
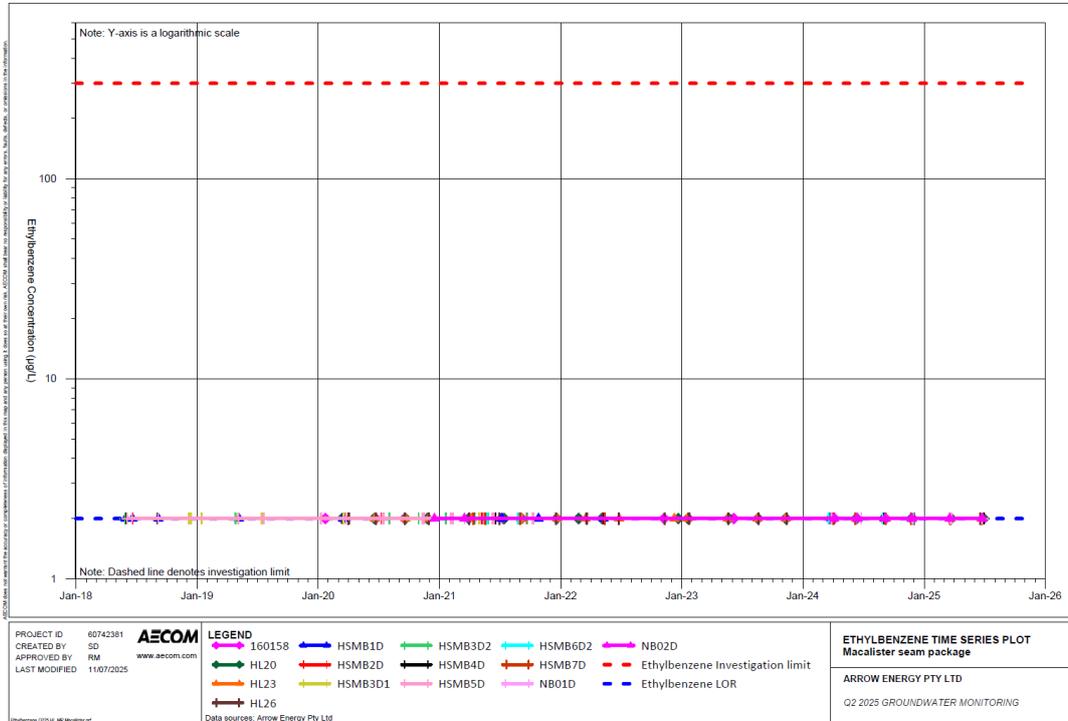


Figure 3-41: Ethylbenzene Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone



**Figure 3-42: Ethylbenzene Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package**

**Xylene**

- In Q2 2025, following historical trends, Xylene concentration in the monitoring bores screened within Wambo coal seam, Springbok Sandstone, and Macalister seam package, including Arrow’s monitoring bores, were all below the investigation limit, refer to Figure 3-43, Figure 3-44, and Figure 3-45.

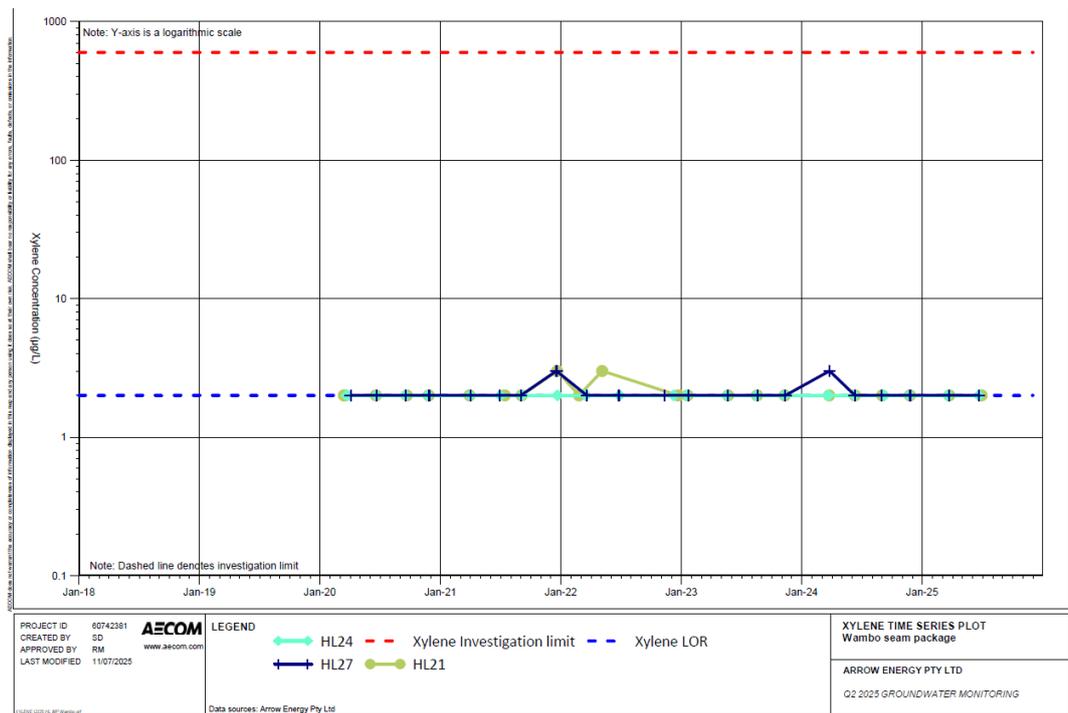


Figure 3-43: Xylene Concentration Time Series in the Monitoring Bores Screened Within Wambo Coal Seam

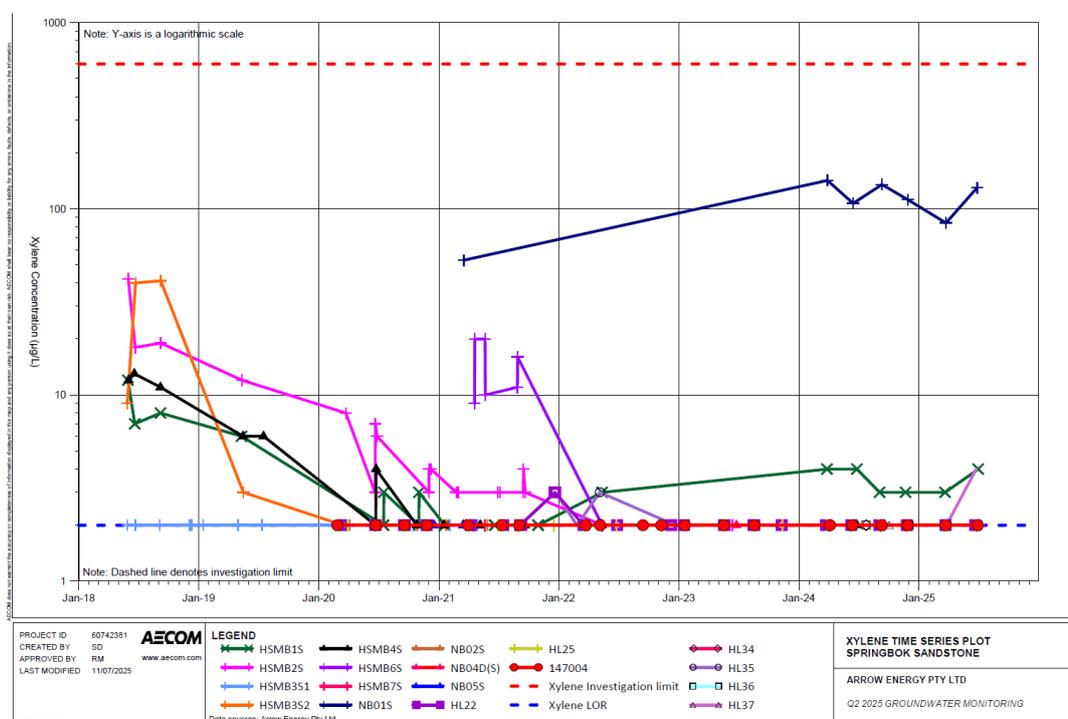


Figure 3-44: Xylene Concentration Time Series in the Monitoring Bores Screened Within Springbok Sandstone

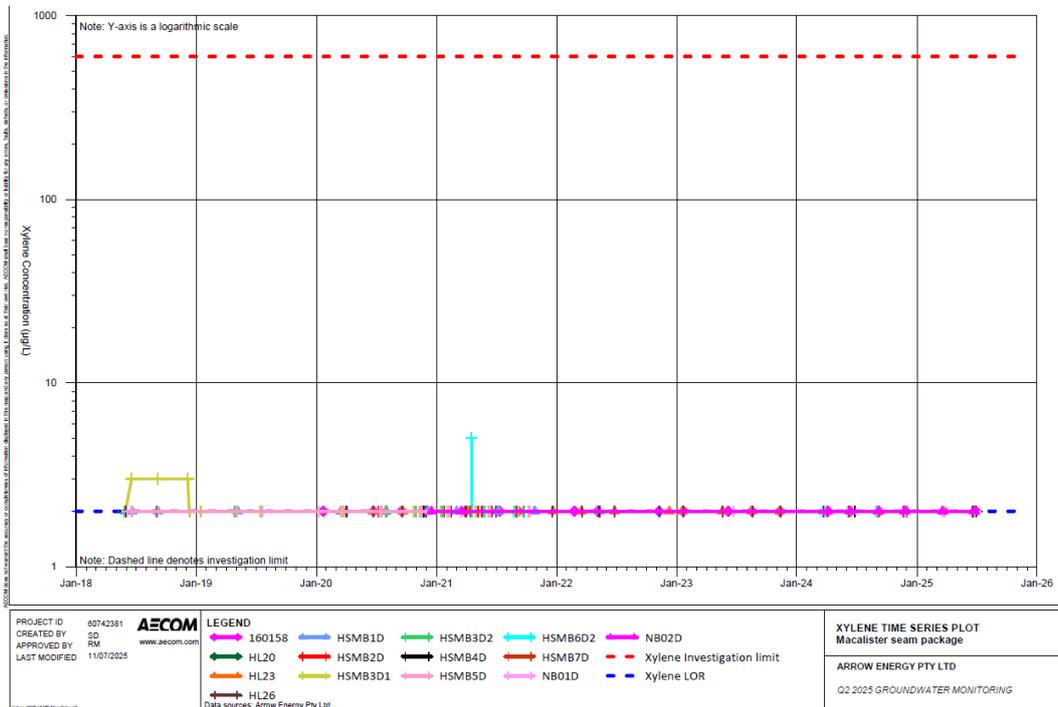


Figure 3-45: Xylene Concentration Time Series in the Monitoring Bores Screened Within Macalister Seam Package

## 4. Trigger Level Exceedances and Data Assessment

This section provides the groundwater monitoring exceedance data. Laboratory reports are presented in Appendix A.

### 4.1 Trigger Level Exceedances

The trigger level exceedances in Q2 2025 are summarised in Table 4-1. The following observations have been made:

#### Macalister coal seam

- Phenol (LOR = 1 µg/L) was reported above the investigation level (> LOR) in HSMB1D (9 µg/L), and HSMB4D (4 µg/L);
- 2-Methylphenol (LOR = 1 µg/L) was not reported above the investigation level (> LOR) in any of groundwater monitoring bores screened in Macalister coal seam;
- 3- & 4-Methylphenol (LOR = 2 µg/L) was reported above the investigation level (> LOR) in HSMB1D (2.6 µg/L), and HSMB4D (4.3 µg/L);

- Naphthalene was not identified in any of groundwater monitoring bores screened in the Macalister coal seam;
- TRH silica gel cleanup was not identified exceedances in any of groundwater monitoring bores screened in the Macalister coal seam;
- Total Cyanide (LOR = 0.004 mg/L) was reported above the investigation level (0.08 mg/L) in HSMB1D (0.363 mg/L), HSMB2D (0.194 mg/L), HSMB3D2 (0.113 mg/L), HSMB4D (0.544 mg/L), and HSMB7D (0.322 mg/L);
- Benzene (LOR = 1 µg/L) was reported at or above the investigation level (1 µg/L) in HSMB1D (1 µg/L), HSMB3D1 (3 µg/L), HSMB5D (4 µg/L), HSMB7D (7 µg/L), and NB02D (13 µg/L);
- Laboratory results have not reported Toluene, Ethylbenzene and Xylene above the investigation level in any of groundwater monitoring bores screened in Macalister coal seam.

### Springbok Sandstone

- Phenol (LOR = 1 µg/L) was reported above the investigation level (> LOR) in HSMB1S (9.1 µg/L), HSMB2S (9.8 µg/L), HSMB3S1 (5 µg/L), HSMB3S2 (2.5 µg/L), HSMB4S (3.7 µg/L), NB05S (1.3 µg/L), NB01S (17.4 µg/L), NB02S (2.6 µg/L), Hopeland 34 (9.7 µg/L), Hopeland 36 (59.7 µg/L), and Hopeland 37 (17.7 µg/L).
- 2-Methylphenol (LOR = 1 µg/L) was reported above the investigation level (> LOR) in Hopeland 34 (1.4 µg/L) and NB01S (1.2 µg/L);
- 3- & 4-Methylphenol (LOR = 2 µg/L) was reported above the investigation level (> LOR) in Hopeland 34 (3 µg/L), Hopeland 36 (2 µg/L), Hopeland 37 (9.6 µg/L), and NB01S (50.5 µg/L), and NB02S (6.8 µg/L) ;
- Naphthalene (LOR = 1 µg/L) was reported at or above the investigation level (> LOR) in HSMB1S (1.6 µg/L), HSMB2S (1.9 µg/L), HSMB3S2 (1.1 µg/L), HSMB4S (1.6 µg/L), and NB04D(S) (1 µg/L).
- TRH silica gel cleanup was not identified exceedances in any of groundwater monitoring bores screened in the Springbok Sandstone;
- Total Cyanide (LOR = 0.004 mg/L) was reported above the investigation level (0.08 mg/L) in HSMB1S (0.186 mg/L), HSMB2S (0.277 mg/L), HSMB4S (0.217 mg/L), NB05S (0.092 mg/L), and NB02S (0.419 mg/L);
- Benzene (LOR = 1 µg/L) was reported at or above the investigation level (1 µg/L) in Hopeland 37 (2 µg/L), HSMB1S (128 µg/L), HSMB2S (114 µg/L), HSMB3S1 (3 µg/L), HSMB3S2 (16 µg/L), HSMB4S (240 µg/L), NB01S (2790 µg/L), HSMB6S (2 µg/L), NB02S (9 µg/L), and NB05S (1 µg/L);
- Toluene (LOR = 2 µg/L) was reported at or above the investigation level (0.8 mg/L or 800 µg/L) in NB01S (825 µg/L);
- Laboratory results reported no detectable Ethylbenzene, and Xylene in any of groundwater monitoring bores screened in Springbok Sandstone.

**Wambo Seam Package**

- There were no reported exceedances above the investigation limits for Total Phenolic compounds, PAHs (including Naphthalene), TRH (Silica Gel cleanup), Cyanide, Benzene, Toluene, Ethylbenzene, and Xylene in Hopeland 21, Hopeland 24, and Hopeland 27 screened within Wambo Seam Package formation.

The exceedances reported above are considered to be indicative of previously existing conditions and do not indicate mobilisation of contaminants, therefore no action was taken to prevent a recurrence of the exceedances. Arrow Energy has not undertaken production activity on PL253 and therefore has not caused potential or actual environmental harm, confirmed by the results reported.

**Table 4-1: Exceedance Results**

Compound	Investigation Limits	Limit of Reporting (LOR)	Hopeland 34	Hopeland 36	Hopeland 37	HSMB15	HSMB1D	HSMB25	HSMB2D	HSMB351	HSMB3D1	HSMB352	HSMB3D2	HSMB4D	HSMB45	HSMB5D	HSMB65	HSMB7D	NB055	NB015	NB025	NB02D	NB04D(S)	
			EB2521593-010	EB2522724-008	EB2522107-002	EB2522724-010	EB2522724-009	EB2522724-012	EB2522724-011	EB2522724-013	EB2522107-003	EB2522724-014	EB2522107-004	EB2522724-015	EB2522107-005	EB2522107-006	EB2522724-017	EB2522107-007	EB2522724-021	EB2522724-018	EB2522724-020	EB2522724-019	EB2522107-010	
<b>Phenolic Compounds</b>																								
Phenol (µg/L)	> LOR	1 µg/L	9.7	59.7	17.7	9.1	9	9.8		5		2.5		4	3.7				1.3	17.4	2.6			
2-Methylphenol (µg/L)	> LOR	1 µg/L	1.4																		1.2			
3- & 4-Methylphenol (µg/L)	> LOR	2 µg/L	3	2	9.6		2.6							4.3							50.5	6.8		
<b>Polynuclear Aromatic Hydrocarbons (PAHs) Including Naphthalene</b>																								
Naphthalene (µg/L)	> LOR	1 µg/L				1.6		1.9				1.1			1.6									1
<b>Cyanide</b>																								
Total Cyanide (mg/L)	0.08 mg/L	0.004 mg/L				0.186	0.363	0.277	0.194				0.113	0.544	0.217				0.322	0.092		0.419		
<b>BTEXN</b>																								
Benzene (µg/L)	1 µg/L	1 µg/L			2	128	1	114		3	3	16			240	4	2	7	1	2790	9	13		
Toluene (µg/L)	0.8 mg/L	2 µg/L																			825			

## 5. Conclusion

This report presents groundwater quality monitoring results in Q2 2025 exceeding any of the investigation limits specified by EA0001401, fulfilling the requirements of EA conditions Water 1(1), Water 6, Water 15, and Water 15A. It investigates the potential for environmental harm by analysing and interpretation of these results. The Q2 2025 groundwater monitoring results are consistent with those observed in the previous monitoring quarters.

Phenol was reported above the investigation level in HSMB1D, and HSMB4D screened in Macalister coal seam, and in HSMB1S, HSMB2S, HSMB3S1, HSMB3S2, HSMB4S, NB05S, NB01S, NB02S, Hopeland 34, Hopeland 36, and Hopeland 37 screened within Springbok Sandstone.

2-Methylphenol was not identified above the investigation level in any of groundwater monitoring bores screened in Macalister coal seam, but it was reported above the investigation level in Hopeland 34 and NB01S.

3- & 4-Methylphenol was reported above the investigation level in HSMB1D, and HSMB4D screened in Macalister coal seam, and in the Hopeland 34, Hopeland 36, Hopeland 37, NB01S, and NB02S screened within Springbok Sandstone.

Naphthalene was not identified in any of groundwater monitoring bores screened in Macalister coal seam, but it was reported above the investigation level in HSMB1S, HSMB2S, HSMB3S2, NB04D(S), and HSMB4S screened within Springbok Sandstone.

TRH silica gel cleanup was not identified exceedances in any of groundwater monitoring bores screened in the Macalister coal seam or Springbok Sandstone;

Total Cyanide was reported above the investigation level in HSMB1D, HSMB2D, HSMB3D2, HSMB4D, and HSMB7D screened in Macalister coal seam, and in NB02S, NB05S, HSMB1S, HSMB2S, and HSMB4S screened within Springbok Sandstone.

Benzene was reported at or above the investigation level in HSMB1D, HSMB3D1, HSMB5D, HSMB7D, and NB02D screened in Macalister coal seam, and in Hopeland 37, HSMB1S, HSMB2S, HSMB3S1, HSMB3S2, HSMB4S, NB01S, HSMB6S, NB02S, and NB05S screened within Springbok Sandstone.

Toluene was not detected above investigation levels in Macalister coal seam bores but was detected at slightly above investigation levels in NB01S within the Springbok Sandstone.

Laboratory results reported no detectable Ethylbenzene and Xylene in any of groundwater monitoring bores screened in Macalister coal seam, Springbok Sandstone, and Wambo Seam Package.

There were no reported exceedances above the investigation limits for Total Phenolic compounds, PAHs (including Naphthalene), TRH (Silica Gel cleanup), Cyanide, Benzene, Toluene, Ethylbenzene, and Xylene in Hopeland 21, Hopeland 24, and Hopeland 27 screened within Wambo Seam Package formation.

