BEFORE THE EPA
OMV NEW ZEALAND LIMITED APPLICATION FOR MARINE DISCHARGE CONSENT TO DISCHARGE OFFSHORE PROCESSING DRAINAGE (HARMFUL SUBSTANCES FROM DECK DRAINS)

IN THE MATTER of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012

AND

IN THE MATTER of a Decision-making Committee appointed to consider a marine discharge consent application made by OMV New Zealand Limited for the discharge of trace amounts of harmful substances from deck drains in the South Taranaki Bight

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STATEMENT OF EVIDENCE OF GERALD HELMUT HOLLINGER FOR OMV NEW ZEALAND LIMITED

Mobile Offshore Drilling Units

Dated: 30 July 2018

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EXECUTIVE SUMMARY

1. Three types of Mobile Offshore Drilling Units (**MODUs**) will be considered for OMV's proposed drilling campaign. A semi-submersible MODU is the most likely one to be used.

2. All MODUs have, in principle, a similar deck drainage system that is separated into hazardous and non-hazardous deck drainage. MODUs have water treatment systems on board which allow them to treat contaminated water. Under The International Convention for the Prevention of Pollution from Ships (**MARPOL**) Annexe 1 (Regulations for the Prevention of Pollution by Oil), water, where the oil content is less than 15ppm, can be discharged to sea.

3. It should be noted that water treatment systems cannot guarantee removal of harmful substances; therefore harmful substances will only be stored in dedicated areas protected from the weather, like the sack store or in covered bunded pallets within bunded areas.

4. Not all MODUs treat the fluids from the non-hazardous deck drains. Some allow direct discharge to sea of fluids collected inside this area due to the low likelihood of the presence of oil or harmful substances.

5. OMV will select a MODU or MODUs through a rigorous tender processes whereby any offered rigs will be evaluated against OMV's operational and Health, Safety, Security and Environmental requirements.

INTRODUCTION

Qualifications and experience

6. My full name is Gerald Helmut Hollinger.

7. I have a degree in Petroleum Engineering from the Leoben Montan University, Austria. I have worked in the oil and gas industry for 13 years, which has included 12 years of work on onshore and offshore international drilling campaigns.

8. From 2012 - 2017, I worked as a Senior Drilling Engineer / Team Leader in Norway, executing an offshore drilling campaign that comprised of 5 subsea exploration and appraisal wells in the Barents Sea.

9. I am currently employed as Well Engineering Manager for OMV New Zealand Limited (**OMV**), based in New Plymouth, and have held that position since June 2018. Prior to that, I worked for OMV Exploration & Production GmbH, Austria as the Department Manager for Drilling and Well Completion Engineering.

10. My principal role is to manage well workovers and interventions, where typically failed equipment inside a well is replaced and the production restored. I also oversee the well engineering tasks related to the Exploration and Appraisal Drilling (**EAD**) activities for OMV. In more detail, I am responsible for:

    (a) ensuring that the planning and execution of all operational activities are compliant with the OMV Well Engineering Management System, the OMV Health, Safety, Security and Environment (**HSSE**) Management System and New Zealand legislation;

    (b) alignment with relevant regulatory authorities such as WorkSafe New Zealand High Hazards Unit, Maritime New Zealand and the Environmental Protection Authority;

    (c) providing, in a timely manner, the required notifications and consent applications for all workovers, well interventions and drilling activities;

    (d) managing a team of experienced well engineering professionals including, but not limited to: Drilling Superintendent, Well Engineering lead, Senior Drilling Engineer(s), Drilling Engineer(s), Completion Engineer(s) and HSSE Advisor(s).

    (e) quality assurance and contractor management of all involved services in the well planning and well construction processes; and

(f) coordination with the OMV head office for assurance activities, including gate approvals for drilling programs, well engineering audits and rig acceptance audits.

Code of Conduct

11. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2011 and that I have complied with it when preparing my evidence. Other than when I state that I am relying on the advice of another person, this evidence is entirely within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

12. I confirm that this evidence is true and correct to best of my knowledge.

Role in the EAD Programme

13. For the upcoming EAD campaign, I will be involved in the MODU selection process. Part of my role is to ensure that:

(a) the technical requirements and specifications as outlined in the tender documents are met;

(b) a quality assurance process is followed (pre-hire audits, MODU acceptance audits, technical verifications, etc);

(c) crew competency meets OMV's requirements;

(d) the MODU operator has an appropriate HSSE management system in place and applies it;

(e) OMV standards are communicated and adhered to by the contractor; and

(f) OMV HSSE expectations are met.

