

25 October 2022

Project No. 20446132-005-L-Rev0

Shay McDonald

Otago Regional Council
Private Bag 1954
Dunedin 9054

RESPONSE TO REQUEST FOR FURTHER INFORMATION – RM22.099 – MOBIL OIL NEW ZEALAND LIMITED

Dear Shay,

Thank you for your request for further information in respect of the above application.

This letter¹ provides responses on behalf of Mobil Oil New Zealand Limited (Mobil) to the requests for further information in respect of the resource consent application RM22.099 and pursuant to section 92 of the Resource Management Act 1991 (RMA), as set out in the Otago Regional Council (ORC) letter to WSP New Zealand Limited² (WSP), dated 11 October 2022.

The responses to the questions are set out below in the same order as they are listed in the s92 request for further information from ORC. Each question is presented and is followed by WSP's response on behalf of Mobil.

Section 92 Response

- 1) **Groundwater monitoring wells BH48, BH49, and BH51³ have measured naphthalene, ethylbenzene, and xylene at concentrations exceeding ANZG 95% species protection guideline values for marine ecosystems. Groundwater elevations in this area are typically higher than the reported depth of the stormwater lines; therefore, it is possible that groundwater could enter the stormwater system through cracks or joins in the pipes. As such, please provide the following information:**
 - a) **Please provide any stormwater monitoring data, if any is available, and analysis of data, that would be helpful in determining whether naphthalene, ethylbenzene, and xylene may have entered the stormwater pipes under Halsey Street,**

¹ This letter is subject to the attached limitations.

² In April 2021 Golder Associates Inc. and its subsidiaries and affiliated companies, including Golder Associates (NZ) Limited ('the Company') was acquired by Canadian listed company, WSP Global Inc. As part of that acquisition, in January 2022 the Company amalgamated with WSP New Zealand Limited (ultimately owned by WSP Global Inc.) under Part XIII of the Companies Act 1993. On 1 January 2022 the Company changed its legal name to "WSP New Zealand Limited". Golder Associates (NZ) Limited was amalgamated into WSP New Zealand Limited as of 1 January 2022.

³ Correspondence with ORC (email between ORC (S McDonald) and WSP (A Hart) dated 11 October 2022) after issuance of the s92 request confirms that the specific monitoring wells should be BH48, BH51 and BH59 as referred to in the DCC submission on the application.

- b) Please provide any data, and analysis of data, related to measurements of volatile organic compounds from stormwater manholes, if any data is available.**
- c) Please provide an updated assessment on effects to Otago Harbour based on the fact that stormwater may be a potential pathway for contaminants to enter the Coastal Marine Area as a result of this activity.**

Our Response:

Stormwater Quality Data

Based on information prepared at the time of the ESA (Golder Associates (NZ) Limited (Golder) 2019a) and Closure (Golder 2019b) reports, it is understood that DCC owns two concrete stormwater lines beneath Halsey Street. DCC's Geographic Information System⁴ (GIS) shows the stormwater lines to be 1,950 mm and 1,300 mm in diameter with invert levels of 99.893 m RL (2.36 m below ground level (m bgl)) at Jutland Street and 99.829 m RL (2.94 m bgl) at Fryatt Street. The stormwater lines form part of the stormwater system that receives stormwater from the wider Dunedin City and discharge via an outfall to Otago Harbour beneath the HarbourCold facility.

DCC holds a coastal permit (RM11.313.03) from ORC authorising the discharge of contaminants to the coastal marine area for the purpose of stormwater disposal. Under the Coastal Permit, DCC is required to undertake monitoring of stormwater quality, harbour receiving water quality, harbour sediment monitoring and biological monitoring. Of relevance to this application (RM22.099) is the requirement to monitor stormwater quality at the outfall of the Halsey Street stormwater system.

Compliance monitoring⁵ reports (Ryder 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021) prepared to document monitoring under the Coastal Permit have been reviewed with respect to stormwater quality data. The Coastal Permit includes a requirement for monitoring of PAHs in stormwater prior to the point of discharge to Otago Harbour. The Coastal Permit does not require monitoring for BTEX compounds. Under the Coastal Permit, monitoring for PAHs is undertaken to target a wet weather event and specifically at "*low tide within two hours of the commencement of a rain event (more than 2.5 mm of rain), following an antecedent dry period of at least 72 hours of no rainfall in the catchment*" (Ryder 2016). As such it is designed to assess the first flush which typically contains the highest contaminant concentrations.