Arrow Energy has not undertaken production activity on PL253 and has not caused potential of actual environmental harm based upon the results reported. It can be concluded that exceedances reported above are considered to be indicative of previously existing conditions. Therefore, Arrow has not taken any action to prevent a recurrence of these exceedances.

No widespread or consistent detection of increasing concentrations of the more typical UCG contaminants such as Benzene or PAHs were detected. These results are considered to be indicative of previously existing conditions. Therefore, it can be concluded that there is no potential for environmental harm from Arrow Energy activities in Hopeland PL 253.

## 6. Document Administration

This document has been created using ORG-ARW-IMT-TEM-00005 v4.0

### Revision history

Revision	Revision Date	Revision Summary	Author
0	11/07/2025	Report Started	Yousef Beiraghdar
	21/07/2025	Rev1	Yousef Beiraghdar

### Controlled document location

SHL-ARW-ENV-REP-00027

### Related documents

Document Number	Document title

### Acceptance and release

#### Author

Position	Release Date
Principal Hydrogeologist	21/07/2025

#### Reviewer

Position	Release Date

#### Approver(s)

Position	Approval Date
Groundwater Manager	21/07/2025

**Appendix A: Laboratory Reports**



## CERTIFICATE OF ANALYSIS

Work Order	: <b>EB2521593</b>	Page	: 1 of 16
Amendment	: <b>1</b>		
Client	: <b>SRG Global Asset Care Pty Ltd</b>	Laboratory	: Environmental Division Brisbane
Contact	: Obzervr AECOM 1	Contact	: Jarret Venderley
Address	: GPO BOX 5262 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3552-8685
Project	: Arrow - Hopeland MP	Date Samples Received	: 24-Jun-2025 09:00
Order number	: 4520016217	Date Analysis Commenced	: 24-Jun-2025
C-O-C number	: 2306-37B1-3071	Issue Date	: 07-Jul-2025 16:04
Sampler	: Obzervr AECOM 1		
Site	: ----		
Quote number	: EB24ALSARROW0001 V4		
No. of samples received	: 10		
No. of samples analysed	: 10		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist	Brisbane Organics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Organics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Tatijana Markoska	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Vincent Muller	Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD





## General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
^ = This result is computed from individual analyte detections at or above the level of reporting  
ø = ALS is not NATA accredited for these tests.  
~ = Indicates an estimated value.

- EK027G: LOR raised for Thiocyanate on sample no.7 due to sample matrix.
- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO<sub>2</sub> and Fluoride to the Anions.
- **Cyanate, Cyanide, Methane in Water, and Thiocyanate conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.**
- EK084: Unionized Hydrogen Sulfide (UHS) requires field temperature, pH and EC to be provided on the chain of custody (COC) for each sample. In the absence of these parameters, the laboratory has analysed pH, EC and used a standard room temperature of 25°C to calculate UHS.
- Amendment (07/07/2025): This report has been amended following a change to the EP071SG – TRH Total Recoverable Hydrocarbons – Silica Gel Cleanup result reported for sample 'Hopeland 25' (EB2521593\_007) due to an analyst error. All details are recorded in client query 25BNCC290 and a full investigation will be detailed in corrective action request 25BNC082.
- EP071-SV – TRH Semivolatiles Fractions Only: The LOR for C10 - C14 Fraction has been raised in samples 'GCMPDQ225\_01' (EB2521593\_001), 'Hopeland 25' (EB2521593\_007) and 'Hopeland 34' (EB2521593\_010) due to laboratory background contamination.
- EP005 (Total Organic Carbon): Samples 'Hopeland 23' (EB2521593-005) & 'Hopeland 27' (EB2521593-009) required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- It is recognised that EG020T (Total Metals by ICP-MS) is less than EG020F (Dissolved Metals by ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPSDQ225_01	GCMPSDQ225_02	GCMPTBQ225_01	Hopeland 22	Hopeland 23
Sampling date / time				20-Jun-2025 09:35	21-Jun-2025 04:03	19-Jun-2025 08:02	20-Jun-2025 09:09	22-Jun-2025 11:35	
Compound	CAS Number	LOR	Unit	EB2521593-001	EB2521593-002	EB2521593-003	EB2521593-004	EB2521593-005	
				Result	Result	Result	Result	Result	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	9150	1960	----	4940	1330	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	89	----	9	34	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	28	950	----	132	586	
Total Alkalinity as CaCO3	----	1	mg/L	28	1040	----	140	620	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	----	<1	<1	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	5020	599	----	2580	491	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	176	3	----	63	4	
Magnesium	7439-95-4	1	mg/L	49	1	----	9	<1	
Sodium	7440-23-5	1	mg/L	2300	679	----	1420	503	
Potassium	7440-09-7	1	mg/L	589	22	----	102	3	
<b>ED093F: SAR and Hardness Calculations</b>									
Total Hardness as CaCO3	----	1	mg/L	641	12	----	194	10	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	----	0.001	<0.001	
Boron	7440-42-8	0.05	mg/L	0.28	0.35	----	0.38	0.30	
Barium	7440-39-3	0.001	mg/L	5.42	0.220	----	1.83	0.124	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	1.01	0.005	----	0.025	0.004	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPSDQ225_01	GCMPSDQ225_02	GCMPTBQ225_01	Hopeland 22	Hopeland 23
Sampling date / time				20-Jun-2025 09:35	21-Jun-2025 04:03	19-Jun-2025 08:02	20-Jun-2025 09:09	22-Jun-2025 11:35	
Compound	CAS Number	LOR	Unit	EB2521593-001	EB2521593-002	EB2521593-003	EB2521593-004	EB2521593-005	
				Result	Result	Result	Result	Result	
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	----	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<b>0.009</b>	<0.005	----	<b>0.006</b>	<0.005	
Lithium	7439-93-2	0.001	mg/L	<b>0.150</b>	<b>0.062</b>	----	<b>0.103</b>	<b>0.032</b>	
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<b>0.001</b>	<b>0.001</b>	----	<b>0.001</b>	<0.001	
Boron	7440-42-8	0.05	mg/L	<b>0.26</b>	<b>0.32</b>	----	<b>0.34</b>	<b>0.30</b>	
Barium	7440-39-3	0.001	mg/L	<b>6.08</b>	<b>0.260</b>	----	<b>1.87</b>	<b>0.135</b>	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	<b>0.004</b>	<0.001	
Manganese	7439-96-5	0.001	mg/L	<b>1.10</b>	<b>0.007</b>	----	<b>0.027</b>	<b>0.004</b>	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	<0.001	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	----	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<b>0.008</b>	<0.005	----	<b>0.009</b>	<0.005	
Lithium	7439-93-2	0.001	mg/L	<b>0.133</b>	<b>0.054</b>	----	<b>0.091</b>	<b>0.031</b>	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	<0.0001	<0.0001	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	<0.0001	<0.0001	
<b>EG050F: Dissolved Hexavalent Chromium</b>									



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPSDQ225_01	GCMPSDQ225_02	GCMPTBQ225_01	Hopeland 22	Hopeland 23
Sampling date / time				20-Jun-2025 09:35	21-Jun-2025 04:03	19-Jun-2025 08:02	20-Jun-2025 09:09	22-Jun-2025 11:35	
Compound	CAS Number	LOR	Unit	EB2521593-001	EB2521593-002	EB2521593-003	EB2521593-004	EB2521593-005	
				Result	Result	Result	Result	Result	
<b>EG050F: Dissolved Hexavalent Chromium - Continued</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	----	<0.01	<0.01	
<b>EG050T: Total Hexavalent Chromium</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	----	<0.01	<0.01	
<b>EK020G: Cyanate by Discrete Analyser</b>									
Cyanate	88402-73-7	0.1	mg/L	<0.1	<0.1	----	<0.1	<0.1	
<b>EK026SF: Total CN by Segmented Flow Analyser</b>									
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	----	<0.004	<0.004	
<b>EK027G: Thiocyanate by discrete analyser</b>									
Thiocyanate	463-56-9	0.1	mg/L	0.2	0.1	----	<0.1	<0.1	
<b>EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser</b>									
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	----	<0.004	<0.004	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	0.2	2.5	----	0.6	1.6	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	0.40	0.56	----	0.95	0.31	
<b>EK084: Un-ionized Hydrogen Sulfide</b>									
∅ Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	----	<0.1	<0.1	
∅ Ionised Hydrogen Sulfide	----	0.1	mg/L	<0.1	0.6	----	0.3	<0.1	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	142	37.7	----	75.6	26.2	
∅ Total Cations	----	0.01	meq/L	----	30.9	----	----	----	
∅ Total Cations	----	0.01	meq/L	128	----	----	68.2	22.2	
∅ Ionic Balance	----	0.01	%	----	9.83	----	----	----	
∅ Ionic Balance	----	0.01	%	5.27	----	----	5.09	8.44	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	9	11	----	7	<5	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	27800	27600	----	26000	36900	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPSDQ225_01	GCMPSDQ225_02	GCMPBQ225_01	Hopeland 22	Hopeland 23
Sampling date / time				20-Jun-2025 09:35	21-Jun-2025 04:03	19-Jun-2025 08:02	20-Jun-2025 09:09	22-Jun-2025 11:35	
Compound	CAS Number	LOR	Unit	EB2521593-001	EB2521593-002	EB2521593-003	EB2521593-004	EB2521593-005	
				Result	Result	Result	Result	Result	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup</b>									
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	<50	<50	
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	----	<50	<50	
<b>EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup</b>									
>C10 - C16 Fraction	----	100	µg/L	<100	<100	----	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	<100	<100	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	----	<100	<100	
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	<100	<100	
<b>EP075(SIM)A: Phenolic Compounds</b>									
Phenol	108-95-2	1.0	µg/L	12.2	<1.0	----	<1.0	<1.0	
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
2-Methylphenol	95-48-7	1.0	µg/L	2.4	<1.0	----	<1.0	<1.0	
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	3.8	<2.0	----	<2.0	<2.0	
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	----	<2.0	<2.0	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPSDQ225_01	GCMPSDQ225_02	GCMPTBQ225_01	Hopeland 22	Hopeland 23
Sampling date / time					20-Jun-2025 09:35	21-Jun-2025 04:03	19-Jun-2025 08:02	20-Jun-2025 09:09	22-Jun-2025 11:35
Compound	CAS Number	LOR	Unit	EB2521593-001	EB2521593-002	EB2521593-003	EB2521593-004	EB2521593-005	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	----	<1.0	<1.0	
<sup>^</sup> Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	----	<0.5	<0.5	
<sup>^</sup> Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	----	<0.5	<0.5	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	
C10 - C14 Fraction	----	50	µg/L	<120	<50	----	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	<50	<50	
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	----	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	
<sup>^</sup> C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	<100	<100	----	<100	<100	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPSDQ225_01	GCMPSDQ225_02	GCMPTBQ225_01	Hopeland 22	Hopeland 23
Sampling date / time				20-Jun-2025 09:35	21-Jun-2025 04:03	19-Jun-2025 08:02	20-Jun-2025 09:09	22-Jun-2025 11:35	
Compound	CAS Number	LOR	Unit	EB2521593-001	EB2521593-002	EB2521593-003	EB2521593-004	EB2521593-005	
				Result	Result	Result	Result	Result	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued</b>									
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	<100	<100	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	----	<100	<100	
<sup>^</sup> >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	<100	<100	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
<sup>^</sup> Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2	
<sup>^</sup> Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1.0	%	34.4	16.5	----	25.9	27.3	
2-Chlorophenol-D4	93951-73-6	1.0	%	84.3	35.8	----	58.6	65.6	
2,4,6-Tribromophenol	118-79-6	1.0	%	64.6	22.0	----	27.8	29.4	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1.0	%	86.3	52.3	----	83.3	87.5	
Anthracene-d10	1719-06-8	1.0	%	74.3	60.9	----	64.2	91.8	
4-Terphenyl-d14	1718-51-0	1.0	%	104	58.9	----	97.6	89.6	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	90.5	93.4	92.0	92.5	93.4	
Toluene-D8	2037-26-5	2	%	96.8	95.9	92.6	95.8	98.0	
4-Bromofluorobenzene	460-00-4	2	%	103	99.2	100	100	106	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 24	Hopeland 25	Hopeland 26	Hopeland 27	Hopeland 34
Sampling date / time				21-Jun-2025 04:03	22-Jun-2025 07:57	19-Jun-2025 02:30	22-Jun-2025 09:15	20-Jun-2025 09:35	
Compound	CAS Number	LOR	Unit	EB2521593-006	EB2521593-007	EB2521593-008	EB2521593-009	EB2521593-010	
				Result	Result	Result	Result	Result	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	1960	8540	1620	1880	9230	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	93	<1	28	73	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	944	2	616	993	29	
Total Alkalinity as CaCO3	----	1	mg/L	1040	2	644	1060	29	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	<1	<1	<1	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	610	4940	624	496	5230	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	3	176	4	2	172	
Magnesium	7439-95-4	1	mg/L	1	42	<1	<1	47	
Sodium	7440-23-5	1	mg/L	738	2090	585	702	2200	
Potassium	7440-09-7	1	mg/L	24	77	16	16	580	
<b>ED093F: SAR and Hardness Calculations</b>									
Total Hardness as CaCO3	----	1	mg/L	12	612	10	5	623	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	0.001	<0.001	0.001	
Boron	7440-42-8	0.05	mg/L	0.34	0.27	0.34	0.30	0.27	
Barium	7440-39-3	0.001	mg/L	0.242	4.52	0.180	0.269	5.55	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.002	<0.001	<0.001	<0.001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	0.005	5.08	0.004	0.005	1.01	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 24	Hopeland 25	Hopeland 26	Hopeland 27	Hopeland 34
Sampling date / time				21-Jun-2025 04:03	22-Jun-2025 07:57	19-Jun-2025 02:30	22-Jun-2025 09:15	20-Jun-2025 09:35	
Compound	CAS Number	LOR	Unit	EB2521593-006	EB2521593-007	EB2521593-008	EB2521593-009	EB2521593-010	
				Result	Result	Result	Result	Result	
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<0.005	<b>0.014</b>	<0.005	<b>0.006</b>	<b>0.008</b>	
Lithium	7439-93-2	0.001	mg/L	<b>0.060</b>	<b>0.161</b>	<b>0.036</b>	<b>0.048</b>	<b>0.144</b>	
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<b>0.001</b>	<0.001	<0.001	<0.001	<b>0.001</b>	
Boron	7440-42-8	0.05	mg/L	<b>0.33</b>	<b>0.25</b>	<b>0.32</b>	<b>0.28</b>	<b>0.26</b>	
Barium	7440-39-3	0.001	mg/L	<b>0.262</b>	<b>5.18</b>	<b>0.198</b>	<b>0.276</b>	<b>6.20</b>	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<b>0.002</b>	<0.001	<0.001	<0.001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<b>0.009</b>	<b>0.002</b>	<0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	<b>0.006</b>	<b>5.96</b>	<b>0.005</b>	<b>0.005</b>	<b>1.12</b>	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<0.005	<b>0.016</b>	<0.005	<0.005	<b>0.015</b>	
Lithium	7439-93-2	0.001	mg/L	<b>0.056</b>	<b>0.148</b>	<b>0.032</b>	<b>0.046</b>	<b>0.130</b>	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EG050F: Dissolved Hexavalent Chromium</b>									



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 24	Hopeland 25	Hopeland 26	Hopeland 27	Hopeland 34
Sampling date / time				21-Jun-2025 04:03	22-Jun-2025 07:57	19-Jun-2025 02:30	22-Jun-2025 09:15	20-Jun-2025 09:35	
Compound	CAS Number	LOR	Unit	EB2521593-006	EB2521593-007	EB2521593-008	EB2521593-009	EB2521593-010	
				Result	Result	Result	Result	Result	
<b>EG050F: Dissolved Hexavalent Chromium - Continued</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
<b>EG050T: Total Hexavalent Chromium</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
<b>EK020G: Cyanate by Discrete Analyser</b>									
Cyanate	88402-73-7	0.1	mg/L	<0.1	0.2	<0.1	<0.1	<0.1	
<b>EK026SF: Total CN by Segmented Flow Analyser</b>									
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	
<b>EK027G: Thiocyanate by discrete analyser</b>									
Thiocyanate	463-56-9	0.1	mg/L	0.1	<0.5	<0.1	0.1	0.1	
<b>EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser</b>									
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	2.4	0.3	1.3	2.3	0.2	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	0.60	0.23	0.45	0.48	0.39	
<b>EK084: Un-ionized Hydrogen Sulfide</b>									
∅ Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Ionised Hydrogen Sulfide	----	0.1	mg/L	0.6	<0.1	0.4	<0.1	<0.1	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	38.0	139	30.5	35.2	148	
∅ Total Cations	----	0.01	meq/L	----	116	----	----	----	
∅ Total Cations	----	0.01	meq/L	32.9	----	26.0	31.0	123	
∅ Ionic Balance	----	0.01	%	----	9.13	----	----	----	
∅ Ionic Balance	----	0.01	%	7.10	----	7.81	6.23	9.27	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	12	3	6	<5	5	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	23500	33200	28200	24300	26500	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 24	Hopeland 25	Hopeland 26	Hopeland 27	Hopeland 34
Sampling date / time				21-Jun-2025 04:03	22-Jun-2025 07:57	19-Jun-2025 02:30	22-Jun-2025 09:15	20-Jun-2025 09:35	
Compound	CAS Number	LOR	Unit	EB2521593-006	EB2521593-007	EB2521593-008	EB2521593-009	EB2521593-010	
				Result	Result	Result	Result	Result	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup</b>									
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50	
<b>EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup</b>									
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
<b>EP075(SIM)A: Phenolic Compounds</b>									
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<b>9.7</b>	
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<b>1.4</b>	
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<b>3.0</b>	
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 24	Hopeland 25	Hopeland 26	Hopeland 27	Hopeland 34
Sampling date / time				21-Jun-2025 04:03	22-Jun-2025 07:57	19-Jun-2025 02:30	22-Jun-2025 09:15	20-Jun-2025 09:35	
Compound	CAS Number	LOR	Unit	EB2521593-006	EB2521593-007	EB2521593-008	EB2521593-009	EB2521593-010	
				Result	Result	Result	Result	Result	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued</b>									
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	
<sup>^</sup> >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
<sup>^</sup> Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2	
<sup>^</sup> Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1.0	%	26.2	28.1	24.4	25.7	26.7	
2-Chlorophenol-D4	93951-73-6	1.0	%	57.4	69.4	56.6	59.6	66.2	
2,4,6-Tribromophenol	118-79-6	1.0	%	25.4	49.3	28.9	30.7	51.5	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1.0	%	85.4	86.1	82.1	90.1	83.4	
Anthracene-d10	1719-06-8	1.0	%	66.2	67.4	60.0	69.6	65.1	
4-Terphenyl-d14	1718-51-0	1.0	%	106	89.5	93.6	106	87.6	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	92.6	91.6	96.0	93.1	94.3	
Toluene-D8	2037-26-5	2	%	96.1	94.6	98.4	100	90.2	
4-Bromofluorobenzene	460-00-4	2	%	98.7	99.1	108	105	93.8	



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10	72
2-Chlorophenol-D4	93951-73-6	27	130
2,4,6-Tribromophenol	118-79-6	19	181
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	14	146
Anthracene-d10	1719-06-8	35	137
4-Terphenyl-d14	1718-51-0	36	154
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry / Biology).