14. I will be actively involved in the preparation and internal approval of the Emergency Response Plan, Emergency Spill Response Plan (**ESRP**) and Oil Spill Response Plans (**OSCP**) as well as in associated exercises for the

personnel involved in operations to demonstrate the effectiveness of these plans, both internally and to the Regulators as required.

Scope of Evidence

15. In this evidence, I will:

(a) briefly describe a typical Mobile Offshore Drilling Unit (**MODU**) that OMV will use for its EAD programme;

(b) describe a typical deck drainage system on a MODU, and the systems that are used to prevent a direct discharge overboard;

(c) describe OMV's MODU selection process and the subsequent selection of harmful substances; and

(d) explain the circumstances in which a direct overboard discharge could occur, including the amount and composition of substances that could be discharged.

MOBILE OFFSHORE DRILLING UNITS

16. At the time of writing this document, the tender documents for the unit are still under preparation. As such, the information that follows is of a general nature.

17. Three types of MODUs can be considered for the drilling campaign planned by OMV:

(a) Jack-up: This type of MODU typically has a buoyant hull and 3 (sometimes 4) legs and needs to be towed to location. Once on location, the legs are lowered until the support of the seafloor is sufficient to jack the hull up to the desired working height. Whilst there are special jack-up's that can operate in water depths of 150m, the types most commonly in use are designed for water depths of 100-120m or less.

Figure 1: A jack-up MODU[1]

(b) Drill Ship: This type of MODU is ship-shaped. It is commonly used for deep water drilling operations in remote areas. The benefits of using a drill ship are the generous deck space and quick mobilisation and demobilisation. Drill ships are generally not anchored but dynamically positioned (**DP**). DP MODUs are typically used for drilling in water depths in excess of 400m.

Figure 2: A drill ship MODU

(c) Semi-submersible: This type of MODU is an 'all-rounder' and can operate in shallow waters as well as on deep water drilling operations. Some semi-submersibles may need to be towed to location, while some are self-propelled. Once on location, the MODU submerges from transit draft to drilling draft by taking on

[1] The jack-up MODU in this photo is the ENSCO 107 (grey hull) alongside the Maari WHP (yellow hull).

ballast (seawater). They can be anchored, fully DP or a mix of both (**POSMORATA)**.

Figure 3: A semi-submersible MODU

18. Due to the water depths in OMV's permits (100-150m), a jack-up is unlikely to be chosen for the upcoming campaign. Similarly, a drill ship for such shallow water is also not an ideal solution. Accordingly, it is likely that OMV will use a semi-submersible for the EAD programme, but the final selection will depend on MODU availability.

MOBILE OFFSHORE DRILLING UNIT DECK DRAINAGE SYSTEMS

19. The following schematics and descriptions are generic from various MODUs and not specific to any particular MODU, since the contracting phase has not yet been completed.

20. The set-up of the deck drainage system varies from MODU to MODU. However, typically the deck drainage system on MODUs consists of 'hazardous drains' which flow to a collection tank from areas where the presence of hydrocarbons and / or harmful substances is possible, and 'non-hazardous drains' which flow to a collection tank from areas where the presence of hydrocarbons and/or harmful substances is unlikely.

21. A MODU may operate with plugs / bungs in the drains at all times or during certain operating modes, depending on the deck drainage design and the

drainage management philosophy. A typical deck drainage system is shown in the diagram below:

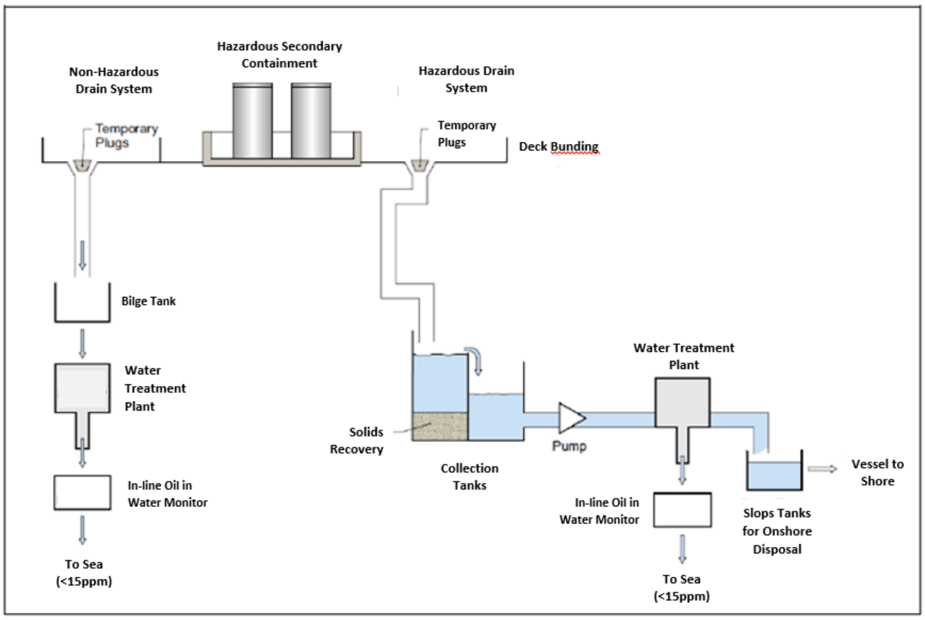

Figure 4: A Typical Deck Drainage System on MODUs

Water treatment systems

22. Water treatment systems, often referred to as oily water separator (**OWS**) systems, that meet the MARPOL Annexe I requirements, have an in-line oil in water (**OIW**) measurement system that continuously monitors the output from the OWS system and ensures that only water containing less than 15ppm OIW is discharged overboard. If the oil content exceeds the limitation, the fluid is re-directed back into the treatment system and will not be discharged.

23. The untreatable collected oil and solids (**slops**) from this system are transferred via supply vessel to an approved onshore disposal facility, either via intermediate bulk containers (**IBC**) or bulk transfer, depending on the volume to be discarded.

24. The following sections describe different separation methods that OWS systems may use to process the water before it passes through an in-line oil in water monitor.

Skimmer Tank Separation

25. The most basic type of a separation system is a skimmer tank, which basically uses the gravity difference of oil and water to separate the two fluids. Since no mechanical or chemical separation is involved, the process is time consuming and emulsions cannot be separated in this system.

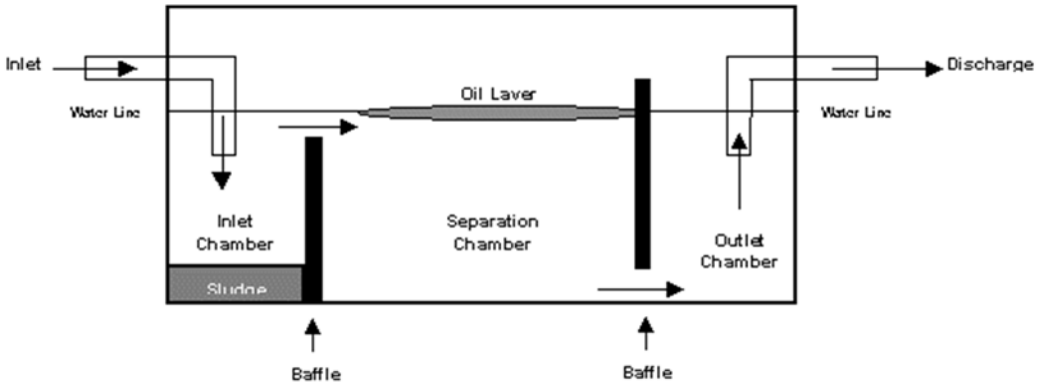

Figure 5: Basic skimmer tank separation

Centrifuge Separation

26. A centrifugal separator is a device designed to separate oil and water by centrifugation. It generally contains a cylindrical container that rotates inside a larger stationary container.

27. The denser liquid, usually water, accumulates at the periphery of the rotating container and is collected from the side of the device, whereas the less dense liquid, usually oil, accumulates at the rotation axis and is collected from the centre. A centrifuge system speeds up the separation process and enhances the separation efficiency due to the higher g-forces acting on the fluid.

