

संदर्भ सं./Ref. No.: HSE/E/43C-1/717

दिनांक/Date: 30.05.2026

From	:	Executive Director (HSE & ESG)
To	:	Deputy Director General of Forests (Central), Sub Office, Guwahati (under Regional Office, Shillong), 4th Floor, Housefed Building, Rukminigaon, Guwahati-781022. (Email : iro.guwahati-mefcc@gov.in , iro.moefcc.ghy@gmail.com)
Subject	:	Submission of Half-yearly (October 2025 to March 2026) compliance reports of the conditions stipulated in the Environment Clearance (EC) granted to Oil India Limited.

Sir,

Reference to above subject, please find enclosed herewith the Half-yearly (**October 2025 to March 2026**) compliance reports of the conditions stipulated in the Environment Clearance (EC) granted to Oil India Limited. List of the EC are tabulated below:

S.No	EC Identification No/File No.	Name of the EC proposal
1.	F. No. J-11011/413/2008-IA II (I) dated 24.01.2011	OCS Bhogpara., Augmentation capacity of Intermediate Tank Farm (ITF) at Tengakhat, Hapjan Savitri Crude Oil Pipeline in Tengakhat Naharkatiya-Jorajan area.
2.	F. No. J-11011/1251/2007-IA II (I) dated 01.11.2011	Exploratory Drilling of 01 (One) well at Doomdooma-Pengry Area, District Tinsukia, Assam.
3.	F. No. J-11011/682/2008-IA II (I) dated 17.06.2013	Expansion of Gas field Development in Tengakhat-Naharkatia-Jorajan area and Doomdooma Pengry area, Assam by M/s Oil India Ltd.
4.	F. No. J-11011/116/2018-IA II (I) dated 07.01.2020	Onshore Oil & Gas Exploration & Development Drilling and Production in Ningru Oil & Gas Field in Districts Changlang and Namsai for Ningru PML Block (Arunachal Pradesh)
5.	F. No. J-11011/1260/2007-IA II (I) dated 09.04.2020	Onshore Oil & Gas Development Drilling and Production in Mechaki Area covering Mechaki, Mechaki Extension, Baghjan and Tinsukia Extension PMLs on District Tinsukia (Assam).
6.	F. No. J-11011/150/2016- IA II (I) dated 11.05.2020	Extension Drilling & Testing of Hydrocarbons at 7 (seven) Locations under Dibru-Saikhowa

		National Park Area, North-West of Baghjan PML, District Tinsukia, Assam.
7.	F. No. J-11011/1253/2007-IA II (I) dated 28.12.2020	Onshore Oil & Gas development drilling and production by M/S Oil India Ltd in Dibrugarh district under Dibrugarh, Chabua, Hugrija and Tinsukia PMLs. (Dibrugarh- Bhogpara)
8.	F. No. J-11011/375/2016-IA II (I) dated 28.12.2020	Onshore Oil & Gas Development Drilling and Production (179 wells and 9 Production Installations) in North Hapjan – Tinsukia – Dhola area under Tinsukia district, Assam
9.	F. No. J-11011/35/2018-IA II (I) dated 26.02.2021	Onshore Oil & Gas development drilling and production by M/S Oil India Ltd. Located in Khagorijan Oil & Gas Field in Dibrugarh & Tinsukia District under Tinsukia PML, Tinsukia Extension PML and Chabua PML District: Dibrugarh, Assam
10.	F. No. J-11011/186/2016-IA II (I) dated 03.03.2021	Onshore Oil & Gas development drilling and production in Borhat-Titlagarh area, Dibrugarh, Sibsagar and Charaideo Districts under Sapkainth, Borhat, Moran Extension and Doomdooma PMLs.
11.	EC22A002AS110311 F. No. J-11011/156/2017-IA II (I) dated 28.11.2022	Oil & Gas development drilling and production (16 exploratory, 73 developmental drilling wells and 9 Production Installations) in Moran Area under Dibrugarh, Sibsagar and Charaideo districts, Assam.
12.	EC23A002AS125690 F. No. J-11011/1254/2007-IA II (I) dated 13.01.2023	Oil & Gas development drilling and production (68 developmental drilling wells and 9 Production Installations) in Khowang Shalmari Area under Dibrugarh, Sibsagar districts, Assam.
13.	EC23A002AS188131 F.No J-11011/1257/2007- IA II (I) dated 17.04.2023	Onshore Oil & Gas development drilling and production (167 wells and 7 production Installations) in Tengakhat-Kathaloni-Dikom (TKD) under Dibrugarh district, Assam.
14.	EC23A002AS198872 F. No. J-11011/388/2016-IA II (I) dated 31.07.2023	Onshore Oil & Gas development drilling (67 wells) in Jorajan Area under Dibrugarh, Charaideo and Tinsukia districts, Assam.
15.	EC23A002AS146942 F.No. J-11011/546/2017-IA(I)	Onshore Oil & Gas development drilling and production (294 wells and 2 Production



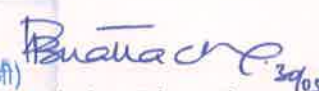
HSE Department
Oil India Limited
Duliajan, Dibrugarh, 786602, Assam
Phone : 0374-2800542
Email: safety@oilindia.in

	dated 20.09.2023	Installations) in Naharkatiya-Deohal-Bogapani-Nagajan (NDBN) area under Dibrugarh & Tinsukia districts, Assam.
16.	EC No: J-11011/463/2008-I A II(I) DATED 16.01.2012	Baghjan - STF crude Oil Pipeline & Gas Transmission pipeline from Baghjan to CGGS

This is for your kind information please.

Thanking you.

Yours faithfully,
For Oil India Limited


कार्यकारी निदेशक (एचएसई एवं ईएसजी)
Executive Director (HSE & ESG) (Arindam Bhattacharyya)
नोडल अधिकारी (ईसी/एफसी/एनबीडब्ल्यू)
Nodal Officer (EC/FC/NBWL)
ऑयल इंडिया लिमिटेड
Oil India Limited
For Resident Chief Executive

Encl: As above

Copy:

1. Director, Monitoring Cell, MoEF, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi-110003.
2. Zonal Office, Central Pollution Control Board, "TUM-SIR", Lower Motinagar, Near Fire Brigade Headquarter, Shillong-793014.
3. Chairman, Assam Pollution Control Board, Bamunimaidan, Guwahati-781021, Assam.
4. Chairman, Arunachal Pradesh State Pollution Control Board, Office of the Principal Chief and Secretary (E&F) Conservator of Forests, Govt. of Arunachal Pradesh, Itanagar-791111, Arunachal Pradesh.

STATUS OF COMPLIANCE OF EC CONDITIONS

Installation: OCS-BHOGPARA

Period: 01/09/2025-30/03/2026

EC No: No J-11011/413/2008-I A II(I) DATED 24.01.2011

Specific Condition		
Sl No.	EC Condition	Compliance status/Remark
i.	Environmental clearance is subject to obtaining prior clearance from wildlife angle including clearance from the Standing Committee of the National Board for Wildlife regarding impact of the proposed project on the Padumani Wildlife Sanctuary (8.2 km from new BUS at Mahum), Borjhan Wildlife Sanctuary (5 km from STF) and 3 recently declared Wildlife sanctuaries (declared on 20th October, 1999) besides Dibru-Saikhowa National Park (9 km from BUS) located within 10 km. area as applicable.	Not Applicable The project does not attract wildlife clearance.
ii.	Grant of environmental clearance does not necessarily imply that wildlife clearance shall be granted to the project. The proposal for wildlife clearance shall be considered by the respective authorities on their merits and decision taken. The investment made in the project, if any, based on environmental clearance so granted, in anticipation of the clearance from wildlife angle shall be at the cost and risk of the project proponent and Ministry of Environmental & Forests shall not be responsible in this regard in any manner.	Point noted
iii.	Ambient air quality shall be monitored for PM ₁₀ , SO ₂ , NO _x , and non-methane hydrocarbon (NMHC) as per the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R No. 826(E) dated 16 th November 2009.	Complied. Display of AAQM parameters is being done at site. Copy of Ambient Air Quality Monitoring Report is enclosed as annexure 1
iv.	The stacks of adequate height shall be provided to control emissions from all the sources including DG sets, steam generators etc. as per the regulatory requirements and emissions from stacks shall meet the MOEF/CPCB guidelines.	Complied. Attached as annexure 2 .

Sl. No.	EC Condition	Compliance status/Remark
v.	The company shall make the arrangement for control of noise from the DG sets and meet DG set norms notified by the MoEF.	Complied The DG set and noise monitoring report is attached as annexure 2 .
vi.	Total ground water requirement for OCS, STF, ITF and BUS shall not exceed 128 m ³ /day/well and prior permission shall be obtained from the Central Ground Water authority/state Ground Water Board (CGWA/SGWB). A copy of the permission shall be submitted to the Ministry's Regional Office at Shillong. Effluent Treatment Plant (ETP) shall be installed to control oil content and other parameters as per Assam Pollution Control board (APCB) and/or Environment (Protection) Act whichever is more stringent. Treated wastewater shall be passed through multi-media filters to remove solids and clarified water shall be collected into storage tubes before pumping to disposal wells. Oily waste water shall be treated in oil separator to remove oil content in the effluent. Domestic effluent shall be treated in septic tank followed by soak pit. The treated effluent shall be monitored regularly.	Complied. Formation water of Bhogpara OCS is treated in ETP Tengakhat to desired standards. ETP sampling report is attached as annexure 3
vii.	Tank bottom sludge from crude oil tanks of OCS shall be stored in secured covered impermeable concrete sludge pit located outside the proposed installation before safe disposal through approved/registered recyclers. Waste oil and used batteries shall be sold to authorized recyclers/re-processors. Secured land fill shall be as per the design approved by the CPCB and obtain authorization from the Assam SPCB. Copy of authorization shall be submitted to Ministry's Regional Office at Shillong.	Point noted. Shall be done when tank cleaning will be carried out.
viii.	Total storage capacity of the tanks shall not exceed 40,000 KL after expansion. Capacity of the each of the storage tank shall not exceed 5,000 KL. Instead of fixed roof tanks, floating roof tanks shall be provided.	Complied.
ix.	A comprehensive Oil Spill Contingency plan (OSCP) shall be prepared to handle all major, moderate and minor spill.	Complied during all the operation & maintenance activities. Attached as annexure 4
x.	All the OCS shall have facilities for knocking out water from the formation fluid. The Formation	Complied

Sl. No.	EC Condition	Compliance status/Remark
	water from Electrostatic, Emulsion Treater (EET) shall be disposed to the disposal wells only after ensuring all the parameters within permissible limit of Assam PCB and / or prescribed under E(P) Act whichever is more stringent.	
xi.	Use of bowser for the transportation of oil shall be stopped as soon as pipeline is installed.	Complied
xii.	M/s OIL shall prepare a remediation plan (both bio-remediation) where solid is contaminated due to spillage of oil in existing units and submit to MOEF.	Complied In Situ & Ex-Situ Bioremediation plan is in place for any soil contamination. Remediation plan facility at Dikom is valid until 5.12.2027
xiii.	An immediate action shall be ensured to control and treat oil spill or oil sludge using suitable method. Remaining oil shall be remediated through bioremediation / Phyto-remediation etc. Therecyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers.	Complied Emergency Response Plan to mitigate oil spillage and its control is in place and bioremediation is carried out for remaining oil. Attached as annexure 4
xiv.	All the solid/hazardous waste including bottom sludge shall be handled as per the rules and guidelines under Manufacture, Storage and Import of Hazardous chemicals Rules, 1989 as amended in October, 1994 and January, 2000. All the oily sludge from ITF, STF, and BUS OCS shall be stored in secured land fill (SLF) as per CPCB guidelines.	Complied as per the Rules. Secured, covered, impermeable sludge storage facility is available.
xv.	Handling and disposal of hazardous wastes shall be in accordance with the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008. Authorization from the Assam SPCB shall be obtained for collections/treatment/storage/disposal of hazardous wastes.	Complied.
xvi.	The project authorities shall patrol and inspect the pipeline regularly for detection of faults as per OISD guidelines and continuous monitoring of pipeline operations by adopting non- destructive method (S) of testing. Pearson survey and continuous potentialsurvey shall be carried out a regular interval to ensure the adequacy of cathodic protection system.	Complied
xvii.	The project authorities shall install SCADA system for safe operation of pipeline and leak Detection Systems (LDS). Additional sectionalizing valves in the residential area and	Complied SCADA system has been installed at the installation to monitor the leak for safe operation of pipeline. Hence complied.

Sl. No.	EC Condition	Compliance status/Remark
	sensitive installations shall be provided to prevent the spillage of the oil in the event of pipeline failure. Intelligent pigging facility shall be provided for the entire pipeline system for internal corrosion monitoring.	
xviii.	M/S OIL shall ensure smokeless flaring in case of ground flaring. The company shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. At the place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during operation. To prevent fire and explosion at Oil and Gas facility, potential ignition sources shall be kept to a minimum and adequate separation distance between potential ignition sources and flammable materials shall be in place.	Complied. Complete combustion is ensured by adequate supply of air. To avoid liquid carrying over during plant upset, knockout drums are equipped to handle oil spillage. Paved surface with proper draining to avoid water logging. Also remote ignition is at place
xix.	The flare system shall be designed as per good oil field practices and oil industry Safety Directorate (OISD) guidelines.	Complied. List of OISD guidelines is attached as annexure 5.
xx.	The firefighting facilities shall be designed as per OISD-117 guidelines. For fighting prolonged fires, the company shall firm up a plan for assured water supply from nearby ground water/surface water sources.	Complied.
xxi.	Comprehensive Risk assessment and Consequence Analysis for all the activities regarding impact of the proposed project on the Secondary Tank Farm (STF), Oil Collecting Station (OCS), Intermediate Tank Farm (ITF), Browser Unloading station (BUS) and pipeline shall be carried out. Action plan to implement the recommendations shall be submitted to the ministry and proper implementation shall be ensured.	Complied Risk analysis for the installation has been carried out internally and risk register is being maintained. Hence complied. HAZOP, QRA, CA are being carried out as per OISD GDN 206 & ATR also being prepared are being verified by OISD, DGMS during audits
xxii.	Occupational health surveillance of the workers shall be carried out as per the prevailing Acts and Rules.	Already exists and implemented as per the prevailing Acts/ Regulations. Hence complied.
xxiii.	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA/EMP report.	Complied with the environmental protection measures and safeguards recommended in the EIA/EMP report.
xxiv.	The surface facilities shall be installed as per applicable codes and standards, international practices and applicable local regulations.	Complied. All the surface facilities are installed as per applicable codes and standards, international practices and

Sl. No.	EC Condition	Compliance status/Remark
		applicable local regulations such as API, ASTM, OISD, OMR, APCB & CPCB etc.
xxv.	The design, material of construction, assembly, inspection, testing and safety aspects of operation and maintenance of pipeline and transporting the natural gas/oil shall be governed by ASME/ANSI B 31.8/B31.4 and OISD standard 141.	Complied.
xxvi.	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Not Applicable
General Condition		
Sl No.	EC Condition	Compliance status/Remark
i.	The project authorities must strictly adhere to the stipulations made by the Assam State Pollution Control Board (ASPCB), State Government and any other statutory authority.	Complied
ii.	No further expansion or modifications in the project shall be carried out without prior approval of the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Complied No further expansion has been carried out
iii.	The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous chemicals Rules, 2000 as amended subsequently. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire safety Inspectorate etc. must be obtained, wherever applicable.	Complied.

Sl. No.	EC Condition	Compliance status/Remark
iv.	The project authorities must strictly comply with the rules and regulation with regarding to handling and disposal of Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/disposal of hazardous wastes.	Complied. We are already in the process of obtaining TSDF certification.
v.	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generations. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70dBA (nighttime).	Complied.
vi.	A separate Environment Management Cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	Already exists centrally at HSE department.
vii.	The project authorities shall provide adequate funds both recurring and non- recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds provided shall not be diverted for any other purpose.	Complied.
viii.	The Regional Office of this Ministry/CentralPollution Control Board/ Assam State PollutionControl Board shall monitor the stipulated conditions.A six-monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	Complied.
ix.	A copy of clearance letter shall be sent by the proponent to concern Panchayat, Zila Parishad / Municipal Corporation, Urban Local Body and local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.	Complied

Sl. No.	EC Condition	Compliance status/Remark
x.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF, the respective Zonal Office of CPCB and the Assam SPCB. The Criteria pollutant levels namely, SPM, RSPM, SO ₂ , NO _x , HC (Methane & Non-methane), VOCs (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects, shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	Complied Compliance status including monitored data is regularly uploaded on company's website and sent to concerned government authorities. Monitored data is also enclosed herewith.
xi.	The Project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environment conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and Assam SPCB. The Regional Office of this Ministry/CPCB/ Assam SPCB shall monitor the stipulated conditions.	Complied EC compliance report for the period April 2025 to Sept 2025 was submitted to Sub-RO, Guwahati, Zonal Office CPCB, Shillong and, Chairman - Pollution Control Board Assam vide L.No. Ref. No.:HSE/E/43C-1/1481 dated 29.11.2025. Also, copy of the EC and Six-monthly compliance report are uploaded to OIL website under the link https://www.oil-india.com/environmental-compliance-reports Cover letter attached as annexure 6
xii.	The environment statement for each financial year ending 31st march in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail.	Complied. Environment Statement (Form – V) for the F.Y. 2025-26 was submitted to Pollution Control Board, Assam Ref. No.: HSE/E/21(B)/928 dated: 01.09.2025 Copy of the same is enclosed as Annexure 7
xiii.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the Assam SPCB and may also be seen at Website of the Ministry of Environment and Forest at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspaper that are widely circulated in the region of which one shall be forwarded to the Regional Office.	Complied

Sl. No.	EC Condition	Compliance status/Remark
xiv.	Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	Complied

Ambient Air Quality Monitoring Report

Name & Address of the Customer :		Report No. : MSK/2025-26/02088			
"M/s OIL INDIA LIMITED", Duliajan, Dibrugarh, Assam-786602		Report Date : 23.12.2025			
		Sample Description : Ambient Air			
		Sample Number : MSKGL/ED/2025-26/12/01537			
		Sampling Location : OCS BHOGPARA			
Instrument ID : RDS 1317-DTK-2008/ FPS 92-DTL-2021		GPS Reading : N 27°51'38", E 95°42'53"			
Ref. No.:W.O. NO.- 8129283 of Contract No. 6119277					
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date		
12.12.2025	15.12.2025	15.12.2025	22.12.2025		
Enviromental Conditions During Sampling & Transport Condition :Temperature : 24°C, Rain fall : No					
Analysis Result					
Sl. No.	Test Parameter	Method	Unit	Results	CPCB Limit
1.	Particulate Matter (PM ₁₀)	IS : 5182 (Part-23)-2006	(µg/m ³)	72.5	100
2.	Particulate Matter (PM _{2.5})	IS : 5182 (Part-24)	(µg/m ³)	40.7	60
3.	Sulphur Dioxide (SO ₂)	IS : 5182 (Part-2)-2001	(µg/m ³)	7.4	80
4.	Nitrogen Dioxide (NO ₂)	IS : 5182 (Part-6)-2006	(µg/m ³)	23.6	80
5.	Carbon Monoxide (CO)	IS 5182 : (Part-10) :1999	(mg/m ³)	0.82	2
6.	Ozone (O ₃)	IS:5182 (Part-IX)-1974 Reaffirmed-2019	(µg/m ³)	21.2	180
7.	Ammonia (NH ₃)	IS 5182 (Part 25) : 2018	(µg/m ³)	<20.0	400
8.	Lead (Pb)	USEPA IO-3.4	(µg/m ³)	<0.01	1
9.	Nickel (Ni)	USEPA IO-3.4	(ng/m ³)	<5.0	20
10.	Arsenic (As)	USEPA IO-3.4	(ng/m ³)	<1.0	6
11.	Benzene (C ₆ H ₆)	IS 5182 : (Part 11) :2006	(µg/m ³)	<4.2	5
12.	Benzo(a)Pyrene (BaP)	IS 5182 : (Part 12) :2004	(ng/m ³)	<0.5	1
13.	Mercury (Hg)	USEPA IO-5.0	(µg/m ³)	<0.002	...
14.	Methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	2.05	...
15.	Non-methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	<0.5	...
16.	Total Hydrocarbon	IS 5182 : (Part 17)	ppm	2.05	...
17.	Volatile Organic Compounds (VOC)	IS 5182 : (PART-11):2006	(µg/m ³)	<4.2	...
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality					

Analyzed By:**Prepared By:****Authorized Signatory**

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation. : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation. : Office Assistant

Signature :

Name : Mr. Ravi Sankar Roy

Designation : Branch Manager

- The results relate only to the item(s) tested.
- This Test Report shall not be reproduced except in full, without the permission of Mitra S.K. Private Limited.
- Our Lab is Approved by NABL & MOEF, Lab Address : P-48 Udayan Industrial Estate, 3 Pagladanga Road Kol-700015

Head Office: Shrachi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016. West Bengal, India.

Tel : 91 33 40143000 / 22650006 / 22650007 Fax : 91 33 22650008

Email : info@mitrask.com. Website: www.mitrask.com



Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

The Illumination Levels in Different Areas as per OISD RP-149

Name of Installation: **OCS Bhogpara**

Date: **12.12.2025**
Time: **07 30 PM**

Sl. No.	Area	Standard Illumination Level as per OISD 149 (in Lux)	Measurement Illumination Level in Lux	Remarks
1	Main road (along process units, power house, workshops etc.)	7-10 lux	15	
2	Secondary Roads (along storage tanks setting basin etc.)	3-5 lux		
3	Tank farm	10	13	
4	Pump houses, sheds	100	91	
5	Main Operation Platforms and access stairs	60		
6	Ordinary platforms	20		
7	Process areas, pipe racks, heat exchanger, heater, separators, cooling tower, columns, pig launching/receiving loading areas, flare etc.	60	21 74	
8	Switching gear building	150-200	189	
9	Transformer bay	100		
10	Battery room	150		
11	Control room building/laboratory	400		
12	Boiler house	150		
13	Charger/UPS rooms	150-200		
14	Cooling Tower	60		
15	Switchyard (i) Operating Areas	100		
16	(ii) Other Areas	50		
17	Warehouse	100		
18	Office	300	206	
19	Compressor area	200		
20	Watch room	100		
21	Stairs	50	47	
22	Corridors / lifts	70	65	
23	Tube well, gate & watchman booth	100	72	
24	Fire House, Garage	100-150	135	

Make: **M BERAVAL**
Model: **1380**
Sl.No: **R230014751**

Signature of IM /
Authorized Person

[Signature]

Approved by

Mr. Uttam Proddhan
Suptd. Research Scientist
Oil India Ltd. Duliajan. Assam

[Signature]
Authorised Person

Mitra S K Private Limited



Oil India Ltd.