(WATER) EP033: C1 - C4 Hydrocarbon Gases

(WATER) EK026SF: Total CN by Segmented Flow Analyser

(WATER) EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser

(WATER) EK020G: Cyanate by Discrete Analyser

(WATER) EK027G: Thiocyanate by discrete analyser



## CERTIFICATE OF ANALYSIS

Work Order	: <b>EB2522107</b>	Page	: 1 of 15
Amendment	: <b>2</b>		
Client	: <b>SRG Global Asset Care Pty Ltd</b>	Laboratory	: Environmental Division Brisbane
Contact	: Obzervr AECOM 1	Contact	: Jarret Venderley
Address	: GPO BOX 5262 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3552-8685
Project	: Arrow Hopeland MP	Date Samples Received	: 27-Jun-2025 08:20
Order number	: 4520016217	Date Analysis Commenced	: 29-Jun-2025
C-O-C number	: 2606-37B1-4E6B	Issue Date	: 14-Jul-2025 11:11
Sampler	: Obzervr AECOM 1		
Site	: ----		
Quote number	: EB24ALSARROW0001 V4		
No. of samples received	: 10		
No. of samples analysed	: 10		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Beatriz Llarinas	Senior Chemist	Brisbane Organics, Stafford, QLD
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Tatijana Markoska	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD



## General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
^ = This result is computed from individual analyte detections at or above the level of reporting  
ø = ALS is not NATA accredited for these tests.  
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO<sub>2</sub> and Fluoride to the Anions.
- **Cyanate, Cyanide, Thiocyanate & Methane in Water conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.**
- EK084: Unionized Hydrogen Sulfide (UHS) requires field temperature, pH and EC to be provided on the chain of custody (COC) for each sample. In the absence of these parameters, the laboratory has analysed pH, EC and used a standard room temperature of 25°C to calculate UHS.
- Amendment (14/07/2025): This report has been amended following the update of sample ID for NB04DS to "NB04(D)S". All analysis results are as per the previous report.
- Amendment (14/07/2025): This report has been amended following the update of sample ID for NB04(D)S to "NB04D(S)". All analysis results are as per the previous report.
- EP075(SIM) – PAH/Phenols (SIM): Sample 'Hopeland 37' (EB2522107-002) required dilution prior to analysis due to matrix interference. LOR values have been adjusted accordingly. Surrogate recovery not determined.
- EP071SG – TRH Total Recoverable Hydrocarbons – Silica Gel Cleanup \ EP071 – TRH Semivolatle Fraction: The duplicate recovery for sample EB2521859\_006 is not determined due to laboratory error. Insufficient volume remaining for re-extraction.
- EG020-T (Total Metals by ICP-MS): Limit of reporting raised due to matrix interference.
- EP005 (Total Organic Carbon): Samples 'HSMB3D1' (EB2522107-003) & 'HSMB5D' (EB2522107-006) required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- It is recognised that EG020T (Total Metals by ICP-MS) is less than EG020F (Dissolved Metals by ICP-MS) for 'HSMB4S' (EB2522107-005). However, the difference is within experimental variation of the methods.
- EG020-F (Dissolved Metals by ICP-MS): Limit of reporting raised due to matrix interference.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPTBQ225_02	Hopeland 37	HSMB3D1	HSMB3D2	HSMB4S
Sampling date / time				23-Jun-2025 07:30	24-Jun-2025 12:27	25-Jun-2025 01:45	24-Jun-2025 04:15	25-Jun-2025 08:17	
Compound	CAS Number	LOR	Unit	EB2522107-001	EB2522107-002	EB2522107-003	EB2522107-004	EB2522107-005	
				Result	Result	Result	Result	Result	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	----	15000	1820	2400	9880	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	----	222	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	----	163	63	90	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	----	<1	570	923	52	
Total Alkalinity as CaCO3	----	1	mg/L	----	384	632	1010	52	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	35	<1	<1	<1	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	----	7320	718	816	5350	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	----	186	5	5	252	
Magnesium	7439-95-4	1	mg/L	----	<1	1	2	25	
Sodium	7440-23-5	1	mg/L	----	851	636	820	1750	
Potassium	7440-09-7	1	mg/L	----	6510	38	80	1460	
<b>ED093F: SAR and Hardness Calculations</b>									
Total Hardness as CaCO3	----	1	mg/L	----	464	17	21	732	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	----	<0.005	<0.001	<0.001	<0.001	
Boron	7440-42-8	0.05	mg/L	----	0.08	0.24	0.28	0.09	
Barium	7440-39-3	0.001	mg/L	----	0.221	0.213	0.248	3.22	
Beryllium	7440-41-7	0.001	mg/L	----	<0.005	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	----	<0.0005	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	----	<0.005	<0.001	<0.001	<0.001	
Chromium	7440-47-3	0.001	mg/L	----	<0.005	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	----	0.005	<0.001	<0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	----	<0.005	0.019	0.015	3.54	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPTBQ225_02	Hopeland 37	HSMB3D1	HSMB3D2	HSMB4S
Sampling date / time					23-Jun-2025 07:30	24-Jun-2025 12:27	25-Jun-2025 01:45	24-Jun-2025 04:15	25-Jun-2025 08:17
Compound	CAS Number	LOR	Unit	EB2522107-001	EB2522107-002	EB2522107-003	EB2522107-004	EB2522107-005	
				Result	Result	Result	Result	Result	
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Nickel	7440-02-0	0.001	mg/L	----	<b>0.026</b>	<0.001	<0.001	<b>0.001</b>	
Lead	7439-92-1	0.001	mg/L	----	<0.005	<0.001	<0.001	<0.001	
Selenium	7782-49-2	0.01	mg/L	----	<0.05	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	----	<0.05	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	----	<0.025	<0.005	<0.005	<0.005	
Lithium	7439-93-2	0.001	mg/L	----	<b>0.381</b>	<b>0.035</b>	<b>0.057</b>	<b>0.119</b>	
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	----	<0.005	<0.001	<0.001	<0.001	
Boron	7440-42-8	0.05	mg/L	----	<b>0.10</b>	<b>0.41</b>	<b>0.41</b>	<b>0.16</b>	
Barium	7440-39-3	0.001	mg/L	----	<b>0.257</b>	<b>0.258</b>	<b>0.303</b>	<b>3.74</b>	
Beryllium	7440-41-7	0.001	mg/L	----	<0.005	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	----	<0.0005	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	----	<0.005	<0.001	<0.001	<0.001	
Chromium	7440-47-3	0.001	mg/L	----	<b>0.007</b>	<0.001	<0.001	<b>0.004</b>	
Copper	7440-50-8	0.001	mg/L	----	<b>0.012</b>	<0.001	<b>0.005</b>	<0.001	
Manganese	7439-96-5	0.001	mg/L	----	<b>0.142</b>	<b>0.020</b>	<b>0.018</b>	<b>3.45</b>	
Nickel	7440-02-0	0.001	mg/L	----	<b>0.035</b>	<0.001	<b>0.001</b>	<b>0.002</b>	
Lead	7439-92-1	0.001	mg/L	----	<0.005	<0.001	<b>0.008</b>	<0.001	
Selenium	7782-49-2	0.01	mg/L	----	<0.05	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	----	<0.05	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	----	<b>0.044</b>	<b>0.013</b>	<b>0.021</b>	<b>0.008</b>	
Lithium	7439-93-2	0.001	mg/L	----	<b>0.490</b>	<b>0.070</b>	<b>0.097</b>	<b>0.227</b>	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	----	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	----	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EG050F: Dissolved Hexavalent Chromium</b>									



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPTBQ225_02	Hopeland 37	HSMB3D1	HSMB3D2	HSMB4S
Sampling date / time				23-Jun-2025 07:30	24-Jun-2025 12:27	25-Jun-2025 01:45	24-Jun-2025 04:15	25-Jun-2025 08:17	
Compound	CAS Number	LOR	Unit	EB2522107-001	EB2522107-002	EB2522107-003	EB2522107-004	EB2522107-005	
				Result	Result	Result	Result	Result	
<b>EG050F: Dissolved Hexavalent Chromium - Continued</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	----	<0.01	<0.01	<0.01	<0.01	
<b>EG050T: Total Hexavalent Chromium</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	----	<0.01	<0.01	<0.01	<0.01	
<b>EK020G: Cyanate by Discrete Analyser</b>									
Cyanate	88402-73-7	0.1	mg/L	----	<0.1	<0.1	<0.1	0.6	
<b>EK026SF: Total CN by Segmented Flow Analyser</b>									
Total Cyanide	57-12-5	0.004	mg/L	----	<0.004	0.010	0.113	0.217	
<b>EK027G: Thiocyanate by discrete analyser</b>									
Thiocyanate	463-56-9	0.1	mg/L	----	3.1	<0.1	0.2	0.2	
<b>EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser</b>									
Weak Acid Dissociable Cyanide	----	0.004	mg/L	----	<0.004	<0.004	0.005	0.051	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	----	0.1	1.4	1.0	0.3	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	----	4.70	0.69	0.73	7.66	
<b>EK084: Un-ionized Hydrogen Sulfide</b>									
∅ Unionized Hydrogen Sulfide	----	0.1	mg/L	----	<0.1	<0.1	<0.1	<0.1	
∅ Ionised Hydrogen Sulfide	----	0.1	mg/L	----	<0.1	<0.1	<0.1	<0.1	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	----	215	32.9	43.2	152	
∅ Total Cations	----	0.01	meq/L	----	213	29.0	38.1	128	
∅ Ionic Balance	----	0.01	%	----	0.49	6.33	6.23	8.52	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	----	77	<5	21	106	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	----	888	24300	12100	11600	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup</b>									
C10 - C14 Fraction	----	50	µg/L	----	<50	<50	<50	<50	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPTBQ225_02	Hopeland 37	HSMB3D1	HSMB3D2	HSMB4S
Sampling date / time					23-Jun-2025 07:30	24-Jun-2025 12:27	25-Jun-2025 01:45	24-Jun-2025 04:15	25-Jun-2025 08:17
Compound	CAS Number	LOR	Unit		EB2522107-001	EB2522107-002	EB2522107-003	EB2522107-004	EB2522107-005
					Result	Result	Result	Result	Result
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup - Continued</b>									
C15 - C28 Fraction	----	100	µg/L	----	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	----	60	<50	<50	<50	<50
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	----	60	<50	<50	<50	<50
<b>EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup</b>									
>C10 - C16 Fraction	----	100	µg/L	----	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	----	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	----	<100	<100	<100	<100	<100
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	----	<100	<100	<100	<100	<100
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	----	<100	<100	<100	<100	<100
<b>EP075(SIM)A: Phenolic Compounds</b>									
Phenol	108-95-2	1.0	µg/L	----	17.7	<1.0	<1.0	<1.0	3.7
2-Chlorophenol	95-57-8	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	----	9.6	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
2,4-Dimethylphenol	105-67-9	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
2,4-Dichlorophenol	120-83-2	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
2,6-Dichlorophenol	87-65-0	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	----	<5.0	<2.0	<2.0	<2.0	<2.0
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	1.6
Acenaphthylene	208-96-8	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPTBQ225_02	Hopeland 37	HSMB3D1	HSMB3D2	HSMB4S
Sampling date / time					23-Jun-2025 07:30	24-Jun-2025 12:27	25-Jun-2025 01:45	24-Jun-2025 04:15	25-Jun-2025 08:17
Compound	CAS Number	LOR	Unit	EB2522107-001	EB2522107-002	EB2522107-003	EB2522107-004	EB2522107-005	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Fluorene	86-73-7	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	----	<1.2	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	----	<2.5	<1.0	<1.0	<1.0	<1.0
<sup>^</sup> Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	----	<1.2	<0.5	<0.5	<0.5	<b>1.6</b>
<sup>^</sup> Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	----	<1.2	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	<b>60</b>	<20	<20	<20	<b>240</b>
C10 - C14 Fraction	----	50	µg/L	----	<b>7350</b>	<50	<50	<50	<b>310</b>
C15 - C28 Fraction	----	100	µg/L	----	<b>1880</b>	<100	<100	<100	<b>340</b>
C29 - C36 Fraction	----	50	µg/L	----	<b>260</b>	<50	<50	<50	<50
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	----	<b>9490</b>	<50	<50	<50	<b>650</b>
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<b>90</b>	<20	<20	<20	<b>260</b>
<sup>^</sup> C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<b>80</b>	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	----	<b>7530</b>	<100	<100	<100	<b>240</b>
>C16 - C34 Fraction	----	100	µg/L	----	<b>1450</b>	<100	<100	<100	<b>340</b>



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GCMPTBQ225_02	Hopeland 37	HSMB3D1	HSMB3D2	HSMB4S
Sampling date / time				23-Jun-2025 07:30	24-Jun-2025 12:27	25-Jun-2025 01:45	24-Jun-2025 04:15	25-Jun-2025 08:17	
Compound	CAS Number	LOR	Unit	EB2522107-001	EB2522107-002	EB2522107-003	EB2522107-004	EB2522107-005	
				Result	Result	Result	Result	Result	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued</b>									
>C34 - C40 Fraction	----	100	µg/L	----	170	<100	<100	<100	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	----	9150	<100	<100	580	
<sup>^</sup> >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	----	7530	<100	<100	240	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	2	3	<1	240	
Toluene	108-88-3	2	µg/L	<2	6	<2	<2	20	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	2	<2	<2	<2	
<sup>^</sup> Total Xylenes	----	2	µg/L	<2	4	<2	<2	<2	
<sup>^</sup> Sum of BTEX	----	1	µg/L	<1	12	3	<1	260	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1.0	%	----	Not Determined	32.4	31.6	28.2	
2-Chlorophenol-D4	93951-73-6	1.0	%	----	Not Determined	65.4	67.4	63.5	
2,4,6-Tribromophenol	118-79-6	1.0	%	----	Not Determined	40.8	56.2	80.9	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1.0	%	----	Not Determined	108	88.3	72.2	
Anthracene-d10	1719-06-8	1.0	%	----	Not Determined	99.2	95.8	74.6	
4-Terphenyl-d14	1718-51-0	1.0	%	----	Not Determined	100	97.2	83.9	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	107	108	113	106	109	
Toluene-D8	2037-26-5	2	%	94.2	99.5	100	94.1	95.4	
4-Bromofluorobenzene	460-00-4	2	%	94.9	106	108	95.2	98.1	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB5D	HSMB7D	HSMB7S	NB01D	NB04D(S)
Sampling date / time				25-Jun-2025 10:40	24-Jun-2025 11:55	24-Jun-2025 02:05	25-Jun-2025 03:15	23-Jun-2025 04:00	
Compound	CAS Number	LOR	Unit	EB2522107-006	EB2522107-007	EB2522107-008	EB2522107-009	EB2522107-010	
				Result	Result	Result	Result	Result	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	1520	4400	4960	3080	5520	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	70	69	<1	134	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	650	314	39	1900	96	
Total Alkalinity as CaCO3	----	1	mg/L	719	384	39	2040	96	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	<1	<1	<1	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	520	2340	2730	739	3330	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	2	6	70	9	68	
Magnesium	7439-95-4	1	mg/L	<1	5	7	4	20	
Sodium	7440-23-5	1	mg/L	533	1470	1480	1220	1930	
Potassium	7440-09-7	1	mg/L	41	217	222	28	26	
<b>ED093F: SAR and Hardness Calculations</b>									
Total Hardness as CaCO3	----	1	mg/L	5	36	204	39	252	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	0.004	
Boron	7440-42-8	0.05	mg/L	0.23	0.28	0.26	0.43	0.35	
Barium	7440-39-3	0.001	mg/L	0.112	0.632	1.82	0.844	2.57	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.001	<0.001	<0.001	<0.001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	0.005	0.032	0.210	0.005	0.091	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB5D	HSMB7D	HSMB7S	NB01D	NB04D(S)
Sampling date / time				25-Jun-2025 10:40	24-Jun-2025 11:55	24-Jun-2025 02:05	25-Jun-2025 03:15	23-Jun-2025 04:00	
Compound	CAS Number	LOR	Unit	EB2522107-006	EB2522107-007	EB2522107-008	EB2522107-009	EB2522107-010	
				Result	Result	Result	Result	Result	
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<b>0.006</b>	
Lithium	7439-93-2	0.001	mg/L	<b>0.033</b>	<b>0.130</b>	<b>0.102</b>	<b>0.091</b>	<b>0.142</b>	
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<b>0.004</b>	
Boron	7440-42-8	0.05	mg/L	<b>0.30</b>	<b>0.28</b>	<b>0.24</b>	<b>0.40</b>	<b>0.34</b>	
Barium	7440-39-3	0.001	mg/L	<b>0.133</b>	<b>0.663</b>	<b>1.88</b>	<b>0.882</b>	<b>2.62</b>	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<b>0.002</b>	<0.001	<0.001	<0.001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<b>0.006</b>	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<b>0.097</b>	<0.001	<0.001	<b>0.006</b>	<0.001	
Manganese	7439-96-5	0.001	mg/L	<b>0.014</b>	<b>0.032</b>	<b>0.210</b>	<b>0.006</b>	<b>0.086</b>	
Nickel	7440-02-0	0.001	mg/L	<0.001	<b>0.001</b>	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<b>0.155</b>	<b>0.002</b>	<0.001	<b>0.011</b>	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<b>0.053</b>	<0.005	<0.005	<b>0.010</b>	<0.005	
Lithium	7439-93-2	0.001	mg/L	<b>0.049</b>	<b>0.133</b>	<b>0.102</b>	<b>0.087</b>	<b>0.143</b>	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EG050F: Dissolved Hexavalent Chromium</b>									



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB5D	HSMB7D	HSMB7S	NB01D	NB04D(S)
Sampling date / time				25-Jun-2025 10:40	24-Jun-2025 11:55	24-Jun-2025 02:05	25-Jun-2025 03:15	23-Jun-2025 04:00	
Compound	CAS Number	LOR	Unit	EB2522107-006	EB2522107-007	EB2522107-008	EB2522107-009	EB2522107-010	
				Result	Result	Result	Result	Result	
<b>EG050F: Dissolved Hexavalent Chromium - Continued</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
<b>EG050T: Total Hexavalent Chromium</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
<b>EK020G: Cyanate by Discrete Analyser</b>									
Cyanate	88402-73-7	0.1	mg/L	0.4	1.2	<0.1	<0.1	0.2	
<b>EK026SF: Total CN by Segmented Flow Analyser</b>									
Total Cyanide	57-12-5	0.004	mg/L	0.051	0.322	<0.004	<0.004	<0.004	
<b>EK027G: Thiocyanate by discrete analyser</b>									
Thiocyanate	463-56-9	0.1	mg/L	0.1	0.2	<0.1	0.2	<0.1	
<b>EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser</b>									
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.056	<0.004	<0.004	<0.004	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	1.9	0.8	0.4	0.5	0.4	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	0.78	3.26	1.49	0.82	0.97	
<b>EK084: Un-ionized Hydrogen Sulfide</b>									
∅ Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Ionised Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	29.0	73.7	77.8	61.6	95.8	
∅ Total Cations	----	0.01	meq/L	24.3	70.2	74.1	54.6	89.6	
∅ Ionic Balance	----	0.01	%	8.81	2.42	2.41	6.06	3.34	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	<5	7	5	6	6	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	19900	11300	15600	11800	16400	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup</b>									
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB5D	HSMB7D	HSMB7S	NB01D	NB04D(S)
Sampling date / time				25-Jun-2025 10:40	24-Jun-2025 11:55	24-Jun-2025 02:05	25-Jun-2025 03:15	23-Jun-2025 04:00	
Compound	CAS Number	LOR	Unit	EB2522107-006	EB2522107-007	EB2522107-008	EB2522107-009	EB2522107-010	
				Result	Result	Result	Result	Result	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup - Continued</b>									
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50	
<b>EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup</b>									
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
<b>EP075(SIM)A: Phenolic Compounds</b>									
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<b>1.0</b>	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB5D	HSMB7D	HSMB7S	NB01D	NB04D(S)
Sampling date / time					25-Jun-2025 10:40	24-Jun-2025 11:55	24-Jun-2025 02:05	25-Jun-2025 03:15	23-Jun-2025 04:00
Compound	CAS Number	LOR	Unit		EB2522107-006	EB2522107-007	EB2522107-008	EB2522107-009	EB2522107-010
					Result	Result	Result	Result	Result
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<b>1.0</b>
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		<b>60</b>	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		<b>60</b>	<50	<50	<50	<50
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		<b>110</b>	<100	<100	<100	<100



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB5D	HSMB7D	HSMB7S	NB01D	NB04D(S)
Sampling date / time				25-Jun-2025 10:40	24-Jun-2025 11:55	24-Jun-2025 02:05	25-Jun-2025 03:15	23-Jun-2025 04:00	
Compound	CAS Number	LOR	Unit	EB2522107-006	EB2522107-007	EB2522107-008	EB2522107-009	EB2522107-010	
				Result	Result	Result	Result	Result	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued</b>									
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<b>110</b>	<100	<100	<100	<100	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<b>4</b>	<b>7</b>	<1	<1	<1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
^ Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2	
^ Sum of BTEX	----	1	µg/L	<b>4</b>	<b>7</b>	<1	<1	<1	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1.0	%	<b>27.3</b>	<b>32.6</b>	<b>30.8</b>	<b>32.2</b>	<b>29.2</b>	
2-Chlorophenol-D4	93951-73-6	1.0	%	<b>52.9</b>	<b>53.6</b>	<b>74.4</b>	<b>70.6</b>	<b>69.2</b>	
2,4,6-Tribromophenol	118-79-6	1.0	%	<b>31.7</b>	<b>29.6</b>	<b>78.6</b>	<b>55.1</b>	<b>61.8</b>	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1.0	%	<b>78.7</b>	<b>92.0</b>	<b>82.5</b>	<b>91.6</b>	<b>75.6</b>	
Anthracene-d10	1719-06-8	1.0	%	<b>79.6</b>	<b>102</b>	<b>91.9</b>	<b>97.0</b>	<b>86.0</b>	
4-Terphenyl-d14	1718-51-0	1.0	%	<b>88.5</b>	<b>107</b>	<b>93.8</b>	<b>103</b>	<b>101</b>	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	<b>107</b>	<b>103</b>	<b>106</b>	<b>108</b>	<b>108</b>	
Toluene-D8	2037-26-5	2	%	<b>93.4</b>	<b>96.5</b>	<b>94.2</b>	<b>96.0</b>	<b>93.2</b>	
4-Bromofluorobenzene	460-00-4	2	%	<b>100</b>	<b>99.2</b>	<b>96.5</b>	<b>97.9</b>	<b>96.5</b>	



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10	72
2-Chlorophenol-D4	93951-73-6	27	130
2,4,6-Tribromophenol	118-79-6	19	181
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	14	146
Anthracene-d10	1719-06-8	35	137
4-Terphenyl-d14	1718-51-0	36	154
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry / Biology).