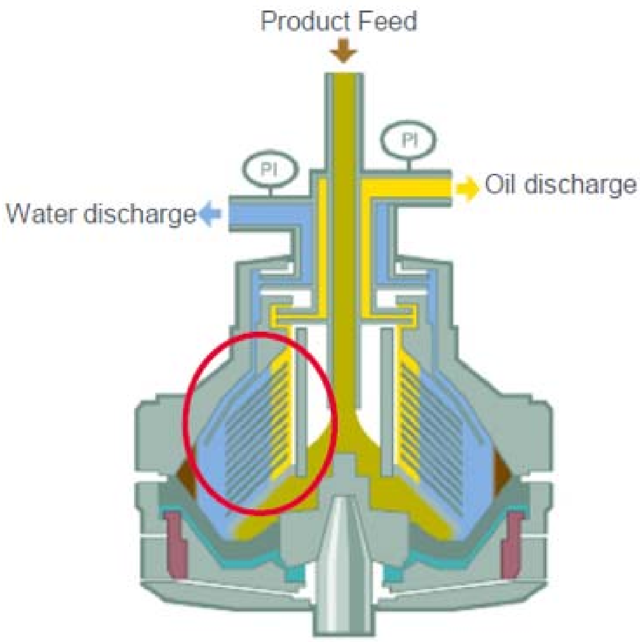

Figure 5: Basic Centrifuge Separation

Coalescing Separation

28. This method uses an oleophilic media[2], which the contaminated water is pressed through. During this stage, oil is separated from the water and will form small droplets, which gradually coalesce into larger drops that rise to the surface of the water in the separator. The clean water is discharged at the bottom, forcing it through another layer of oleophilic media (which increases the separation efficiency) as shown in the picture below.

[2] An oleophilic media is a substance that provides a surface for oil droplets to meet and grow into larger droplets.

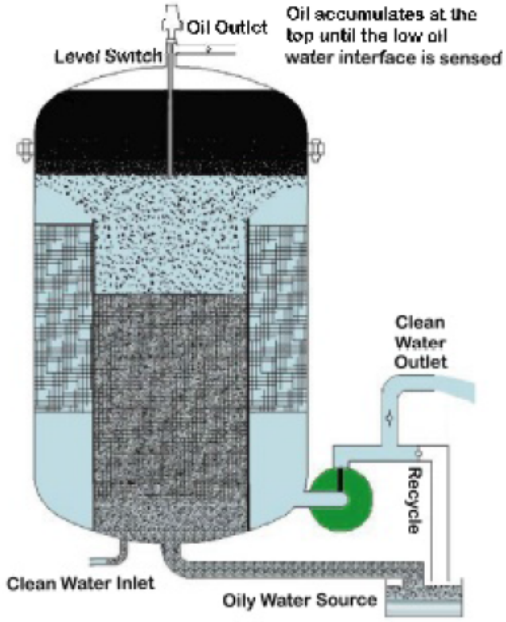

Figure 6: Basic Coalescing Separation

29. Treatment capacities for such systems described above are typically in the range of 5 to 10 m^3/hr. It is important to note that the removal of harmful substances by water treatment systems is not assured. The degree of removal depends on the density of the substance and whether it sinks or floats.

SELECTION OF A MODU

30. Selection of a MODU is subject to a tender process whereby OMV sets detailed criteria for the capability and performance of the MODU. Each tenderer will answer questions in regards to the technical specification of the rig. HSSE forms 25% of OMV's technical evaluation.

31. The technical evaluation of any offered rig will focus on requirements set out by the evaluation team and any non-compliant bids will not be considered further. Key elimination criteria for any offered MODU are set in accordance with the HSSE and technical requirements. The criteria include:

(a) the rig must not be cold stacked[3] prior the assignment;

[3] A cold stacked rig is a rig which has not been in use and, for example, is being stored in a harbour with minimal crew.

(b) the contractor must have an appropriate HSSE management system in place;

(c) the unit must be able to operate in the planned water depth;

(d) the OWS handling capacity must be a minimum of $10m^3/h$;

(e) all hazardous deck drains are fully contained and directed into a storage tank with a minimum holding capacity of $5m^3$;and

(f) automatic measurement of any discharge after the oil water separation system for residual oil content is in place.

32. Other technical differences will be ranked according to their impact on the unit's performance. This technical ranking will include HSSE aspects.

33. Once the technical ranking is finalised, the offers will be assessed commercially and then a short list is created with the best 1 to 3 MODU’s.

34. All rigs on this short list will be subject to a pre-hire audit. This audit ensures that the MODU is compliant with OMV’s standards for the management of technical integrity and HSSE. Audits will focus on safety critical elements, procedures and systems and verify that the contractor maintains and operates the unit in accordance with OMV's requirements.