[Signature]
A. E. M. (C.F.)
20 450

Ambient Air Quality Monitoring Report

Name & Address of the Customer :		Report No. : MSK/2025-26/02534			
"M/s OIL INDIA LIMITED", Duliajan, Dibrugarh, Assam-786602		Report Date : 28.02.2026			
		Sample Description : Ambient Air			
		Sample Number : MSKGL/ED/2025-26/02/01197			
		Sampling Location: OCS BHOGPARA			
Ref. No.:W.O. NO.- 8129283 of Contract No. 6119277		Instrument ID : RDS 341-DTF-2018/ FPS 95-DTL-2021			
Date of Sampling		Sample Received Date		Analysis Start Date	
13.02.2026		16.02.2026		16.02.2026	
				Analysis Complete Date	
				21.02.2026	
GPS Reading : N 27°51'38", E 95°42'53"					
Enviromental Conditions During Sampling & Transport Condition : Temperature : 27°C, Rain fall : No					
Analysis Result					
Sl. No.	Test Parameter	Method	Unit	Results	CPCB Limit
1.	Particulate Matter (PM ₁₀)	IS : 5182 (Part-23)-2006	(µg/m ³)	75.2	100
2.	Particulate Matter (PM _{2.5})	IS : 5182 (Part-24)	(µg/m ³)	36.5	60
3.	Sulphur Dioxide (SO ₂)	IS : 5182 (Part-2)-2001	(µg/m ³)	7.2	80
4.	Nitrogen Dioxide (NO ₂)	IS : 5182 (Part-6)-2006	(µg/m ³)	23.9	80
5.	Carbon Monoxide (CO)	IS 5182 : (Part-10) :1999	(mg/m ³)	0.72	2
6.	Ozone (O ₃)	IS:5182 (Part-IX)-1974 Reaffirmed-2019	(µg/m ³)	21.5	180
7.	Ammonia (NH ₃)	IS 5182 (Part 25) : 2018	(µg/m ³)	<20.0	400
8.	Lead (Pb)	IS 5182 : (PART-30)	(µg/m ³)	<0.01	1
9.	Nickel (Ni)	IS 5182 : (PART-30)	(ng/m ³)	<5.0	20
10.	Arsenic (As)	IS 5182 : (PART-30)	(ng/m ³)	<1.0	6
11.	Benzene (C ₆ H ₆)	IS 5182 : (Part 11) :2006	(µg/m ³)	<4.2	5
12.	Benzo(a)Pyrene (BaP)	IS 5182 : (Part 12) :2004	(ng/m ³)	<0.5	1
13.	Mercury (Hg)	USEPA IO-5.0	(µg/m ³)	<0.002	...
14.	Methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	2.14	...
15.	Non-methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	<0.5	...
16.	Total Hydrocarbon	IS 5182 : (Part 17)	ppm	2.14	...
17.	Volatile Organic Compounds (VOC)	IS 5182 : (PART-11):2006	(µg/m ³)	<4.2	...
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality					

Analyzed By:



Signature :
 Name : Mr. Dipankar Mazumdar
 Designation : Technical Manager

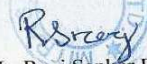
Prepared By:



Signature :
 Name : Mr. Dipankar Das
 Designation : Office Assistant

Authorized Signatory

For Mitra S.K. Private Limited



Signature :
 Name : Mr. Ravi Sankar Roy
 Designation : Branch Manager

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- Our Lab is Approved by MOEF, Lab Address : P-48 Udayan Industrial Estate, 3 Pagladanga Road Kol-700015

Ambient Air Quality Monitoring Report

Name & Address of the Customer :		Report No. : MSK/2025-26/02334			
"M/s OIL INDIA LIMITED", Duliajan, Dibrugarh, Assam-786602		Report Date : 29.01.2026			
		Sample Description : Ambient Air			
		Sample Number : MSKGL/ED/2025-26/01/01179			
		Sampling Location: OCS BHOGPARA			
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277		Instrument ID : RDS 1940-DTB-2011/ FPS 91-DTL-2021			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date		
19.01.2026	23.01.2026	23.01.2026	28.01.2026		
Enviromental Conditions During Sampling & Transport Condition : Temperature : 25°C, Rain fall : No					
Analysis Result					
Sl. No.	Test Parameter	Method	Unit	Results	CPCB Limit
1.	Particulate Matter (PM ₁₀)	IS : 5182 (Part-23)-2006	(µg/m ³)	74.6	100
2.	Particulate Matter (PM _{2.5})	IS : 5182 (Part-24)	(µg/m ³)	32.6	60
3.	Sulphur Dioxide (SO ₂)	IS : 5182 (Part-2)-2001	(µg/m ³)	7.2	80
4.	Nitrogen Dioxide (NO ₂)	IS : 5182 (Part-6)-2006	(µg/m ³)	25.1	80
5.	Carbon Monoxide (CO)	IS 5182 : (Part-10) :1999	(mg/m ³)	0.66	2
6.	Ozone (O ₃)	IS:5182 (Part-IX)-1974 Reaffirmed-2019	(µg/m ³)	23.5	180
7.	Ammonia (NH ₃)	IS 5182 (Part 25) : 2018	(µg/m ³)	<20.0	400
8.	Lead (Pb)	IS 5182 : (PART-30)	(µg/m ³)	<0.01	1
9.	Nickel (Ni)	IS 5182 : (PART-30)	(ng/m ³)	<5.0	20
10.	Arsenic (As)	IS 5182 : (PART-30)	(ng/m ³)	<1.0	6
11.	Benzene (C ₆ H ₆)	IS 5182 : (Part 11) :2006	(µg/m ³)	<4.2	5
12.	Benzo(a)Pyrene (BaP)	IS 5182 : (Part 12) :2004	(ng/m ³)	<0.5	1
13.	Mercury (Hg)	USEPA IO-5.0	(µg/m ³)	<0.002	...
14.	Methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	1.96	...
15.	Non-methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	<0.5	...
16.	Total Hydrocarbon	IS 5182 : (Part 17)	ppm	1.96	...
17.	Volatile Organic Compounds (VOC)	IS 5182 : (PART-11):2006	(µg/m ³)	<4.2	...
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality					

Analyzed By:

Signature : 
 Name : Mr. Dipankar Mazumdar
 Designation : Technical Manager

Prepared By:

Signature : 
 Name : Mr. Dipankar Das
 Designation : Office Assistant

Authorized Signatory

For Mitra S.K. Private Limited

Signature : 
 Name : Mr. Ravi Sankar Roy
 Designation : Branch Manager

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Head Office: Shrachi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016, West Bengal, India.
 Tel. : 91 33 40143000 / 22650006 / 22650007 Fax : 91 33 22650008
 Email : info@mitrask.com. Website: www.mitrask.com

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02135A14
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 29.12.2025
		Nature of Sample	: Stack Emission
		Sample Mark	: OCS BHOGPARA
		Sample Number	: MSKGL/ED/2025-26/12/01702
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
12.12.2025	15.12.2025	15.12.2025	22.12.2025

ANALYSIS RESULT

A.	<u>General information about stack :</u>		:	
1.	Stack connected to	:	CODP-1	
2.	Emission due to	:	NG	
3.	Material of construction of Stack	:	MS	
4.	Shape of Stack	:	Circular	
5.	Whether stack is provided with permanent platform & ladder	:	Yes	
6.	DG capacity	:	157 HP	
B.	<u>Physical characteristics of stack :</u>			
1.	Height of the stack from ground level	:	2.4384 m	
2.	Diameter of the stack at sampling point	:	0.1016 m	
3.	Area of Stack	:	0.00810 m2	
C.	<u>Analysis/Characteristic of stack:</u>			
	1. Fuel used : NG			
D.	<u>Result of sampling & analysis of gaseous emission</u>	<u>Result</u>	<u>Limit as per CPCB</u>	<u>Method</u>
1.	Temperature of emission (°C)	146	...	USEPA Part 2, 25.09.1996
2.	Barometric Pressure (mm of Hg)	762.0	...	USEPA Part 2, 25.09.1996
3.	Velocity of gas (m/sec.)	19.66	...	USEPA Part 2, 25.09.1996
4.	Quantity of Gas Flow (Nm3/hr)	405	...	USEPA Part 2, 25.09.1996
5.	Concentration of Oxygen (%v/v)	13.8	...	IS:13270 :1992 Reaff, 2014
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.112	≤ 3.5	IS:13270 :1992 Reaff, 2014
7.	Concentration of Carbon Dioxide (%v/v)	5.4	...	IS:13270 :1992 Reaff, 2014
8.	Concentration of Sulphur Dioxide (mg/Nm3)	22.9	...	USEPA-29, 25/06/1996
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.159	≤ 4.7	USEPA Part-7, 12/03/1996& USEPA 18 -25.09.1996
10.	Concentration of Lead (mg/Nm3)	<0.005	...	USEPA-29, 25/06/1996
11.	Concentration of Particulate matter (g/kW-hr)	0.081	≤ 0.3	USEPA Part-17, 16/08/1996
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.018K	≤ 0.7	AS PER CPCB
E.	<u>Pollution control device:</u>			<u>Remarks:</u> Nil
	Details of pollution control devices attached with the stack : Nil			

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation. : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation. : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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Email : info@mitrask.com. Website: www.mitrask.com

Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02135A15
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 29.12.2025
		Nature of Sample	: Stack Emission
		Sample Mark	: OCS BHOGPARA
		Sample Number	: MSKGL/ED/2025-26/12/01703
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
12.12.2025	15.12.2025	15.12.2025	22.12.2025

ANALYSIS RESULT

A.	General information about stack :			:	
1.	Stack connected to	:	DRENCHING PUMP-1		
2.	Emission due to	:	HSD		
3.	Material of construction of Stack	:	MS		
4.	Shape of Stack	:	Circular		
5.	Whether stack is provided with permanent platform & ladder	:	Yes		
6.	DG capacity	:	310 HP		
B.	Physical characteristics of stack :			:	
1.	Height of the stack from ground level	:	2.4384 m		
2.	Diameter of the stack at sampling point	:	0.1016 m		
3.	Area of Stack	:	0.00810 m ²		
C.	Analysis/Characteristic of stack:			:	
	1. Fuel used : NG			:	
D.	Result of sampling & analysis of gaseous emission				
		Result	Limit as per CPCB	Method	
1.	Temperature of emission (°C)	131	...	USEPA Part 2, 25.09.1996	
2.	Barometric Pressure (mm of Hg)	762.0	...	USEPA Part 2, 25.09.1996	
3.	Velocity of gas (m/sec.)	17.98	...	USEPA Part 2, 25.09.1996	
4.	Quantity of Gas Flow (Nm ³ /hr)	385	...	USEPA Part 2, 25.09.1996	
5.	Concentration of Oxygen (%v/v)	13.4	...	IS:13270 :1992 Reaff, 2014	
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.247	≤ 3.5	IS:13270 :1992 Reaff, 2014	
7.	Concentration of Carbon Dioxide (%v/v)	5.8	...	IS:13270 :1992 Reaff, 2014	
8.	Concentration of Sulphur Dioxide (mg/Nm ³)	25.7	...	USEPA-29, 25/06/1996	
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.341	≤ 4.7	USEPA Part-7, 12/03/1996 & USEPA 18 -25.09.1996	
10.	Concentration of Lead (mg/Nm ³)	<0.005	...	USEPA-29, 25/06/1996	
11.	Concentration of Particulate matter (g/kW-hr)	0.113	≤ 0.3	USEPA Part-17, 16/08/1996	
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.102K	≤ 0.7	AS PER CPCB	
E.	Pollution control device:			Remarks: Nil	
	Details of pollution control devices attached with the stack : Nil				

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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Email : info@mitrask.com. Website: www.mitrask.com

Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02135A16
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 29.12.2025
		Nature of Sample	: Stack Emission
		Sample Mark	: OCS BHOGPARA
		Sample Number	: MSKGL/ED/2025-26/12/01704
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
12.12.2025	15.12.2025	15.12.2025	22.12.2025

ANALYSIS RESULT

A.	General information about stack :		:
1.	Stack connected to	:	GENSET-1
2.	Emission due to	:	NG
3.	Material of construction of Stack	:	MS
4.	Shape of Stack	:	Circular
5.	Whether stack is provided with permanent platform & ladder	:	Yes
6.	DG capacity	:	250 KVA
B.	Physical characteristics of stack :		
1.	Height of the stack from ground level	:	2.4384 m
2.	Diameter of the stack at sampling point	:	0.1016 m
3.	Area of Stack	:	0.00810 m2
C.	Analysis/Characteristic of stack:		
	1. Fuel used : NG		
D.	Result of sampling & analysis of gaseous emission	Result	Limit as per CPCB
			Method
1.	Temperature of emission (°C)	122	...
2.	Barometric Pressure (mm of Hg)	762.0	...
3.	Velocity of gas (m/sec.)	16.86	...
4.	Quantity of Gas Flow (Nm3/hr)	368	...
5.	Concentration of Oxygen (%v/v)	13.6	...
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.212	≤ 3.5
7.	Concentration of Carbon Dioxide (%v/v)	6.0	...
8.	Concentration of Sulphur Dioxide (mg/Nm3)	25.1	...
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.262	≤ 4.7
10.	Concentration of Lead (mg/Nm3)	<0.005	...
11.	Concentration of Particulate matter (g/kW-hr)	0.106	≤ 0.3
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.016K	≤ 0.7
E.	Pollution control device:		Remarks: Nil
	Details of pollution control devices attached with the stack : Nil		

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation. : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation. : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

NOISE LEVEL MEASUREMENT REPORT

LOCATION : OCS Bhogpara

(Production Installation – OCS/EPs/QPS)

Date : 12.12.2025

Time : 07.30 PM

Sl. No.	Noise Level Measurement at		Measurement in dB(A)	Threshold limit value for Noise as per OISD-166		Recommendation
				Duration per day(hours)	Sound Level (dBA)	
1	Control Room / Operator Room	Door Open	51			
		Door Closed	52			
2	Middle of Group Area		56	8	90	
3	At the Entrance		51	6	92	
4	Security Hut		51	4	95	
5	Meter Shed		56	3	97	
6	Tank Area		48	2	100	
7	Air Compressor			1 - ½	102	
				1	105	
				½	110	
				¼ or less	115	

Sl. No.	Noise Level Measurement at	Noise level at source in dB(A)	At a distance from the shed												Near boundary of the installation in dB(A)	Remarks
			5 mtrs				10 mtrs				15 mtrs					
			North	South	East	West	North	South	East	West	North	South	East	West		
1	CODP	97	87	88	87	79									East – 61 West – 53 North – 57 South – 50	
2	FWDP	84	78	77	78	76										
3	Drenching pump	95	86	84	86	84										
4	Emulsion Treater	74	70	67	68	67										
5	Indirect Heater	65	61	60	61	61										
6	Chemical Dosing Pump	66	62	61	62	61										
7	Power house	87	82	80	80	83										
8	SCADA Room															
9	Water Pump House															

Sound Level Meter : Make - HTC

S/N - SL1350

Noise level measurement taken by : Jitu Mohan

Authorised Person
Mitra SK Pvt. Ltd.

Approved by
Mr. Uttam Prodhon
Suptdg Research Scientist
Oil India Ltd, Duliajan

Authorised Person
Oil India Ltd.

Ref. No.: Chem/A&E/Injection/461/26

Date: 05.04.2026

CGM - Western Fields

Attn. : Jahnavee Bharadwaj, Senior Engineer (Production- Western Fields)

Sub: INJECTION WATER SAMPLE ANALYSIS REPORT

Letter/memo ref. no.: WF/GTA-I/Chem/2026/85, dated: 03.04.2026

Characteristics	Unit	Test Results (ETP Tengakhat)	Test method/Instrument used
Appearance	-	Clear	Visual
Turbidity	NTU	4.91	BIS 3025-10-2023 / Turbidity meter
pH	-	6.9	BIS 3025-11-2022 / Metrohm pH meter
Iron (as Fe)	mg/l	BDL	BIS 3025-53-2024 / UV-vis Spectrophotometer (Method range 0.075-0.5 mg/l)
Salinity (as NaCl)	mg/l	3000	BIS 3025-32-2019 / Titration with silver nitrate
Chloride (as Cl)	mg/l	1820	BIS 3025-32-2019 / Titration with silver nitrate
Total Hardness (as CaCO ₃)	mg/l	232	BIS 3025-21-2009 / Titration with EDTA
Total Suspended solids	mg/l	26	BIS 3025-17-2022 / Gravimetric method
Total Dissolved solids	mg/l	3808	BIS 3025-16-2023 / Gravimetric method
Dissolved Oxygen	mg/l	3.12	BIS 3025-38-2023 / Dissolved Oxygen meter
Oil & Grease	mg/l	BDL	ASTM D 8193-18 / Erachek X (Method range 0.5-1000 mg/l)

Sample details. :

1. Type of sample : Injection Water
2. Sample Collection Date : 03.04.2026
3. Sample Collected from (Source/ Location) : ETP Tengakhat
4. Sample received on (date & time) : 03.04.2026, 06:30 PM
5. Test completion date : 05.04.2026

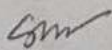
BDL : Below Detectable Limit

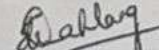
Note : 1) The test results of this report apply to the sample as received.

2) Parameters were tested as per requirement of the customer.

SG
Tested by: SG/BD

Analytical & Environmental Lab.
Chemical Department, Oil India
Chem/A&E/Injection/File/07


Surajit Bora
Chief Chemist (Lab)
(Reviewed by)


Euracia L. Wahlang
GM-Chemical
(Approved by)

Ref. No.: Chem/A&E/Injection/349/26

Date: 13.03.2026

CGM - Central Fields

Attn. : Jahnavee Bharadwaj , Senior Engineer (Production - Central Fields)

Sub: INJECTION WATER SAMPLE ANALYSIS REPORT

Letter/memo ref. no.: CF/GTA-I/Chem/2026/57, dated: 11.03.2026

Characteristics	Unit	Test Results (ETP Tengakhat)	Test method/Instrument used
Appearance	-	Clear	Visual
Turbidity	NTU	4.28	BIS 3025-10-2023 / Turbidity meter
pH	-	6.7	BIS 3025-11-2022 / Metrohm pH meter
Iron (as Fe)	mg/l	BDL	BIS 3025-53-2024 / UV-vis Spectrophotometer (Method range: 0.075-0.5 mg/l)
Salinity (as NaCl)	mg/l	3700	BIS 3025-32-2019 / Titration with silver nitrate
Chloride (as Cl)	mg/l	2243	BIS 3025-32-2019 / Titration with silver nitrate
Total Hardness (as CaCO ₃)	mg/l	396	BIS 3025-21-2009 / Titration with EDTA
Total Suspended solids	mg/l	8	BIS 3025-17-2022 / Gravimetric method
Total Dissolved solids	mg/l	4100	BIS 3025-16-2023 / Gravimetric method
Dissolved Oxygen	mg/l	2.6	BIS 3025-38-2023 / Dissolved Oxygen meter
Oil & Grease	mg/l	BDL	ASTM D 8193-18 / Erachek X (Method range: 0.5-1000 mg/l)

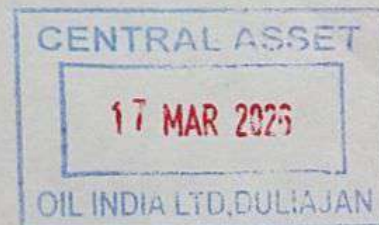
Sample details. :

1. Type of sample : Injection water Sample
2. Sample Collection Date : 11.03.2026
3. Sample Collected from (Source/ Location) : ETP Tengakhat
4. Sample received on (date & time) : 11.03.2026, 06:30 PM
5. Test completion date : 13.03.2026

BDL : Below Detectable Limit

Note : 1) The test results of this report apply to the sample as received.

2) Parameters were tested as per requirement of the customer.



Tested by: SRB/BU

Analytical & Environmental Lab.
Chemical Department, Oil India
Chem/A&E/Injection/File/07

Surajit Bora
Chief Chemist (Lab)
(Reviewed by)

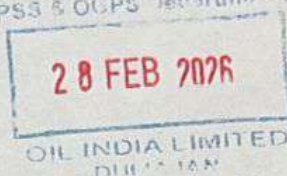
Euracia L. Wahlang
GM- Chemical
(Approved by)

Ref. No.: Chem/A&E/Injection/278/26

CGM - OGPS

Attn.: Jahnavee Bharadwaj, Senior Engineer (OGPS)

Office of the JCM (PSS & OGPS)
PSS & OGPS Department



Date: 27.02.2026

Sub: INJECTION WATER SAMPLE ANALYSIS REPORT

Letter/memo ref. no.: CF/GTA-I/Chem/2026, dated: 25.02.2026

Characteristics	Unit	Test Results (ETP Tengakhat)	Test method/Instrument used
Appearance	-	Clear	Visual
Turbidity	NTU	0.97	BIS 3025-10-2023 / Turbidity meter
pH	-	6.8	BIS 3025-11-2022 / Metrohm pH meter
Iron (as Fe)	mg/l	0.11	BIS 3025-53-2024 / UV-vis Spectrophotometer (Method range: 0.075-0.5 mg/l)
Salinity (as NaCl)	mg/l	3400	BIS 3025-32-2019 / Titration with silver nitrate
Chloride (as Cl)	mg/l	2062	BIS 3025-32-2019 / Titration with silver nitrate
Total Hardness (as CaCO ₃)	mg/l	240	BIS 3025-21-2009 / Titration with EDTA
Total Suspended solids	mg/l	42	BIS 3025-17-2022 / Gravimetric method
Total Dissolved solids	mg/l	3533	BIS 3025-16-2023 / Gravimetric method
Dissolved Oxygen	mg/l	1.50	BIS 3025-38-2023 / Dissolved Oxygen meter
Oil & Grease	mg/l	BDL	ASTM D 8193-18 / Erachek X (Method range: 0.5-1000 mg/l)

Sample details.:

1. Type of sample : Injection water Sample
2. Sample Collection Date : 25.02.2026
3. Sample Collected from (Source/ Location) : ETP Tengakhat
4. Sample received on (date & time) : 25.02.2026, 07:00 PM
5. Test completion date : 27.02.2026

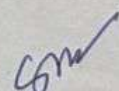
BDL : Below Detectable Limit

Note : 1) The test results of this report apply to the sample as received.