(WATER) EK027G: Thiocyanate by discrete analyser

(WATER) EP033: C1 - C4 Hydrocarbon Gases

(WATER) EK026SF: Total CN by Segmented Flow Analyser

(WATER) EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser

(WATER) EK020G: Cyanate by Discrete Analyser



## CERTIFICATE OF ANALYSIS

Work Order : **EB2522724**  
Client : **SRG Global Asset Care Pty Ltd**  
Contact : Obzervr AECOM 1  
Address : GPO BOX 5262  
BRISBANE QLD, AUSTRALIA 4001  
Telephone : ----  
Project : Arrow Hopeland MP  
Order number : 4520016217  
C-O-C number : 0107-37B1-BBB0  
Sampler : Obzervr AECOM 1  
Site : ----  
Quote number : EB24ALSARROW0001 V4  
No. of samples received : 22  
No. of samples analysed : 22

Page : 1 of 33  
Laboratory : Environmental Division Brisbane  
Contact : Jarret Venderley  
Address : 2 Byth Street Stafford QLD Australia 4053  
Telephone : +61-7-3552-8685  
Date Samples Received : 02-Jul-2025 08:50  
Date Analysis Commenced : 02-Jul-2025  
Issue Date : 11-Jul-2025 15:44



Accreditation No. 825  
Accredited for compliance with  
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD



## General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.  
LOR = Limit of reporting  
^ = This result is computed from individual analyte detections at or above the level of reporting  
ø = ALS is not NATA accredited for these tests.  
~ = Indicates an estimated value.

- EG050G-F/T (Dissolved/Total Hexavalent Chromium): Some samples were diluted due to matrix interference. LOR adjusted accordingly.
- EK027G: LOR raised for Thiocyanate due to sample matrix.
- EK028SF: LOR raised for Weak CN and Total CN for various samples due to sample matrix.
- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO<sub>2</sub> and Fluoride to the Anions.
- **Thiocyanate, Cyanate, Cyanide and Methane in water conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.**
- EK084: Unionized Hydrogen Sulfide (UHS) requires field temperature, pH and EC to be provided on the chain of custody (COC) for each sample. In the absence of these parameters, the laboratory has analysed pH, EC and used a standard room temperature of 25°C to calculate UHS.
- EG035F (Dissolved Mercury by FIMS): Limit of reporting raised due to matrix interference.
- EP071SG – TRH Total Recoverable Hydrocarbons – Silica Gel Cleanup: Sample EB2522223\_001 shows poor matrix spike recovery due to matrix interference.
- EP005 (Total Organic Carbon): Samples 'AES9443' (EB2522724-001) & 'Hopeland 21' (EB2522724-006) required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- EP080 - Volatile TRH/BTEX: Sample 'NB01S' (EB2522724-018) required dilution prior to analysis due to high-level contaminants. LOR values have been adjusted accordingly.
- EG020-F (Dissolved Metals by ICP-MS): Limit of reporting raised due to matrix interference.
- It is recognised that EG020T (Total Metals by ICP-MS) is less than EG020F (Dissolved Metals by ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- EG035T (Total Mercury by FIMS): Limit of reporting raised for HSMB3S2 (EB2522724-014) due to matrix interference.
- EP075(SIM) – PAH/Phenols (SIM): The LOR for Phenol has been raised in sample 'HSMB6S' (EB2522724-017) and 'NB02D' (EB2522724-019) due to laboratory background contamination.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	AES9443	GCMPFBQ225_01	GCMPRSQ225_01	GCMPDQ225_04	GCMPBQ225_03
Sampling date / time				28-Jun-2025 04:55	30-Jun-2025 11:40	29-Jun-2025 08:32	26-Jun-2025 03:25	27-Jun-2025 08:30	
Compound	CAS Number	LOR	Unit	EB2522724-001	EB2522724-002	EB2522724-003	EB2522724-004	EB2522724-005	
				Result	Result	Result	Result	Result	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	6190	----	<10	17200	----	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	<1	<1	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	18	----	<1	<1	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	530	----	4	2	----	
Total Alkalinity as CaCO3	----	1	mg/L	549	----	4	2	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	----	<1	<1	----	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	3610	----	<1	8480	----	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	94	----	<1	654	----	
Magnesium	7439-95-4	1	mg/L	76	----	<1	228	----	
Sodium	7440-23-5	1	mg/L	2160	----	<1	4380	----	
Potassium	7440-09-7	1	mg/L	14	----	<1	30	----	
<b>ED093F: SAR and Hardness Calculations</b>									
Total Hardness as CaCO3	----	1	mg/L	548	----	<1	2570	----	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	<0.001	<0.005	----	
Boron	7440-42-8	0.05	mg/L	0.42	----	<0.05	0.26	----	
Barium	7440-39-3	0.001	mg/L	2.68	----	<0.001	12.6	----	
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	<0.001	<0.005	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	<0.0001	<0.0005	----	
Cobalt	7440-48-4	0.001	mg/L	<0.001	----	<0.001	<0.005	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	----	<0.001	<0.005	----	
Copper	7440-50-8	0.001	mg/L	0.003	----	<0.001	<0.005	----	
Manganese	7439-96-5	0.001	mg/L	0.041	----	<0.001	6.32	----	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	AES9443	GCMPFBQ225_01	GCMPRSQ225_01	GCMPDQ225_04	GCMPBQ225_03
Sampling date / time				28-Jun-2025 04:55	30-Jun-2025 11:40	29-Jun-2025 08:32	26-Jun-2025 03:25	27-Jun-2025 08:30	
Compound	CAS Number	LOR	Unit	EB2522724-001	EB2522724-002	EB2522724-003	EB2522724-004	EB2522724-005	
				Result	Result	Result	Result	Result	
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Nickel	7440-02-0	0.001	mg/L	0.017	----	<0.001	<0.005	----	
Lead	7439-92-1	0.001	mg/L	<0.001	----	<0.001	<0.005	----	
Selenium	7782-49-2	0.01	mg/L	<0.01	----	<0.01	<0.05	----	
Vanadium	7440-62-2	0.01	mg/L	<0.01	----	<0.01	<0.05	----	
Zinc	7440-66-6	0.005	mg/L	0.015	----	<0.005	<0.025	----	
Lithium	7439-93-2	0.001	mg/L	0.124	----	<0.001	0.238	----	
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	<0.001	<0.001	----	
Boron	7440-42-8	0.05	mg/L	0.43	----	<0.05	0.19	----	
Barium	7440-39-3	0.001	mg/L	2.83	----	<0.001	12.2	----	
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	<0.001	<0.001	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	<0.0001	<0.0001	----	
Cobalt	7440-48-4	0.001	mg/L	<0.001	----	<0.001	0.002	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	----	<0.001	0.003	----	
Copper	7440-50-8	0.001	mg/L	0.020	----	<0.001	<0.001	----	
Manganese	7439-96-5	0.001	mg/L	0.041	----	<0.001	7.65	----	
Nickel	7440-02-0	0.001	mg/L	0.017	----	<0.001	0.002	----	
Lead	7439-92-1	0.001	mg/L	0.002	----	<0.001	<0.001	----	
Selenium	7782-49-2	0.01	mg/L	<0.01	----	<0.01	<0.01	----	
Vanadium	7440-62-2	0.01	mg/L	<0.01	----	<0.01	<0.01	----	
Zinc	7440-66-6	0.005	mg/L	0.102	----	<0.005	<0.005	----	
Lithium	7439-93-2	0.001	mg/L	0.109	----	<0.001	0.241	----	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	<0.0001	<0.0001	----	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	<0.0001	<0.0001	----	
<b>EG050F: Dissolved Hexavalent Chromium</b>									



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	AES9443	GCMPFBQ225_01	GCMPRSQ225_01	GCMPSDQ225_04	GCMPBQ225_03
Sampling date / time				28-Jun-2025 04:55	30-Jun-2025 11:40	29-Jun-2025 08:32	26-Jun-2025 03:25	27-Jun-2025 08:30	
Compound	CAS Number	LOR	Unit	EB2522724-001	EB2522724-002	EB2522724-003	EB2522724-004	EB2522724-005	
				Result	Result	Result	Result	Result	
<b>EG050F: Dissolved Hexavalent Chromium - Continued</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	----	<0.01	<0.01	----	
<b>EG050T: Total Hexavalent Chromium</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	----	<0.01	<0.01	----	
<b>EK020G: Cyanate by Discrete Analyser</b>									
Cyanate	88402-73-7	0.1	mg/L	0.4	----	<0.1	0.1	----	
<b>EK026SF: Total CN by Segmented Flow Analyser</b>									
Total Cyanide	57-12-5	0.004	mg/L	<0.004	----	<0.004	<0.004	----	
<b>EK027G: Thiocyanate by discrete analyser</b>									
Thiocyanate	463-56-9	0.1	mg/L	0.2	----	<0.1	<0.5	----	
<b>EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser</b>									
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	----	<0.004	<0.004	----	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	0.5	----	<0.1	0.2	----	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	3.48	----	<0.01	0.49	----	
<b>EK084: Un-ionized Hydrogen Sulfide</b>									
∅ Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	----	<0.1	<0.1	----	
∅ Ionised Hydrogen Sulfide	----	0.1	mg/L	<0.1	----	<0.1	<0.1	----	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	113	----	0.08	239	----	
∅ Total Cations	----	0.01	meq/L	105	----	<0.01	243	----	
∅ Ionic Balance	----	0.01	%	3.46	----	----	0.71	----	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	<5	----	<1	5	----	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	12800	----	<10	21000	----	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup</b>									
C10 - C14 Fraction	----	50	µg/L	<50	----	<50	<50	----	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	AES9443	GCMPFBQ225_01	GCMPRSQ225_01	GCMPSDQ225_04	GCMPBQ225_03
Sampling date / time					28-Jun-2025 04:55	30-Jun-2025 11:40	29-Jun-2025 08:32	26-Jun-2025 03:25	27-Jun-2025 08:30
Compound	CAS Number	LOR	Unit	EB2522724-001	EB2522724-002	EB2522724-003	EB2522724-004	EB2522724-005	
				Result	Result	Result	Result	Result	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup - Continued</b>									
C15 - C28 Fraction	----	100	µg/L	<100	----	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	----	<50	<50	<50	----
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	<50	<50	<50	----
<b>EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup</b>									
>C10 - C16 Fraction	----	100	µg/L	<100	----	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	<100	<100	<100	----
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	<100	<100	<100	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	<100	<100	<100	----
<b>EP075(SIM)A: Phenolic Compounds</b>									
Phenol	108-95-2	1.0	µg/L	<1.0	----	<1.0	<b>3.0</b>	<1.0	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	----	<2.0	<2.0	<2.0	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	----	<2.0	<2.0	<2.0	----
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	<1.0	<1.0	<1.0	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	AES9443	GCMPFBQ225_01	GCMPRSQ225_01	GCMPDQ225_04	GCMPBQ225_03
Sampling date / time					28-Jun-2025 04:55	30-Jun-2025 11:40	29-Jun-2025 08:32	26-Jun-2025 03:25	27-Jun-2025 08:30
Compound	CAS Number	LOR	Unit	EB2522724-001	EB2522724-002	EB2522724-003	EB2522724-004	EB2522724-005	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Fluorene	86-73-7	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Anthracene	120-12-7	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Pyrene	129-00-0	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Chrysene	218-01-9	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	<0.5	<0.5	----	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	----	<1.0	<1.0	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	<0.5	<0.5	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	<0.5	<0.5	----	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	
C10 - C14 Fraction	----	50	µg/L	<50	----	<50	<b>90</b>	----	
C15 - C28 Fraction	----	100	µg/L	<100	----	<100	<100	----	
C29 - C36 Fraction	----	50	µg/L	<50	----	<50	<50	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	<50	<b>90</b>	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<b>20</b>	<20	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	<100	----	<100	<100	----	
>C16 - C34 Fraction	----	100	µg/L	<100	----	<100	<100	----	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	AES9443	GCMPFBQ225_01	GCMPRSQ225_01	GCMPSDQ225_04	GCMPQBQ225_03
Sampling date / time				28-Jun-2025 04:55	30-Jun-2025 11:40	29-Jun-2025 08:32	26-Jun-2025 03:25	27-Jun-2025 08:30	
Compound	CAS Number	LOR	Unit	EB2522724-001	EB2522724-002	EB2522724-003	EB2522724-004	EB2522724-005	
				Result	Result	Result	Result	Result	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued</b>									
>C34 - C40 Fraction	----	100	µg/L	<100	----	<100	<100	----	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	<100	<100	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	<100	<100	----	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	<1	<1	3	<1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	5	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	3	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
^ Total Xylenes	----	2	µg/L	<2	<2	<2	3	<2	
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	11	<1	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1.0	%	34.7	----	35.7	27.8	----	
2-Chlorophenol-D4	93951-73-6	1.0	%	78.4	----	87.5	66.7	----	
2,4,6-Tribromophenol	118-79-6	1.0	%	90.8	----	103	66.1	----	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1.0	%	74.8	----	81.6	64.2	----	
Anthracene-d10	1719-06-8	1.0	%	94.7	----	106	82.0	----	
4-Terphenyl-d14	1718-51-0	1.0	%	103	----	121	102	----	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	100.0	98.5	98.2	108	97.7	
Toluene-D8	2037-26-5	2	%	89.8	91.4	90.2	88.4	91.2	
4-Bromofluorobenzene	460-00-4	2	%	87.7	87.0	88.1	92.4	88.0	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 21	Hopeland 35	Hopeland 36	HSMB1D	HSMB1S
Sampling date / time				29-Jun-2025 12:27	28-Jun-2025 09:08	28-Jun-2025 09:27	30-Jun-2025 08:15	30-Jun-2025 07:55	
Compound	CAS Number	LOR	Unit	EB2522724-006	EB2522724-007	EB2522724-008	EB2522724-009	EB2522724-010	
				Result	Result	Result	Result	Result	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	2720	11100	2930	3940	9170	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	220	<1	86	29	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	681	76	362	404	35	
Total Alkalinity as CaCO3	----	1	mg/L	901	76	449	433	35	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	<1	<1	1	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	1150	5830	1470	1920	5000	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	2	144	4	17	161	
Magnesium	7439-95-4	1	mg/L	2	134	7	5	43	
Sodium	7440-23-5	1	mg/L	1060	2380	1040	1330	2400	
Potassium	7440-09-7	1	mg/L	46	1620	86	238	409	
<b>ED093F: SAR and Hardness Calculations</b>									
Total Hardness as CaCO3	----	1	mg/L	13	911	39	63	579	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.003	0.002	<0.001	<0.001	
Boron	7440-42-8	0.05	mg/L	0.34	0.26	0.39	0.22	0.15	
Barium	7440-39-3	0.001	mg/L	0.344	4.40	0.359	0.768	3.29	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	0.003	0.161	0.004	0.071	17.7	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 21	Hopeland 35	Hopeland 36	HSMB1D	HSMB1S
Sampling date / time				29-Jun-2025 12:27	28-Jun-2025 09:08	28-Jun-2025 09:27	30-Jun-2025 08:15	30-Jun-2025 07:55	
Compound	CAS Number	LOR	Unit	EB2522724-006	EB2522724-007	EB2522724-008	EB2522724-009	EB2522724-010	
				Result	Result	Result	Result	Result	
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<b>0.002</b>	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<0.005	<b>0.006</b>	<0.005	<0.005	<b>0.032</b>	
Lithium	7439-93-2	0.001	mg/L	<b>0.074</b>	<b>0.168</b>	<b>0.065</b>	<b>0.110</b>	<b>0.217</b>	
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<b>0.001</b>	<b>0.004</b>	<b>0.002</b>	<0.001	<0.001	
Boron	7440-42-8	0.05	mg/L	<b>0.42</b>	<b>0.29</b>	<b>0.48</b>	<b>0.27</b>	<b>0.18</b>	
Barium	7440-39-3	0.001	mg/L	<b>0.363</b>	<b>4.59</b>	<b>0.375</b>	<b>0.822</b>	<b>3.37</b>	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	<b>0.003</b>	<b>0.162</b>	<b>0.003</b>	<b>0.077</b>	<b>17.6</b>	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<b>0.001</b>	<b>0.001</b>	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<b>0.007</b>	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<0.005	<b>0.010</b>	<b>0.009</b>	<0.005	<b>0.032</b>	
Lithium	7439-93-2	0.001	mg/L	<b>0.096</b>	<b>0.177</b>	<b>0.082</b>	<b>0.139</b>	<b>0.263</b>	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EG050F: Dissolved Hexavalent Chromium</b>									