35. Once the contract is signed and prior to drilling commencing, another audit will be performed on the unit to verify it meets all of the requirements. All findings classified as critical (unacceptable from a HSSE or technical perspective) need to be adequately addressed before the rig can commence a drilling operation.

36. Very often, alignment will be sought with previous operators of a MODU to identify scopes of previous audits. This allows OMV to tailor future audits on certain aspects which can be identified issues or items which have not been addressed in previous audits.

37. All planning and preparation activities for the campaign will follow the OMV Well Engineering Management System. Detailed risk assessments will be performed at various stages and incorporated in the operational procedures and work instructions to ensure mitigation actions or prevention methods are understood by all personnel and implemented effectively.

38. Where required, bridging documents will be established to address differences in management systems with certain contractors.

SELECTION OF SUBSTANCES

39. Substances stored on a MODU are driven by operational requirements. For example, for general maintenance this could be the type of oil recommended by the manufacturer for optimal operation of a piece of equipment.

40. For well engineering, the design of the well and the geology of the formation need to be considered. Substances are selected that will optimise hole cleaning (the removal of cuttings from the wellbore) and maintain the integrity of the well (with a suitably weighted fluid column and cement with a suitable composite strength to ensure no fluids can escape from the cased well) and optimal lubrication (to reach the subsea target of the well).

41. As mentioned previously, OMV has not yet contracted a MODU, and at this stage of the planning final well designs are not yet known. However, OMV will utilise the HSNO classification system to inform its decision-making process during the testing and evaluation of substances for the EAD programme to ensure that, where practicable, the substances selected for drilling operations will be the least harmful substance technically capable of meeting the operational requirements.

POSSIBLE HARMFUL SUBSTANCES PRESENT ON THE MODU

42. Below is a list of substances that may be present on the MODU during the EAD campaign that potentially could contain harmful substances.

Substance Category	Synthetic Based Drilling Muds	Water Based Drilling Muds	Cementing	General Maintenance
Antifoam	●		●	
Base Oil	●			
Biocide	●	●	●	
Brine	●			
Corrosion Inhibitor	●			
Crosslinking Chemical			●	
Defoamer	●		●	
Demulsifier	●			
Dispersant			●	
Drilling Lubricant	●			
Emulsifier	●			
Engine Oil				●
Filter Cake Removal	●			
Filtrate Reducer	●			
Fluid Loss Control Chemical	●	●	●	
Gear / Transmission Oil				●
Hydraulic Oil				●
Machine Lubricant				●
pH Alteration	●			
Pipe Release Chemical	●			
Shale Inhibitor / Encapsulator	●		●	
Surfactants			●	
Viscosifier	●		●	

Figure 7: List of substances potentially with harmful components

43. Harmful substances are always stored in a protected, designated and bunded area. In case a fully enclosed area is unavailable, covered bunded pallets (Figure 7) can be used, but they will still be located inside a bunded deck area.

Figure 7: Covered bunded pallets

44. Depending on the MODU and the design of the deck and drainage system, coaming around all decks is generally available to prevent accidental drainage of any substance directly from deck to sea. However, if areas are classified as clean or non-hazardous, this coaming might not be present.

45. If OMV contracts a MODU without full coaming, stringent procedures would be in place and enforced to avoid spillage of any materials other than water in this area. For example, there would be no laydown areas for chemical substances, oils or contaminated equipment to be stored or used in that area.

46. If any substance (other than water) is spilled on deck, the spill will be cleaned up immediately. Spill kits, containing absorbent soak pads, pillows and snakes, will be available on board the MODU and are located in dedicated areas on the deck. Bungs or stoppers will be available close to deck drain apertures so that the drain can be isolated temporarily while cleaning up the spill. Full details of emergency spill response and oil spill response procedures will be detailed in the ESRP / OSCP.

47. Once the spill is cleaned up, there may be some residue of the substance that cannot be recovered with the equipment in the spill kits and is invisible to the naked eye. The residue would be washed off and flushed into the drainage system.

EXTREMELY HIGH RAINFALL EVENTS AND ACTIVATION OF THE DELUGE SYSTEM

48. If all hazardous and non-hazardous deck drain areas are bunded, extensive rainfall or the activation of the deluge system may exceed the capacity of

the OWS system. In these events, column storage tanks or any other available tanks can be utilized to store the excessive amount of fluid. However, if there is a stability concern or safety critical work could not be executed on deck due to excessive water flooding, preservation of life would take precedence, and the non-hazardous deck drains may be opened, under a PTW, for direct discharge to sea. This would only happen once the decks were checked and it has been confirmed no oil or harmful substance contaminants are present.