Total PAH concentrations have been reported between the detection limit (limit is not specified) in 2015 (Ryder 2015) and 0.000204 mg/L in 2016 (Ryder 2016). A total PAH concentration of 0.00009 mg/L was identified in 2014 (Ryder 2014). Monitoring reports prepared after 2016 do not provide data on PAH concentrations in the stormwater given the specified sampling conditions were reported not to be encountered.

The period for which PAH concentrations in stormwater are available aligns with a period of groundwater monitoring undertaken at the site. The groundwater monitoring data (Golder 2019a) includes monitoring wells adjacent to the DCC stormwater lines.

As concentrations of individual PAHs are not included in the monitoring reports, direct comparison with the ANZG (2018) 95% guideline values for marine ecosystems cannot be undertaken. However, the reported concentrations of total PAH, which represents the sum of individual PAHs (including naphthalene), are at least two orders of magnitude below the ANZG (2018) guideline value for naphthalene (0.07 mg/L) and at or below the lowest ANZG (2018) low reliability guideline value (0.0002 mg/L for benzo(a)pyrene). Based on this it is

⁴ <https://www.dunedin.govt.nz/do-it-online/maps-and-photos/water-services-map-and-wws-work-in-progress>

⁵ <https://www.dunedin.govt.nz/services/stormwater/stormwater-monitoring>

reasonable to conclude that concentrations of individual PAHs in the stormwater system are below ANZG (2018) 95% guideline values for marine ecosystems.

Dissolved phase groundwater concentrations for ethylbenzene, xylenes, naphthalene and total PAH at wells BH48, BH51 and BH59 for the period between 2014 and 2017 (Golder 2019b), and available total PAH stormwater data for the same period (Ryder 2014, 2015, 2016) are presented in Table 1. As noted in the Closure Report (Golder 2019b), ethylbenzene and naphthalene were the focus of the assessment as they are considered to represent the primary indicators of petroleum hydrocarbon impacts associated with LNAPL present on the site.

Table 1: Summary of primary hydrocarbon concentrations in groundwater (Golder 2019b) and stormwater line (Ryder 2014, 2015, 2016).

Date	Monitoring Well	Ethylbenzene	m&p-Xylene	o-Xylene	Naphthalene	Total PAH
ANZG (2018) 95% Marine Ecosystems		ne	ne	ne	0.07	ne
ANZG (2018) Low Reliability		0.08	0.075	0.35	-	ne
Groundwater						
June 2014	BH48	0.0016	<0.002	<0.001	0.25	0.25
May 2015		<0.001	<0.002	<0.001	0.081	0.085
June 2016		<0.001	<0.002	<0.001	0.027	0.029
April 2017		<0.001	<0.002	<0.001	0.0007	0.0027
June 2014	BH51	0.0044	<0.002	<0.001	0.092	0.102
May 2015		0.035	0.018	<0.001	0.31	0.32
June 2016		0.0182	<0.002	<0.001	0.131	0.135
April 2017		0.023	<0.002	<0.001	0.26	0.27
May 2015	BH59	0.0158	0.031	0.0078	0.35	0.35
June 2016		0.063	0.011	0.0024	0.078	0.079
April 2017		<0.001	<0.002	<0.001	<0.0005	0.0025
Halsey Street Stormwater						
2014	-	nc	nc	nc	nc	0.00009
2015	-	nd	nc	nc	nc	<LOR ¹
2016	-	nc	nc	nc	nc	0.000204

Notes: Concentrations expressed in units of mg/L. 'ne' denotes trigger value not derived. 'nc' denotes no data collected. '<LOR' denotes below laboratory limits of reporting. ¹ Ryder (2015) does not report the LOR for the analysis. Yellow shading indicates exceedance of but same order of magnitude as ANZG (2018) guideline value. Orange shading denotes exceedance (by one order of magnitude) of ANZG (2018) guideline value.

Data presented in the Closure Report (Golder 2019b) shows that groundwater concentrations are delineated with respect to the ANZECC (2000) trigger values at monitoring wells BH48 and BH59. Naphthalene and ethylbenzene were identified to exceed the assessment criteria at BH51 in April 2017). Xylenes (both m&p- and o- isomers) were below the assessment criteria and typically below the laboratory LORs in these three monitoring wells.