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 21	Hopeland 35	Hopeland 36	HSMB1D	HSMB1S
Sampling date / time				29-Jun-2025 12:27	28-Jun-2025 09:08	28-Jun-2025 09:27	30-Jun-2025 08:15	30-Jun-2025 07:55	
Compound	CAS Number	LOR	Unit	EB2522724-006	EB2522724-007	EB2522724-008	EB2522724-009	EB2522724-010	
				Result	Result	Result	Result	Result	
<b>EG050F: Dissolved Hexavalent Chromium - Continued</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
<b>EG050T: Total Hexavalent Chromium</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
<b>EK020G: Cyanate by Discrete Analyser</b>									
Cyanate	88402-73-7	0.1	mg/L	0.6	<0.1	0.2	<0.1	5.3	
<b>EK026SF: Total CN by Segmented Flow Analyser</b>									
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	0.363	0.186	
<b>EK027G: Thiocyanate by discrete analyser</b>									
Thiocyanate	463-56-9	0.1	mg/L	0.1	<0.5	<0.1	0.2	<0.5	
<b>EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser</b>									
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	0.048	<0.008	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	1.6	0.3	1.3	0.6	0.2	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	3.27	0.09	0.28	<0.01	23.9	
<b>EK084: Un-ionized Hydrogen Sulfide</b>									
∅ Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Ionised Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	50.4	166	50.4	62.8	142	
∅ Total Cations	----	0.01	meq/L	47.5	163	48.2	65.2	126	
∅ Ionic Balance	----	0.01	%	2.95	0.85	2.26	1.86	5.72	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	<5	10	5	19	98	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	19200	12800	13000	38800	22500	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup</b>									
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 21	Hopeland 35	Hopeland 36	HSMB1D	HSMB1S
Sampling date / time				29-Jun-2025 12:27	28-Jun-2025 09:08	28-Jun-2025 09:27	30-Jun-2025 08:15	30-Jun-2025 07:55	
Compound	CAS Number	LOR	Unit	EB2522724-006	EB2522724-007	EB2522724-008	EB2522724-009	EB2522724-010	
				Result	Result	Result	Result	Result	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup - Continued</b>									
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50	
<b>EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup</b>									
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
<b>EP075(SIM)A: Phenolic Compounds</b>									
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<b>59.7</b>	<b>9.0</b>	<b>9.1</b>	
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<b>2.0</b>	<b>2.6</b>	<2.0	
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<b>1.6</b>	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 21	Hopeland 35	Hopeland 36	HSMB1D	HSMB1S
Sampling date / time					29-Jun-2025 12:27	28-Jun-2025 09:08	28-Jun-2025 09:27	30-Jun-2025 08:15	30-Jun-2025 07:55
Compound	CAS Number	LOR	Unit		EB2522724-006	EB2522724-007	EB2522724-008	EB2522724-009	EB2522724-010
					Result	Result	Result	Result	Result
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
<sup>^</sup> Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<b>1.6</b>
<sup>^</sup> Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	<b>150</b>
C10 - C14 Fraction	----	50	µg/L	<b>60</b>	<b>130</b>	<b>210</b>	<50	<50	<b>350</b>
C15 - C28 Fraction	----	100	µg/L	<b>120</b>	<100	<b>180</b>	<100	<100	<b>270</b>
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	<50
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	<b>180</b>	<b>130</b>	<b>390</b>	<50	<50	<b>620</b>
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	<b>140</b>
<sup>^</sup> C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<b>100</b>	<b>290</b>	<100	<100	<b>310</b>
>C16 - C34 Fraction	----	100	µg/L	<b>130</b>	<100	<100	<100	<100	<b>260</b>



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Hopeland 21	Hopeland 35	Hopeland 36	HSMB1D	HSMB1S
Sampling date / time				29-Jun-2025 12:27	28-Jun-2025 09:08	28-Jun-2025 09:27	30-Jun-2025 08:15	30-Jun-2025 07:55	
Compound	CAS Number	LOR	Unit	EB2522724-006	EB2522724-007	EB2522724-008	EB2522724-009	EB2522724-010	
				Result	Result	Result	Result	Result	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued</b>									
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<b>130</b>	<b>100</b>	<b>290</b>	<100	<b>570</b>	
<sup>^</sup> >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<b>100</b>	<b>290</b>	<100	<b>310</b>	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<b>1</b>	<b>128</b>	
Toluene	108-88-3	2	µg/L	<2	<b>2</b>	<2	<2	<b>10</b>	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<b>4</b>	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
<sup>^</sup> Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<b>4</b>	
<sup>^</sup> Sum of BTEX	----	1	µg/L	<1	<b>2</b>	<1	<b>1</b>	<b>142</b>	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1.0	%	<b>28.5</b>	<b>32.7</b>	<b>33.6</b>	<b>30.6</b>	<b>36.6</b>	
2-Chlorophenol-D4	93951-73-6	1.0	%	<b>41.4</b>	<b>74.3</b>	<b>48.4</b>	<b>67.8</b>	<b>79.7</b>	
2,4,6-Tribromophenol	118-79-6	1.0	%	<b>28.9</b>	<b>95.7</b>	<b>35.7</b>	<b>74.3</b>	<b>116</b>	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1.0	%	<b>71.6</b>	<b>73.5</b>	<b>75.8</b>	<b>75.1</b>	<b>74.0</b>	
Anthracene-d10	1719-06-8	1.0	%	<b>96.7</b>	<b>99.3</b>	<b>106</b>	<b>97.0</b>	<b>102</b>	
4-Terphenyl-d14	1718-51-0	1.0	%	<b>103</b>	<b>100</b>	<b>106</b>	<b>105</b>	<b>100</b>	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	<b>96.0</b>	<b>80.1</b>	<b>96.3</b>	<b>82.6</b>	<b>106</b>	
Toluene-D8	2037-26-5	2	%	<b>89.7</b>	<b>86.0</b>	<b>91.0</b>	<b>87.5</b>	<b>89.3</b>	
4-Bromofluorobenzene	460-00-4	2	%	<b>87.1</b>	<b>89.2</b>	<b>88.7</b>	<b>88.6</b>	<b>90.3</b>	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB2D	HSMB2S	HSMB3S1	HSMB3S2	HSMB4D
Sampling date / time				30-Jun-2025 09:45	30-Jun-2025 09:30	27-Jun-2025 09:30	27-Jun-2025 11:54	30-Jun-2025 11:40	
Compound	CAS Number	LOR	Unit	EB2522724-011	EB2522724-012	EB2522724-013	EB2522724-014	EB2522724-015	
				Result	Result	Result	Result	Result	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	<b>3390</b>	<b>3430</b>	<b>14800</b>	<b>20200</b>	<b>9000</b>	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<b>62</b>	<b>240</b>	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<b>533</b>	<b>264</b>	<b>8</b>	<b>2</b>	<b>191</b>	
Total Alkalinity as CaCO3	----	1	mg/L	<b>595</b>	<b>504</b>	<b>8</b>	<b>2</b>	<b>191</b>	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	<1	<1	<1	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	<b>1490</b>	<b>1640</b>	<b>7380</b>	<b>9610</b>	<b>4960</b>	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	<b>10</b>	<1	<b>492</b>	<b>694</b>	<b>58</b>	
Magnesium	7439-95-4	1	mg/L	<b>2</b>	<1	<b>116</b>	<b>195</b>	<b>14</b>	
Sodium	7440-23-5	1	mg/L	<b>1130</b>	<b>1260</b>	<b>3460</b>	<b>4270</b>	<b>2500</b>	
Potassium	7440-09-7	1	mg/L	<b>134</b>	<b>111</b>	<b>217</b>	<b>371</b>	<b>1290</b>	
<b>ED093F: SAR and Hardness Calculations</b>									
Total Hardness as CaCO3	----	1	mg/L	<b>33</b>	<1	<b>1710</b>	<b>2540</b>	<b>202</b>	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.005	<0.001	
Boron	7440-42-8	0.05	mg/L	<b>0.27</b>	<b>0.33</b>	<b>0.08</b>	<b>0.13</b>	<b>0.22</b>	
Barium	7440-39-3	0.001	mg/L	<b>0.417</b>	<b>0.066</b>	<b>10.8</b>	<b>13.8</b>	<b>3.97</b>	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.005	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<b>0.002</b>	<0.001	<0.005	<b>0.002</b>	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.005	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.005	<0.001	
Manganese	7439-96-5	0.001	mg/L	<b>0.024</b>	<b>0.004</b>	<b>18.1</b>	<b>12.4</b>	<b>0.217</b>	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB2D	HSMB2S	HSMB3S1	HSMB3S2	HSMB4D
Sampling date / time					30-Jun-2025 09:45	30-Jun-2025 09:30	27-Jun-2025 09:30	27-Jun-2025 11:54	30-Jun-2025 11:40
Compound	CAS Number	LOR	Unit		EB2522724-011	EB2522724-012	EB2522724-013	EB2522724-014	EB2522724-015
					Result	Result	Result	Result	Result
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Nickel	7440-02-0	0.001	mg/L		<0.001	<b>0.007</b>	<b>0.002</b>	<0.005	<b>0.002</b>
Lead	7439-92-1	0.001	mg/L		<0.001	<b>0.002</b>	<0.001	<0.005	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.05	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.05	<0.01
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<b>0.023</b>	<0.025	<b>0.007</b>
Lithium	7439-93-2	0.001	mg/L		<b>0.098</b>	<b>0.164</b>	<b>0.323</b>	<b>0.386</b>	<b>0.278</b>
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Boron	7440-42-8	0.05	mg/L		<b>0.32</b>	<b>0.42</b>	<b>0.10</b>	<b>0.12</b>	<b>0.27</b>
Barium	7440-39-3	0.001	mg/L		<b>0.432</b>	<b>0.069</b>	<b>12.0</b>	<b>13.5</b>	<b>4.20</b>
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L		<0.001	<b>0.002</b>	<0.001	<0.001	<b>0.002</b>
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<b>0.002</b>	<b>0.007</b>	<0.001	<0.001	<b>0.002</b>
Manganese	7439-96-5	0.001	mg/L		<b>0.030</b>	<b>0.005</b>	<b>18.8</b>	<b>11.5</b>	<b>0.234</b>
Nickel	7440-02-0	0.001	mg/L		<0.001	<b>0.006</b>	<b>0.002</b>	<b>0.004</b>	<b>0.002</b>
Lead	7439-92-1	0.001	mg/L		<b>0.005</b>	<b>0.016</b>	<0.001	<0.001	<b>0.006</b>
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<b>0.021</b>	<b>0.022</b>	<b>0.007</b>
Lithium	7439-93-2	0.001	mg/L		<b>0.123</b>	<b>0.230</b>	<b>0.361</b>	<b>0.461</b>	<b>0.314</b>
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0005	<0.0001
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0005	<0.0001
<b>EG050F: Dissolved Hexavalent Chromium</b>									



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB2D	HSMB2S	HSMB3S1	HSMB3S2	HSMB4D
Sampling date / time				30-Jun-2025 09:45	30-Jun-2025 09:30	27-Jun-2025 09:30	27-Jun-2025 11:54	30-Jun-2025 11:40	
Compound	CAS Number	LOR	Unit	EB2522724-011	EB2522724-012	EB2522724-013	EB2522724-014	EB2522724-015	
				Result	Result	Result	Result	Result	
<b>EG050F: Dissolved Hexavalent Chromium - Continued</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
<b>EG050T: Total Hexavalent Chromium</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
<b>EK020G: Cyanate by Discrete Analyser</b>									
Cyanate	88402-73-7	0.1	mg/L	0.2	0.3	2.6	0.7	0.2	
<b>EK026SF: Total CN by Segmented Flow Analyser</b>									
Total Cyanide	57-12-5	0.004	mg/L	0.194	0.277	<0.004	0.020	0.544	
<b>EK027G: Thiocyanate by discrete analyser</b>									
Thiocyanate	463-56-9	0.1	mg/L	0.2	0.2	<0.5	<0.5	0.7	
<b>EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser</b>									
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.014	<0.004	<0.020	<0.008	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	1.5	0.8	<0.1	0.1	0.2	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	0.77	3.38	1.61	2.45	5.32	
<b>EK084: Un-ionized Hydrogen Sulfide</b>									
∅ Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Ionised Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	53.9	56.3	208	271	144	
∅ Total Cations	----	0.01	meq/L	53.2	57.6	190	246	146	
∅ Ionic Balance	----	0.01	%	0.63	1.15	4.56	4.88	0.71	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	6	36	28	71	48	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	22400	16000	11300	10000	16100	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup</b>									
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB2D	HSMB2S	HSMB3S1	HSMB3S2	HSMB4D
Sampling date / time					30-Jun-2025 09:45	30-Jun-2025 09:30	27-Jun-2025 09:30	27-Jun-2025 11:54	30-Jun-2025 11:40
Compound	CAS Number	LOR	Unit		EB2522724-011	EB2522724-012	EB2522724-013	EB2522724-014	EB2522724-015
					Result	Result	Result	Result	Result
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
<sup>^</sup> Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	1.9	<0.5	1.1	<0.5	<0.5
<sup>^</sup> Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	130	<20	30	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	190	150	510	200	
C15 - C28 Fraction	----	100	µg/L	<100	1250	220	460	1010	
C29 - C36 Fraction	----	50	µg/L	<50	100	60	80	160	
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	<50	1540	430	1050	1370	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	140	<20	40	<20	
<sup>^</sup> C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	20	<20	
>C10 - C16 Fraction	----	100	µg/L	<100	120	140	460	200	
>C16 - C34 Fraction	----	100	µg/L	<100	1280	240	460	1080	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB2D	HSMB2S	HSMB3S1	HSMB3S2	HSMB4D
Sampling date / time				30-Jun-2025 09:45	30-Jun-2025 09:30	27-Jun-2025 09:30	27-Jun-2025 11:54	30-Jun-2025 11:40	
Compound	CAS Number	LOR	Unit	EB2522724-011	EB2522724-012	EB2522724-013	EB2522724-014	EB2522724-015	
				Result	Result	Result	Result	Result	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued</b>									
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<b>110</b>	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<b>1400</b>	<b>380</b>	<b>920</b>	<b>1390</b>	
<sup>^</sup> >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<b>120</b>	<b>140</b>	<b>460</b>	<b>200</b>	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	<b>114</b>	<b>3</b>	<b>16</b>	<1	
Toluene	108-88-3	2	µg/L	<2	<b>12</b>	<2	<b>3</b>	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
<sup>^</sup> Total Xylenes	----	2	µg/L	<2	<2	<2	<2	<2	
<sup>^</sup> Sum of BTEX	----	1	µg/L	<1	<b>126</b>	<b>3</b>	<b>19</b>	<1	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1.0	%	<b>28.5</b>	<b>31.2</b>	<b>29.0</b>	<b>33.6</b>	<b>31.2</b>	
2-Chlorophenol-D4	93951-73-6	1.0	%	<b>60.1</b>	<b>75.1</b>	<b>68.3</b>	<b>77.5</b>	<b>68.2</b>	
2,4,6-Tribromophenol	118-79-6	1.0	%	<b>59.0</b>	<b>110</b>	<b>101</b>	<b>111</b>	<b>105</b>	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1.0	%	<b>64.8</b>	<b>74.6</b>	<b>65.4</b>	<b>73.5</b>	<b>62.7</b>	
Anthracene-d10	1719-06-8	1.0	%	<b>82.8</b>	<b>98.4</b>	<b>90.0</b>	<b>99.8</b>	<b>95.4</b>	
4-Terphenyl-d14	1718-51-0	1.0	%	<b>90.8</b>	<b>96.5</b>	<b>89.2</b>	<b>99.4</b>	<b>94.8</b>	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	<b>97.2</b>	<b>101</b>	<b>87.8</b>	<b>102</b>	<b>98.4</b>	
Toluene-D8	2037-26-5	2	%	<b>89.6</b>	<b>88.0</b>	<b>92.2</b>	<b>89.0</b>	<b>90.2</b>	
4-Bromofluorobenzene	460-00-4	2	%	<b>87.0</b>	<b>87.0</b>	<b>92.7</b>	<b>89.1</b>	<b>86.0</b>	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB6D2	HSMB6S	NB01S	NB02D	NB02S
Sampling date / time				27-Jun-2025 09:55	26-Jun-2025 03:25	27-Jun-2025 02:35	26-Jun-2025 10:33	26-Jun-2025 08:20	
Compound	CAS Number	LOR	Unit	EB2522724-016	EB2522724-017	EB2522724-018	EB2522724-019	EB2522724-020	
				Result	Result	Result	Result	Result	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	4200	17200	12000	3830	14300	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	11	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	142	<1	<1	61	33	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	755	18	17	1990	<1	
Total Alkalinity as CaCO3	----	1	mg/L	897	18	17	2060	44	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	<1	<1	8	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	1670	8180	6050	994	7090	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	5	637	415	16	701	
Magnesium	7439-95-4	1	mg/L	3	217	75	6	<1	
Sodium	7440-23-5	1	mg/L	1500	4160	3120	1740	3740	
Potassium	7440-09-7	1	mg/L	109	30	116	22	113	
<b>ED093F: SAR and Hardness Calculations</b>									
Total Hardness as CaCO3	----	1	mg/L	25	2480	1340	65	1750	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.005	<0.001	<0.001	<0.001	
Boron	7440-42-8	0.05	mg/L	0.29	0.21	0.28	0.47	0.26	
Barium	7440-39-3	0.001	mg/L	0.931	13.2	8.64	1.12	7.90	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.005	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0005	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.005	<0.001	<0.001	0.002	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.005	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.005	<0.001	<0.001	0.016	
Manganese	7439-96-5	0.001	mg/L	0.016	6.38	1.50	0.010	<0.001	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB6D2	HSMB6S	NB01S	NB02D	NB02S
Sampling date / time				27-Jun-2025 09:55	26-Jun-2025 03:25	27-Jun-2025 02:35	26-Jun-2025 10:33	26-Jun-2025 08:20	
Compound	CAS Number	LOR	Unit	EB2522724-016	EB2522724-017	EB2522724-018	EB2522724-019	EB2522724-020	
				Result	Result	Result	Result	Result	
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.005	<b>0.007</b>	<0.001	<b>0.024</b>	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.005	<0.001	<0.001	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.05	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.05	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.025	<b>0.012</b>	<0.005	<b>0.006</b>	
Lithium	7439-93-2	0.001	mg/L	<b>0.090</b>	<b>0.239</b>	<b>0.407</b>	<b>0.098</b>	<b>0.395</b>	
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron	7440-42-8	0.05	mg/L	<b>0.34</b>	<b>0.18</b>	<b>0.32</b>	<b>0.59</b>	<b>0.26</b>	
Barium	7440-39-3	0.001	mg/L	<b>0.946</b>	<b>11.9</b>	<b>9.81</b>	<b>1.19</b>	<b>7.94</b>	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<b>0.002</b>	<0.001	<0.001	<b>0.002</b>	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<b>0.001</b>	<b>0.017</b>	
Manganese	7439-96-5	0.001	mg/L	<b>0.020</b>	<b>7.63</b>	<b>1.67</b>	<b>0.010</b>	<b>0.001</b>	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<b>0.006</b>	<0.001	<b>0.023</b>	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<b>0.010</b>	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	<0.005	<b>0.008</b>	<b>0.012</b>	<0.005	<b>0.006</b>	
Lithium	7439-93-2	0.001	mg/L	<b>0.113</b>	<b>0.271</b>	<b>0.465</b>	<b>0.137</b>	<b>0.453</b>	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EG050F: Dissolved Hexavalent Chromium</b>									