49. Rain statistics for the area where operations are planned can be used to verify that the likelihood of such an event is remote. Mr Forrest discusses rainfall in his evidence. During my career I have never experienced a deck drainage over-ride due to rainfall or the activation of the deluge system.

50. I also note that a part of a MODU's firefighting strategy might be to open the deck drains to sea to ensure that any burning substances are flushed off the deck as quickly as possible. Again, preservation of life will take precedence should this be required.

Preventing a wrong valve being opened in the system

51. A possible reason for the unintended discharge of harmful substances is the opening of a wrong valve in the system, which accidently directs the fluid to sea. For this reason, all valves that would allow discharge overboard are locked in closed position and registered in the MODU Isolation Register. Operating such a valve requires a PTW. An integral part of such a PTW is the risk assessment to ensure any likelihood of accidental spill is reduced to an absolute minimum. A double valve system as well as defined maintenance frequencies can also be part of the assurance to avoid spills due to a leaking discharge valve, depending on the particular MODU.

Transfer of slops

52. Transfer of slops or the collected fluid (as described in paragraph 19) to the supply vessel in order to transport the hazardous material to an adequate onshore disposal facility can lead to unintended spills (e.g. through transfer hose failure, or operating the wrong valve). Bulk hose transfer operations are managed under the PTW system and require a related risk assessment

and toolbox talk (**TBT**) with all involved personnel. A TBT is a discussion with the personnel involved in the task where they discuss the hazards and controls from the risk assessment and allocate tasks so that everything that needs to be done is communicated, tasked to individuals and understood.

53. The use of an OWS system and discharging the clean water (less than 15ppm) helps to keep the produced slop volumes small and therefore minimises the number of transfers to the supply vessel. This again reduces the likelihood of such spills happening.

RESPONSE TO EPA REPORTS

54. I have reviewed the OGS report and wish to make the following comments on the key risks set out in Section 5.1 of the report.

55. During the MODU contracting process, currently in progress, the Tenderers have been made aware of the relevant New Zealand legislative requirements to be met, which have been detailed in the invitation to tender (ITT). In particular the ITT specifies the following:

(a) All areas where spills can occur directly to sea, shall be fitted with a closed boundary.

(b) The height of the boundary shall be sufficient to prevent the fluid from spilling over the edge due to rig movement.

(c) There shall be separate drain storage tanks for:

(i) drains from clean areas;
(ii) drains from polluted non Hazardous areas; and
(iii) drains from Hazardous areas.

(d) Dump valves for drains in for example pump room, mud pit room, deck area, etc, must be padlocked and controlled under the Permit to Work System.

(e) In relation to the oil separation system throughput:

(i) no oily water shall be discharged to the sea if the oil content is above 15ppm; and

(ii) there shall be an online monitoring system (with historical log) for all drain water discharged to sea. Calibration of the online meter shall be included in the maintenance system.

56. The key risks in section 5.1 of the OGS report are otherwise addressed in the table below (design of bunds), in paragraph 14 above (spill response exercises), and in the 'Selection of MODU' section of my evidence at paragraphs 30 to 38 above (history of integrity issues).

57. For ease of reference, I have also set out OMV response to the request for further information in this report below. I helped prepare the response.

No.	REFERENCE #	CLARIFICATION	LEVEL	STATUS	RESPONSE
1	5.1, Bullet 5, p 10 **No Reference**	Confirm that the design of all bunds, coaming and hard-covered bunded pallets for hazardous areas will contain the maximum volume of harmful substances stored in all vessels or containers held in the governed area in the event of leak/rupture.		Open	Bunds and coaming would be capable of containing the whole volume of one of the maximum sized receptacle stored in that area. We cannot determine a foreseeable event where more than one would burst or leak once placed inside the bund.
2	6.2, para 7, p 12 **No Reference**	How are the solids collected and where do the solids go as they build up in the collection tank?		Open	Separation system solids are collected in the bottom of the settlement tank (1st stage of separation) and periodically the tank is taken out of service and either pumped out or dug out depending on the sediment in the bottom of the tank.