2) Parameters were tested as per requirement of the customer.

SB
Tested by: SB/SG

Analytical & Environmental Lab.
Chemical Department, Oil India
Chem/A&E/Injection/File/07


Surajit Bora
Chief Chemist (Lab)
(Reviewed & Approved by)



ऑयल इंडिया लिमिटेड

(सकल संपत्ति का रक्षक)

Oil India Limited

(INCORPORATED IN INDIA)

OIL SPILL CONTINGENCY PLAN

**Prepared by
HSE Department
OIL INDIA LIMITED**



ऑयल इंडिया लिमिटेड
(भारत सरकार का उद्यम)
Oil India Limited
(A Government of India Enterprise)

Oil Spill Contingency Plan in OIL INDIA LIMITED

Approval

	Name	Signature
Approved by	Shri Ajit Chandra Haloi Chief General Manager (HSE)	
Reviewed by	Shri Gopal Govinda Rasu Dy. General Manager (HSE)	
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Date	Revision Details	Revision Number
01.06.2013	First Issue	00
23.11.2022	Second Issue	01

Executive Summary

Oil India Limited, by its nature of operation has storage, transportation and handling facilities of oil through tankages, pipelines and browsers, distributed in its area of operation. Oil Spill Contingency Plan (OSCP) is endeavoured to be practical document for preparedness for probable incidents of oil spillage and guidance for tackling an oil spill and recovery from the effects with some procedures laid down.

Having an OSCP fulfils the requirement of Indian Government commitments to the United Nation's conventions on Oil Spills and its response. Ministry of Environment, Forest and climate change (MoEF&CC) has also emphasized the same as per Indian Coast Guard's National Oil Spill Disaster Contingency Plan and various notifications to individual companies at the time of commencement of operations in the oil fields.

This OSCP is for On-shore operations only considering the geographical location of OIL's operation. The document defines the roles and responsibilities, procedures of response in tier-I spillage, escalation to tier -II and tier-III and operational readiness in its scope of applicability. The OSCP is prepared under the guidance of OISD-GDN- 200 guidelines of Indian Coast guard wherever applicable. American Petroleum Institute's documents are also referred. It is aligned with the Off Site Disaster Management Plan, ERDMP & Corporate Disaster Management Plan.



(A C Haloi)

Chief General Manager (HSE) - HoD

Date: 23.11.2022

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ABBREVIATIONS & ACCRONYMS

DCR	Disaster Control Room
DMP	Disaster Management Plan
DOP	Delegation of Power
ECR	Emergency Control Room
ECT	Emergency Control Team
ERDMP	Emergency Response and Disaster Management Plan
IM	Installation Manager
NOS	DCP National Oil Spill Disaster Contingency Plan.
OISD	Oil Industries Safety Directorate
OIL	Oil India Limited
OSC	On site Coordinator
OSCP	Oil Spill Contingency Plan
OSD	Oil Spill Dispersant
OSR	Oil Spill Response
POL	Petroleum Oil and Lubricants

1.0 SCOPE

This “Oil Spill Contingency Plan” is applicable to the Geographical Area of OIL’s onshore operation in FHQ Area, viz. producing districts of Assam & Arunachal Pradesh. However, it may be referred in other spheres also. The scope includes the containment, control, clean up and recovery of oil spillage that may arise from OIL’s exploration, drilling, production and transportation activities. It does not include the litigations, compensation etc.

2.0 OBJECTIVE

- To establish an effective system for detection and reporting of spills.
- To establish adequate measures for preparedness for tackling of oil spillage at various locations.
- To facilitate rapid and effective response to oil spillage.
- To establish adequate measures for crew, responders, and public health and safety, and protect the land and water environment.
- To establish appropriate response techniques to prevent, control and combat pollution and dispose-off the recovered material in an environmentally sound manner.
- To provide a training and develop awareness amongst the employees.
- To provide plan & programme for practice drill based on scenarios.
- To meet statutory requirements.
- To establish response procedures for oil spill.

3.0 INTERFACE WITH OTHER PLANS

This plan is developed in conjunction with the following documents:

- (i) OIL HSE Policy and Plan
- (ii) Off-site Disaster Management Plan, On-site Disaster Management Plan and ERDMP of OIL.
- (iii) National Oil Spill Disaster Contingency Plan (NOS-DCP) issued by the Coast Guard Headquarters.
- (iv) OISD GDN- 200 for Preparation of Oil Spill Response Contingency Plan.
- (v) OISD GDN- 165: Rescue and relief operations for POL truck tank accident.

4.0 PERCEIVED OIL SPILL RISKS AND SPILL QUANTITIES

4.1 Response to an oil spillage depends upon two factors: Quantity of oil spilled and Circumstances of the spill. Depending upon the scenario the response should be attempted. Broadly, the oil spill scenarios are categorized as:

1. Tier- I: Preparedness and response to small spill within capabilities of an individual installation/facility.
2. Tier-II: Preparedness and response to spill that requires the co-ordination of more than one source of equipment and personnel (or other than resources from OIL).
3. Tier-III: Major spill requiring the mobilization of all available national resources and depending upon the circumstances, will likely involve mobilization of regional and international systems.

4.2 Risk Assessment:

Factors on which the assessment is to be conducted are listed for guidance for implantation of this plan at Installation level:

1. Source of leakage;
2. Location;
3. Circumstances;
4. Quantity of leakage;
5. Financial Implication;
6. Regulatory Implication;
7. Weather condition;
8. Reputational risks;

Considering the factors listed above assessment of risks of oil spillage to be done at installation level. A copy of such document shall be prepared and kept for reference at every installation.

Main spill scenarios of spillage are briefed below for guidance. However, exhaustive assessment of risks to be made and kept for reference at installation level.

The facilities/ resources of Commercial, Social, Ecological and recreational value around an installation have to be identified by the Installation at installation level and keep a list of those at respective installation to supplement this plan.

4.2.1 Well Blow - out Incidents:

Various stages of drilling shall be assessed for -

- a. Exploratory wells:
- b. Developmental wells:
- c. Producing wells:

An oil spill due to Well Blow out is possible during Drilling activities when wells are drilled to meet exploration, development or production requirement. Well blowout is also possible during any subsequent “Well Intervention” of existing wells for Work - Over activities. In the event of an unfortunate well blow out, the situation will call for the immediate services of Well Control specialists. However, adherence to established drilling procedures, which includes proper use of Blowout Preventers (BOPs) of rated pressures, will adequately control the oil spill risk due to well blowouts. Available Contingency Plan for impending blowout to be followed.

4.2.2 Leakage from Couplings/ Joints/ Valves:

Spillage due to likely leak from sources, like, Hose Joints, Valves and Blinds, Swivel Joints, Flange Joints are to be assessed at installation level. Such Installations shall assess the risk of oil spill for the probable leakages from flanges of pipelines under it.

4.2.3. Spillage from Tanker:

Spillage from tank and bowzers may occur due to road accidents. To avoid risks of road accidents necessary legal and available best practices should be taken. Given a spillage, occur in spite, if information were received from other sources and agencies, the crew who are in the responsibility of emergency communication shall convey information to depot / terminal / installation immediately. OISD-GDN-165 to be referred in this respect.

4.4.4 Leakage from pipeline:

The pipeline carries highly inflammable crude oil & natural gas. Though utmost precautions are taken, sometimes the pipeline may leak, due to corrosion, miscreant activity, god's act, failure of safety devices etc. Since the pipelines are numerous and distributed in many geographical profiles, spillage of crude is highly situation and location specific. Given the numbers of pipelines, vastness of network, locations chance of spillage from a pipeline is highest.

4.4.5 Bursting of pipeline in the river Crossings/ Rail / road bridges / Aerial Crossings:

The bursting at these may be caused due to corrosion, by accidental hit by heavy equipment, by snapping of aerial crossings, accidental hit by heavy equipment, by snapping of aerial crossings pipe support strings, miscreant activity etc. This may result in huge oil spillage polluting the water.

4.4.6 War and Civil commotion:

Due to bombing during war or by terrorist or attempted pilferage, the pipeline may develop leak or burst. The oil spillage may be high and may result in fire.

4.4.7 Hurricane Damage to Pipeline at rail/road bridge/aerial crossing

Due to high velocity of wind, the pipe supports may be snapped. This may result in breakage of pipeline leading to oil spillage. If there is a heavy rainfall, due to high turbulence of water, there may not be any fire.

5. SPILL RESPONSE STRATEGY

5.1 OIL shall adhere to the applicable standards in its equipment. Oil Spill Response flow of information & responsibilities is given at Annexure-4 and Annexure-5, as per the plan, the responsibilities during oil spill response is well defined.

In any oil spill response, mobilization of resources depends on a number of factors. Those are:

- Different risk scenarios, quantity of spill, and spill tracking;
- Equipment need;

- Man power requirement;
- Communication channels;
- Operation;
- Data directory

5.2 The Station in-charges (or Installation Managers), from both probable upstream and downstream shall proceed to detect the exact location to find out the exact location of spillage on receipt of the information of spillage from any source. In the meantime, search party will process along the row and locate the spill site. This ground party will have a mobile fitted jeep, hand wheel of block valves, box key etc (Refer Annexure-6). They will locate the exact site and inform as per the information flow matrix Annexure-4 and Annexure-5. The On-site Co-ordinator (OSC) shall act as the controller of the incident, arrange for the mobilization of emergency equipment, men and materials and position at the site in his best capacity. OSC will establish radio link/communication between the sites and communicate as per the communication channel of Annexure-4 and Annexure-5 respectively.

5.3 OIL SPILL EQUIPMENT

The following spill control equipment should be in place in sufficient quantity as per the finding of assessment carried out as mentioned in 4.2 and record should be maintained in the following format :

(i) Sorbent & Sorbent booms (river standard)	(viii) Raft
(ii) Petroleum sorbent rolls	(ix) Drum
(iii) Petroleum sorbent pillars	(x) Pump
(iv) Skimmer	(xi) OCV
(v) Oil spill Dispersant (OSD)	(xii) Hand Boom
(vi) Tent	(xiii) HC Pads
(vii) Tags	(xiv) Life Jacket

Format:

RESOURCES	QTY.	LOCATION	CUSTODIAN DEPT.
1)			

Custodian Department shall procure the equipment and keep in a readily deployable position/condition.

6. RESPONSE PLANNING:

6.1 Reporting of oil spill incident:

Immediately upon notice of oil spill, "Incident Reporting" shall be done in the prescribed format (Format: Annexure- 2) to the following:

- Internal within the organisation through mail, and SMS.
- OISD when applicable
- Mutual Aid Partners (in case it is declared Tier-II)

IM shall ensure to inform internally to HoD-PSS Department for necessary support services. The reporting may be done as per Annexure-4 & Annexure-5 flow chart.

6.2 Isolation & Security:

OSC or IM shall ensure to isolate the line both in upstream & downstream if any. Ensure the safety of the area by providing security guards, prohibiting smoking and use of naked lights through Security Dept. Area to be cordoned off and safety signboards to be posted. IM's shall also ensure lock out and tag out of isolation valves at both the ends. IM shall obtain permission from the landowners with the support and co-ordination from HR-E/ PA and Land Department, if necessary for use of their private land in raising earth bunds cutting cellar to contain the leak. Apart from visual observation by the team under the OSC, aerial surveys shall be made if necessary. Eventually senior level executive (DGM & above) shall take over as the OSC and move to the spillage site with team comprising of representatives from various concerned departments like Security, PSS & Civil. He will have the overall responsibility & he will have authority over the members of the cross functional team. All the representatives shall work under his guidance and with co-ordination with the OSC. After assessing the situation with team, OSC shall appraise the Asset Manager and RCE. RCE shall be fully empowered to take decisions and activate ECT. Entire communication channel shall be guided by Annexure-4 and Annexure-5. OSC shall report to the management as per the format of Annexure-4 and Annexure-5. While Assessing OSC shall consider the factors as per 4.2.

As required by the circumstances the team will:

- Obtain a suitable slick-tracking model for the size of oil spill that has occurred and predict the likely developments of the incident.
- Mobilise clean-up teams and equipment as advised by OSC.
- Liaise with other departments.
- Arrange for contracted vessels to be equipped with any required equipment (i.e. PRP/OSD, booms, absorbent booms, mats etc.)
- Inform nearby installation operators if slick is identified to be moving out of the operating area.
- Keep OSC informed of major developments affecting clean-up operations onshore.
- Assess requirement of water and land transport and accordingly take action.
- Stand down only after instruction from OSC.
- Submit log of events to HoD-HSE.
- Arrange to return equipment/services availed from other sources.
- Commence procedures to ensure payments are made for emergency resources.

6.3 Retrieving oil spills:

Retrieve the oil into drums/tanks in the case of large oil spills using pneumatic pump for transport the oil from spoiled area to the tanks.

6.4 Firefighting:

Fire Tenders shall move immediately on receipt of call to the location and take position. Firefighting team shall be under the control of HoD-HSE put trailer pump or any other portable fire pump in service and act as per the scenario.

6.5 Repair:

Repair shall be attempted as soon as possible to avoid further spillage. Work out the methods of leak repair in consultations with Chief Coordinator and Operation Coordinator (Refer 8.2) giving accurate information on the extent of damage. However, recovery from the spillage shall not be delayed for the sake of repair. OSC shall always prioritize control and containment of spillage over repair of the leakage. Mobilization of men and materials required for the leak repair work as directed from Headquarters. OSC/IM shall carry out leak repair works as demanded by the situation on arrival of men and materials for that purpose.

Note:

01. In the event of a hurricane, communication may be completely disrupted. After stopping the pumping operations, the search party should approach from both upstream/ stations and isolate the line for stoppage of the leak.

02. In case of war or civil commotion, the control measures for different locations will be as discussed earlier taking the law and order authorities into confidence and under their guidance.

6.6 Strategy for oil and waste storage and disposal:

There are two major steps in oil spillage contingency. Those are Containment and Recovery. The oily waste can be either collected from the affected area. During onshore waste collection, it will be mostly oil with mud sand, pebbles, small plants etc. and chocolate mousse. During spill in water body, the waste collection would include oil, oily waste mixture, chocolate mousse, floating debris soaked in oil, floating vegetation etc.

The spilled oil shall be collected into drums/tanks in the case of large oil spills using pump for transport. Necessary oil tanker or bowser shall be kept nearby to the site and the collected oil shall be unloaded at the designated area in a safe & environmental friendly manner.

The hazardous waste is to be managed and handled as per Hazardous Wastes (Management and Handling) Amendment Rules, 2016.

7. EMERGENCY CONTROL TEAM (ECT)/ECR

The ECT/ECR will comprise of the following members under the leadership of ED-FHQ-A.

- Asset Manager/ Surface Manager
- HoD-PSS
- HoD – HSE
- HoD- Civil
- HoD– Admin.
- HoD-PA
- HoD-Finance and Accounts / GM (F&A)
- HoD-Contract
- HoD- Electrical
- HoD- Materials
- HoD- Security

They may appoint their representatives in senior executive level.

7.1 Important duties:

(A) On Site Co coordinator (OSC)

On Site Coordinator shall be the official Installation Manager (IM) under whose jurisdiction oil spill has taken place, shall be the person responsible for the oil spill response activities.

On Site Coordinator (OSC) is to assess the situation of the spill and shall take action as per following:

1. Effective and Safe deployment of oil spill response (OSR) equipment and deployment of trained OSR team.
2. Requisitioning of extra manpower from Support Manager through ECR.
3. Shall prepare the duty roster of personnel's and ensure that every one has understood his duty to be performed.
4. Shall ensure that each duty watch is suitably turned around as per demand of the situation.
5. Shall ensure that he is always in communication with his team /team leaders as well as Emergency Control Room (ECR) with the help of VHF /Walkie Talkie, Mobile Cell Phone.
6. Shall assess the oil spill scenario and requirement of consumable items for example Sorbent sheets, Sorbent booms, Dispersants etc. and initiating procurement action indicating approximate time when these items are required.

7. Shall ensure that all the actions carried out are logged suitably. (This would assist in analysing efficiency of men and machine both as well as provide scope for further improvement in various actions).
8. Shall route all his requirements of men and material including vehicles and watercrafts etc. through Incident Controller only.
9. Shall ensure safe recovery/return and accounting of all the items provided to him for the purpose.
10. Shall ensure that all his men are in possession of proper safety gears prior to starting of any operations i.e. Lifejacket, Life Buoy Lifeline, Raincoat, Torches, Working hand gloves etc.
11. Shall give regular feed back to ECT on the developments of oil scenario to formulate and decide future course of actions. Shall ensure action and anticipate the future requirement of men, material etc.

Sequential Steps

Immediate:

- Start personal log of events.
- Establish the following information:
 - Time spill occurred,
 - Position and shape of the slick,
 - Visual appearance and apparent thickness of the oil,
 - Percentage cover of the various thickness of oil,
 - Speed and direction of the slick,
 - Sensitive areas/vessels, etc. in its path,
 - Local weather conditions and sea state. - Investigate the source of leak / spillage
 - Co-ordinate with OSC in drawing a strategy and dealing with the Emergency.
 - Contact and aboard the vessel planned to have ERT and the OSR equipment.
- Determine whether resources available can handle the incident onshore/ offshore. If not, request activation of further mobilization of resources as per the Oil Spill Contingency Plan from ECT.
- Instruct boat (In case of water bodies) to take samples of spilled oil, if possible, for analysis and evaluation.
- Initiate production shut down depending on the conditions.
- For a spill capable of being controlled by the resources available offshore, contain and collect oil using OSR equipment.

General:

- Inform ECT as frequently as possible, but at least once every hour, of all actions and developments offshore.
- OSC shall ensure management report and overall containment, control, recovery, clean-up and deciding future strategies in consultation with ECT/ECR.

Standing Down:

- Send status report to ECR
- Ensure records of the event are gathered from all parties.
- Ensure all OSR equipment are cleaned after operation as per the maintenance schedule and store properly.
- Ensure borrowed equipment are returned as per contract and recovered oil is properly stored or disposed.
- Advise vessels suitably.
- Restore normal operation.
- Forward all log of events to ECT for HSE Manager's record and action.

(B) Head-Admin & Head – HSE shall themselves or by representatives suitable for liaison with government authority. They will act in consultation with the respective HOD's.

(C) Bio remediation – shall be done through third party. In this regard, rate contract shall be formed by PSS in consultation with HOD – HSE. HOD – PSS shall be the contract coordinator & single point contact for the same.

(D) Disposal of collected oil shall be done by respective asset through authorised recycle of oily waste & Asset Manager shall be accountable for the disposal. Hazardous waste rule, 2016 shall be strictly adhered to.

(E) Notices from authorities shall be taken care of by HOD - HSE. HOD – HSE shall be supplemented by necessary data by respective asset, PSS, admin department etc.

(F) Legal aid shall be initiated if necessary in the preview of HOD – Admin. All concerned shall supplement HOD Admin with necessary data, representation in this regard.

(G) HOD-PA shall take necessary action to manage media & public to ascertain company's reputation.

(H) HoD-Finance, HoD-Contract and HoD-Materials shall provide necessary support for urgent contract and procurement. Where there are financial implications, approval to be obtained from Competent Authority as per prevailing DoP. Framing of contracts to be done as per the prevailing procedures and DoP. However, the restrictions imposed (if any) for procurement

of items shall be eased, considering the urgent requirement of the spill response items, as they would be required only in emergency conditions.

8.0 RESPONSE ORGANIZATION

8.1 Initial Phase

In the initial phase only someone close enough to the scene of emergency can exercise emergency co-ordination. Accordingly, the Installation Manager (IM) will assume the role of Site Coordinator (OSC).

8.2 Intermediate Phase

The Chief Co-ordinator (CC) of the respective sphere (FHQ/PHQ/Project) may appoint a person (DGM/GM) under purview of the Disaster Management Plan (DMP), who is normally stationed at Base to take over the task at Site Control Room (SCR) as OSC. Alternatively, IM shall continue as the OSC until senior officers shall assume the duty of OSC at site, depending upon the gravity of the situation.

8.3 Function

The Coordinator will make an assessment of the situation; the type and quantity of assistance required and communicate the same to the his/her Zonal/Sectional in-charge who in turn will inform his Head of the Department/GM as the case may be for further information to the Chief Corporate Co-ordinator (CCC) of the DMP. The OSC will mobilize the resources available at site, deal with the situation and take such actions as directed by the Chief Co-ordinator at the FHQ/PHQ/Projects. He will transmit situation reports to the base disaster control room if necessitated at regular interval prefixing a numerical sequence to each message.

8.4 Site Control Room

- **Location:**

The Site Control Room (SCR) will function at the installation depending upon situation. In case the situation warrants activation of Onsite Disaster Management Plan, an alternate site control room will be set up at a safe distance at a place closest to the installation.

- **Mobilization:**

The Site Co-coordinator (OSC) will set up SCR as soon as he becomes aware of the emergency.

- **Function**

To prepare report on status of the emergency from time to time and take steps to fight the emergency. Determine the type of assistance required & mobilize the same through SCR.

8.5 Disaster Control Room (DCR)

- **Location**

A control room established at the base station of the sphere (FHQ/PHQ/Project) as the case may be will be termed as the Disaster Control Room.

- Mobilization

The GGM/ED (FHQ Affairs) who is the nodal officer of the spheres stationed at FHQ will open up Control Room/Set up control room as soon as he becomes aware of the emergency.

- Function

To prepare report on status of the emergency from time to time and take steps to fight the emergency. Determine the type of assistance required & mobilize the same through DCR.