As part of this response, the groundwater quality data has been assessed against the ANZG (2018) toxicant default guideline values⁶ (Table 1). Dissolved ethylbenzene and xylenes in wells BH48, BH51 and BH59 were below these guideline values in the monitoring data collected between 2014 and 2017. Based on the 2017 data, naphthalene in well BH51 represented the only exceedance of the guideline values in the wells closest to the DCC stormwater lines.

Total PAH concentrations in groundwater are higher (by up to three orders of magnitude) than measured within the stormwater pipe during similar period. This indicates that while limited ingress of dissolved hydrocarbons may have and be occurring into the stormwater pipe, this has and is not resulting in elevated PAH concentrations, associated with discharges from the former Mobil terminal in stormwater.

Presence of VOCs in Stormwater Manholes

Monitoring of the presence of volatile organic compounds (VOCs) in stormwater manholes has not been undertaken as part of ESA works.

VOC concentrations in monitoring wells adjacent to the stormwater lines have been monitored during GMEs undertaken between 2014 and 2017. Concentrations of VOCs in monitoring wells BH48, BH51 and BH59 were generally below 10 ppm (and typically less than 1 ppm). It is noted that a VOC reading of 1,150 ppm was measured in monitoring well BH51 in 2015. This result corresponded with evidence of LNAPL globules in the monitoring well at this time. LNAPL was not observed in subsequent monitoring rounds and well headspace VOC concentrations were less than 10 ppm.

For comparison, and assuming that the impacts relate to a fresh release of petrol, a VOC concentration of 20 ppm, as a measure of total hydrocarbons could be applied as a stop work trigger and re-assessment of work environment and controls. This value is based on a tenfold safety factor applied to the WES TWA for petrol of 300 ppm and accounting for PID response factors of 0.5 for individual BTEX compounds.

Further it is noted that soil vapour monitoring undertaken adjacent to the HarbourCold identified concentrations of benzene up to 6 µg/m³. This is equivalent to 0.001 ppm which is below the workplace exposure standard (WES) time weighted average (TWA) of 1 ppm for benzene.

The measured VOCs concentrations in monitoring wells adjacent to the stormwater lines are below this screening criteria and hence indicate a low level of risk associated with the migration of VOCs into the stormwater line.

Updated Assessment on Effects to Otago Harbour

Based on the additional information presented in this response, it is considered that the assessment of effects presented in the ESA (Golder 2019a) and Closure Report (Golder 2019b) remains valid, particularly in relation to potential discharges via the DCC Halsey Street stormwater lines.

⁶ <https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/search>

Specifically, it is noted that:

- Dissolved phase groundwater hydrocarbon concentrations are delineated with respect to ANZG (2018) 95% marine trigger values prior to the point of contact with the stormwater lines and point of discharge to Otago Harbour.
- Monitoring data collected by DCC from the Halsey Street stormwater lines identifies low concentrations of total PAH. The identified concentrations are at least two orders of magnitude below dissolved phase groundwater concentrations and ANZG (2018) 95% marine trigger values.
- Assessment of the groundwater concentrations against the ANZG (2018) 95% marine guideline values provides a conservative assessment in that it does not account for attenuation and dilution between the site and Otago Harbour. Further as noted in the Closure Report (Golder 2019b) the ANZG (2018) guidelines are based on assessing receiving water quality after reasonable mixing. Given that Otago Harbour is a large water body, dilution rates are likely to be high (potentially in the order of 1000:1 (MfE 2011) following the discharge of groundwater.

Closing

We trust the above information fulfils ORC's requirements. If you have any questions regarding this letter, please contact the undersigned by email at andrew.hart@wsp.com or by phone on +64 29 707 0981.

Yours sincerely

WSP New Zealand Limited



Andrew Hart
Technical Principal - Contaminated Land

CC: Chris Belej – Mobil Oil New Zealand Limited

Attachments: Limitations

[https://golderassociates.sharepoint.com/sites/139835/project files/6 deliverables/005-l additional s92/20449679-005-l-rev0.docx](https://golderassociates.sharepoint.com/sites/139835/project%20files/6%20deliverables/005-l%20additional%20s92/20449679-005-l-rev0.docx)

References

- ANZECC 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. National Water Quality Management Strategy Paper No. 4, Vol. 1 (2nd revision). ANZECC, Canberra.
- ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia.