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB6D2	HSMB6S	NB01S	NB02D	NB02S
Sampling date / time				27-Jun-2025 09:55	26-Jun-2025 03:25	27-Jun-2025 02:35	26-Jun-2025 10:33	26-Jun-2025 08:20	
Compound	CAS Number	LOR	Unit	EB2522724-016	EB2522724-017	EB2522724-018	EB2522724-019	EB2522724-020	
				Result	Result	Result	Result	Result	
<b>EG050F: Dissolved Hexavalent Chromium - Continued</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.10	<0.01	
<b>EG050T: Total Hexavalent Chromium</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	<0.01	<0.10	<0.01	
<b>EK020G: Cyanate by Discrete Analyser</b>									
Cyanate	88402-73-7	0.1	mg/L	0.1	0.4	0.2	0.1	1.6	
<b>EK026SF: Total CN by Segmented Flow Analyser</b>									
Total Cyanide	57-12-5	0.004	mg/L	0.014	<0.008	<0.004	<0.004	0.419	
<b>EK027G: Thiocyanate by discrete analyser</b>									
Thiocyanate	463-56-9	0.1	mg/L	0.2	<0.5	<0.5	0.3	<0.5	
<b>EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser</b>									
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.008	<0.004	<0.004	0.068	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	1.8	0.3	<0.1	0.4	<0.1	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	1.31	0.55	3.07	0.75	5.09	
<b>EK084: Un-ionized Hydrogen Sulfide</b>									
∅ Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
∅ Ionised Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	65.0	231	171	69.2	201	
∅ Total Cations	----	0.01	meq/L	68.5	231	166	77.5	200	
∅ Ionic Balance	----	0.01	%	2.62	0.06	1.62	5.68	0.12	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	7	4	7	14	8	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	20200	21500	14900	10100	11600	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup</b>									
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB6D2	HSMB6S	NB01S	NB02D	NB02S
Sampling date / time					27-Jun-2025 09:55	26-Jun-2025 03:25	27-Jun-2025 02:35	26-Jun-2025 10:33	26-Jun-2025 08:20
Compound	CAS Number	LOR	Unit	EB2522724-016	EB2522724-017	EB2522724-018	EB2522724-019	EB2522724-020	
				Result	Result	Result	Result	Result	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup - Continued</b>									
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	<50
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50	<50
<b>EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup</b>									
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	<100
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	<100
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	<100
<b>EP075(SIM)A: Phenolic Compounds</b>									
Phenol	108-95-2	1.0	µg/L	<1.0	<3.8	<b>17.4</b>	<3.8	<b>2.6</b>	
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<b>1.2</b>	<1.0	<1.0	
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<b>50.5</b>	<2.0	<b>6.8</b>	
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB6D2	HSMB6S	NB01S	NB02D	NB02S
Sampling date / time					27-Jun-2025 09:55	26-Jun-2025 03:25	27-Jun-2025 02:35	26-Jun-2025 10:33	26-Jun-2025 08:20
Compound	CAS Number	LOR	Unit	EB2522724-016	EB2522724-017	EB2522724-018	EB2522724-019	EB2522724-020	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<b>3680</b>	<20	<b>20</b>	
C10 - C14 Fraction	----	50	µg/L	<50	<50	<b>110</b>	<50	<b>120</b>	
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<b>50</b>	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<b>160</b>	<50	<b>120</b>	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<b>3510</b>	<20	<b>20</b>	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<50	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<b>110</b>	
>C16 - C34 Fraction	----	100	µg/L	<b>110</b>	<100	<b>110</b>	<100	<100	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	HSMB6D2	HSMB6S	NB01S	NB02D	NB02S
Sampling date / time				27-Jun-2025 09:55	26-Jun-2025 03:25	27-Jun-2025 02:35	26-Jun-2025 10:33	26-Jun-2025 08:20	
Compound	CAS Number	LOR	Unit	EB2522724-016	EB2522724-017	EB2522724-018	EB2522724-019	EB2522724-020	
				Result	Result	Result	Result	Result	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued</b>									
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<b>110</b>	<100	<b>110</b>	<100	<b>110</b>	
<sup>^</sup> >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<b>110</b>	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	<b>2</b>	<b>2790</b>	<b>13</b>	<b>9</b>	
Toluene	108-88-3	2	µg/L	<2	<b>4</b>	<b>825</b>	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<b>38</b>	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<b>2</b>	<b>90</b>	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<b>40</b>	<2	<2	
<sup>^</sup> Total Xylenes	----	2	µg/L	<2	<b>2</b>	<b>130</b>	<2	<2	
<sup>^</sup> Sum of BTEX	----	1	µg/L	<1	<b>8</b>	<b>3780</b>	<b>13</b>	<b>9</b>	
Naphthalene	91-20-3	5	µg/L	<5	<5	<25	<5	<5	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1.0	%	<b>32.6</b>	<b>38.3</b>	<b>35.9</b>	<b>34.4</b>	<b>28.0</b>	
2-Chlorophenol-D4	93951-73-6	1.0	%	<b>73.7</b>	<b>74.2</b>	<b>78.6</b>	<b>69.4</b>	<b>45.6</b>	
2,4,6-Tribromophenol	118-79-6	1.0	%	<b>87.8</b>	<b>70.8</b>	<b>102</b>	<b>60.4</b>	<b>27.4</b>	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1.0	%	<b>74.6</b>	<b>83.5</b>	<b>74.9</b>	<b>83.5</b>	<b>75.8</b>	
Anthracene-d10	1719-06-8	1.0	%	<b>95.8</b>	<b>76.6</b>	<b>99.2</b>	<b>74.6</b>	<b>84.0</b>	
4-Terphenyl-d14	1718-51-0	1.0	%	<b>102</b>	<b>109</b>	<b>99.9</b>	<b>105</b>	<b>99.1</b>	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	<b>99.7</b>	<b>101</b>	<b>85.1</b>	<b>80.2</b>	<b>83.1</b>	
Toluene-D8	2037-26-5	2	%	<b>93.1</b>	<b>93.2</b>	<b>87.7</b>	<b>85.5</b>	<b>91.6</b>	
4-Bromofluorobenzene	460-00-4	2	%	<b>110</b>	<b>110</b>	<b>87.5</b>	<b>86.1</b>	<b>94.9</b>	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	NB05S	RN160158	----	----	----
Sampling date / time				26-Jun-2025 12:57	29-Jun-2025 10:20	----	----	----	
Compound	CAS Number	LOR	Unit	EB2522724-021	EB2522724-022	-----	-----	-----	
				Result	Result	----	----	----	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	<b>4970</b>	<b>2140</b>	----	----	----	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<b>105</b>	<b>59</b>	----	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<b>15</b>	<b>824</b>	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	<b>120</b>	<b>883</b>	----	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<b>7</b>	<1	----	----	----	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	<b>2820</b>	<b>755</b>	----	----	----	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	<b>24</b>	<b>4</b>	----	----	----	
Magnesium	7439-95-4	1	mg/L	<1	<b>1</b>	----	----	----	
Sodium	7440-23-5	1	mg/L	<b>1820</b>	<b>870</b>	----	----	----	
Potassium	7440-09-7	1	mg/L	<b>56</b>	<b>3</b>	----	----	----	
<b>ED093F: SAR and Hardness Calculations</b>									
Total Hardness as CaCO3	----	1	mg/L	<b>60</b>	<b>14</b>	----	----	----	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<b>0.002</b>	----	----	----	
Boron	7440-42-8	0.05	mg/L	<b>0.42</b>	<b>0.29</b>	----	----	----	
Barium	7440-39-3	0.001	mg/L	<b>1.15</b>	<b>0.181</b>	----	----	----	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----	
Copper	7440-50-8	0.001	mg/L	<0.001	<b>0.001</b>	----	----	----	
Manganese	7439-96-5	0.001	mg/L	<0.001	<b>0.005</b>	----	----	----	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	NB05S	RN160158	----	----	----
Sampling date / time				26-Jun-2025 12:57	29-Jun-2025 10:20	----	----	----	
Compound	CAS Number	LOR	Unit	EB2522724-021	EB2522724-022	-----	-----	-----	
				Result	Result	----	----	----	
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Nickel	7440-02-0	0.001	mg/L	<b>0.002</b>	<b>0.010</b>	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	----	----	----	
Zinc	7440-66-6	0.005	mg/L	<0.005	<b>0.006</b>	----	----	----	
Lithium	7439-93-2	0.001	mg/L	<b>0.184</b>	<b>0.045</b>	----	----	----	
<b>EG020T: Total Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	<b>0.001</b>	----	----	----	
Boron	7440-42-8	0.05	mg/L	<b>0.36</b>	<b>0.27</b>	----	----	----	
Barium	7440-39-3	0.001	mg/L	<b>1.07</b>	<b>0.192</b>	----	----	----	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	----	----	----	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----	
Copper	7440-50-8	0.001	mg/L	<b>0.004</b>	<b>0.004</b>	----	----	----	
Manganese	7439-96-5	0.001	mg/L	<b>0.001</b>	<b>0.005</b>	----	----	----	
Nickel	7440-02-0	0.001	mg/L	<b>0.002</b>	<b>0.013</b>	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	----	----	----	
Zinc	7440-66-6	0.005	mg/L	<0.005	<b>0.010</b>	----	----	----	
Lithium	7439-93-2	0.001	mg/L	<b>0.165</b>	<b>0.047</b>	----	----	----	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----	
<b>EG035T: Total Recoverable Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----	
<b>EG050F: Dissolved Hexavalent Chromium</b>									



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	NB05S	RN160158	----	----	----
Sampling date / time				26-Jun-2025 12:57	29-Jun-2025 10:20	----	----	----	
Compound	CAS Number	LOR	Unit	EB2522724-021	EB2522724-022	-----	-----	-----	
				Result	Result	----	----	----	
<b>EG050F: Dissolved Hexavalent Chromium - Continued</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	----	----	----	
<b>EG050T: Total Hexavalent Chromium</b>									
Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	----	----	----	
<b>EK020G: Cyanate by Discrete Analyser</b>									
Cyanate	88402-73-7	0.1	mg/L	<b>0.8</b>	<b>0.2</b>	----	----	----	
<b>EK026SF: Total CN by Segmented Flow Analyser</b>									
Total Cyanide	57-12-5	0.004	mg/L	<b>0.092</b>	<0.004	----	----	----	
<b>EK027G: Thiocyanate by discrete analyser</b>									
Thiocyanate	463-56-9	0.1	mg/L	<0.1	<b>0.1</b>	----	----	----	
<b>EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser</b>									
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<b>0.019</b>	<0.004	----	----	----	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	<b>0.4</b>	<b>1.5</b>	----	----	----	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	<b>2.24</b>	<b>0.44</b>	----	----	----	
<b>EK084: Un-ionized Hydrogen Sulfide</b>									
∅ Unionized Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	----	----	----	
∅ Ionised Hydrogen Sulfide	----	0.1	mg/L	<0.1	<0.1	----	----	----	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	<b>82.1</b>	<b>38.9</b>	----	----	----	
∅ Total Cations	----	0.01	meq/L	<b>81.8</b>	<b>38.2</b>	----	----	----	
∅ Ionic Balance	----	0.01	%	<b>0.18</b>	<b>0.96</b>	----	----	----	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	<b>3</b>	<b>7</b>	----	----	----	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	<b>12200</b>	<b>17800</b>	----	----	----	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup</b>									
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	----	----	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	NB05S	RN160158	----	----	----
Sampling date / time				26-Jun-2025 12:57	29-Jun-2025 10:20	----	----	----	
Compound	CAS Number	LOR	Unit	EB2522724-021	EB2522724-022	-----	-----	-----	
				Result	Result	----	----	----	
<b>EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup - Continued</b>									
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	----	----	
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----	
<sup>^</sup> C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	----	----	----	
<b>EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup</b>									
>C10 - C16 Fraction	----	100	µg/L	<100	<100	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	----	----	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	----	----	----	
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds</b>									
Phenol	108-95-2	1.0	µg/L	<b>1.3</b>	<1.0	----	----	----	
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	----	----	----	
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	----	----	----	
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	----	----	----	
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	----	----	----	
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	----	----	----	
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	----	----	----	
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	----	----	----	
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	----	----	----	
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	----	----	----	
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	----	----	----	
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	----	----	----	
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	----	----	----	
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	----	----	----	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	NB05S	RN160158	----	----	----
Sampling date / time				26-Jun-2025 12:57	29-Jun-2025 10:20	----	----	----	
Compound	CAS Number	LOR	Unit	EB2522724-021	EB2522724-022	-----	-----	-----	
				Result	Result	----	----	----	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	----	----	----	
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	----	----	----	
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	----	----	----	
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	----	----	----	
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	----	----	----	
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	----	----	
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	----	----	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	<1.0	----	----	----	
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	----	----	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----	
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	----	----	----	
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	----	----	----	
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	----	----	----	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	----	----	----	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	----	----	----	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	----	----	
C10 - C14 Fraction	----	50	µg/L	<b>90</b>	<50	----	----	----	
C15 - C28 Fraction	----	100	µg/L	<100	<100	----	----	----	
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<b>90</b>	<50	----	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	----	----	----	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	----	----	----	
>C10 - C16 Fraction	----	100	µg/L	<100	<100	----	----	----	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	----	----	----	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	NB05S	RN160158	----	----	----
Sampling date / time				26-Jun-2025 12:57	29-Jun-2025 10:20	----	----	----	
Compound	CAS Number	LOR	Unit	EB2522724-021	EB2522724-022	-----	-----	-----	
				Result	Result	----	----	----	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued</b>									
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----	
<sup>^</sup> >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	----	----	----	
<sup>^</sup> >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	----	----	----	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	1	<1	----	----	----	
Toluene	108-88-3	2	µg/L	4	<2	----	----	----	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	----	----	----	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	----	----	----	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	----	----	----	
<sup>^</sup> Total Xylenes	----	2	µg/L	<2	<2	----	----	----	
<sup>^</sup> Sum of BTEX	----	1	µg/L	5	<1	----	----	----	
Naphthalene	91-20-3	5	µg/L	<5	<5	----	----	----	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1.0	%	29.7	33.4	----	----	----	
2-Chlorophenol-D4	93951-73-6	1.0	%	70.4	73.2	----	----	----	
2,4,6-Tribromophenol	118-79-6	1.0	%	76.9	72.8	----	----	----	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1.0	%	55.4	81.7	----	----	----	
Anthracene-d10	1719-06-8	1.0	%	84.6	103	----	----	----	
4-Terphenyl-d14	1718-51-0	1.0	%	97.2	108	----	----	----	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	87.0	87.7	----	----	----	
Toluene-D8	2037-26-5	2	%	93.2	91.1	----	----	----	
4-Bromofluorobenzene	460-00-4	2	%	93.8	91.1	----	----	----	



## Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10	72
2-Chlorophenol-D4	93951-73-6	27	130
2,4,6-Tribromophenol	118-79-6	19	181
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	14	146
Anthracene-d10	1719-06-8	35	137
4-Terphenyl-d14	1718-51-0	36	154
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry / Biology).

(WATER) EK027G: Thiocyanate by discrete analyser

(WATER) EP033: C1 - C4 Hydrocarbon Gases

(WATER) EK026SF: Total CN by Segmented Flow Analyser

(WATER) EK028SF: Weak Acid Dissociable CN by Segmented Flow Analyser

(WATER) EK020G: Cyanate by Discrete Analyser

**Appendix B: QA/QC Summary**

# DRAFT

## 1.0 Data Quality Indicators (DQI)

The DQIs have been established to set acceptance limits on field and laboratory data collected as part of this investigation. The DQIs comprise five parameters including precision, accuracy, representativeness, comparability and completeness (PARCC). The DQIs are presented in **Table 1**.

**Table 1** Data Quality Indicators

DQI	Field	Laboratory	Acceptable Limits
<b>P</b>	<ul style="list-style-type: none"> <li>SOP<sup>1</sup> appropriate</li> <li>Collection of inter-laboratory and intra-laboratory samples</li> </ul>	Intra-laboratory samples (1 in 10 primary samples)	RPD <sup>2</sup> of < 30%
		Inter-laboratory samples (1 in 20 primary samples)	RPD of < 30%
		Laboratory duplicate samples	Result < 10 times LOR: no limit Result 10-20 times LOR: 0-50% Result >20 times LOR: 0-20%
<b>A</b>	<ul style="list-style-type: none"> <li>SOP appropriate</li> <li>QAQC samples collected</li> <li>Calibration of equipment (water quality meters)</li> </ul>	Trip blanks (1/day)	Non-detect for analytes
		Method blanks	Laboratory specific limits <sup>3</sup>
		Matrix spikes	Laboratory specific limits <sup>3</sup>
		Surrogate spikes	Laboratory specific limits <sup>3</sup>
		Laboratory control samples	Laboratory specific limits <sup>3</sup>
		Laboratory prepared spikes	Result < 10 times LOR: no limit Result 10-20 times LOR: 0-50% Result >20 times LOR: 0-20%
<b>R</b>	<ul style="list-style-type: none"> <li>SOP appropriate</li> <li>Appropriate media sampled</li> </ul>	<ul style="list-style-type: none"> <li>All samples analysed per the SAQP and COC</li> </ul>	<ul style="list-style-type: none"> <li>Samples analysed for all analytes listed in the EA</li> </ul>
<b>C</b>	<ul style="list-style-type: none"> <li>SOP appropriate</li> <li>Experienced field staff</li> <li>Same sample method</li> <li>Climatic conditions</li> </ul>	<ul style="list-style-type: none"> <li>Same analytical methods used (including clean-up)</li> <li>Comparable LOR</li> <li>NATA accredited laboratories</li> <li>Consistent reported units of measurement</li> </ul>	<ul style="list-style-type: none"> <li>As per ASC NEPM (2013)</li> <li>Less than investigation limits</li> </ul>
<b>C</b>	<ul style="list-style-type: none"> <li>SOP appropriate</li> <li>All accessible locations sampled</li> <li>Experienced field staff</li> <li>Documentation correct</li> </ul>	<ul style="list-style-type: none"> <li>All accessible samples analysed</li> <li>Appropriate methods implemented</li> <li>Appropriate LORs</li> <li>Sample documentation completed</li> <li>Sample holding times generally complied</li> </ul>	<ul style="list-style-type: none"> <li>As per ASC NEPM (2013)</li> <li>Less than investigation limits</li> </ul>

Notes:

<sup>1</sup> Standard Operating Procedures.

<sup>2</sup> Relative percent difference.

<sup>3</sup> Reference will be made to the laboratory Analyte Specific Acceptance Criteria (ASAC), calculated on the basis of historical database (i.e. statistically derived limits. These are updated regularly and each laboratory report may have slightly different limits. The limits will be assessed on a batch by batch basis).

The following sections assess the achievement of the DQOs in consideration of the DQIs.

# DRAFT

## 2.0 Data evaluation

### 2.1 Field

#### 2.1.1 Field staff

Samples were collected by suitably qualified and experienced AECOM environmental scientists / engineers. Sampling was primarily undertaken with reference to Arrow's SOP for 'Groundwater Monitoring at Shallow and Deep Groundwater Monitoring Bores' (SDA-ARW-ENV-SOP-00001).

Monitoring and sampling of groundwater was also carried out in accordance with the relevant documents listed under EA0001401 (Condition Number General 11) and following guidance documents:

- Queensland Government's Monitoring and Sampling Manual 2018 – Environmental Protection (Water and Wetland Biodiversity) Policy 2019.
- Groundwater Sampling and Analysis – A Field Guide (Sundaram *et al.* 2009).
- Australian/New Zealand Standard AS/NZS 5667.11.1998 ISO 5667-11:1993 – Water Quality – Sampling Part 11: Guidance on sampling of groundwaters.
- Arrow's Standard Operating Procedure for 'Groundwater Monitoring at Shallow and Deep Groundwater Monitoring Bores' (SDA-ARW-ENV-SOP-00001).

#### 2.1.2 Sampling methodologies

The adopted sampling methodologies are presented in the Arrow's SOP for 'Groundwater Monitoring at Shallow and Deep Groundwater Monitoring Bores' (SDA-ARW-ENV-SOP-00001).

#### 2.1.3 Sample handling and preservation

All samples were kept chilled following sample collection and during transit to the analytical laboratory. Samples were preserved and pre-treated in-field as per the container requirements of the primary laboratory detailed in **Table 2**.

Well ID, sample date, and analytical requirements were recorded on the Chain of Custody (COC) documentation, which accompanied the samples to the laboratory. Signed copies of the COCs are provided with the laboratory reports.

Review of the laboratory reports indicated samples were received by the laboratories in appropriate containers and within the recommended temperature ( $4 \pm 2^\circ\text{C}$ ), except for those isolated occurrences identified and presented in the laboratory batch-specific Sample Receipt Notification.

Table 2: Sample containment and preservation

Matrix	Analyte	Container
Water	Major cations / anions, hardness, Total Dissolved Solids	500 mL plastic bottle, unpreserved
	Metals (dissolved)	60 mL plastic bottle with nitric acid (HNO <sub>3</sub> ), preservative and field filtered
	Metals (total)	60 mL plastic bottle with HNO <sub>3</sub> , unpreserved
	Hexavalent Chromium (dissolved)	60 mL plastic bottle with sodium hydroxide (NaOH), preservative and field filtered
	Hexavalent Chromium (total)	60 mL plastic bottle with NaOH, preservative
	TRH C <sub>10</sub> -C <sub>40</sub> , PAH, Phenols	100 mL glass amber bottle with Teflon-lined cap, unpreserved
	TRH C <sub>6</sub> -C <sub>10</sub> , BTEXN	2 x 40 mL amber glass with Teflon-lined septa, sulfuric acid (H <sub>2</sub> SO <sub>4</sub> ) preservative

# DRAFT

Matrix	Analyte	Container
	TOC	40 mL amber glass vial with Teflon-lined septa, H <sub>2</sub> SO <sub>4</sub> preservative
	Unionized Hydrogen Sulfide	125 mL plastic bottle, zinc acetate preservative
	Cyanate, total cyanide, WAD	60 mL opaque plastic bottle, NaOH preservative
	Ammonia as N	60 mL plastic bottle, H <sub>2</sub> SO <sub>4</sub> preservative
	Thiocyanate	250 mL plastic bottle, H <sub>2</sub> SO <sub>4</sub> preservative

## 2.1.4 Calibration

Water Quality Meters (WQM) were used during fieldwork. The equipment was calibrated by the Supplier (e.g. Kennards Hire) prior to delivery and then by AECOM during fieldworks, in accordance with manufacturer's instructions. All calibration results were satisfactory.