8.6 Chief Coordinator (CC) at FHQ/PHQ/PROJECT level

FHQ/ PHQ/Project Head will be the Chief Co-ordinator where the emergency has taken place and will exercise control through GGM (FHQ Affairs) who is the Nodal Officer stationed at FHQ Alternate Chief Co-ordinator will be the next Senior Most in the FHQ/PHQ/Project.

In case the emergency within the installation is likely to have effect beyond the installation premises or an emergency outside the premises of the installation is likely to effect the operations of the installation, and Disaster Management Plan (Mutual Aid) is activated, CC shall inform Nodal Officer of FHQ to further intimate Corporate Disaster Management Group and request the intervention of Corporate Disaster Management group for activation of Corporate Level DMP if felt necessary. The Nodal Officer shall immediately inform the Nodal Officer of Corporate Disaster Management Group, CMD and Corporate Coordinators.

9.0 SITE SPECIFIC RESPONSE PLAN

9.1. Oil Spillage in Water Bodies:

In OIL's operational areas, there are hundreds of rivers, rivulets and water bodies. Thousands of people are economically dependent upon these water bodies and rivers. Although it is not possible to give detail for every spillage scenario, it is tried to give an overall idea to mitigate spillage in rivers and water bodies. Oil spills in rivers differ from spills that occur in the open ocean.

Some oils are denser than river water. Oil usually floats because it is less dense than the water it is floating on. (Density is the mass, or weight, of a substance divided by its volume.) The density of river water is usually about 1 gram per cubic centimetre (g/cc). Sometimes the density of an oil is so close to that of river water that the oil moves along the river partly underwater. When such oil finally moves into the ocean at the river mouth, it can re-float. This does not happen very often, but it is something we have to think about whenever oil is spilled in a river. If spilled oil sinks, it can be very difficult to

clean up. If something causes it to pool on the bottom (for example, it may be trapped behind a sunken vessel), then vacuum devices can be used to try to get the oil off the bottom. As you might guess, this method may not be very effective because vacuums may capture a lot of water and sand along with the oil.

Movement is usually downstream. Unlike in a bay or the open ocean, currents in a river are generally directed downstream (except very close to the mouth of the river, where it enters the ocean; here, a flood tide might actually reverse the flow of the surface water). The greater predictability of river currents makes it easier to forecast which way the oil will move. Wind blowing across the river also affects where the oil will come ashore. If the wind is blowing straight down the river (as might happen on a river with high banks), it often will travel quite far down the river before it comes in contact with a beach. In order for the oil to beach, the wind must blow the oil to one side of the river or the other.

Dams and locks influence oil movement. Rivers sometimes contain dams or locks that slow or divert water flow. Dams and locks also slow down the movement of spilled oil. In fact, oil tends to collect in areas next to dams or locks, where it can be picked up from the surface of the water by skimmers (devices that "skim" the oil off the water surface), sorbent pads (big square pads of an absorbing material that the oil will stick to), or sorbent booms.

Vegetation may grow right at the water's edge. Along many rivers, plants and trees grow right up to the river's edge. Those rivers do not have the open, sandy shores that you find along many parts of the open coast. It is much harder to remove oil from vegetation than from a hard-packed sand beach. Spill responders try to protect the plants by using booms, but if the vegetation gets oiled, responders often either cut, burn, or flush it with water to try to get the oil out.

Oil can interact with sediment carried by rivers. Rivers often carry a lot of sediment in their currents. That means when oil droplets drift into the water column of a river, the sediment has the potential to stick to the oil droplets. Eventually (depending on how strong flowing and full of sediment a river is) some of the oil-sediment combination may settle out to the bottom of the river, usually near the river mouth as the water slows down and reaches the ocean.

The trajectory (direction of movement) of oil spilled into a river is affected not only by the river currents -- which generally take the oil downstream -- but also by the wind. If the wind blows straight down the river, the oil may travel quite far down the river before it comes in contact with either bank. However, if the wind blows at an angle to the river, the oil is more likely to be blown towards one or the other riverbank.

When an oil spill occurs on water, it is critical to contain the spill as quickly as possible in order to minimize danger and potential damage to persons, property, and natural resources. Containment equipment is used to restrict the spread of oil and to allow for its recovery, removal, or dispersal. The most common type of equipment used to control the spread of oil is floating barriers, called booms.

Containment booms are used to control the spread of oil to reduce the possibility of polluting shorelines and other resources, as well as to concentrate oil in thicker surface layers, making recovery easier. In addition, booms may be used to divert and channel oil slicks along desired paths, making them easier to remove from the surface of the water. Although there is a great deal of variation in the design and construction of booms, all generally share four basic characteristics:

- An above-water “freeboard” to contain the oil and to help prevent waves from splashing oil over the top of the boom
- A flotation device
- A below-water skirt to contain the oil and help reduce the amount of oil lost under the boom
- A “longitudinal support,” usually a chain or cable running along the bottom of the skirt, that strengthens the boom against wind and wave action; may also serve as a weight or ballast to add stability and help keep the boom upright

When a spill occurs and no containment equipment is available, barriers can be improvised from whatever materials are at hand. Although they are most often used as temporary measures to hold or divert oil until equipment that is more sophisticated arrives, improvised booms can be an effective way to deal with oil spills, particularly in calm water such as streams, slow-moving rivers, or sheltered bays and inlets. Improvised booms are made from such common materials as wood, plastic pipe, inflated fire hoses, automobile tires, and empty oil drums. They can be as simple as a board placed across the surface of a slow-moving stream, or a berm built by bulldozers pushing a wall of sand out from the beach to divert oil from a sensitive section of shoreline.

RECOVERY OF OIL:

Once an oil spill has been contained, efforts to remove the oil from the water can begin. Three different types of equipment—booms, skimmers, and sorbents—are commonly used to recover oil from the surface.

Booms

When used in recovering oil, booms are often supported by a horizontal arm extending directly off one or both sides of a vessel. Sailing through the heaviest sections of the spill at low speeds, a vessel scoops the oil and traps it between the angle of the boom and the vessel's hull. In another variation, a boom is moored at the end points of a rigid arm extended from the vessel, forming a "U"- or "J"- shaped pocket in which oil can collect. In either case, the trapped oil can then be pumped out to holding tanks and returned to shore for proper disposal or recycling.

Skimmers

A skimmer is a device for recovery of spilled oil from the water's surface. Skimmers may be self-propelled and may be used from shore or operated from vessels. The efficiency of skimmers depends on weather conditions. In moderately rough or choppy water, skimmers tend to recover more water than oil. Three types of skimmers— weir, oleophilic, and suction—are described below. Each type offers advantages and drawbacks, depending on the type of oil being cleaned up, the conditions of the sea during clean-up efforts, and the presence of ice or debris in the water.

Sorbents

Sorbents are materials that soak up liquids. They can be used to recover oil through the mechanisms of absorption, adsorption, or both. Absorbents allow oil to penetrate into pore spaces in the material they are made of, while adsorbents attract oil to their surfaces but do not allow it to penetrate into the material. To be useful in combating oil spills, sorbents need to be both oleophilic and hydrophobic (water-repellent). Although they may be used as the sole clean-up method in small spills, sorbents are most often used to remove final traces of oil, or in areas that cannot be reached by skimmers. Once sorbents have been used to recover oil, they must be removed from the water and properly disposed of on land or cleaned for re-use. Any oil that is removed from sorbent materials must also be properly disposed of or recycled.

Dispersing agents

Dispersing agents, also called dispersants, are chemicals that contain surfactants, or compounds that act to break liquid substances such as oil into small droplets. In an oil spill, these droplets disperse into the water column, where they are subjected to natural processes—such as wind, waves, and currents—that help to break them down further. This helps to clear oil from the water surface, making it less likely that the oil slick will reach the shoreline. The effectiveness of a dispersant is determined by the composition of the oil it is being used to treat and the method and rate at which the dispersant is applied.

Bioremediation

Bioremediation technologies can help biodegradation processes work faster. Bioremediation refers to the act of adding materials to the environment, such as fertilizers or microorganisms, that will increase the rate at which natural biodegradation occurs. Furthermore, bioremediation is often used after all mechanical oil recovery methods have been used.

Shoreline Clean-up:

Both natural processes and physical methods aid in the removal and containment of oil from shorelines. Sometimes physical methods are used to enhance naturally occurring processes. Examples of a technology that uses both natural processes and physical methods to clean up an oil spill are biodegradation and bioremediation, which are described later.

9.2 Oil Spillage on land:

Manual recovery

Manual recovery is the most common method of shoreline clean up and involves teams of workers using rakes, shovels, and other tools to remove oil and debris. The oiled materials are collected in buckets and drums for transfer to a processing station. Workers may also use suction hoses, pumps, and vacuum trucks to recover spilled oil. While manual clean-up is a slow, painstaking process, it generates less waste than other techniques.

Berms / Trenches

Spills on land can be contained for recovery by building berms or dikes in the path of the oil flow, using either soil from the area, sand bags, or other construction materials. It is important to make sure the berm does not cause oil to back up and permeate the soil, where it could contaminate groundwater. If the water table is high and the oil will not permeate the soil, shallow trenches may be dug to collect oil for removal.

Land booms

Land booms look like large sausages. They are made from oil absorbent material causing them to act as a barrier. This prevents oil from leaving an area surrounded by land booms.

Hydrocarbon pads

Hydrocarbon pads are a type of oil absorbent pads. Each pad absorbs a large quantity of oil. They are effective where there is a pool of oil, which needs to be soaked up. Once the pads are saturated, they can be collected in sealed plastic bags for disposal.

Sorbents

It contains microbes, which are dormant until they come into contact with hydrocarbons. These microbes consume the oil, cleaning the soil of all evidence of the hydrocarbon spill. If the spill has seeped into the soil, it may be necessary to dig up the top layer and aerate the soil. Microbes function best when damp, so spraying the area with water also aids the clean-up operation.

Bio-remediation

Bioremediation technologies can help biodegradation processes work faster. Bioremediation refers to the act of adding materials to the environment, such as fertilizers or microorganisms, that will increase the rate at which natural biodegradation occurs. Furthermore, bioremediation is often used after all mechanical oil recovery methods have been used.

In-situ burning

In-situ burning of oil involves the ignition and controlled combustion of oil. It can be used when oil is spilled on a water body or on land. In-situ burning is typically used in conjunction with mechanical recovery on open water. Fire resistant booms are often used to collect and concentrate the oil into a slick that is thick enough to burn. Many factors influence the decision to use in-situ burning on inland or coastal waters including ***prevailing regulatory requirements***. Elements affecting the use of burning include water temperature, wind direction and speed, wave amplitude, slick thickness, oil type, and the amount of oil weathering and emulsification that have occurred. Weathering is a measure of the amount of oil already having escaped to the atmosphere through evaporation.

10.0 TERMINATION OF OPERATION

The termination of the operation shall be decided by the RCE on feedback received from ECT and OSC. Regulating authorities like SPCB, District Administration etc. shall also be contacted before coming to this decision. Competent authority may issue press release.

10.1 Standing down equipment, cleaning, maintenance and repair

10.1.1 Replacement

On completion of Pollution Response Operations, all the equipment, machineries and consumables shall be accounted for and checked for their serviceability. All equipment and machineries shall be thoroughly washed with fresh water as per the OEM's guidelines, necessary for maintenance and then the equipment stored, and secured in their respective places.

10.1.2 Preparing final detailed report

After completion of operations, the OSC shall prepare a detailed report covering all the aspects of the oil spill clean-up, which shall include success and failures, as well as lessons learnt, recommendations about equipment, man power, plans etc. The report is to be forwarded to Leader, ECT/ECR.

10.1.3 Reviewing plans and procedures from lessons learnt

The DCR will carry out deliberations on the report received from OSC and give its recommendations to HoD-HSE for putting it to ED/Management for necessary action.

10.2 Help from mutual aid partners

In case of the spill containment is beyond the internal resources the OSC may seek help from mutual aid partners to arrest the loss to bare minimum. In this regard, the approved document on “Offsite Emergency Response Plan” may be referred.

11.0 TRAINING SCHEDULES AND DRILL / EXERCISES

11.1 Oil spill response drills and exercises

OIL shall have regular internal exercises and testing, validation and updating of the OSCP to ensure that skills and awareness related to OSR are maintained to a state of operational readiness as well as the effectiveness of this plan. This will also check the functional ability of the ERT/ ECR. In order to have optimal utilisation of equipment with minimum wear and tear, quarterly exercises are recommended for testing of OSCP. Testing and exercises also provide management an opportunity to assess equipment, measure performance and obtain feedback from participants, update and correct the OSCP, show sincerity for protection of marine environment and company’s commitment on oil spill prevention and response.

Exercise and drills may involve any or a combination of the following:

- (i) Oil spill contingency plan
- (ii) Mock exercise activating oil spill response
- (iii) Equipment and personnel mobilization and deployment
- (iv) Joint exercise with other companies
- (v) Full-scale incident management exercise

Each exercise shall be debriefed to identify weaknesses in the OSCP and equipment, and appropriate remedial action shall be undertaken where required. The Head (S&E) shall ensure that amendments reflecting these actions are incorporated into this plan.

HoD-HSE shall suggest training courses & HR-L shall only provide training that all OSR Team personnel who would be handling / operating the OSR equipment and materials undergo specific training and gain confidence in handling and operation of the equipment, as they are to operate.

11.2 Improving contingency plans

After an oil spill has been controlled and cleaned up, or after an exercise, the companies, as well as the local, state, and central agencies that were involved in the emergency or exercise, should assess the usefulness of their contingency plans. Information gathered during the assessment, such as problems that had not been considered in the original plan and the successes or failures of clean-up techniques used, is used to revise and improve contingency plans. Lessons learned during oil spills and exercises are shared with other private, state, regional, and central agencies so that they too may learn from oil spills.

12.0 FURTHER REFERENCES AND OTHER ORGANIZATIONAL

References and other organizational documents to be consulted along with this Oil Spill Contingency Plan are:

- (i) Onsite and Off-site Disaster Management Plan of OIL
- (ii) Corporate Disaster Management Plan of OIL
- (iii) ERDMP wherever applicable.

ANNEXURE-1

CHARACTERISTIC AND BEHAVIOR OF OIL:

Characteristics of Oil being handled by the installation:

OIL is handling crude and gas. The types and characteristics of crude are:

Properties of crude are:

Properties of gas are:

Weathering process:

Rainy weather:

Sunny weather:

Facilities/ Resources at risk:

ANNEXURE – 2

OIL SPILL REPORT FORM

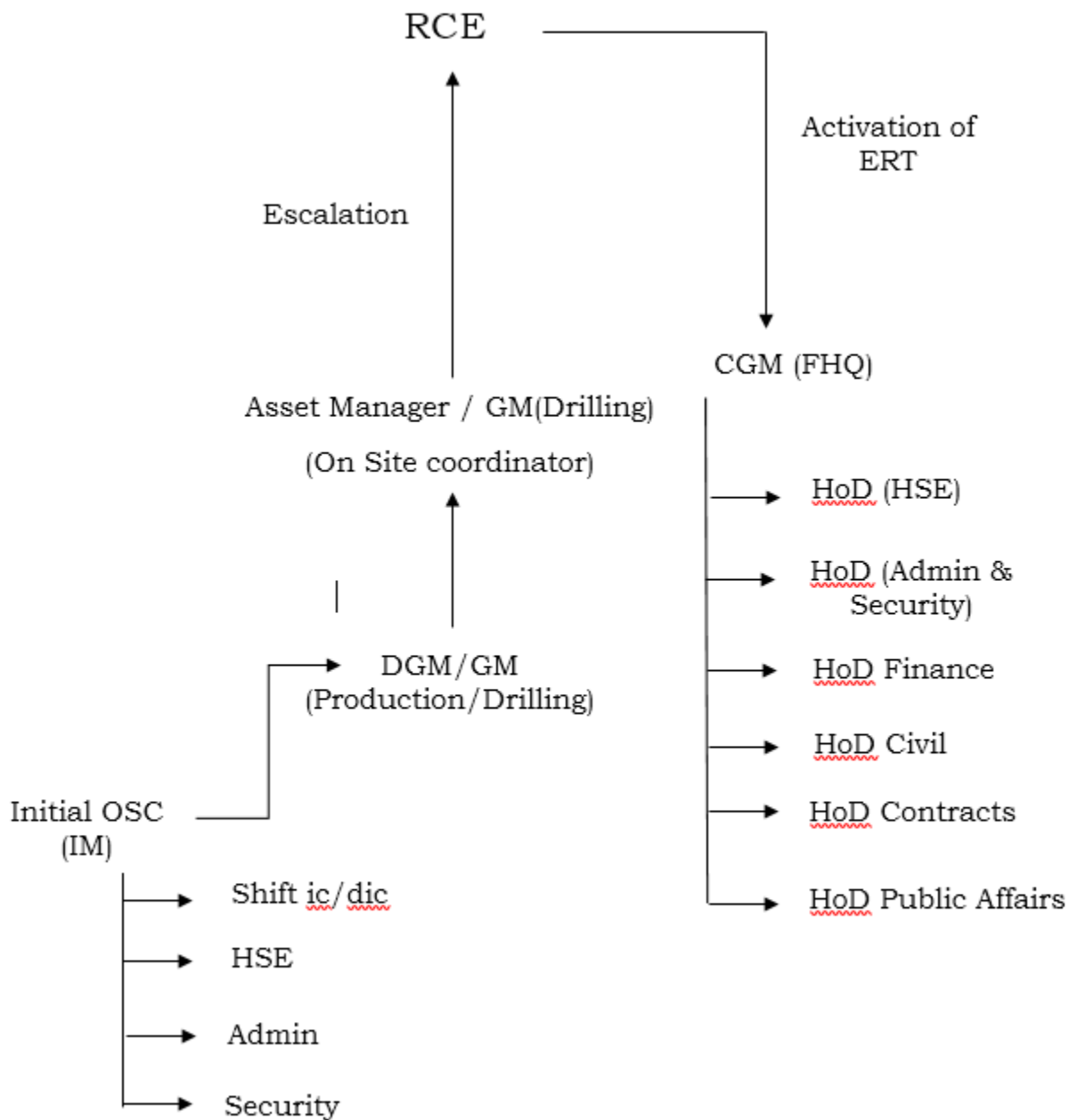
1. Name of person reporting incident:
2. Title / Designation:
3. Company:
4. Telephone / Fax numbers:
5. Date and time:
6. Spill Location:
7. Type and quantity of oil spilled:
8. Cause of Spill:
9. Response to spillage (if any):
10. Any other information:

ANNEXURE – 3

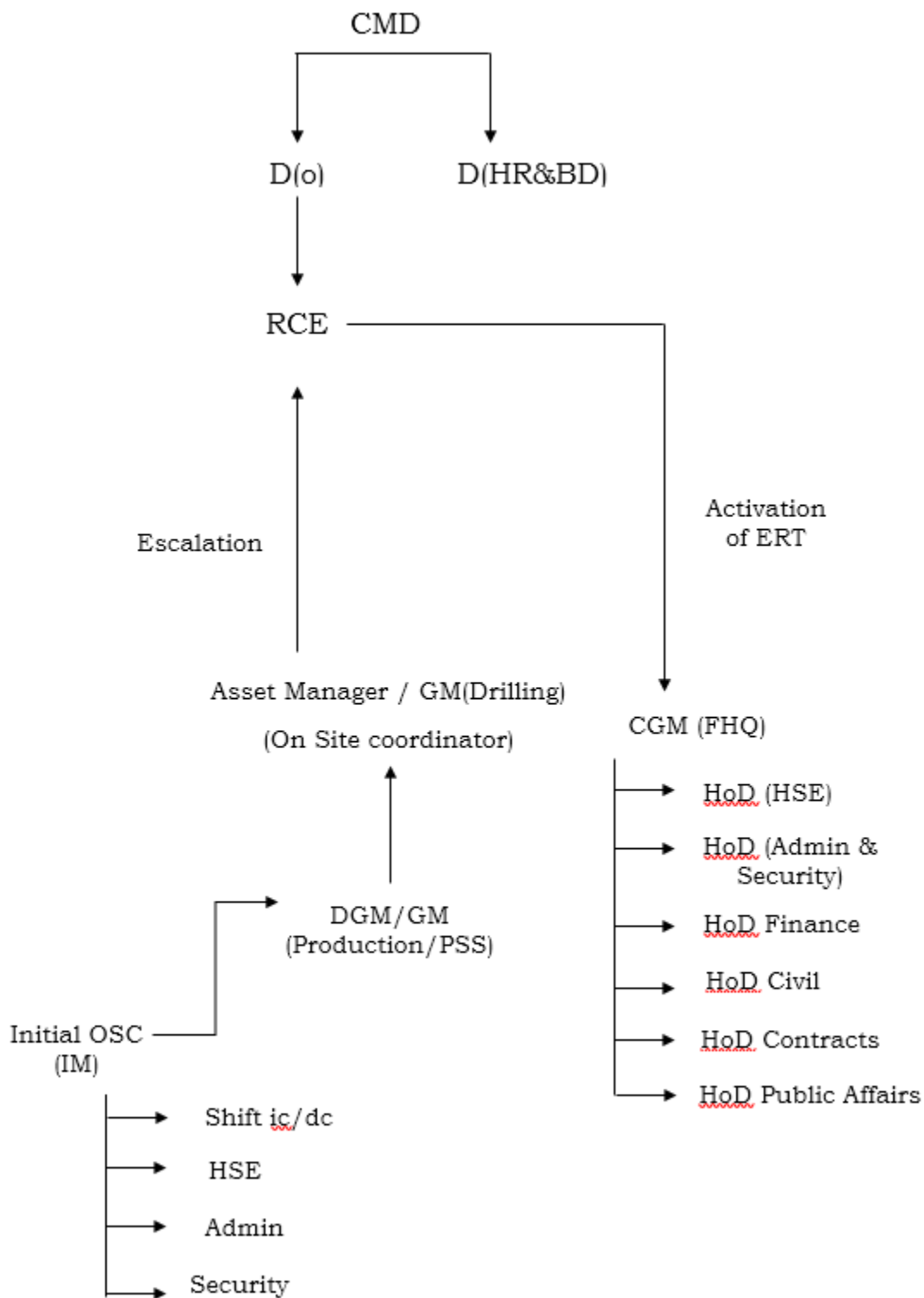
MANAGEMENT REPORT

- Present Location:
- No. of man power deployed:
- Use of OSD (if used):
- Equipment deployed:
- Weather condition:
- Amount of oil recovered:
- Amount of oil transferred for storage/disposal:
- Difficulties encountered:
- Any other:

ANNEXURE – 4
Communication Channel (TIER II)



ANNEXURE – 5
Communication Channel (TIER III)



ANNEXURE – 6

DO'S AND DON'TS

1. DO'S

- Release only authorized verified written information.
- Keep accurate records and logs of all enquiries and news coverage.
- Escort the press and government agencies to the nearest safe place on the Emergency site.
- Have designated spokesmen. Know what information can and cannot be released.