- Golder 2019a. Former Mobil Dunedin Terminal -199 Fryatt Street, Dunedin: Supplementary Environmental Site Assessment. Report prepared by Golder Associates (NZ) Limited for Mobil Oil New Zealand Limited, May 2019.
- Golder 2019b. Former Mobil Dunedin Terminal -199 Fryatt Street, Dunedin: Closure Report. Report prepared by Golder Associates (NZ) Limited for Mobil Oil New Zealand Limited, November 2019.
- MfE 2011. Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand. Ministry for the Environment, Wellington.
- Ryder 2011. Compliance Monitoring 2011 - Stormwater Discharges from Dunedin City (ORC Resource Consents 2002.080-2002.110 and 2006.222). Report prepared by Ryder Consulting Limited for Dunedin City Council, June 2011.
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- Ryder 2016. Stormwater Compliance Monitoring 2016 Stormwater Discharges from Dunedin City ORC Discharge Permits RM11.313.01 –RM11.313.10. Report prepared by Ryder Consulting Limited for Dunedin City Council, June 2016
- Ryder 2017. Stormwater Compliance Monitoring 2017: Stormwater discharges from Dunedin City to the coast. ORC Discharge Permits RM11.313.01 – RM11.313.10. Report prepared by Ryder Consulting Limited for Dunedin City Council, August 2017.
- Ryder 2018. Dunedin City Council - Stormwater Compliance Monitoring 2017. Report prepared by Ryder Environmental Limited for Dunedin City Council, August 2018.
- Ryder 2019. Dunedin City Council - Stormwater Compliance Monitoring July 2018 – June 2019. Report prepared by Ryder Environmental Limited for Dunedin City Council, August 2019.
- Ryder 2020. Dunedin City Council - Stormwater Compliance Monitoring July 2019 – June 2020. Report prepared by Ryder Environmental Limited for Dunedin City Council, July 2020.
- Ryder 2021. Dunedin City Council - Stormwater Compliance Monitoring July 2020 – June 2021. Report prepared by Ryder Environmental Limited for Dunedin City Council, September 2021.

Report Limitations

This report has been provided by WSP New Zealand Limited (“WSP”) subject to the following limitations:

- i) The purpose for which the works were performed is set out in the report.
- ii) The scope of the works to be performed and described is in accordance with Purchase Order No. 4410887578. A description of the work done is set out in the report. If a matter is not addressed, do not assume that any determination has been made by WSP in regards to it.
- iii) This report is prepared based on the information reviewed at the time of preparation of the report.
- iv) WSP did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the report. If a service is not expressly indicated, do not assume it has been provided. Conclusions from field work are an expression of opinion based on samples or locations at the site. The report accordingly is not operating as a guarantee that the condition of the site could not be different at points between sampling locations or at different parts of the site. Thus, due to the inherent variability in natural soils and subsurface conditions it is therefore unlikely that the results, assumptions and conclusions set out in this report will represent the extremes of conditions at any location removed from the specific points of sampling.
- v) Where this report indicates that information has been provided to WSP by Mobil Oil New Zealand Limited or by third parties, WSP has made no independent verification of this information except as expressly stated in the report.
- vi) The analysis and conclusions presented in this report are applicable as at the date of this report. WSP does not make any representation or warranty that the conclusions in the report can be extrapolated for future use as there may be changes in the conditions of the site, applicable legislation or other factors that would affect the conclusions contained in this report.
- vii) All relevant legislation in the jurisdiction in which the site is located and relating to the works has been complied with by WSP as at the date of this report.
- viii) The report should be read in full and no excerpts are to be taken as representative of the conclusions. The report should not be used or relied upon for any purpose except as defined in the report and subject to the limitations set out in this section.
- ix) This report has been prepared on the instruction of Mobil Oil New Zealand Limited and may be used and relied on by Mobil Oil New Zealand Limited and its Affiliates, and other entities contemplated in the agreement between WSP and Mobil Oil New Zealand Limited, such as purchasers of the site, lenders to purchasers, property owners, purchasers from property owners, lessees from property owners and assignees of lease from lessees of property owners.
- x) WSP accepts no responsibility for damages, if any, suffered by any other third party as a result of decisions made or actions based on this report.
- xi) Affiliates means (a) Exxon Mobil Corporation or any parent of Exxon Mobil Corporation, (b) any company or partnership in which Exxon Mobil Corporation or any parent of Exxon Mobil Corporation now or hereafter(1) owns or (2) controls, directly or indirectly, more than fifty percent (50%) of the ownership interest having the right to vote or appoint its directors or functional equivalents (“Affiliated Company”), (c) any joint venture in which Exxon Mobil Corporation, any parent of Exxon Mobil Corporation, or an Affiliated Company is the operator, and (d) any successor in interest to (a) and (c) above.