## 2.1.5 Holding times

Samples were delivered to laboratories as early as possible to reduce holding time breaches. Extraction and analysis holding time non-compliances are presented in **Table 3**. Analytes that have exceeded recommended holding times may generate erroneous results that could lead to misreporting of monitoring data.

**Table 3** Extraction and analysis holding time non-compliances

Batch	Matrix	Sample ID	Analyte	Days overdue	
				Extraction	Analysis
EB2521593	Water	Hopeland 26	Total Petroleum Hydrocarbons (TPH) and TPH - Silica gel cleanup	2	0
		GCMPSDQ225_01, Hopeland 22, Hopeland 34	Total Petroleum Hydrocarbons (TPH) and TPH - Silica gel cleanup	1	0
		Hopeland 26	Total Recoverable Hydrocarbons (TRH) and TRH - Silica gel cleanup	2	0
		GCMPSDQ225_01, Hopeland 22, Hopeland 34	Total Recoverable Hydrocarbons (TRH) and TRH - Silica gel cleanup	1	0
		Hopeland 26	Phenolic compounds	2	0
		GCMPSDQ225_01, Hopeland 22, Hopeland 34	Phenolic compounds	1	0

# DRAFT

Batch	Matrix	Sample ID	Analyte	Days overdue	
				Extraction	Analysis
		Hopeland 26	Polynuclear Aromatic Hydrocarbons	2	0
		GCMPSDQ225_01, Hopeland 22, Hopeland 34	Polynuclear Aromatic Hydrocarbons	1	0

## 2.1.6 Duplicates and triplicate

Duplicate (intra-laboratory) and triplicate (inter-laboratory) samples provide information regarding the accuracy of sampling, sample preparation, sample analysis and sample heterogeneity. The purpose of duplicates is to estimate the variability of a given characteristic or contaminant associated with a population. The purpose of triplicates is to assess the accuracy of the primary laboratory data.

The duplicate and triplicate samples were obtained from the same location by placing approximately equal portions of the primary sample into sample containers. Duplicates and triplicates were labelled so as to conceal their relationship to the primary sample from the laboratory in accordance with SOPs and the SAQP. Primary and duplicate / triplicate pairings were recorded in the QAQC tracker.

Variation in duplicate / triplicate results is commonly observed due to sample heterogeneity and / or low reported concentrations near the LOR, particularly for solid matrix samples. The overall precision of duplicates and triplicates is assessed by their Relative Percent Difference (RPD) and whether it meets the DQI of 30%.

The RPD is given by:

$$RPD = \frac{|C1 - C2|}{(C1 + C2)/2} \times 100$$

Where C1 = primary sample result, and C2 = duplicate / triplicate sample result.

Primary and duplicate / triplicate sample results and RPDs are presented in at the rear of this Appendix. The rate, number of duplicate / triplicate samples and number of RPD exceedances is summarised below in **Table 4**:

**Table 4 Analysis of duplicates and triplicates**

Analyte	Primary samples	Duplicate samples (rate)	Duplicate of samples with RPD exceedances	Triplicate samples (rate)	Triplicate of samples with RPD exceedances
TRH	34	4 (11.7%)	0	2 (5.9 %)	2
TPH	34	4 (11.7%)	0	2 (5.9 %)	0
Monocyclic Aromatic Hydrocarbons	34	4 (11.7%)	0	2 (5.9 %)	0
Polynuclear Aromatic Hydrocarbons	34	4 (11.7%)	0	2 (5.9 %)	0
Metals (total and dissolved)	34	4 (11.7%)	0	2 (5.9 %)	2
Major Ions	34	4 (11.7%)	5	2 (5.9 %)	0
Alkalinity	34	4 (11.7%)	2	2 (5.9 %)	2
Cyanides	34	4 (11.7%)	0	2 (5.9 %)	0
Cyanate	34	4 (11.7%)	0	2 (5.9 %)	0

# DRAFT

Analyte	Primary samples	Duplicate samples (rate)	Duplicate of samples with RPD exceedances	Triplicate samples (rate)	Triplicate of samples with RPD exceedances
Thiocyanate	34	4 (11.7%)	0	2 (5.9 %)	0
Phenolic Compounds	34	4 (11.7%)	0	2 (5.9 %)	0
Methane	34	4 (11.7%)	0	2 (5.9 %)	1
TOC	34	4 (11.7%)	1	2 (5.9 %)	0

The rate of duplicate and triplicate sample analyses met the DQI of 1 in 10 primary samples (12.9%) for duplicate samples and 1 in 20 primary samples (7.35%) for triplicate samples. The rate of duplicate and triplicate sample analyses is satisfactory for the purpose of this assessment.

RPDs for duplicate samples met the DQI (30%) for most analytes. Elevated RPDs are attributed to low concentrations at or near the LOR, with the results within the same order of magnitude for most samples. The duplicate RPDs are considered acceptably precise.

RPDs for triplicate samples exceeded the DQI (30%) for several analytes, particularly for total recoverable hydrocarbons, metals, alkalinity, methane, major ions, and total organic carbon. This may indicate sample heterogeneity or differences in laboratory sub-sampling, sample preparation, sample analysis by the secondary laboratory.

## 2.1.7 Decontamination and Rinsate blanks

All groundwater wells were equipped with dedicated downhole pump and/or disposable consumables except for two bores (RN160158 and RN147004). One Rinsate blank sample was collected between sampling each unequipped bore from the bladder pump. Exceedances were reported marginally above the LOR for major ions and alkalinity, which was collected prior to sampling RN160158. It is considered unlikely that the decontamination procedure has impacted the analytical results from RN160158 as concentrations were reported 2 to 3 orders of magnitude higher in the primary sample compared to the rinsate sample for the same analytes.

## 2.1.8 Trip Blanks

A trip blank assesses the potential for cross contamination during transit to the laboratory.

Analytical results for the two trip blank samples are presented on at the rear of this Appendix and concentrations were less than the laboratory LOR, indicating that cross contamination was unlikely to have occurred during sample storage and transit to the laboratory.

## 2.2 Laboratory Data

### 2.2.1 Laboratories

Samples were submitted to the following laboratories:

- **ALS Environmental** in Stafford, QLD (Primary laboratory).
- **ALS Environmental** in Smithfield, NSW (Primary laboratory – thiocyanate, cyanate and cyanide analysis only).  
ALS (NATA accreditation number 825) was used as the primary laboratory and is NATA accredited for the analyses conducted.
- **SGS Melbourne** in Notting Hill, VIC (Secondary laboratory).
- **SGS Sydney** in Alexandria, NSW (Secondary laboratory – total cyanide and WAD cyanide only):
- **SGS Cairns** in Portsmith, QLD (Secondary laboratory – cyanate only): (NATA accreditation number 2562) was used as the secondary (or 'check') laboratory and is NATA accredited for the analyses conducted.

# DRAFT

## 2.2.2 Analytical methods

The laboratory LORs were compared to the investigation limits, as summarised in **Table 5**. No elevated LOR compared to the investigation limits were recorded except for PAH and phenolic compounds in Hopeland 37, TPH C10-C14 fraction in Hopeland 25 and Hopeland 34, Naphthalene in HB01S, metals in Hopeland 37, HSMB3S2, and HSMB6S, cyanides in HSMB1S, HSMB3S2, HMB4D, and HSMB6S, TOC in Hopeland 21, Hopeland 23, Hopeland 27, HSMB3D1, HSMB5D, and RN147004, Thiocyanate in Hopeland 25, Hopeland 35, HSMB1S, HSMB3S1, HSMB3S2, HSMB6S, NB01S, NB02S which reported elevated LORs. According to the laboratory information, samples were required dilutions prior to analysis due to matrix interference hence LOR values were adjusted.

**Table 5 LOR and investigation limits**

Analyte	LOR	Investigation limit (EA0001401)
Total phenolic compounds	1.0-2.0 µg/L	>LOR
PAH	0.5-1.0 µg/L	>LOR
TRH	100 µg/L	>LOR
Cyanide	0.004 mg/L	0.08 mg/L
Benzene	0.001 mg/L	0.001 mg/L
Toluene	0.002 mg/L	0.8 mg/L
Ethylbenzene	0.002 mg/L	0.3 mg/L
Xylene	0.002 mg/L	0.6 mg/L

## 2.2.3 Laboratory (method) blanks

Laboratory or control blanks consist of reagents specific to each individual analytical method and are prepared and analysed by laboratories in the same manner as regular samples. The preparation and analysis of laboratory blanks enables the measurement of contamination within the laboratory.

Laboratory blanks are typically analysed at a frequency of 1 in 20, with a minimum of one analysed per batch. Review of the laboratory reports indicated that frequency of laboratory method blanks was acceptable, and the method blank results were below the laboratory LOR.

## 2.2.4 Laboratory duplicates

Laboratory duplicate samples are prepared in the laboratory by splitting a field sample and analysing it as two independent samples. The analysis of laboratory duplicate samples provides an indication of analytical precision and may be influenced by sample heterogeneity. The laboratory duplicate RPDs are used to assess laboratory precision.

Laboratory duplicates are typically analysed at a frequency of 1 in 10, with a minimum of one analysed per batch, when the batch size exceeds five samples. Review of the laboratory reports indicated that the frequency of duplicate analyses met the required frequency for all analytes except for PAH/Phenols (EB2521593 and EB2522724) and TRH – Semi volatile fraction and TRH Silica Gel (EB2522106, EB2522107, and EB2522724). All RPDs for the laboratory duplicate samples met the laboratory DQI.

## 2.2.5 Laboratory Control Spikes

Laboratory Control Spikes (LCS) are prepared within the laboratory by spiking an aliquot of an appropriate clean matrix reagent with known concentrations of specific analytes. The LCS is then analysed and the results are used to assess the laboratory performance on sample preparation and analysis procedure. Accuracy is assessed by calculation of Percent Recovery (PR).

LCS are typically analysed at a frequency of 1 in 20, with a minimum of one analysed per analytical batch. Review of the laboratory reports indicated that the frequency of LCS was acceptable and that all LCS PRs met the DQI.

# DRAFT

## 2.2.6 Matrix spikes

Matrix spikes (MS) are prepared within the laboratory by adding a known concentration (i.e. a spike) of a contaminant into the sample. The sample is then analysed and the amount of spike recovered is measured to assess the effects of the sample matrix on the accuracy and precision of the analytes. Essentially, spikes are used to confirm that the laboratory method is recovering the analyte that is being tested. Accuracy is assessed by the calculation of the PR.

MS are typically analysed at a frequency of 1 in 20, with a minimum of one analysed per analytical batch. Review of the laboratory reports indicated that the frequency of MS was acceptable except for PAH/Phenols (EB2521593, EB2522106, EB2522107, and EB2522724) and TRH – Semi volatile fraction and TRH Silica Gel (EB2522106, EB2522107, and EB2522724). All MS PRs met the DQI, with the exception of those identified and presented in **Table 6**.

Overall, the data is considered to be acceptably accurate.

**Table 6 Matrix spikes**

Batch	Analyte	Data (%)	Limits (%)	Comment
EB2521593	Methane	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.
EB2522106	Sulfate as SO <sub>4</sub> - Turbidimetric	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.
	Chloride	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.
EB2522107	Sulfate as SO <sub>4</sub> - Turbidimetric	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.
	Chloride	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.
	Ammonia as N	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.
	Methane	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.
	Chloride	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.
	Ammonia as N	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.
	TPH C10 - C14 Fraction	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.
	TPH C15 - C28 Fraction	13.6	33-117	Recovery less than lower data quality objective
	TRH >C10 - C16 Fraction	-	-	MS recovery not determined, background level greater than or equal to 4x spike level.

## 2.2.7 Surrogates

Surrogates are compounds which are similar to the organic analytes of interest in chemical composition, extraction, and chromatographic behaviour, but which are not normally found in field

**DRAFT**

samples. Surrogates are generally spiked into all sample aliquots prior to preparation and analysis by chromatographic methods. Essentially, surrogates are used to test the laboratory method.

PRs are calculated for each surrogate, providing an indication of analytical accuracy. US EPA methodology (SW846) requires that surrogate testing be performed whenever analysing by Gas Chromatography or HPLC (i.e. for organics).

Review of the laboratory reports indicated that the PRs for surrogates met the DQI hence the data is considered to be acceptably accurate.

**2.2.8 Data usability**

Non-conformances were recorded for duplicate and triplicate sample RPD values, analyte holding times, laboratory duplicates, laboratory control spikes, and matrix spikes.

It is noted that the secondary laboratory was in a different State compared to the primary laboratory, which may be impacting sample quality. It is recommended that the primary and secondary laboratories be selected in the same State to avoid holding time exceedances during sample transit.

Based on an assessment of field and laboratory QA/QC data, the reported analytical results of the primary laboratory are considered, by achievement of the DQIs, to be reliable and representative of concentrations of the chemical contaminants analysed at the locations sampled.

QAQC RPD

Lab Report Number	EB2521593	EB2521593		EB2521593	EB2521593		EB2522107	EB2522106		EB2522107	ME373212		EB2522724	EB2522724		EB2522724	ME373221			
Field ID	Hopeland 34	GCMPDQ225_01		Hopeland 24	GCMPDQ225_02		HSMB3D1	GCMPDQ225_03		HSMB3D1	GCMPDQ225_01		HSMB6S	GCMPDQ225_04		HSMB6S	GCMPDQ225_02			
Date	20 Jun 2025	20 Jun 2025		21 Jun 2025	21 Jun 2025		25 Jun 2025	25 Jun 2025		25 Jun 2025	25 Jun 2025		26 Jun 2025	26 Jun 2025		26 Jun 2025	26 Jun 2025			
Sample Type	Primary	Intra Lab Dup	RPD	Primary	Intra Lab Dup	RPD	Primary	Intra Lab Dup	RPD	Primary	Inter Lab Dup	RPD	Primary	Intra Lab Dup	RPD	Primary	Inter Lab Dup	RPD		
Unit	EQL																			
<b>Total Recoverable Hydrocarbons</b>																				
C6-C10 fraction	µg/L	10	<20	<20	0	<20	<20	0	<20	<20	0	<20	<10	0	<20	20	0	<20	<10	0
C6-C10 fraction (minus BTEX)(F1)	µg/L	10	<20	<20	0	<20	<20	0	<20	<20	0	<20	<10	0	<20	<20	0	<20	<10	0
>C10-C16 (minus Naphthalene)(F2)	µg/L	10	<100	<100	0	<100	<100	0	<100	<100	0	<100	<10	0	<100	<100	0	<100	290	97
>C10-C16 fraction	µg/L	10	<100	<100	0	<100	<100	0	<100	<100	0	<100	<10	0	<100	<100	0	<100	290	97
>C16-C34 fraction	µg/L	50	<100	<100	0	<100	<100	0	<100	<100	0	<100	<50	0	<100	<100	0	<100	<50	0
>C34-C40 fraction	µg/L	50	<100	<100	0	<100	<100	0	<100	<100	0	<100	<50	0	<100	<100	0	<100	<50	0
>C10-C40 fraction (sum)	µg/L	50	<100	<100	0	<100	<100	0	<100	<100	0	<100	<50	0	<100	<100	0	<100	290	97
C6-C40 Fraction	µg/L	50	-	-	-	-	-	-	-	-	-	-	<50	-	-	-	-	-	290	-
<b>Total Recoverable Hydrocarbons - Silica Gel</b>																				
>C10-C16 fraction (Silica Gel)	µg/L	10	<100	<100	0	<100	<100	0	<100	<100	0	<100	<10	0	<100	<100	0	<100	<10	0
>C10-C16 (minus Naphthalene)(F2) (Silica Gel)	µg/L	10	<100	<100	0	<100	<100	0	<100	<100	0	<100	<10	0	<100	<100	0	<100	<10	0
>C16-C34 fraction (Silica Gel)	µg/L	50	<100	<100	0	<100	<100	0	<100	<100	0	<100	<50	0	<100	<100	0	<100	<50	0
>C34-C40 fraction (Silica Gel)	µg/L	50	<100	<100	0	<100	<100	0	<100	<100	0	<100	<50	0	<100	<100	0	<100	<50	0
>C10-C40 fraction (sum) (Silica Gel)	µg/L	50	<100	<100	0	<100	<100	0	<100	<100	0	<100	<50	0	<100	<100	0	<100	<50	0
C6-C40 Fraction (SG)	µg/L	50	-	-	-	-	-	-	-	-	-	-	<50	-	-	-	-	-	290	-
<b>Total Petroleum Hydrocarbons</b>																				
C6-C9 fraction	µg/L	10	<20	<20	0	<20	<20	0	<20	<20	0	<20	<10	0	<20	<20	0	<20	<10	0
C10-C14 fraction	µg/L	50	<140 <sup>RI</sup>	<120 <sup>RI</sup>	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	90	57	<50	270	138
C15-C28 fraction	µg/L	50	<100	<100	0	<100	<100	0	<100	<100	0	<100	<50	0	<100	<100	0	<100	<50	0
C29-C36 fraction	µg/L	50	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0
C10-C36 fraction (sum)	µg/L	50	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	90	57	<50	270	138
C6-C36 fraction (sum)	µg/L	50	-	-	-	-	-	-	-	-	-	-	<50	-	-	-	-	-	270	-
<b>Total Petroleum Hydrocarbons - Silica Gel</b>																				
C10-C14 fraction (Silica Gel)	µg/L	10	<50	<50	0	<50	<50	0	<50	<50	0	<50	<10	0	<50	<50	0	<50	<10	0
C15-C28 fraction (Silica Gel)	µg/L	50	<100	<100	0	<100	<100	0	<100	<100	0	<100	<50	0	<100	<100	0	<100	<50	0
C29-C36 fraction (Silica Gel)	µg/L	50	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0
C10-C36 fraction (sum) (Silica Gel)	µg/L	50	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0
C6 - C36 (Total) after Silica Gel Cleanup	µg/L	50	-	-	-	-	-	-	-	-	-	-	<50	-	-	-	-	-	<50	-
<b>Monocyclic Aromatic Hydrocarbons</b>																				
Benzene	µg/L	1	<1	<1	0	<1	<1	0	3	3	0	3	4.4	38	2	3	40	2	2.2	10
Toluene	µg/L	1	<2	<2	0	<2	<2	0	<2	<2	0	<2	<1	0	4	5	22	4	4.6	14
Ethylbenzene	µg/L	1	<2	<2	0	<2	<2	0	<2	<2	0	<2	<1	0	<2	<2	0	<2	<1	0
m&p-Xylene	µg/L	1	<2	<2	0	<2	<2	0	<2	<2	0	<2	<1	0	2	3	40	2	2.5	22
o-Xylene	µg/L	1	<2	<2	0	<2	<2	0	<2	<2	0	<2	<1	0	<2	<2	0	<2	1.6	0
Total Xylenes	µg/L	1	<2	<2	0	<2	<2	0	<2	<2	0	<2	<1	0	2	3	40	2	4.1	69
Total BTEX	µg/L	1	<1	<1	0	<1	<1	0	3	3	0	3	4	29	8	11	32	8	11	32
Naphthalene (BTEXN)	µg/L	1	<5	<5	0	<5	<5	0	<5	<5	0	<5	<1	0	<5	<5	0	<5	<1	0
<b>Polynuclear Aromatic Hydrocarbons</b>																				
Benzo(a)pyrene TEQ calc (Zero)	µg/L	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	-	-	<0.5	<0.5	0	<0.5	-	-
Naphthalene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Acenaphthylene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Acenaphthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Fluorene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Phenanthrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Benzo(a)anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Benzo(b)fluoranthene	µg/L	1	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	<1	-
Benzo(k)fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Benzo(b&j)fluoranthene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Benzo(b&j) & Benzo(k)fluoranthene	µg/L	2	-	-	-	-	-	-	-	-	-	-	<2	-	-	-	-	-	<2	-
Benzo(a)pyrene	µg/L	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<1	0
Chrysene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Pyrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Indeno(1,2,3-cd)pyrene	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0
Sum of PAHs	µg/L	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	-	-	<0.5	<0.5	0	<0.5	-	-
<b>Metals</b>																				
Arsenic	mg/L	0.0005	0.001	0.001	0	0.001	0.001	0	<0.001	<0.001	0	<0.001	<0.0005	0	<0.001	<0.001	0	<0.001	<0.005	0
Arsenic (filtered)	mg/L	0.0005	0.001	0.001	0	0.001	0.001	0	<0.001	<0.001	0	<0.001	<0.0005	0	<0.001	<0.0005 <sup>RI</sup>	0	<0.001	<0.005	0
Barium	mg/L	0.001	6.20	6.08	2	0.262	0.260	1	0.258	0.250	3	12.2	11.9	2	11.9	13	9	13	9	9
Barium (filtered)	mg/L	0.001	5.																	