2. DON'TS

- Speculate on the causes of the emergency.
- Speculate on the resumption of normal operations.
- Speculate on the outside effects of emergencies.
- Speculate on the value of losses and damage.
- Interfere with the legitimate duties of media executives
- Place blame of emergencies.
- Crowd in the affected area (those who have no role assigned in the disaster plan should stick to their jobs.)

ANNEXURE-7**SPILL RESPONSE METHODS**

(Courtesy: National Oceanic Atmospheric Administration: American Petroleum Institute)

This section describes methods previously categorized for use during response to oil spills in inland environments and habitats. The methods are used in the protection, recovery, and cleanup phases of a response. The main objective of *protection* is to keep oil out of a habitat or to reduce the amount that enters. *Recovery* consists of removing floating oil from the water surface. The *cleanup* phase consists of removing stranded oil from shoreline habitats via physical, chemical, and enhanced biological means. In most spill response situations, protection and oil recovery are the immediate goals. Combinations of protection, recovery, and cleanup methods are commonly used though these guidelines treat each method separately.

The following section includes a summary of the objective in using the method, a general description of the method, applicable habitat types, conditions under which the methods should be used, biological constraints commonly applied to the use of the method to protect sensitive resources, and the environmental effects expected from the proper use of the method. Some of the methods listed require special authorization for use during a spill; the appropriate agency must be contacted about the need for special approvals. We encourage you to refer to the references listed in Annexure A for further information.

Physical Response Methods

- | | |
|--------------------------------|--|
| 1. Natural Recovery | 11. Sediment Reworking |
| 2. Booming | 12. Vegetation Removal |
| 3. Skimming | 13. In-Situ Burning |
| 4. Barrier/Berm | 14. Flooding |
| 5. Physical Herding | 15. Low-Pressure, Cold-Water Flushing |
| 6. Manual Oil Removal/Cleaning | 16. High-Pressure, Cold-Water Flushing |
| 7. Mechanical Oil Removal | 17. Low-Pressure, Hot-Water Flushing |
| 8. Sorbents | 18. High-Pressure, Hot-Water Flushing |
| 9. Vacuum | 19. Steam Cleaning |
| 10. Debris Removal | 20. Sand Blasting |

Chemical Response Methods

- | | |
|-----------------------------|------------------------------------|
| 21 Dispersants | 22 Solidifiers |
| 23 Emulsion Treating Agents | 24 Chemical Shoreline Pretreatment |
| 25 Visco-Elastic Agents | 26 Shoreline Cleaning Agents |
| 27 Herding Agents | |

Biological Response Methods

- 28 Nutrient Enrichment
- 29 Natural Microbial Seeding

1. Natural Recovery

Objective:

No attempt to remove any stranded oil in order to minimize impact to the environment, or because there is no proven effective method for cleanup.

Description:

No action is taken, although monitoring of the incident continues.

Applicable Habitat Types: Can be used on all habitat types.

When to Use:

On remote or inaccessible habitats, when natural removal rates are very fast (e.g., the evaporation of gasoline), when the degree of oiling is light, or when cleanup actions will do more harm than natural removal.

Biological Constraints:

This method may be inappropriate for areas where high numbers of mobile animals (birds, terrestrial mammals) or endangered species use the body of water or shoreline.

Environmental Effects:

Same as from the oil alone.

2. Booming

Objective:

To control the movement of floating oil by containment, diversion, deflection, or exclusion.

Description:

Placement of a device (boom) on the water that forms a barrier to floating oil. *Containment* is deploying a boom to hold the oil until it can be removed. *Deflection* is moving oil away from sensitive areas. *Diversion* is moving oil toward recovery sites that have slower flow, better access, etc. *Exclusion* is placing boom to prevent oil from reaching sensitive areas. The ultimate goal is to recover the oil.

Applicable Habitat Types:

Can be used on all water environments. Booms begin to fail by entrainment when the effective current or towing speed exceeds 0.7 knots perpendicular to the boom.

When to Use:

Nearly all types of response to spills on water involve deploying boom to assist in the recovery of floating oil. Booms must be properly deployed and maintained, including removing accumulated debris. Containment booming of gasoline spills is usually not attempted, because of both fire and inhalation hazards to responders. However, when public health is at risk, booming of gasoline can be attempted with use of foam and extreme safety procedures. Deflection or exclusion booming of sensitive areas to prevent exposure to oil, including gasoline, can be an important protection action.

Biological Constraints:

Placement and maintenance of anchoring points should not cause excessive physical disruption. Boom must be maintained so that it does not trap oil improperly and cause more damage. Traffic to / from boom sites should not disturb wildlife.

Environmental Effects:

Minimal if surface disturbance by cleanup work force traffic is controlled.

3. Skimming

Objective:

To recover floating oil from the water surface.

Description:

Mechanized equipment is placed at the oil / water interface. There are five different types of skimmers: weir, suction, centrifugal, submersion, and oleophilic. They may operate

independently from shore, be mounted on vessels, or be completely self-propelled. All require collection and concentration of floating oil at the skimmer, usually using booms.

Large amounts of water are often collected and must be handled. Adequate storage of recovered oil / water mixture must be available.

Applicable Habitat Types:

Can be used on all water environments. Waves, currents, and debris reduce skimmer efficiencies.

When to Use:

When sufficient amounts of floating oil can be contained. Skimming of gasoline spills is usually not feasible, because of both fire and inhalation hazards to responders. However, when public health is at risk, skimming of gasoline can be attempted using foam and extreme safety procedures.

Biological Constraints:

Traffic to / from skimming sites should not disturb wildlife.

Environmental Effects

Minimal if surface disturbance by cleanup work force traffic is controlled.

4. Barriers/Berms

Objective:

To prevent entry of oil into a sensitive area or to divert oil to a collection area.

Description:

A physical barrier is placed across an area to prevent moving oil from passing. Barriers can consist of earthen berms, filter fences, air bubble barriers, or trenches. When it is necessary for water to pass, because of water volume or downstream needs, underflow dams (for low flow rates) or overflow dams are used.

Applicable Habitat Types:

In streams and dry valleys, where the width and depth of the area to be closed off are relatively small. Also, at the mouths of small creeks along lake shorelines, to prevent oil from being blown upstream.

When to Use:

When the flow of oil threatens sensitive habitats. If the barrier does not fail, it is the most effective strategy to exclude oil from an area.

Biological Constraints:

Place barriers away from sensitive areas, such as spawning sites. Downstream water requirements should be monitored to prevent dewatering of sensitive areas.

Environmental Effects:

May disrupt or contaminate sediments along banks or in channel. Dewatering or poor water quality downstream may affect aquatic organisms.

5. Physical Herding

Objective:

To free oil trapped in debris or vegetation on water; to direct the movement of floating oil towards containment and recovery devices; or to push oil away from sensitive areas.

Description:

Water or air streams and propeller wash generate a current to dislodge trapped oil and herd the released oil to containment and recovery area. May mix oil with water to form emulsified oil.

Applicable Habitat Types:

In lakes and ponds where there are little or no currents, along rivers and streams where the channel or banks are accessible, and in and around manmade structures such as wharves and piers.

When to Use:

In low-current or stagnant waterbodies, to herd oil in booms towards recovery devices. Along rivers and streams, when *mobile* oil has penetrated vegetated banks or accumulated in log jams or other debris, water spray and prop wash can mobilize the oil to flow downstream to collection points.

Biological Constraints:

None.

Environmental Effects:

May generate high levels of suspended sediments and mix them with the oil, resulting in deposition of contaminated sediments in benthic habitats.

6. Manual Oil Removal/Cleaning

Objective:

To remove surface oil with hand tools and manual labor.

Description:

Removal of surface oil by manual means (hands, rakes, shovels, buckets, rags, sorbent pads, etc.) and placing in containers. No mechanized equipment is used.

Applicable Habitat Types:

Can be used on all habitat types.

When to Use:

Light to moderate oiling conditions for stranded oil, or heavy oils on water that have formed semi-solid to solid masses that can be picked up manually.

Biological Constraints:

Foot traffic over sensitive areas (wetlands, floating vegetation, etc.) needs to be restricted or prevented. There may be periods when access should be avoided, such as during bird nesting.

Environmental Effects

Minimal if surface disturbance by crew movement and waste generation is controlled.

7. Mechanical Oil Removal

Objective:

Removal of oil from water surface, bottom sediments, and shorelines with heavy equipment.

Description:

Oil and oiled sediments are collected and removed using backhoes, dredges, graders, bulldozers, draglines, etc. On land, the oiled material is pushed into piles and transported offsite for treatment / disposal. On water, the equipment is operated from shore or barges to recover large amounts of heavy or solidified oil.

Applicable Habitat Types:

On land, possible wherever there are surface sediments accessible to heavy equipment. On water, used in lakes, rivers, etc., where oil accumulates.

When to Use:

When large amounts of oiled materials have to be collected and removed. Along shorelines, care should be taken to remove sediments only to the depth of oil penetration, which can be difficult

with heavy equipment. Should be used carefully where excessive sediment removal may erode the beach. Will need special permission to use in areas with known cultural resources.

Biological Constraints:

Heavy equipment may be restricted in sensitive habitats (e.g., wetlands, soft substrate) or areas containing endangered plants and animals.

Environmental Effects:

The equipment is heavy, with many support personnel required. May be detrimental if excessive sediments are removed without replacement. All organisms in the sediments will be affected, although the need to remove the oil may make this response method the best overall alternative. Runoff from exposed oil and fine-grained oily sediments can affect adjacent bodies of water.

8. Sorbents

Objective:

To remove floating oil by adsorption onto oleophilic material placed in water or at the waterline.

Description:

Sorbent material is placed *on the water surface*, allowing it to absorb oil as it is released by natural processes. Forms include sausage boom, rolls, sweeps, pads, and snares. Efficacy depends on the capacity of the particular sorbent, energy available for lifting oil off the substrate, and stickiness of the oil. Recovery of all sorbent material is mandatory.

Applicable Habitat Types:

Can be used on any habitat or environment type.

When to Use:

When the stranded oil is mobile and transport of oil is expected on or off the site. The oil must be viscous and thick enough to be released by the substrate and absorbed by the sorbent. Often used as a secondary treatment method after gross oil removal and in sensitive areas where access is restricted.

Biological Constraints:

Access for deploying and retrieving sorbents should not affect soft or sensitive habitats or wildlife. Sorbent use should be monitored to prevent overuse and generating large volumes of waste.

Environmental Effects:

Physical disturbance of habitat during deployment and retrieval. When the sorbents are no longer effective, oil may remain in critical habitats during sensitive periods.

9. Vacuum

Objective:

To remove free oil pooled on the substrate or from the water in sheltered areas.

Description:

A vacuum unit with a suction head recovers free oil. The equipment can range from small, portable units that fill individual 55-gallon drums to large supersuckers that are truck-mounted and can lift large rocks. Can be used with booms and flushing systems to move the oil toward the suction head. Removal rates from substrates can be extremely slow.

Applicable Habitat Types:

Any accessible habitat type. May be mounted on barges for water-based operations, on trucks backed to the recovery area, or hand-carried to remote sites.

When to Use:

When free, liquid oil is stranded on the substrate (usually in depressions), trapped in vegetation and is readily accessible, or concentrated on the water surface. Often used instead of skimmers for floating oil recovery. Usually requires shoreline access points. Used in recovery of gasoline spills only with special precautions such as: applying foam to suppress vapors, testing for flammable vapor, locating the vacuum truck a safe distance from spill, and venting the pump discharge safely.

Biological Constraints:

Special restrictions should be identified for areas where foot traffic and equipment operation should be limited, such as soft substrates. Operations in wetlands need to be very closely monitored, with a site-specific list of restrictions.

Environmental Effects:

Minimal if foot and vehicular traffic is controlled and minimal substrate is removed.

10. Debris Removal

Objective:

To remove contaminated debris from the shoreline or water surface.

Description:

Manual or mechanical removal of debris from the shore or water surface. Can include cutting up and removal of oiled logs.

Applicable Habitat Types:

Can be used on any habitat or environment type where safe access is allowed.

When to Use:

When driftwood and debris are heavily contaminated and provide a potential source of chronic oil release, an aesthetic problem, a source of contamination for other organisms in the area, or skimmer clogging problems.

Biological Constraints:

Disturbance to adjacent areas should be minimized. Foot traffic over sensitive areas (wetlands, spawning grounds) needs to be restricted. May be periods when access should be restricted (spawning periods, large numbers of migratory waterbirds).

Environmental Effects:

Physical disruption of substrate, especially when equipment must be deployed to recover a large quantity of debris.

11. Sediment Reworking

Objective:

To rework oiled sediments to break up the oil deposits, increase its surface area, and mix deep subsurface oil layers, which will expose the oil to natural removal processes and enhance the rate of oil degradation.

Description:

The oiled sediments are roto-tilled, disked, or otherwise mechanically mixed using heavy equipment. Along lake shores, oiled sediments may also be pushed lower on the shore to enhance natural cleanup from reworking by wave activity. The process may be aided with high-volume flushing of gravel.

Applicable Habitat Types:

On any sedimentary substrate that can support heavy equipment.

When to Use:

On sand to gravel beaches with subsurface oil, where sediment removal is not feasible (due to erosion concerns or disposal problems). Also where surface oil deposits have started to form

pavements or crusts. Appropriate for sites where the oil is stranded above the normal water level.

Biological Constraints:

Avoid use on shores near water intakes, fish-spawning areas, or near bird-nesting or concentration areas because of the potential for release of oil and oiled sediments into adjacent bodies of water.

Environmental Effects:

Due to the mixing of oil into sediments, this method could further expose organisms that live below the original layer of oil. Repeated mixing over time could delay re-establishing organisms. Runoff from treated sites could contaminate downslope areas.

12. Vegetation Removal

Objective:

To cut and remove oiled vegetation to prevent oiling of wildlife or chronic oil releases.

Description:

Manual cutting of oiled rooted vegetation using weed eaters. Cut vegetation is raked up. Floating vegetation is removed either manually or mechanically.

Applicable Habitat Types:

Wetlands composed of emergent, herbaceous vegetation and floating aquatic vegetation.

When to Use:

When the risk of oiled vegetation contaminating wildlife is greater than the value of the vegetation that is to be cut, and there is no less destructive method that removes or reduces the risk to acceptable levels.

Biological Constraints:

Operations must be strictly monitored to minimize the degree of root destruction and mixing of oil deeper into the sediments. Access in bird-nesting areas should be restricted during nesting seasons.

Environmental Effects:

Vegetation removal will destroy habitat for many animals. Cut areas will have reduced plant growth. Along exposed sections of shoreline, the vegetation may not regrow, eroding and destroying the habitat. Trampled areas will recover much more slowly.

13. In-Situ Burning

Objective:

To remove oil from the water surface or habitat by burning.

Description:

Oil floating on the water surface is collected into slicks at least 2-3 millimeters thick and ignited. The oil can be contained in fire resistant booms, or by natural barriers such as ice or the shore. On land, oil in the habitat is burned, usually when it is on a combustible substrate such as vegetation, logs, and other debris. Oil can be burned off non-flammable substrates using a burn promoter. On sedimentary substrates, it may be necessary to dig trenches for oil to accumulate in pools thick enough to burn efficiently. Heavy and emulsified oils are harder to ignite and sustain an efficient burn, but are still burnable.

Applicable Habitat Types:

On any habitat type except dry muddy substrates where heat may impact the biological productivity of the habitat.

When to Use:

On floating slicks, early in the spill event when the oil can kept thick enough (2-3 millimeters). On land, where there is heavy oil in sites not amenable or accessible to physical removal and it is important to immobilize the stranded oil quickly. In wetlands and mud habitats, a water layer minimizes impacts to sediments and roots. Many potential applications for spills in ice.

Biological Constraints:

Large volumes of smoke are generated, and its effect on nesting birds and populated areas should be evaluated.

Environmental Effects:

Temperature and air quality effects are likely to be localized and short-lived. Toxicological impact from burn residues have not been evaluated. There are few studies on the relative effects of burning oiled wetlands compared to other techniques or natural recovery, but the limited data indicate little impact of burning relative to natural recovery when the soils are saturated.

14. Flooding

Objective:

To wash oil stranded on the land surface to the water's edge for collection.

Description:

A perforated header pipe or hose is placed above the oiled shore or bank. Ambient water is pumped through the header pipe at low pressures and flows downslope to the water. On porous sediments,

water flows through the substrate, pushing loose oil ahead of it (or floats oil to the water's surface) then transports the oil down the slope for pickup. Flow is maintained to remove the majority of free oil. Oil is trapped by booms and is recovered by skimmers or other suitable equipment.

Applicable Habitat Types:

All habitat types.

When to Use:

In heavily oiled areas when the oil is still fluid and loosely adheres to the substrate, and where oil has penetrated into gravel sediments. This method is frequently used with other washing techniques (low- or high-pressure, cold water).

Biological Constraints:

Not appropriate where nearshore sediments contain rich biological communities.

Environmental Effects:

Habitat may be physically disturbed by foot traffic during operations and smothered by sediments washed down the slope. Oiled sediment may be transported to shallow nearshore areas, contaminating them and burying benthic organisms.

15. Low-Pressure, Cold-Water Flushing

Objective:

To remove liquid oil that has adhered to the substrate or manmade structures, pooled on the surface, or become trapped in vegetation.

Description:

Ambient water is sprayed at low pressures (<50 psi), usually from hand-held hoses, to lift oil from the substrate and direct it to the water's edge for pickup. Can be used with a flooding system to prevent released oil from re-adhering to the substrate.

Applicable Habitat Types:

On heavily oiled substrates, riprap, and seawalls where the oil is still liquid. In wetlands and along vegetated banks where free oil is trapped in vegetation.

When to Use:

Where free, liquid oil is stranded onshore or floating in very shallow areas.

Biological Constraints:

Not appropriate where nearshore sediments contain rich biological communities. May need to restrict use so that the oil / water effluent does not drain across sensitive habitats. Use from boats

will prevent foot traffic in soft substrates and vegetation. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable.

16. High-Pressure, Cold-Water Flushing

Objective:

To remove oil that has adhered to hard substrates or manmade structures.

Description:

Similar to low-pressure flushing except that water pressure is 100-1,000 psi. High-pressure spray will more effectively remove sticky or viscous oils. If water volumes are low, sorbents are placed directly below the treatment area to recover oil.

Applicable Habitat Types:

Bedrock, manmade structures, and gravel habitats.

When to Use:

When low-pressure flushing is not effective at removing adhered oil, which must be removed to prevent continued oil release or for aesthetic reasons. When a directed water jet can remove oil from hard-to-reach sites.

Biological Constraints:

May need to restrict flushing so that the oil / water effluent does not drain across sensitive habitats. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

May drive oil deeper into the substrate if water jet is improperly applied. If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable.

17. Low-Pressure, Hot-Water Flushing

Objective:

To remove non-liquid oil that has adhered to the substrate or manmade structures, or pooled on the surface.

Description:

Hot water (90°F up to 170°F) is sprayed with hoses at low pressures (<50 psi) to liquefy and lift oil from the substrate and direct it to the water's edge for pickup. Used with flooding to prevent released oil from re-adhering to the substrate.

Applicable Habitat Types:

On heavily oiled bedrock, sand to gravel substrates, and manmade structures.

When to Use:

Where heavy, but relatively fresh oil is stranded onshore. The strategy is to heat the oil to above its pour point, so it will flow. Less effective on sticky oils.

Biological Constraints:

Avoid wetlands or nearshore sediments with rich biological communities. Use should be restricted so that the hot oil / water effluent does not contact sensitive habitats. Boat use will prevent foot traffic in soft substrates and vegetation. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

Hot water can kill all organisms in direct contact. If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable during the response.

18. High-Pressure, Hot-Water Flushing

Objective:

To mobilize weathered and viscous oil adhered to surfaces.

Description:

Hot water (90°F up to 170°F) is sprayed with hand wands at pressures greater than 100 psi. Used without water flooding, this procedure requires immediate use of vacuum or sorbents to recover the oil / water runoff. When used with a flooding system, the oil is flushed to the water surface for collection by skimmers or sorbents.

Applicable Habitat Types:

Gravel habitats, bedrock, and manmade structures.

When to Use:

When oil has weathered to the point that even warm water at low pressure no longer

effectively removes oil, to prevent continued release of oil. To remove viscous oil from manmade structures for aesthetic reasons.

Biological Constraints:

Use should be restricted so that the oil / water effluent does not drain across sensitive habitats (damage can result from exposure to oil, oiled sediments, and hot water). Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

All attached organisms and plants in the direct spray zone will be removed or killed, even when used properly. Oiled sediment may be transported to shallow nearshore areas, contaminating them and burying benthic organisms.

19. Steam Cleaning

Objective:

To remove heavy residual oil from solid substrates.

Description:

Steam or very hot water (170°F to 212°F) is sprayed with hand wands at high pressure. Water volumes are very low compared to flushing methods.

Applicable Habitat Types:

Manmade structures such as seawalls and riprap.

When to Use:

When heavy oil residue remaining on a shoreline needs to be cleaned for aesthetic reasons, and when hot-water wash is not effective.

Biological Constraints:

Not to be used in areas of soft substrate, vegetation, or high biological abundance directly on or below the structure.

Environmental Effects:

Complete destruction of all organisms in the spray zone. Difficult to recover all released oil.

20. Sand Blasting

Objective:

To remove heavy residual oil from solid substrates.

Description:

Use of sandblasting equipment to remove oil from the substrate. May include recovery of used (oiled) sand in some cases.

Applicable Habitat Types:

Manmade structures such as seawalls and riprap.

When to Use:

When heavy oil residue is remaining on the shoreline, which needs to be cleaned for aesthetic reasons, and even steam cleaning is not effective.