No.	REFERENCE #	CLARIFICATION	LEVEL	STATUS	RESPONSE
3	6.2, para 13, bullet 2, p13 **3.3.2, bullet 2, page 36**	Will the MODU have automated alarms to monitor oil-in-water content prior to discharge, if not what method or system will be used?		Open	The MODU will have a certified in-line OIW monitoring system. At a maximum this meter would be certified 5-yearly as per MARPOL requirements. However, some manufacturers specify a shorter certification frequency and the OIW monitor will be maintained as per OEM requirements via planned maintenance routines in the MODU maintenance management system. These will be detailed further in the OSCP / ESRP for the MODU.
4	6.2, para 13, bullet 4, p13 **3.3.2, bullet 3, page 36**	Will the regular water checks be carried out on the MODU or sent onshore for analysis?		Open	Testing may take place either onshore or offshore depending on the MODU capability (personnel competency and available equipment). This will also be detailed further in the OSCP / ESRP for the MODU.

RESPONSE TO SUBMISSIONS

58. I wish to respond to the several points raised in submissions by Greenpeace of New Zealand Incorporated and Te Runanga o Ngati Ruanui.

Greenpeace of New Zealand Incorporated

59. Greenpeace of New Zealand Incorporated stated:

> ***Application is incomplete***
>
> *Risks are unknown - substances, MODU, zone of influence, cumulative impacts (TTR) and economic costs are unknown*

60. In relation to the selection of harmful substances, I refer page 42 (Section 3.7) of the Consent Application where it clearly states that 100% of a

substance in the 9.1A (most eco-toxic) category was used to assess the potential environmental effects.

61. As for the selection of the MODU please refer to the Selection of a MODU above. It should also be noted that it has been stated in the Consent Application that more than one MODU may be used in the performance of the work associate with the EAD for which the Application is sought.

Te Runanga o Ngati Ruanui

62. Te Runanga o Ngati Ruanui stated**:**

> *We recommend that the EPA considers applying a condition requiring a specially designed zero discharge MODU which is more stable to avoid stability risks, if consent is granted. This type of MODU is Ngati Ruanui's preference. Moreover, under exceptional circumstances for example during periods of excessive and continuous rainfall, a consent condition requiring the activity to cease until sea/weather conditions are considered to be safe to commence operation is appropriate.*

63. It is a misconception to assume that zero discharge MODU's are more stable. Everything that floats will be subject to stability issues. Zero discharge MODU's have more tank storage capacity but in order to maintain stability they will take on and pump out ballast water as required. This is also what happens on a conventional MODU. Decks on-board the MODU would be maintained to a high standard of cleanliness and the likelihood of any MODU, whether zero discharge of not, requiring to bypass the water treatment system is remote. It should be noted that MODU operations are subject to the design limitations of the MODU. These limitations will be clearly stipulated in the MODU Safety Case and shall not be exceeded at any time.

64. Te Runanga o Ngati Ruanui also stated "*Further information is required in terms of the role, if any, of the OWS in treating harmful substances*."

65. The effect, or otherwise, that an OWS system would have on harmful substance depends on the composition of the harmful substance and

whether the substance floats or sinks. This is discussed in paragraph 29 of this evidence and page 41 of the Impact Assessment. The calculations in section 3.7 of the application assume 100% of the spill residue is discharged.

66. In general response to the submissions points headed "Drainage from Hazard Areas" and "Drainage from Non-Hazard Areas", I refer to paragraphs 20 and 21 above. I also note that MODU decks are generally maintained to a high standard of cleanliness on a day-to-day basis to minimise the potential for slips, trips and falls. Other than this no further detail can be supplied until a MODU is contracted.

67. Lastly, I wish to respond to the following suggestion:

> *Given that at this stage the type of MODU to be used is not available and the IA has been based on the above surface area, we consider it appropriate that the EPA apply a condition limiting the deck area to no more than 5,826m^2. Further to this the consent, if granted, should be limited to the information provided particularly those references used in volume calculations. Any changes will require a new application to be submitted to the EPA.*

68. The figure used in the consent application was derived from the deck area of the largest MODU that responded to the OMV invitation to tender in 2017. This invitation to tender has been updated and re-issued to gauge the interest from tenderers including those with zero discharge capabilities. Prior to award of contract, it will not be practicable for OMV to nominate a maximum deck area. I also note that zero discharge installations are likely to be larger due to the additional storage space required.

Gerald Helmut Hollinger

30 July 2018