QAQC RPD

Lab Report Number	EB2521593		EB2521593		RPD	EB2521593		EB2521593		RPD	EB2522107		EB2522106		RPD	EB2522107		ME373212		RPD	EB2522724		EB2522724		RPD	EB2522724		ME373221		RPD						
	Field ID	Hopeland 34		GCMPSDQ225_01		Field ID	Hopeland 24		GCMPSDQ225_02		Field ID	HSMB3D1		GCMPSDQ225_03		Field ID	HSMB3D1		GCMPSTQ225_01		Field ID	HSMB6S		GCMPSDQ225_04		Field ID	HSMB6S		GCMPSTQ225_02							
	Date	20 Jun 2025		20 Jun 2025		Date	21 Jun 2025		21 Jun 2025		Date	25 Jun 2025		25 Jun 2025		Date	25 Jun 2025		25 Jun 2025		Date	26 Jun 2025		26 Jun 2025		Date	26 Jun 2025		26 Jun 2025							
Sample Type	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup	Primary	Intra Lab Dup						
	Unit	EQL																																		
Nickel (filtered)	mg/L	0.0005	<0.001	<0.001	0	<0.001	<0.001	<0.001	<0.001	0	<0.001	<0.001	<0.001	<0.001	0	<0.001	<0.0005	<0.001	<0.001	0	<0.001	<0.0005 <sup>#1</sup>	<0.001	<0.0005 <sup>#1</sup>	0	<0.001	<0.0005 <sup>#1</sup>	<0.001	<0.001	<0.001	0					
Selenium	mg/L	0.001	<0.01	<0.01	0	<0.01	<0.01	<0.01	<0.01	0	<0.01	<0.01	<0.01	<0.01	0	<0.01	<0.001	<0.001	<0.001	0	<0.01	<0.005 <sup>#1</sup>	<0.001	<0.005 <sup>#1</sup>	0	<0.01	<0.005 <sup>#1</sup>	<0.01	<0.01	<0.01	0					
Selenium (filtered)	mg/L	0.001	<0.01	<0.01	0	<0.01	<0.01	<0.01	<0.01	0	<0.01	<0.01	<0.01	<0.01	0	<0.01	<0.001	<0.001	<0.001	0	<0.01	<0.005 <sup>#1</sup>	<0.001	<0.005 <sup>#1</sup>	0	<0.01	<0.005 <sup>#1</sup>	<0.01	<0.01	<0.01	0					
Vanadium	mg/L	0.001	<0.01	<0.01	0	<0.01	<0.01	<0.01	<0.01	0	<0.01	<0.01	<0.01	<0.01	0	<0.01	<0.001	<0.001	<0.001	0	<0.01	<0.005 <sup>#1</sup>	<0.001	<0.005 <sup>#1</sup>	0	<0.01	<0.005 <sup>#1</sup>	<0.01	<0.01	<0.01	0					
Vanadium (filtered)	mg/L	0.001	<0.01	<0.01	0	<0.01	<0.01	<0.01	<0.01	0	<0.01	<0.01	<0.01	<0.01	0	<0.01	<0.001	<0.001	<0.001	0	<0.01	<0.005 <sup>#1</sup>	<0.001	<0.005 <sup>#1</sup>	0	<0.01	<0.005 <sup>#1</sup>	<0.01	<0.01	<0.01	0					
Zinc	mg/L	0.001	0.015	0.008	61	<0.005	<0.005	<0.005	<0.005	0	0.013	<0.005	<0.005	89	0.013	<0.001	<0.001	<0.001	171	0.008	<0.005	<0.005	<0.005	<0.005	46	0.008	<0.005	0.017	72	0						
Zinc (filtered)	mg/L	0.001	0.008	0.009	12	<0.005	<0.005	<0.005	<0.005	0	<0.005	<0.005	<0.005	0	<0.005	<0.005	<0.005	<0.005	0	<0.008	<0.005 <sup>#1</sup>	<0.005	<0.005 <sup>#1</sup>	0	<0.008	<0.005 <sup>#1</sup>	0.020	0	0	0						
Major Ions																																				
Chloride	mg/L	1	5,230	5,020	4	610	599	2	718	716	0	718	-	-	8,180	8,480	4	8,180	-	-	-	-	-	-	-	-	-	-	-	-	-					
Chloride (filtered)	mg/L	1	-	-	-	-	-	-	-	-	-	-	690	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Calcium (filtered)	mg/L	0.1	172	176	2	3	3	0	5	5	0	5	6.6	28	637	654	3	637	740	15	-	-	-	-	-	-	-	-	-	-	-					
Fluoride	mg/L	0.1	0.2	0.2	0	2.4	2.5	4	1.4	1.4	0	1.4	-	-	0.3	0.2	40	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-					
Fluoride (filtered)	mg/L	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Magnesium (filtered)	mg/L	0.1	47	49	4	1	1	0	1	1	0	1	1.2	18	217	228	5	217	230	6	-	-	-	-	-	-	-	-	-	-	-					
Potassium (filtered)	mg/L	0.1	589	589	2	24	22	9	38	38	0	38	39	3	30	30	0	30	28	7	-	-	-	-	-	-	-	-	-	-	-					
Sodium (filtered)	mg/L	0.1	2,200	2,300	4	738	679	8	636	672	6	636	660	4	4,160	4,380	5	4,160	4,800	14	-	-	-	-	-	-	-	-	-	-	-					
Sulfate as SO4 (filtered)	mg/L	1	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Sulfate as SO4 (Turbidimetric) (filtered)	mg/L	1	<1	<1	0	<1	<1	0	<1	14	173	<1	<1	-	<1	<1	0	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-					
Total Anions	meq/L	0.01	148	142	4	38.0	37.7	1	32.9	33.2	1	32.9	-	-	231	239	3	231	-	-	-	-	-	-	-	-	-	-	-	-	-					
Total Cations	meq/L	0.01	123	128	4	32.9	30.9	6	29.0	30.5	5	29.0	-	-	231	243	5	231	-	-	-	-	-	-	-	-	-	-	-	-	-					
Ionic Balance	%	0.01	9.27	5.27	55	7.10	9.83	32	6.33	4.12	42	6.33	-	-	0.06	0.71	169	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-					
Alkalinity																																				
Hydroxide Alkalinity as CaCO3	mg/L	1	<1	<1	0	<1	<1	0	<1	<1	0	<1	<5	0	<1	<1	0	<1	<5	0	-	-	-	-	-	-	-	-	-	-	-	-				
Carbonate Alkalinity as CaCO3	mg/L	1	<1	<1	0	93	89	4	63	67	6	63	74	16	<1	<1	0	<1	<5	0	-	-	-	-	-	-	-	-	-	-	-	-				
Bicarbonate Alkalinity as CaCO3	mg/L	1	29	28	4	944	950	1	570	570	1	570	570	0	18	2	160	18	<5	113	-	-	-	-	-	-	-	-	-	-	-	-				
Total Alkalinity as CaCO3	mg/L	1	29	28	4	1,040	1,040	0	632	634	0	632	640	1	18	2	160	18	<5	113	-	-	-	-	-	-	-	-	-	-	-	-				
Hardness (filtered)	mg/L	1	-	-	-	-	-	-	-	-	-	-	21	-	-	-	-	-	2,800	-	-	-	-	-	-	-	-	-	-	-	-	-				
Hardness as CaCO3 (filtered)	mg/L	1	623	641	3	12	12	0	17	17	0	17	-	-	2,480	2,570	4	2,480	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Inorganics																																				
Residual Alkali	meq/L	0.1	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-				
Cyanides																																				
Cyanide Total	µg/L	4	<4	<4	0	<4	<4	0	10	11	10	10	14	33	<8 <sup>#1</sup>	<4	0	<8 <sup>#1</sup>	17	72	-	-	-	-	-	-	-	-	-	-	-	-				
Weak Acid Dissociable Cyanide	mg/L	0.004	<0.004	<0.004	0	<0.004	<0.004	0	<0.004	<0.004	0	<0.004	-	-	<0.008 <sup>#1</sup>	<0.004	0	<0.008 <sup>#1</sup>	0.012	40	-	-	-	-	-	-	-	-	-	-	-	-				
Cyanate- Soluble																																				
Cyanate	mg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	-	-	0.4	0.1	120	0.4	<0.5	0	-	-	-	-	-	-	-	-	-	-	-	-				
Thiocyanate	mg/L	0.1	0.1	0.2	67	0.1	0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.5 <sup>#1</sup>	<0.5 <sup>#1</sup>	0	<0.5 <sup>#1</sup>	0.3	0	-	-	-	-	-	-	-	-	-	-	-	-				
Phenolic Compounds																																				
3/4-Methylphenol (m/p-cresol)	µg/L	1	3.0	3.8	24	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1	0	<2.0	<2.0	0	<2.0	<1	0	-	-	-	-	-	-	-	-	-	-	-	-				
Phenol	µg/L	1	9.7	12.2	23	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<3.8 <sup>#1</sup>	3.0	0	<3.8 <sup>#1</sup>	8	71	-	-	-	-	-	-	-	-	-	-	-	-				
2-Chlorophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0	-	-	-	-	-	-	-	-	-	-	-	-				
2-Methylphenol (o-Cresol)	µg/L	1	1.4	2.4	53	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0	-	-	-	-	-	-	-	-	-	-	-	-				
2-Nitrophenol	µg/L	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1	0	<1.0	<1.0	0	<1.0	<1	0	-	-	-	-												

QAQC rinsate trip blanks

Lab Report Number	EB2521593	EB2522107	EB2522724	EB2522724	EB2522724
Field ID	GCMPTBQ225_01	GCMPTBQ225_02	GCMPTBQ225_01	GCMPTBQ225_01	GCMPTBQ225_03
Date	19 Jun 2025	23 Jun 2025	30 Jun 2025	29 Jun 2025	27 Jun 2025
Sample Type	Trip Blank	Trip Blank	Field Blank	Rinsate	Trip Blank
Unit	EQL				
<b>Total Recoverable Hydrocarbons</b>					
C6-C10 fraction	µg/L	20	<20	<20	<20
C6-C10 fraction (minus BTEX)(F1)	µg/L	20	<20	<20	<20
>C10-C16 (minus Naphthalene)(F2)	µg/L	100	-	-	<100
>C10-C16 fraction	µg/L	100	-	-	<100
>C16-C34 fraction	µg/L	100	-	-	<100
>C34-C40 fraction	µg/L	100	-	-	<100
>C10-C40 fraction (sum)	µg/L	100	-	-	<100
<b>Total Recoverable Hydrocarbons - Silica Gel</b>					
>C10-C16 fraction (Silica Gel)	µg/L	100	-	-	<100
>C10-C16 (minus Naphthalene)(F2) (Silica Gel)	µg/L	100	-	-	<100
>C16-C34 fraction (Silica Gel)	µg/L	100	-	-	<100
>C34-C40 fraction (Silica Gel)	µg/L	100	-	-	<100
>C10-C40 fraction (sum) (Silica Gel)	µg/L	100	-	-	<100
<b>Total Petroleum Hydrocarbons</b>					
C6-C9 fraction	µg/L	20	<20	<20	<20
C10-C14 fraction	µg/L	50	-	-	<50
C15-C28 fraction	µg/L	100	-	-	<100
C29-C36 fraction	µg/L	50	-	-	<50
C10-C36 fraction (sum)	µg/L	50	-	-	<50
<b>Total Petroleum Hydrocarbons - Silica Gel</b>					
C10-C14 fraction (Silica Gel)	µg/L	50	-	-	<50
C15-C28 fraction (Silica Gel)	µg/L	100	-	-	<100
C29-C36 fraction (Silica Gel)	µg/L	50	-	-	<50
C10-C36 fraction (sum)(Silica Gel)	µg/L	50	-	-	<50
<b>Monocyclic Aromatic Hydrocarbons</b>					
Benzene	µg/L	1	<1	<1	<1
Toluene	µg/L	2	<2	<2	<2
Ethylbenzene	µg/L	2	<2	<2	<2
m&p-Xylene	µg/L	2	<2	<2	<2
o-Xylene	µg/L	2	<2	<2	<2
Total Xylenes	µg/L	2	<2	<2	<2
Total BTEX	µg/L	1	<1	<1	<1
Naphthalene (BTEXN)	µg/L	5	<5	<5	<5
<b>Polynuclear Aromatic Hydrocarbons</b>					
Benzo(a)pyrene TEQ calc (Zero)	µg/L	0.5	-	-	<0.5
Naphthalene	µg/L	1	-	-	<1.0
Acenaphthylene	µg/L	1	-	-	<1.0
Acenaphthene	µg/L	1	-	-	<1.0
Anthracene	µg/L	1	-	-	<1.0
Fluorene	µg/L	1	-	-	<1.0
Phenanthrene	µg/L	1	-	-	<1.0
Fluoranthene	µg/L	1	-	-	<1.0
Benzo(a)anthracene	µg/L	1	-	-	<1.0
Benzo(k)fluoranthene	µg/L	1	-	-	<1.0
Benzo(b)fluoranthene	µg/L	1	-	-	<1.0
Benzo(a)pyrene	µg/L	0.5	-	-	<0.5
Chrysene	µg/L	1	-	-	<1.0
Pyrene	µg/L	1	-	-	<1.0
Benzo(g,h,i)perylene	µg/L	1	-	-	<1.0
Dibenzo(a,h)anthracene	µg/L	1	-	-	<1.0
Indeno(1,2,3-cd)pyrene	µg/L	1	-	-	<1.0
Sum of PAHs	µg/L	0.5	-	-	<0.5
<b>Metals</b>					
Arsenic	mg/L	0.001	-	-	<0.001
Arsenic (filtered)	mg/L	0.001	-	-	<0.001
Barium	mg/L	0.001	-	-	<0.001
Barium (filtered)	mg/L	0.001	-	-	<0.001
Beryllium	mg/L	0.001	-	-	<0.001
Beryllium (filtered)	mg/L	0.001	-	-	<0.001
Boron	mg/L	0.05	-	-	<0.05
Boron (filtered)	mg/L	0.05	-	-	<0.05
Cadmium	mg/L	0.0001	-	-	<0.0001
Cadmium (filtered)	mg/L	0.0001	-	-	<0.0001
Chromium	mg/L	0.001	-	-	<0.001
Chromium (filtered)	mg/L	0.001	-	-	<0.001
Chromium (hexavalent)	mg/L	0.01	-	-	<0.01
Chromium (hexavalent) (filtered)	mg/L	0.01	-	-	<0.01
Cobalt	mg/L	0.001	-	-	<0.001
Cobalt (filtered)	mg/L	0.001	-	-	<0.001
Copper	mg/L	0.001	-	-	<0.001
Copper (filtered)	mg/L	0.001	-	-	<0.001
Lead	mg/L	0.001	-	-	<0.001
Lead (filtered)	mg/L	0.001	-	-	<0.001
Lithium	mg/L	0.001	-	-	<0.001
Lithium (filtered)	mg/L	0.001	-	-	<0.001
Manganese	mg/L	0.001	-	-	<0.001
Manganese (filtered)	mg/L	0.001	-	-	<0.001
Mercury	mg/L	0.0001	-	-	<0.0001
Mercury (filtered)	mg/L	0.0001	-	-	<0.0001
Nickel	mg/L	0.001	-	-	<0.001
Nickel (filtered)	mg/L	0.001	-	-	<0.001
Selenium	mg/L	0.01	-	-	<0.01
Selenium (filtered)	mg/L	0.01	-	-	<0.01
Vanadium	mg/L	0.01	-	-	<0.01
Vanadium (filtered)	mg/L	0.01	-	-	<0.01
Zinc	mg/L	0.005	-	-	<0.005
Zinc (filtered)	mg/L	0.005	-	-	<0.005
<b>Major Ions</b>					
Chloride	mg/L	1	-	-	<1
Calcium (filtered)	mg/L	1	-	-	<1
Fluoride	mg/L	0.1	-	-	<0.1
Magnesium (filtered)	mg/L	1	-	-	<1
Potassium (filtered)	mg/L	1	-	-	<1
Sodium (filtered)	mg/L	1	-	-	<1
Sulfate as SO4 (Turbidimetric) (filtered)	mg/L	1	-	-	<1
Total Anions	meq/L	0.01	-	-	<b>0.08</b>
Total Cations	meq/L	0.01	-	-	<0.01
<b>Alkalinity</b>					
Hydroxide Alkalinity as CaCO3	mg/L	1	-	-	<1
Carbonate Alkalinity as CaCO3	mg/L	1	-	-	<1
Bicarbonate Alkalinity as CaCO3	mg/L	1	-	-	<b>4</b>
Total Alkalinity as CaCO3	mg/L	1	-	-	<b>4</b>
Hardness as CaCO3 (filtered)	mg/L	1	-	-	<1
<b>Nutrients</b>					
Ammonia (as N)	mg/L	0.01	-	-	<0.01
<b>Cyanides</b>					
Cyanide Total	µg/L	4	-	-	<4
Weak Acid Dissociable Cyanide	µg/L	0.004	-	-	<0.004
<b>Phenolic Compounds</b>					
3/4-Methylphenol (m/p-cresol)	µg/L	2	-	-	<2.0
Phenol	µg/L	1	-	-	<1.0
2-Chlorophenol	µg/L	1	-	-	<1.0
2-Methylphenol (o-Cresol)	µg/L	1	-	-	<1.0
2-Nitrophenol	µg/L	1	-	-	<1.0
2,4-Dichlorophenol	µg/L	1	-	-	<1.0
2,4-Dimethylphenol	µg/L	1	-	-	<1.0
2,6-Dichlorophenol	µg/L	1	-	-	<1.0
4-Chloro-3-methylphenol	µg/L	1	-	-	<1.0
2,4,6-Trichlorophenol	µg/L	1	-	-	<1.0
2,4,5-Trichlorophenol	µg/L	1	-	-	<1.0
Pentachlorophenol	µg/L	2	-	-	<2.0
<b>Hydrocarbon Gases</b>					
Methane	µg/L	10	-	-	<10
<b>Physico-Chemical Parameters</b>					
Total Dissolved Solids	mg/L	10	-	-	<10
<b>Organic</b>					
Total Organic Carbon	mg/L	1	-	-	<1
<b>Cyanate - Soluble</b>					
Cyanate	mg/L	0.1	-	-	<0.1
Thiocyanate	mg/L	0.1	-	-	<0.1
<b>Hydrogen sulfide</b>					
Ionised Hydrogen Sulfide	mg/L	0.1	-	-	<0.1
Unionized Hydrogen Sulfide	mg/L	0.1	-	-	<0.1