Biological Constraints:

Not to be used in areas of soft substrate, vegetation, or high biological abundance directly below or adjacent to the structures.

Environmental Effects:

Complete destruction of all organisms in the blast zone. Possible smothering of downstream organisms with sand. When the used sand is not recovered, introduces oiled sediments into the adjacent habitat.

21. Dispersants

Objective:

To remove floating oil from the water surface and disperse it into the water column, to reduce impact to sensitive shoreline habitats and animals that use the water surface.

Description:

Specially formulated products containing surface-active agents are sprayed at concentrations of about 5 percent by volume of the oil onto the slicks by aircraft or from boats. The products can be applied undiluted or mixed with water. The dispersants reduce the oil / water surficial tension and decrease the energy needed for the slick to break into small particles and mix into the water column. Some turbulence is needed to mix the dispersant into the oil and to mix the treated oil into the water.

Applicable Habitat Types:

Open water and large rivers with sufficient depth and volume for mixing and dilution.

When to Use:

When the impact of the floating oil has been determined to be greater than the impact of mixing of oil into the water column.

Biological Constraints:

Use in shallow water could affect benthic resources. The potential impact of dispersed oil on water intakes should be thoroughly considered prior to use.

Environmental Effects:

May increase effects on water-column organisms, particularly plankton and larval fish. Dispersion will only be partially effective, so some water surface impact will still occur.

22. Emulsion-Treating Agents

Objective:

To break or destabilize emulsified oil into separate oil and water phases. Can also be used to prevent emulsion formation.

Description:

Emulsion-treating agents are surfactants that are applied to emulsified oil at low concentrations (0.1-2 percent). They can be injected into skimmer reservoirs to break the emulsion to separate excess water from recovered oil. They also can be sprayed (similar to dispersants) directly onto slicks to break or prevent emulsions.

Applicable Habitat Types:

On all water environments where emulsified oil is present.

When to Use:

For recovered oil, where storage capacities are very limited, to separate the oil and water so that the water can be treated and discharged. On floating slicks, where emulsified oil can reduce skimmer efficiency.

Biological Constraints:

There is insufficient information to evaluate at this time.

Environmental Effects:

Because this is a new application approach, there are very few data available to evaluate environmental effects. Effective dosages are one to two orders of magnitude lower than dispersants. Environmental concerns regarding application to slicks are: how treatment might adversely change the physical or chemical properties of the oil; whether the oil will be more readily dispersed; and how the treated oil will behave upon contact with birds, mammals, and shorelines.

23. Visco-Elastic Agents

Objective:

To impart visco-elastic properties to floating oil and increase skimming rates.

Description:

Chemical agent is applied as a liquid spray or a slurry onto the oil in the proper dosage. Some mixing is required and is usually provided by the water spray during application. Treated oil is rendered visco-elastic, but still fluid, gelatinous, or semi-solid; there is no chemical change in the oil. The primary purpose is to increase the efficiency in skimmer removal rates while minimizing amount of water. Increases the recovery by drum skimmers, but can clog weir-type skimmers.

Applicable Habitat Types:

On all water environments where oil can be contained for recovery with skimmers. Not for use near wetlands or debris because of an increase in adhesive behavior of the treated oil.

When to Use:

When recovery efficiency of skimmers needs to be increased. Must be used with booming or other physical containment. Not for use on heavy oils, which are already highly viscous.

Biological Constraints:

Not suitable for vegetated shores or where there is extensive debris mixed in the oil. Should be avoided when birds or other wildlife that may be more adversely affected by the treated oil cannot be kept away from the treated oil.

Environmental Effects:

May enhance the smothering effect of oil on organisms. Therefore, the treatment should be considered only where recovery of the treated oil is likely.

24. Herding Agents

Objective:

To collect or herd oil into a smaller area and thicker slick in order to increase recovery. Also can be used to herd oil away from sensitive areas or used inside containment booms when it is necessary to move the boom.

Description:

Chemical agents, which are insoluble surfactants and have a high spreading pressure, are applied in small quantities (1-2 gallons per lineal mile) to the clean water surrounding the edge of a fresh

oil slick. They contain the oil, prevent spreading, but do not hold the spill in place. Hand-held, vessel-mounted, or aircraft systems can be used. Must be applied early in spill, when oil is still fluid.

Applicable Habitat Types:

On all stillwater environments.

When to Use:

Potential use for collection and protection. For collection, used to push slicks out from under docks and piers where it has become trapped, or in harbors, where the equipment is readily accessible for use early in the spill. For protection in low-current areas, use to push slicks away from sensitive resources such as wetlands. Not effective in fast currents, rough seas, or rainfall.

Biological Constraints:

Not suitable for use in very shallow water or fish-spawning areas.

Environmental Effects:

Direct acute toxicity to surface layer organisms possible, though available products vary greatly in their aquatic toxicity.

25. Solidifiers

Objective:

To change the physical state of spilled oil from a liquid to a solid to reduce impact of oil to shorelines.

Description:

Chemical agents (polymers) are applied to oil at rates of 10-45 percent, solidifying the oil in minutes to hours. Various broadcast systems, such as leaf blowers, water cannons, or fire suppression systems, can be modified to apply the product over large areas. Can be applied to both floating and stranded oil.

Applicable Habitat Types:

All water environments, bedrock, sediments, and manmade structures.

When to Use:

When immobilization of the oil is desired, to prevent refloating from a shoreline, penetration into the substrate, or further spreading. However, the oil may not fully solidify unless the product is well mixed with the oil, and may result in a mix of solid and untreated oil.

Generally not used on spills of heavy oil because the product cannot be readily mixed into viscous

oils.

Biological Constraints:

Must be able to recover all treated material.

Environmental Effects:

Available products are insoluble and have very low aquatic toxicity. Unrecovered solidified oil may have longer impact because of slow weathering rates. Physical disturbance is likely during application and recovery.

26. Chemical Shoreline Pre-treatment

Objective:

To prevent oil from adhering to or penetrating the substrate.

Description:

Various types of film-forming agents or wetting agents are applied to habitats in advance of the oil to prevent oil adhesion and penetration. Application must occur just prior to stranding of the oil so timing is critical. It should be noted that there are no products now being sold as shoreline pretreatment agents.

Applicable Habitat Types:

Bedrock, sand and gravel habitats, and manmade structures.

When to Use:

When oil is projected to impact an applicable shoreline, particularly those that have high recreational or aesthetic value. However, lack of information on the availability, effects, and effectiveness of products greatly limits their use.

Biological Constraints:

Unknown at this time but there are likely to be constraints based on product toxicity and persistence.

Environmental Effects:

Unknown at this time since there are no commercially available products. There are concerns about toxicity and smothering since these products could be applied directly on clean substrates.

27. Shoreline Cleaning Agents

Objective:

To increase the efficiency of oil removal from contaminated substrates.

Description:

Special formulations are applied to the substrate, as a presoak and / or flushing solution, to soften or lift weathered or heavy oils to enhance flushing methods. The intent is to lower the water temperature and pressure required to mobilize the oil from the substrate during flushing.

Applicable Habitat Types:

On any habitat where water flooding and flushing procedures are applicable.

When to Use:

When the oil has weathered to the point where it cannot be removed using warm to hot water. This approach may be most applicable where flushing effectiveness decreases as the oil weathers.

Biological Constraints:

The released oil should be recovered rather than dispersed into the water column. Use may be restricted where suspended sediment concentrations are high, near wetlands, and near sensitive nearshore resources.

Environmental Effects:

If more oil is dispersed into the water column, there could be more oil sorbed onto suspended sediments and transferred to nearshore habitats, particularly along sheltered shorelines. The toxicity of shoreline cleaners is similar to the toxicity of dispersants.

28. Nutrient Enrichment

Objective:

To speed the rates of natural microbial degradation of oil by adding nutrients (generally nitrogen and phosphorus).

Description:

Nutrients are applied to the habitat in one of several methods: soluble inorganic formulations, which are dissolved in water and applied as a spray, requiring frequent applications; slow-release formulations, which are applied as a solid; and oleophilic formulations, which adhere to the oil itself and are sprayed directly on the oiled areas.

Applicable Habitat Types:

Could be used on any habitat type where safe access is allowed and nutrients are deficient.

When to Use:

On moderately to heavily oiled substrates, after other techniques have been used to remove as much oil as possible; on lightly oiled shorelines where other techniques are destructive or not effective; and where nutrients limit natural degradation. Most effective on diesel-type and medium oils that do not have large amounts of high molecular weight, slowly degrading components. Less effective where oil residues are thick. Not considered for gasoline spills, which will be completely removed by evaporation at faster timeframes than by microbial degradation.

Biological Constraints:

Not suitable in shallow water or restricted waterbodies where nutrient overloading may lead to eutrophication, or where toxicity of nutrients, particularly ammonia, is of concern.

Contact toxicity of oleophilic formulations may restrict areas of direct application. Toxicity tests should be evaluated carefully, as other chemicals in the product could be toxic to aquatic organisms.

Environmental Effects:

Very little information is available on effects in freshwater.

29. Natural Microbe Seeding

Objective:

To speed the rates of microbial degradation of oil by adding live microbes with enhanced oil-degrading abilities.

Description:

Formulations containing hydrocarbon-degrading microbes (usually with fertilizers) are added to the oiled area. The argument is made that indigenous microorganisms will be killed by the oil or will be slow to degrade the oil, so new microbial species need to be added to speed the process of biodegradation. Little information is currently available to show whether natural microbe seeding increases biodegradation more than nutrient enrichment alone.

Applicable Habitat Types:

Could be used on any habitat type where safe access is allowed and additional microbes are needed.

When to Use:

On moderate to heavily oiled substrates, after other techniques have been used to remove as much

oil as possible; on lightly oiled shorelines where other techniques are destructive or not effective; and where existing microorganisms are not present or effective. Most effective on diesel-type and medium oils that do not have large amounts of high molecular weight, slowly degrading components. Less effective where oil residues are thick. Not considered for gasoline spills, which will evaporate faster than they would degrade.

Biological Constraints:

If product contains fertilizers, not suitable in shallow water or restricted bodies of water where nutrient overloading may lead to eutrophication, or where toxicity of nutrients, particularly ammonia, is of concern. Toxicity tests should be evaluated carefully, as other chemicals in the product could be toxic to aquatic organisms

Environmental Effects:

Very little information is available on effects in freshwater.

SPECIAL CONSIDERATIONS

This section summarizes the following selected topics of special concern in freshwater habitats:

- Public health concerns;
- Conditions under which oil might sink;
- Oil behavior in ice conditions;
- Oil behavior and cleanup in permafrost; and
- Firefighting foam.

PUBLIC HEALTH CONCERNS

The human-health concerns associated with oil spills entail risks to the public from exposure to the oil and to responders during cleanup activities. In freshwater areas, the risks of exposure of the public are of special concern, because of the potential for contamination of public drinking water supplies and the proximity of populated areas to spill sites. Human- health risks from spilled oil occur along three potential pathways: ingestion, dermal contact, and inhalation. Ingestion pathways include drinking contaminated water and eating tainted food (e.g., fish, birds, and mammals).

Water intakes in relatively shallow lakes and rivers may be highly susceptible to contamination during oil spills. Response procedures may thus include temporarily closing the intakes, protectively booming the intake area, bringing on-line additional treatment equipment at the water-treatment plant, and / or monitoring water quality for the contaminants of concern. The low-molecular weight, aromatic compounds (benzene, ethylbenzene, toluene, and xylene) are

usually of greatest concern, because of their much higher water solubility, compared to the other compounds in oil. These four compounds usually represent 70-95 percent of the water-soluble fraction (typically about 25-40 ppm) in crude oils. Water-treatment plants that have granular activated carbon filtration systems can remove low levels of oil contamination, especially the aromatic compounds, which can cause taste and odor problems at very low concentrations.

The potential for direct contact of oil on skin is greatest during cleanup, and measures should be taken to keep the public away from all spill response operations. Inhalation of volatile compounds from spills of crude oil and light, refined products poses a risk to the public in adjacent areas. However, these risks are greatest with long-term exposure.

Fire risks are mostly associated with volatile, refined products such as gasoline. Response operations at these spills must be conducted with caution. Often, the best response to spills of volatile products is to allow the product to evaporate, while diverting the slicks away from populated areas and sensitive habitats.

CONDITIONS UNDER WHICH OIL MIGHT SINK IN FRESH WATER

Most oil spills result in floating oil slicks. There are very specific conditions that can cause an oil spill to sink rather than float in freshwater settings.

1 The oil has a specific gravity greater than 1.00 at the ambient temperature.

Specific gravity is the ratio of the density of a material to freshwater. Although nearly all crude oils and most refined products have a specific gravity less than 1.00 and will therefore float, some of the residual refined products (e.g., very heavy fuel oils, asphalt) are so heavy that their specific gravity is greater than 1.00. Spills of these oils can sink immediately and flow along with the bottom currents or as droplets in the water column. However, very small changes in water density can refloat sinking oil. There have been several spills in the freshwater sections of a river where the oil originally sank and moved along the bottom. However, at the fresh / salt mixing zone, where the water density increased with salinity, some of the oil rose to the surface. In other spills, oil has been reported to sink with very cold temperatures at night, only to refloat after the water absorbs heat from the sun.

2 The oil has a specific gravity just under 1.00 but forms a very stable emulsion.

Water-in-oil emulsions can contain up to 80 percent water, which increases the specific gravity accordingly. Also, during the emulsification process, some sediment can be incorporated into the emulsion, either from the suspended sediments in the water mixed into the oil, or those adhered to the floating slick. Only a very small amount of sediment is needed to sink oil. Usually residual refined products (e.g., No. 6 fuel oil, Bunker C) have a specific gravity of 0.99 or greater.

3 The oil comes ashore, picks up sediment, and then is eroded from the shore.

Medium and heavy oils can adsorb to sediment when they strand, making the mixture heavier than water. However, the oil / sediment mixture must be eroded from the shoreline, usually by waves, which tend to break up the oil slicks. The oiled sediment can be deposited in the nearshore zone, but as small tarballs or widely scattered contaminated sediment, rather than a layer of sunken oil. In some instances, the tarballs can stick to each other, forming a tar mat just offshore.

4 The oil is a blend of light and heavy refined products, and the light fraction is lost by evaporation.

Many intermediate fuel oils are actually mixtures of No. 2 and No. 6 oils. If the spill conditions were such that the light oil component completely evaporated, and the heavy oil was particularly heavy, the weathered oil might sink.

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Sr. No.	OISD STD/GDN/RP No	Standard Name	CURRENT EDITION IN VOGUE
1	OISD-STD-105	Work Permit System	Aug, 2023
2	OISD-STD-106	Pressure Relief & Disposal System	Oct, 2010
3	OISD-STD-108	Oil Storage and Handling	Aug, 2023
4	OISD-STD-109	Process Design and Operating Philosophies on Blow Down & sewer system	Jan, 2015
5	OISD-RP-110	Recommended Practices on Static Electricity	Oct, 2018
6	OISD-STD-111	Process Design & Operating Philosophies on Fired Process Furnace	Apr, 2016
7	OISD-STD-112	Safe Handling of Air Hydrocarbon Mixtures & Pyrophoric Substances	Aug, 2019
8	OISD-STD-113	Classification of Area for Electrical Installations at Hydrocarbon Processing & Handling Facilities	Oct, 2013
9	OISD-STD-114	Safe Handling of Hazardous Chemicals	Oct, 2010
10	OISD-GDN-115	Guidelines on Fire Fighting Equipment and Appliances in Petroleum Industry	Aug, 2023
11	OISD-STD-116	Fire Protection Facilities for Petroleum Refineries and Oil/Gas Processing Plants	Oct, 2017
12	OISD-STD-117	Fire Protection Facilities for Petroleum Depots, Terminals, Pipeline Installations & Lube oil installations	Sep, 2017
13	OISD-STD-118	Layouts for Oil and Gas Installations	Jul, 2008
14	OISD-STD-119	Selection, Operation and Maintenance of Pumps : Withdrawn in June, 2024 (Merged with STD-240)	Jul, 2008
15	OISD-STD-120	Selection, Operation and Maintenance of Compressors : Withdrawn in June, 2024 (Merged with STD-240)	Jul, 2008
16	OISD-STD-121	Selection, Operation Inspection & Maintenance of Steam & Gas Turbines : Withdrawn in June, 2024 (Merged with STD-240)	Oct, 2010
17	OISD-RP-122	Selection, Operation and Maintenance of Fans, Blowers, Gear Boxes, Agitators & Mixers : Withdrawn in June, 2024 (Merged with	Jul, 2008
18	OISD-RP-123	Selection, Operation and Maintenance of Rotary Equipment Components : Withdrawn in June, 2024 (Merged with STD-240)	Jul, 2008
19	OISD-RP-124	Predictive Maintenance Practices : Withdrawn in June, 2024 (Merged with STD-240)	Aug, 2007
20	OISD-STD-125	Inspection & Maintenance of Mechanical Seals : Withdrawn in June, 2024 (Merged with STD-240)	Aug, 2007
21	OISD-RP-126	Specific practices for installations and maintenance of Rotating Equipment : Withdrawn in June, 2024 (Merged with STD-240)	Aug, 2007
22	OISD-STD-127	Selection, Operation, Inspection & Maintenance of Diesel Engines : Withdrawn in June, 2024 (Merged with STD-240)	Oct, 2010
23	OISD-STD-128	Inspection of Unfired Pressure Vessels	Jun, 2024

24	OISD-STD-129	Inspection of Storage Tanks	Aug, 2023
25	OISD-STD-130	Inspection of Piping Systems	Jun, 2024
26	OISD-STD-131	Inspection of Boilers	Aug, 2019
27	OISD-STD-132	Inspection of Pressure Relieving devices	Jul, 2012
28	OISD-STD-133	Inspection of Fired Heaters	Apr, 2016
29	OISD-STD-134	Inspection of Heat Exchangers	Oct, 2010
30	OISD-STD-135	Inspection of Loading & Unloading hoses for Petroleum Products	Sep, 2021
31	OISD-STD-137	Inspection of Electrical Equipment	Apr, 2016
32	OISD-STD-138	Inspection of cross country pipeline - onshore : Withdrawn in June , 2012	Jun, 2012
33	OISD-STD-139	Design, Construction, Inspection & Maintenance of Offshore Pipelines and Facilities & Requirements Of Deep Water Pipelines	Oct, 2017
34	OISD-STD-140	Inspection of jetty pipelines : Withdrawn in June, 2024 (merged with STD-141)	Aug, 2019
35	OISD-STD-141	Cross Country liquid hydrocarbon pipeline	Jun, 2024
36	OISD-STD-142	Inspection of fire fighting equipments and systems	Aug, 2023
37	OISD-STD-144	Liquefied Petroleum Gas (LPG) Installations	Oct, 2017
38	OISD-STD-145	Internal Safety Audits	Sep, 2021
39	OISD-RP-146	Preservation of idle electrical equipment	Aug, 2023
40	OISD-RP-147	Inspection & safe practices during electrical installations	Aug, 2023
41	OISD-RP-148	Inspection & safe practices during overhauling electrical equipment	Aug, 2000
42	OISD-RP-149	Design aspects for safety in electrical systems	Oct, 2013
43	OISD-STD-150	Design and Safety Requirements for Liquefied Petroleum Gas Mounded Storage Facility	Sep, 2021
44	OISD-STD-151	Safety in Design, Fabrication and Fittings Propane Tank Trucks	Oct, 2018
45	OISD-STD-152	Safety Instrumentation for Process System in Hydrocarbon Industry	Jun, 2024
46	OISD-STD-153	Maintenance & inspection of safety instrumentation in hydrocarbon industry	Jan, 2015
47	OISD-STD-154	Training in midstream and downstream sector of petroleum industry	Jun, 2024
48	OISD-STD-155	Personal Protective Equipment	Sep, 2021
49	OISD-STD-156	Fire Protection Facilities for Ports Handling Hydrocarbons	Oct, 2017

50	OISD-RP-157	Safety in Transportation of Bulk Petroleum Products (Rail and Road)	Aug, 2019
51	OISD-RP-158	Recommended Practices on Storage and Handling of Bulk Liquefied Petroleum Gas	Aug, 2000
52	OISD-STD-159	LPG Tank Trucks - Requirements of Safety on Design/Fabrication & Fittings	Oct, 2018
53	OISD-STD-160	Protection to fittings mounted on existing LPG tank trucks : Withdrawn in Oct, 2018	Mar, 2003
54	OISD-GDN-161	LPG Tank Truck Incidents Rescue & Relief Operations	Oct, 2018
55	OISD-STD-162	Safety in installation and maintenance of LPG Cylinders Manifold	Oct, 2018
56	OISD-STD-163	Safety of Control Room for Hydrocarbon industry	Jun, 2024
57	OISD-STD-164	Fire Proofing of Steel Supporting Structures in Oil & Gas Industry	Jul, 2012
58	OISD-GDN-165	Guidelines for Rescue & Relief Operations for POL Tank Truck Accident	Aug, 2023
59	OISD-GDN-166	Guidelines for Occupational Health Monitoring in Oil and Gas Industry	Jul, 2012
60	OISD-RP-167	POL Tank lorry Design & Safety	Aug, 2019
61	OISD-GDN-168	Emergency Preparedness Plan for Marketing Locations of Oil Industry: Withdrawn in Aug, 2023	Jul, 1997
62	OISD-GDN-169	OISD Guidelines on Small LPG Bottling Plants (Design and Fire Protection facilities)	Oct, 2017
63	OISD-STD-170	Inspection, Maintenance, Repairs & Rehabilitation of Foundations & Structures	Jul, 1997
64	OISD-STD-171	Preservation of Idle Static & Rotary Mechanical Equipment	Jul, 1998
65	OISD-STD-173	Fire Prevention and Protection System for Electrical Installations	Oct, 2017
66	OISD-STD-174	Well Control	Jun, 2024
67	OISD-STD-175	Cementing Operations	Jan, 2015
68	OISD-STD-176	Safety Health & Environment Training for Exploration & Production (Upstream) Personnel	Aug, 2023
69	OISD-STD-177	Inspection and Maintenance of Insulation System	Sep, 2021
70	OISD-STD-178	Management of Change	Aug, 2023
71	OISD-STD-179	Safety Requirements on Compression, Storage, Handling & Refueling Of Natural Gas (CNG) For Use In Automotive Sector.	Apr, 2016
72	OISD-GDN-180	Lightning Protection	Oct, 2018
73	OISD-STD-181	Geophysical Operations	Jun, 2024

74	OISD-GDN-182	Safe Practices for Workover and Well Stimulation Operations	Oct, 2018
75	OISD-STD-183	Standard on Logging Operations	Oct, 2013
76	OISD-STD-184	Standard on Life Saving Appliances	Sep, 2021
77	OISD-STD-185	Wire Line Operations	Aug, 2002
78	OISD-STD-186	Simultaneous Operations in E&P Industry	Aug, 2023
79	OISD-STD-187	Care and Use of Wire Rope	Aug, 2023
80	OISD-STD-188	Corrosion Monitoring and Control of Offshore & Onshore Pipelines	Aug, 2019
81	OISD-STD-189	Standard On Fire Fighting Equipment for Drilling Rigs, Work Over Rigs and Production Installations	Jul, 2012
82	OISD-STD-190	Safety in Derrick Floor Operations (Onshore and Offshore Drilling Rigs)	Jan, 2015
83	OISD-STD-191	Oil Field Explosive Safety	Oct, 2017
84	OISD-GDN-192	Safety Practices during Construction	Apr, 2016
85	OISD-GDN-193	Guidelines for Gas Lift Operations & Maintenance	Sep, 2001
86	OISD-STD-194	Standard for Unloading, Storage and Regasification of Liquefied Natural Gas (LNG)	Apr, 2016
87	OISD-STD-195	Safety in Design, Operation, Inspection and Maintenance of Hydrocarbon Gas Compressor Stations and Terminals	Sep, 2001
88	OISD-GDN-196	Guidelines for Seeking Environmental Clearance of Development Projects in Petroleum Industry	Sep, 2001
89	OISD-GDN-197	Guidelines for Environmental Impact Assessment	Sep, 2001
90	OISD-GDN-199	Guidelines For Conducting Environmental Audit In Upstream Petroleum Sector (Onland) - Withdrawn in Sep, 2021	Aug, 2000
91	OISD-GDN-200	Guidelines for preparation of oil spill contingency plan	Jun, 2024
92	OISD-RP-201	Environment Management in E&P Sector	Jul, 2008
93	OISD-GDN-202	Field Inspection of Drilling & Work-over Rig Mast, Substructure & Rig Equipment	Jan, 2015
94	OISD-GDN-203	Operation, Maintenance & Inspection of Hoisting Equipment	Sep, 2003
95	OISD-GDN-204	Medical Requirements, Emergency Evacuation and Facilities (for Upstream) : Withdrawn in Aug, 2023	Sep, 2001
96	OISD-RP-205	Recommended Practices for Crane Operation, Maintenance & Testing (for Upstream)	Aug, 2019
97	OISD-GDN-206	Guidelines on Safety Management System in Petroleum Industry	Aug, 2023

98	OISD-GDN-207	Contractor Safety	Apr, 2016
99	OISD-STD-210	Storage, Handling and Refueling of LPG for automotive use	Aug, 2023
100	OISD-GDN-211	Safety in Petroleum Laboratories	Aug, 2019
101	OISD-GDN-212	Guidelines on Environmental Audit (Internal) in Downstream Petroleum Sector : Withdrawn in Sep, 2021	Oct, 2002
102	OISD-STD-214	Cross Country LPG Pipelines	Jun, 2024
103	OISD-STD-216	Electrical Safety in Onshore Drilling & Workover Rigs	Jan, 2015
104	OISD-GDN-218	Guidelines For Safe Rig- Up & Rig- Down Of Drilling And Work-Over Rigs	Oct, 2004
105	OISD-GDN-219	Guidelines on Field Inspection, Handling & Testing of Casing Pipe & Tubing	Oct, 2004
106	OISD-GDN-224	Monitoring & Control of Volatile Organic Compounds Emission	Aug, 2023
107	OISD-STD-225	Storage, Handling & Dispensing at Petroleum Retail Outlets	Oct, 2010
108	OISD-STD-226	Natural Gas Transmission Pipelines and City Gas Distribution Networks	Jun, 2024
109	OISD-STD-227	Emergency Response and Preparedness in Oil & Gas Industry	Aug, 2023
110	OISD-GDN-228	Selection, Training & Placement of Fire Operators in Hydrocarbon & Petrochemical Industry	Jul, 2008
111	OISD-STD-230	Unlined Underground Rock Cavern Storage for Petroleum & Liquefied Petroleum Gas	Sep, 2021
112	OISD-STD-231	Sucker Rod Pumping Units	Jul, 2008
113	OISD-GDN-232	Identification of hazards and control measures in E&P industry : Withdrawn in June, 2024 (Already covered under OISD-GDN-206)	Oct, 2013
114	OISD-GDN-233	Guidelines on inspection of non-piggable pipelines.	Oct, 2013
115	OISD-STD-234	Electrical Safety in Onshore Production Installations in E&P Sector	Jan, 2015
116	OISD-STD-235	Storage, Handling, Refuelling and fire fighting at aviation fuelling stations	Jan, 2015
117	OISD-STD-236	Design, Layout, Operation & Maintenance of Refrigerated LPG Storage	Feb, 2014
118	OISD-STD-237	Layout, Design consideration, Safety, Operation and Maintenance of Lube/ Grease manufacturing and filling plants	Jan, 2015
119	OISD-RP-238	Well Integrity	Apr, 2016
120	OISD-GDN-239	Guidelines On Annular Casing Pressure Management for Onshore Wells	Mar, 2016
121	OISD-STD-240	Asset Integrity Management of rotary equipment	Jun,2024
122	OISD-STD-241	Safety in the production, storage, and transportation of hydrogen and hydrogen blends	Jun,2024
123	OISD-RP-242	Recommended practices for Drilling and Testing of HPHT Wells	Sep, 2021
124	OISD-RP-243	Recommended Practices on Coal based Methane (CBM) operations	Oct, 2018

125	OISD-STD-244	Storage and handling of Petroleum Products at depots and terminals including standalone crude oil storage facilities	Jan, 2015
126	OISD-STD-245	Standard on safety for LNG bunkering facilities at ports for large ships, coastal shipping and inland water transport (IWT) terminals	Oct, 2018

Previous version of withdrawn OISD Standards (For reference only)

STD-138, STD-160, GDN-199, GDN-212, GDN-168,GDN-204,STD-199,STD-120, STD-121,RP-122,RP-123,RP-124,STD-125,RP-126,STD-127,STD-140,GDN-232

संदर्भ सं./Ref. No.: HSE/E/43C-1/1481

दिनांक/Date: 29.11.2025

From	:	Executive Director (HSE & ESG)
To	:	Deputy Director General of Forests (Central), Sub Office, Guwahati (under Regional Office, Shillong), 4th Floor, Housefed Building, Rukminigaon, Guwahati-781022. (Email : iro.guwahati-mefcc@gov.in , iro.moefcc.ghy@gmail.com)
Subject	:	Submission of Half-yearly (April 2025 to September 2025) compliance reports of the conditions stipulated in the Environment Clearance (EC) granted to Oil India Limited.

Sir,

Reference to above subject, please find enclosed herewith the Half-yearly (April 2025 to September 2025) compliance reports of the conditions stipulated in the Environment Clearance (EC) granted to Oil India Limited. List of the EC are tabulated below:

S.No	EC Identification No/File No.	Name of the EC proposal
1.	F. No. J-11011/413/2008-IA II (I) dated 24.01.2011	OCS Bhogpara.
2.	F. No. J-11011/1251/2007-IA II (I) dated 01.11.2011	Exploratory Drilling of 01 (One) well at Doomdooma-Pengry Area, District Tinsukia, Assam.
3.	F. No. J-11011/682/2008-IA II (I) dated 17.06.2013	Expansion of Gas field Development in Tengakhat-Naharkatia-Jorajan area and Doomdooma Pengry area, Assam by M/s Oil India Ltd.
4.	F. No. J-11011/116/2018-IA II (I) dated 07.01.2020	Onshore Oil & Gas Exploration & Development Drilling and Production in Ningru Oil & Gas Field in Districts Changlang and Namsai for Ningru PML Block (Arunachal Pradesh)
5.	F. No. J-11011/1260/2007-IA II (I) dated 09.04.2020	Onshore Oil & Gas Development Drilling and Production in Mechaki Area covering Mechaki, Mechaki Extension, Baghjan and Tinsukia Extension PMLs on District Tinsukia (Assam).
6.	F. No. J-11011/150/2016- IA II (I) dated 11.05.2020	Extension Drilling & Testing of Hydrocarbons at 7 (seven) Locations under Dibru-Saikhowa National Park Area, North-West of Baghjan PML, District Tinsukia, Assam.
7.	F. No. J-11011/1253/2007-IA II (I) dated 28.12.2020	Onshore Oil & Gas development drilling and production by M/S Oil India Ltd in Dibrugarh district under Dibrugarh, Chabua, Hugrijan and Tinsukia PMLs. (Dibrugarh- Bhogpara)
8.	F. No. J-11011/375/2016-IA II (I) dated 28.12.2020	Onshore Oil & Gas Development Drilling and Production (179 wells and 9 Production Installations) in North Hapjan – Tinsukia –



HSE Department
Oil India Limited
Duliajan, Dibrugarh, 786602, Assam
Phone : 0374-2800542
Email: safety@oilindia.in

संदर्भ सं./Ref. No.: HSE/E/21(B)/928

दिनांक/Date: 01.09.2025

From	:	ED (HSE & ESG)
To	:	The Member Secretary, Pollution Control Board, Assam, Bamunimaidam, Guwahati- 781021.
Subject	:	Submission of Environmental Statement (Form-V) under Environment (Protection) Rules, 1986.

Sir,

With reference to the above subject, we are submitting herewith the Environmental Statement (Form-V) for the financial year ending on 31st March 2025 pertaining to the operations of Oil India Limited in the districts of Dibrugarh, Tinsukia, Sivsagar and Charaideo in Assam.

Thanking you.

Yours faithfully,
For **Oil India Limited**


01/09/2025
(R.K. Singh)

**ED (HSE & ESG)-Officiating
Nodal Officer (EC, FC, NBWL)
For Resident Chief Executive**

Encl: As above.

- Copy:**
1. Regional Executive Engineer,
Pollution Control Board Assam,
Back Side of ASTC Bus Station,
Chowkidinghee, Dibrugarh,
PIN: 786001.
 2. Executive Engineer,
Regional Laboratory cum Office,
Pollution Control Board Assam,
Melachakar, Sivsagar,
PIN: 785640.
 3. Executive Engineer,
Regional Office,
Pollution Control Board Assam,
Rangagora Rd, Borguri, Tinsukia,
PIN: 786126

FORM - V
(See Rule 14)
ENVIRONMENTAL STATEMENT FOR THE FINANCIAL YEAR ENDING THE 31st
MARCH, 2025

PART - A

(i) **Name and address of the owner/occupier of the industry operation or process.**

OIL INDIA LIMITED
P.O. DULIAJAN
DIST. DIBRUGARH
ASSAM -786602.

Note: Environmental Statement (Form - V) is pertaining to the operations of Oil India Limited in the districts of Dibrugarh, Tinsukia, Sivasagar and Charaideo in Assam.

(ii) **Industry category:** Red - Oil and gas extraction (on-shore extraction through drilling wells)

(iii) **Production capacity - Units**

OIL's production target is fixed as per the Memorandum of Understanding (MoU) with Ministry of Petroleum and Natural Gas, Govt. of India, which varies from year to year.

Production details during F.Y. 2024-25:

- **Crude Oil:** 3.380 MMT.
- **Natural Gas:** 2935.529832 MMSCM
- **LPG:** 30,525 MT.

(iv) **Year of establishment:**

OIL INDIA LTD. was formed in 1961 as a joint venture with M/S. Burma Oil Company, UK and on 14th Oct. 1981, OIL became a fully owned Govt. of India Enterprise.

(v) **Date of last Environmental Statement submitted:** 24.09.2024.

PART - B
WATER AND RAW MATERIAL CONSUMPTION

(I) Water consumption m³/d:

S.No	Purpose	Water Consumption (m ³ / day)
1.	Process & Cooling	14469.04
2.	Domestic	15956.16
TOTAL		30425.20

Name of Products	Process water consumption per unit of product output	
	During F.Y. 2023-24	During F.Y. 2024-25
(1)	(2)	(3)
Hydrocarbon (Crude Oil, Natural Gas, LPG)	0.96 m ³ /MT (Approx.)	0.94 m ³ /MT (Approx.)

(II) Raw material consumption

*Name of raw materials	Name of products	Consumption of raw material per unit	
		During F.Y. 2023-24	During F.Y. 2024-25
No raw materials are used as Oil India Limited is engaged in Exploratory and Development drilling activities & production of Crude Oil and Natural Gas. However, chemicals such as Bentonite are used for preparation of Water based drilling mud.			

PART – C

POLLUTION DISCHARGED TO ENVIRONMENT/UNIT OF OUTPUT

(Parameter as specified in the consent issued)

Pollutants	Quantity of Pollutants Discharged (mass/day)	Concentrations of pollutants in discharges (mass/volume)	Percentage of variation from prescribed standards with reasons
(a) Water	NIL. There is no discharge of pollutants from drilling locations and Production Installations. Wastewater generated from drilling locations is treated in Effluent Treatment Plant (ETP) and reused	- Quality of ETP treated water from the drilling locations is analyzed frequently. (Test report is enclosed as Annexure – I). - Quality of Formation	No variation is observed. All parameters of treated effluent and Formation water are within the permissible limits.

	back in the drilling operation. The formation water generated after separation from crude oil and treatment is pumped back to the underground formation (depth greater than 1600 m) through formation water disposal wells.	water is analyzed frequently (Test report enclosed as Annexure- II)	
(b) Air	No major air pollutants are emitted from Oil & Gas exploratory and development drilling and production activities except Stack Gas emissions at drilling locations and Production Installations & Flaring at Oil Collecting Stations.	Stack Gas and Ambient Air Quality (AAQ) monitoring is carried out frequently at drilling locations and Production Installations (Test reports enclosed as Annexure- III)	No variation is observed. All parameters of Stack Gas emissions and Ambient Air are within the permissible limits.

PART – D

HAZARDOUS WASTES

(As specified under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016)

Hazardous Wastes	Category of Hazardous Waste as per Schedule - I of HW Rules, 2016	Total Quantity generated	
		During F.Y. 2023-24	During F.Y. 2024-25
a) From process	S.No. 2.2 Sludge containing Oil	3541.99 MT	3849.99MT
	S.No. 5.1 Used or Spent Oil	55 KL	50 KL
	S.No. 33.1 Empty barrels/containers/liners contaminated with hazardous chemicals/wastes	11150 Nos.	13000 Nos.

	S.No. 33.2 Contaminated cotton rags or other cleaning materials	5.58 MT	9.40 MT
b) From pollution control facilities	S.No. 33.5 Chemical sludge from waste water treatment	98.44 KL	197.46 KL

PART – E
SOLID WASTES

Solid Wastes	Total Quantity	
	During F.Y. 2023-24	During F.Y. 2024-25
(a) From process Drill Cuttings	15,200 m ³ (Approx.)	13200 m ³ (Approx.)
(b) From pollution control facilities	NIL	
(c) (1) Quantity recycled or re-utilized within the unit. (2) Sold (3) Disposed	N/A N/A N/A	

PART – F

PLEASE SPECIFY THE CHARACTERIZATION (IN TERMS OF COMPOSITION AND QUANTUM) OF HAZARDOUS AS WELL AS SOLID WASTES AND INDICATE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTES.

(I) Hazardous Wastes:

Name of the Hazardous Waste	Quantity generated during F.Y. 2024-25	Disposal Practices
a) Sludge containing Oil	3849.99MT	Sent to Sludge Processing Plant for oil recovery followed by Bioremediation

b) Used or Spent Oil	50 KL	Stored in barrels under covered shed and sold to authorized recyclers through auction
c) Empty barrels/containers/liners contaminated with hazardous chemicals/wastes	13000 Nos.	Sold to authorized recyclers through auction
d) Contaminated cotton rags or other cleaning materials	9.40 MT	Bioremediation
e) Chemical sludge from waste water treatment	197.46 KL	Disposed in HDPE lined pits

(I) Solid Wastes:

Name of the Solid Waste	Quantity generated during F.Y. 2024-25	Disposal Practices
a) Drill Cuttings	13,200 m ³ (Approx.)	Disposed in HDPE lined pits

PART – G

IMPACT OF THE POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES AND ON THE COST OF PRODUCTION

- Acoustic enclosures have been provided around all gensets to reduce noise levels.
- Recovery of drilling mud from drill cuttings by using a combination of Vertical Cutting Dryer (VCD) and a high-performance centrifuge.
- Wastewater generated from drilling locations is collected in HDPE lined pits, treated in Effluent Treatment Plant (ETP) with Reverse Osmosis unit and the treated effluent is reused back in the drilling operation.
- Formation water generated from Production Installations is treated in Effluent Treatment Plant (ETP) before disposal in the abandoned/ water disposal wells.
- Processing of oily sludge for recovery of Crude oil and further treatment of sludge through Bioremediation.
- Construction of central concrete pit for disposal of waste mud.
- Treatment of Biomedical waste through incinerator.

PART – H

ADDITIONAL MEASURES / INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION, ABATEMENT OF POLLUTION, PREVENTION OF POLLUTION

- Municipal Solid waste treatment plant has been setup for treatment of municipal and solid waste generated at Duliajan Township.
- RCC concrete pit has been constructed for the environmental sound disposal of leftover drilling fluid.
- MoU signed with the Digboi Forest Division, Assam, to carry out afforestation on 100 hectares of degraded forestland.
- Memorandum of Understanding (MoU) in progress with upcoming TSDF facility by Mumbai waste management limited for disposal of hazardous waste generated by our installations and drilling sites.

PART – I

ANY OTHER PARTICULARS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT.

- Zero Routine Flare: Construction of pipelines and installation of Booster compressors led to 59% reduction in flare compared to previous year.
- Replacement of conventional energy intensive equipment (LED lights, BLDC fans etc.) with energy efficient equipment.
- Dynamic Gas Blending (DGB) retrofit kits have been installed on drilling rig engines, enabling them to operate on 100% diesel or a diesel- natural gas mix with up to 70% natural gas substitution. This system reduces environment impact by using flared gas as fuel, effectively substituting diesel and promoting cleaner energy use.

STATUS OF COMPLIANCE OF EC CONDITIONS

- **Installation:** ITF Tengakhat
- **Period:** 01/10/2025 to 31/03/2026
- **EC No:** J-11011/413/2008-I A II(I) DATED 24.01.2011

Specific Condition		
Sl No.	EC Condition	Compliance status/Remark
i.	Environmental clearance is subject to obtaining prior clearance from wildlife angle including clearance from the Standing Committee of the National Board for Wildlife regarding impact of the proposed project on the Padumani Wildlife Sanctuary (8.2 km from new BUS at Mahum), Borjhan Wildlife Sanctuary (5 km from STF) and 3 recently declared Wildlife sanctuaries (declared on 20th October, 1999) besides Dibru-Saikhowa National Park (9 km from BUS) located within 10 km. area as applicable.	Not applicable. The project does not attract wildlife clearance.
ii.	Grant of environmental clearance does not necessarily imply that wildlife clearance shall be granted to the project. The proposal for wildlife clearance shall be considered by the respective authorities on their merits and decision taken. The investment made in the project, if any, based on environmental clearance so granted, in anticipation of the clearance from wildlife angle shall be at the cost and risk of the project proponent and Ministry of Environmental & Forests shall not be responsible in this regard in any manner.	Point noted
iii.	Ambient air quality shall be monitored for PM10, SO2, NOx, and non-methane hydrocarbon (NMHC) as per the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R No. 826(E) dated 16 th November 2009.	Complied. Ambient air quality reports for ITF-Tengakhat are enclosed as annexure 1
iv.	The stacks of adequate height shall be provided to control emissions from all the sources including DG sets, steam generators etc. as per the regulatory requirements and emissions from stacks shall meet the MOEF/CPCB guidelines.	Complied. Emissions from the stack are within norms. Stack report attached as annexure 2

Sl. No.	EC Condition	Compliance status/Remark
v.	The company shall make the arrangement for control of noise from the DG sets and meet DG set norms notified by the MoEF.	Complied No DG units are available under ITF- Tengakhat. Power consumption requirement is met through captive power plant
vi.	Total ground water requirement for OCS, STF, ITF and BUS shall not exceed 128 m ³ /day/well and prior permission shall be obtained from the Central Ground Water authority/state Ground Water Board (CGWA/SGWB). A copy of the permission shall be submitted to the Ministry's Regional Office at Shillong. Effluent Treatment Plant (ETP) shall be installed to control oil content and other parameters as per Assam Pollution Control board (APCB) and/or Environment (Protection) Act whichever is more stringent. Treated wastewater shall be passed through multi-media filters to remove solids and clarified water shall be collected into storage tanks before pumping to disposal wells. Oily waste water shall be treated in oil separator to remove oil content in the effluent. Domestic effluent shall be treated in septic tank followed by soak pit. The treated effluent shall be monitored regularly.	Complied CGWA- NOC for withdrawal of ground water is enclosed for ITF- Tengakhat. Attached as annexure 3 Further, the ground water withdrawal and consumption reports for ITF- Tengakhat are enclosed for ITF- Tengakhat. Hence, complied. Attached as annexure 4 .
vii.	Tank bottom sludge from crude oil tanks of OCS shall be stored in secured covered impermeable concrete sludge pit located outside the proposed installation before safe disposal through approved/registered recyclers. Waste oil and used batteries shall be sold to authorized recyclers/re-processors. Secured land fill shall be as per the design approved by the CPCB and obtain authorization from the Assam SPCB. Copy of authorization shall be submitted to Ministry's Regional Office at Shillong.	Complied It may be noted that tanks are yet to be taken-up for cleaning for M&I jobs. Accordingly, arrangements shall be made available i.e. impermeable concrete-sludge pit for storage of tank sludge (as per EC conditions). Further, as on date, OIL has facilities for processing of waste oil/ sludge through 01 no. Sludge Processing Plant having a processing capacity of 20 KLPD. Hydrocarbon is recovered from the sludge by mechanized process using tricaning method (Industrial Centrifuge) and accordingly, recovered liquid is pumped to nearby Oil Collecting Station. The residual solid sludge is stored and processed through Bioremediation processes.

viii.	Total storage capacity of the tanks shall not exceed 40,000 KL after expansion. Capacity of the each of the storage tank shall not exceed 20,000 KL. Instead of fixed roof tanks, floating roof tanks shall be provided.	Complied
ix.	A comprehensive Oil Spill Contingency plan (OSCP) shall be prepared to handle all major, moderate and minor spill.	Complied. Attached as annexure 5 .
x.	All the OCS shall have facilities for knocking out water from the formation fluid. The Formation	Complied.

Sl. No.	EC Condition	Compliance status/Remark
	water from Electrostatic, Emulsion Treater (EET) shall be disposed to the disposal wells only after ensuring all the parameters within permissible limit of Assam PCB and / or prescribed under E(P) Act whichever is more stringent.	
xi.	Use of browser for the transportation of oil shall be stopped as soon as pipeline is installed.	Complied
xii.	M/s OIL shall prepare a remediation plan (both bio- remediation) where solid is contaminated due to spillage of oil in existing units and submit to MOEF.	Complied Remediation plan facility at Dikom is valid until 5.12.2027
xiii.	An immediate action shall be ensured to control and treat oil spill or oil sludge using suitable method. Remaining oil shall be remediated through bioremediation / Phyto-remediation etc. The recyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers.	Complied Sludge Processing Plant of having a processing capacity of 20 KLPD is in operation for processing/ treatment. Herein, Hydrocarbon is recovered from the sludge by mechanized process using decanting method (Industrial Centrifuge) and accordingly, recovered liquid is pumped to nearby Oil Collecting Station. Emergency Response Plan to mitigate oil spillage and its control is in place and bioremediation is carried out for remaining oil.

xiv.	All the solid/hazardous waste including bottom sludge shall be handled as per the rules and guidelines under Manufacture, Storage and Import of Hazardous chemicals Rules, 1989 as amended in October, 1994 and January, 2000. All the oily sludge from ITF, STF, and BUS OCS shall be stored in secured land fill (SLF) as per CPCB guidelines.	Complied. Form-3 and Form-10 attached as Annexure 6.
xv.	Handling and disposal of hazardous wastes shall be in accordance with the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008. Authorization from the Assam SPCB shall be obtained for collections/treatment/storage/disposal of hazardous wastes.	Complied
xvi.	The project authorities shall patrol and inspect the pipeline regularly for detection of faults as per OISD guidelines and continuous monitoring of pipeline operations by adopting non- destructive method (S) of testing. Pearson survey and continuous potentialsurvey shall be carried out a regular interval to ensure the adequacy of cathodic protection system.	Complied Our pipelines are integrated into a centralized SCADA (Supervisory Control and Data Acquisition) system, providing real-time monitoring of pressure and flow parameters. This allows for instantaneous leak detection and automatic shutdown in the event of any deviation from standard operating limits
xvii.	The project authorities shall install SCADA system for safe operation of pipeline and leak Detection Systems (LDS). Additional sectionalizing valves in the residential area and	Complied SCADA system has been installed at the installation to monitor the leak for safe operation of pipeline.

Sl. No.	EC Condition	Compliance status/Remark
	sensitive installations shall be provided to prevent the spillage of the oil in the event of pipeline failure. Intelligent pigging facility shall be provided for the entire pipeline system for internal corrosion monitoring.	
xxviii.	M/S OIL shall ensure smokeless flaring in case of ground flaring. The company shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. At the place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseousemissions during operation. To prevent fire and explosion at Oil and Gas facility, potential ignition sources shall be kept to a minimum and adequate separation distance between potential ignition sources and flammable materials shall be in place.	Complied No Flaring carried out at ITF Tengakhat
xix.	The flare system shall be designed as per good oil fieldpractices and oil industry Safety Directorate (OISD) guidelines.	Complied
xx.	The firefighting facilities shall be designed as per OISD-117 guidelines. For fighting prolonged fires, thecompany shall firm up a plan for assured water supply from nearby ground water/surface water sources.	Complied
xxi.	Comprehensive Risk assessment and Consequence Analysis for all the activities regarding impact of the proposed project on the Secondary Tank Farm (STF), Oil Collecting Station (OCS), Intermediate Tank Farm (ITF), Browser Unloading station (BUS) and pipeline shall be carried out. Action plan to implementthe recommendations shall be submitted to the ministry and proper implementation shall be ensured.	Complied HAZOP, QRA, CA are being carried out as per OISD GDN 206 & ATR also being prepared are being verified by OISD, DGMS during audits.
xxii.	Occupational health surveillance of the workers shall be carried out as per the prevailing Acts andRules.	Complied
xxiii.	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA/EMP report.	Complied with the environmental protection measures and safeguards recommended in the EIA/EMP report.
xxiv.	The surface facilities shall be installed as per applicable codes and standards, international practices and applicable local regulations.	Complied All the surface facilities are installed as per applicable codes and standards, international practices and

Sl. No.	EC Condition	Compliance status/Remark
		applicable local regulations such as API, ASTM, OISD, OMR, APCB & CPCB etc
xxv.	The design, material of construction, assembly, inspection, testing and safety aspects of operation and maintenance of pipeline and transporting the natural gas/oil shall be governed by ASME/ANSI B 31.8/B31.4 and OISD standard 141.	Complied
xxvi.	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Complied

General Condition

Sl No.	EC Condition	Compliance status/Remark
i.	The project authorities must strictly adhere to the stipulations made by the Assam State Pollution Control Board (ASPCB), State Government and any other statutory authority.	Complied
ii.	No further expansion or modifications in the project shall be carried out without prior approval of the Ministry of environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Complied No further expansion has been carried out
iii.	The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous chemicals Rules, 2000 as amended subsequently. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire safety Inspectorate etc. must be obtained, wherever applicable.	Complied

Sl. No.	EC Condition	Compliance status/Remark
iv.	The project authorities must strictly comply with the rules and regulation with regarding to handling and disposal of Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/disposal of hazardous wastes.	Complied We are already in the process of obtaining TSDF certification.
v.	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generations. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70dBA (night time).	Noise level monitoring reports attached as annexure 7 .
vi.	A separate Environment Management Cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	Complied
vii.	The project authorities shall provide adequate funds both recurring and non- recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose.	Complied
viii.	The Regional Office of this Ministry/Central Pollution Control Board/ Assam State Pollution Control Board shall monitor the stipulated conditions. A six-monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	Complied
ix.	A copy of clearance letter shall be sent by the proponent to concern Panchayat, Zila Parishad / Municipal Corporation, Urban Local Body and local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.	Complied

Sl. No.	EC Condition	Compliance status/Remark
x.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF, the respective Zonal Office of CPCB and the Assam SPCB. The Criteria pollutant levels namely;SPM, RSPM, SO ₂ , NO _x , HC (Methane & Non-methane), VOCs (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	Complied Compliance status including monitored data is regularly uploaded on company's website and sent to concerned government authorities. Monitored data is also enclosed herewith.
xi.	The Project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environment conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional of MOEF, the respective Zonal Office of CPCB and the Assam SPCB. The Regional Office of this Ministry/ CPCB/ Assam SPCB shall monitor the stipulated conditions.	Complied EC compliance report for the period April 2025 to Sept 2025 was submitted to Sub-RO, Guwahati, Zonal Office CPCB, Shillong and, Chairman - Pollution Control Board Assam vide L.No. Ref. No.:HSE/E/43C-1/1481(A) dated 29.11.2025. Also, copy of the EC and Six-monthly compliance report are uploaded to OIL website under the link https://www.oil-india.com/environmental-compliance-reports Cover letter of the same is attached as annexure 8
xii.	The environment statement for each financial year ending 31st march in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail.	Complied. Environment Statement (Form – V) for the F.Y. 2025-26 was submitted to Pollution Control Board, Assam Ref. No.: HSE/E/21(B)/928 dated: 01.09.2025 Copy of the same is enclosed as Annexure 9

xiii.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the Assam SPCB and may also be seen at Website of the Ministry of Environment and Forest at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspaper that are widely circulated in the region of which one shall be forwarded to the Regional Office.	Complied
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No.	EC Condition	Compliance status/Remark
xiv.	Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	Complied

Ambient Air Quality Monitoring Report

Name & Address of the Customer :		Report No. : MSK/2024-25/02228A48			
"M/s OIL INDIA LIMITED", Duliajan, Dibrugarh, Assam-786602		Report Date : 29.12.2024			
		Sample Description : Ambient Air			
		Sample Number : MSKGL/ED/2024-25/12/02075			
		Sampling Location : ITF TENGAKHAT			
Instrument ID : RDS 221-DTJ-2016/ FPS 1120A22		GPS Reading : N 27°51'38", E 95°42'53"			
Ref. No.:W.O. NO.- 8129283 of Contract No. 6119277					
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date		
19.12.2024	23.12.2024	23.12.2024	29.12.2024		
Enviromental Conditions During Sampling & Transport Condition :Temperature : 22°C, Rain fall : NO					
Analysis Result					
Sl. No.	Test Parameter	Method	Unit	Results	CPCB Limit
1.	Particulate Matter (PM ₁₀)	IS : 5182 (Part-23)-2006	(µg/m ³)	58.8	100
2.	Particulate Matter (PM _{2.5})	IS : 5182 (Part-24)	(µg/m ³)	30.6	60
3.	Sulphur Dioxide (SO ₂)	IS : 5182 (Part-2)-2001	(µg/m ³)	6.2	80
4.	Nitrogen Dioxide (NO ₂)	IS : 5182 (Part-6)-2006	(µg/m ³)	16.3	80
5.	Carbon Monoxide (CO)	IS 5182 : (Part-10) :1999	(mg/m ³)	0.44	2
6.	Ozone (O ₃)	IS:5182 (Part-IX)-1974 Reaffirmed-2019	(µg/m ³)	<20.0	180
7.	Ammonia (NH ₃)	IS 5182 (Part 25) : 2018	(µg/m ³)	<10.0	400
8.	Lead (Pb)	USEPA IO-3.4	(µg/m ³)	<0.01	1
9.	Nickel (Ni)	USEPA IO-3.4	(ng/m ³)	<5.0	20
10.	Arsenic (As)	USEPA IO-3.4	(ng/m ³)	<1.0	6
11.	Benzene (C ₆ H ₆)	IS 5182 : (Part 11) :2006	(µg/m ³)	<4.2	5
12.	Benzo(a)Pyrene (BaP)	IS 5182 : (Part 12) :2004	(ng/m ³)	<0.5	1
13.	Mercury (Hg)	USEPA IO-5.0	(µg/m ³)	<0.002	...
14.	Methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	1.99	...
15.	Non-methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	<0.5	...
16.	Total Hydrocarbon	IS 5182 : (Part 17)	ppm	1.99	...
17.	Volatile Organic Compounds (VOC)	IS 5182 : (PART-11):2006	(µg/m ³)	<4.2	...
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality					

Analyzed By:

Signature : 
 Name : Mr. Bhaskarjyoti Dutta
 Designation : Chemist

Prepared By:

Signature : 
 Name : Hiramoni Rajbongshi
 Designation : Office Assistant

Authorized Signatory

For Mitra S.K. Private Limited

Signature : 
 Name : Mr. Ravi Sankar Roy
 Designation : Branch Manager

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- Our Lab is Approved by NABL & MOEF, Lab Address : P-48 Udayan Industrial Estate, 3 Pagladanga Road Kol-700015

Head Office: Shrachi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016, West Bengal, India.
 Tel. : 91 33 40143000 / 22650006 / 22650007 Fax : 91 33 22650008
 Email : info@mitrask.com. Website: www.mitrask.com



Approved by
 Uttam Prodhan

Suptdg. Research Scientist, R&D Dept.,
 Oil India Ltd., Duliajan, Assam

Ambient Air Quality Monitoring Report

Name & Address of the Customer :		Report No. : MSK/2025-26/02247			
"M/s OIL INDIA LIMITED", Duliajan, Dibrugarh, Assam-786602		Report Date : 19.01.2026			
		Sample Description : Ambient Air			
		Sample Number : MSKGL/ED/2025-26/01/00805			
		Sampling Location : ITF TENGAKHAT			
		Instrument ID : RDS 341-DTF-2018/ FPS 95-DTL-2021			
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277		GPS Reading : N 27°23'49", E 95°07'13"			
Date of Sampling	Sample Received Date	Analysis Start Date		Analysis Complete Date	
02.01.2026	05.01.2026	05.01.2026		12.01.2026	
Environmental Conditions During Sampling & Transport Condition : Temperature : 24°C, Rain fall : No					
Analysis Result					
Sl. No.	Test Parameter	Method	Unit	Results	CPCB Limit
1.	Particulate Matter (PM ₁₀)	IS : 5182 (Part-23)-2006	(µg/m ³)	74.2	100
2.	Particulate Matter (PM _{2.5})	IS : 5182 (Part-24)	(µg/m ³)	36.9	60
3.	Sulphur Dioxide (SO ₂)	IS : 5182 (Part-2)-2001	(µg/m ³)	8.2	80
4.	Nitrogen Dioxide (NO ₂)	IS : 5182 (Part-6)-2006	(µg/m ³)	25.2	80
5.	Carbon Monoxide (CO)	IS 5182 : (Part-10) :1999	(mg/m ³)	0.68	2
6.	Ozone (O ₃)	IS:5182 (Part-IX)-1974 Reaffirmed-2019	(µg/m ³)	23.8	180
7.	Ammonia (NH ₃)	IS 5182 (Part 25) : 2018	(µg/m ³)	<20.0	400
8.	Lead (Pb)	IS 5182 : (PART-30)	(µg/m ³)	<0.01	1
9.	Nickel (Ni)	IS 5182 : (PART-30)	(ng/m ³)	<5.0	20
10.	Arsenic (As)	IS 5182 : (PART-30)	(ng/m ³)	<1.0	6
11.	Benzene (C ₆ H ₆)	IS 5182 : (Part 11) :2006	(µg/m ³)	<4.2	5
12.	Benzo(a)Pyrene (BaP)	IS 5182 : (Part 12) :2004	(ng/m ³)	<0.5	1
13.	Mercury (Hg)	USEPA IO-5.0	(µg/m ³)	<0.002	...
14.	Methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	1.90	...
15.	Non-methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	<0.5	...
16.	Total Hydrocarbon	IS 5182 : (Part 17)	ppm	1.90	...
17.	Volatile Organic Compounds (VOC)	IS 5182 : (PART-11):2006	(µg/m ³)	<4.2	...
Limit as per CPCB notification, New Delhi, 18th Nov, 2009, for Ambient air quality					

Analyzed By:

Signature : 
 Name : Mr. Dipankar Mazumdar
 Designation : Technical Manager

Prepared By:

Signature : 
 Name : Mr. Dipankar Das
 Designation : Office Assistant

Authorized Signatory

For Mitra S.K. Private Limited

Signature : 
 Name : Mr. Ravi Sankar Roy
 Designation : Branch Manager

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 Email : info@mitrask.com. Website: www.mitrask.com


Approved By
 Uttam Prodhan
 Dy. CRS – R&D, OIL

Ambient Air Quality Monitoring Report

Name & Address of the Customer :		Report No. : MSK/2025-26/01769			
"M/s OIL INDIA LIMITED", Duliajan, Dibrugarh, Assam-786602		Report Date : 29.11.2025			
		Sample Description : Ambient Air			
		Sample Number : MSKGL/ED/2025-26/11/01087			
		Sampling Location : ITF TENGAKHAT			
Instrument ID : RDS 221-DTJ-2016/ FPS 1120A22		GPS Reading : N 27°23'49", E 95°07'13"			
Ref. No.:W.O. NO.- 8129283 of Contract No. 6119277					
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date		
19.11.2025	22.11.2025	22.11.2025	29.11.2025		
Enviromental Conditions During Sampling & Transport Condition : Temperature : 28°C, Rain fall : No					
Analysis Result					
Sl. No.	Test Parameter	Method	Unit	Results	CPCB Limit
1.	Particulate Matter (PM ₁₀)	IS : 5182 (Part-23)-2006	(µg/m ³)	73.9	100
2.	Particulate Matter (PM _{2.5})	IS : 5182 (Part-24)	(µg/m ³)	29.5	60
3.	Sulphur Dioxide (SO ₂)	IS : 5182 (Part-2)-2001	(µg/m ³)	7.1	80
4.	Nitrogen Dioxide (NO ₂)	IS : 5182 (Part-6)-2006	(µg/m ³)	22.8	80
5.	Carbon Monoxide (CO)	IS 5182 : (Part-10) :1999	(mg/m ³)	0.76	2
6.	Ozone (O ₃)	IS:5182 (Part-IX)-1974 Reaffirmed-2019	(µg/m ³)	20.3	180
7.	Ammonia (NH ₃)	IS 5182 (Part 25) : 2018	(µg/m ³)	<20.0	400
8.	Lead (Pb)	USEPA IO-3.4	(µg/m ³)	<0.01	1
9.	Nickel (Ni)	USEPA IO-3.4	(ng/m ³)	<5.0	20
10.	Arsenic (As)	USEPA IO-3.4	(ng/m ³)	<1.0	6
11.	Benzene (C ₆ H ₆)	IS 5182 : (Part 11) :2006	(µg/m ³)	<4.2	5
12.	Benzo(a)Pyrene (BaP)	IS 5182 : (Part 12) :2004	(ng/m ³)	<0.5	1
13.	Mercury (Hg)	USEPA IO-5.0	(µg/m ³)	<0.002	...
14.	Methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	1.96	...
15.	Non-methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	<0.5	...
16.	Total Hydrocarbon	IS 5182 : (Part 17)	ppm	1.96	...
17.	Volatile Organic Compounds (VOC)	IS 5182 : (PART-11):2006	(µg/m ³)	<4.2	...
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality					

Analyzed By:

Signature : 
 Name : Mr. Dipankar Mazumdar
 Designation : Technical Manager

Prepared By:

Signature : 
 Name : Mr. Dipankar Das
 Designation : Office Assistant

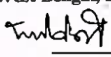
Authorized Signatory

For Mitra S.K. Private Limited

Signature : 
 Name : Mr. Ravi Sankar Roy
 Designation : Branch Manager

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Approved by
 Uttam Prodhan

Suptdg. Research Scientist, R&D Dept.,
 Oil India Ltd., Duliajan, Assam

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02190
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: ITF TENGAKHAT
		Sample Number	: MSKGL/ED/2025-26/12/01739
		Instrument ID	: 135-H-19
Ref. No.:W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
22.12.2025	26.12.2025	26.12.2025	01.01.2026

ANALYSIS RESULT

A.	<u>General information about stack :</u>			
1.	Stack connected to	: DRENCHING PUMP-111		
2.	Emission due to	: HSD		
3.	Material of construction of Stack	: MS		
4.	Shape of Stack	: Circular		
5.	Whether stack is provided with permanent platform & ladder	: Yes		
6.	DG capacity	: 313 HP		
B.	<u>Physical characteristics of stack :</u>			
1.	Height of the stack from ground level	: 10.688 m		
2.	Diameter of the stack at sampling point	: 0.1016 m		
3.	Area of Stack	: 0.00810 m ²		
C.	<u>Analysis/Characteristic of stack:</u>			
	1. Fuel used : HSD			
D.	<u>Result of sampling & analysis of gaseous emission</u>	<u>Result</u>	<u>Limit as per CPCB</u>	<u>Method</u>
1.	Temperature of emission (°C)	136	...	USEPA Part 2, 25.09.1996
2.	Barometric Pressure (mm of Hg)	762.0	...	USEPA Part 2, 25.09.1996
3.	Velocity of gas (m/sec.)	18.56	...	USEPA Part 2, 25.09.1996
4.	Quantity of Gas Flow (Nm ³ /hr)	392	...	USEPA Part 2, 25.09.1996
5.	Concentration of Oxygen (%v/v)	13.6	...	IS:13270 :1992 Reaff, 2014
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.266	≤ 3.5	IS:13270 :1992 Reaff, 2014
7.	Concentration of Carbon Dioxide (%v/v)	5.4	...	IS:13270 :1992 Reaff, 2014
8.	Concentration of Sulphur Dioxide (mg/Nm ³)	25.7	...	USEPA-29, 25/06/1996
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.322	≤ 4.7	USEPA Part-7, 12/03/1996& USEPA 18 -25.09.1996
10.	Concentration of Lead (mg/Nm ³)	<0.005	...	USEPA-29, 25/06/1996
11.	Concentration of Particulate matter (g/kW-hr)	0.141	≤ 0.3	USEPA Part-17, 16/08/1996
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.068K	≤ 0.7	AS PER CPCB
E.	<u>Pollution control device:</u>	<u>Remarks:</u> Nil		
	Details of pollution control devices attached with the stack : Nil			

Analyzed By:**Prepared By:**

Authorized Signatory

For Mitra S.K. Private Limited

Signature : 
Name : Mr. Dipankar Mazumdar
Designation. : Technical Manager

Signature : 
Name : Mr. Dipankar Das
Designation. : Office Assistant

Signature : 
Name : Mr. Ravi Shankar Roy
Designation : Branch Manager

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Email : info@mitrask.com. Website: www.mitrask.com

Approved By
Uttam Prodhan
Dy. CRS – R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02191
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: ITF TENGAKHAT
		Sample Number	: MSKGL/ED/2025-26/12/01740
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
22.12.2025	26.12.2025	26.12.2025	01.01.2026

ANALYSIS RESULT

A.	<u>General information about stack :</u>		:
1.	Stack connected to	:	DRENCHING PUMP-114
2.	Emission due to	:	HSD
3.	Material of construction of Stack	:	MS
4.	Shape of Stack	:	Circular
5.	Whether stack is provided with permanent platform & ladder	:	Yes
6.	DG capacity	:	313 HP
B.	<u>Physical characteristics of stack :</u>		
1.	Height of the stack from ground level	:	4.578 m
2.	Diameter of the stack at sampling point	:	0.1016 m
3.	Area of Stack	:	0.00810 m2
C.	<u>Analysis/Characteristic of stack:</u>		
	1. Fuel used : HSD		
D.	<u>Result of sampling & analysis of gaseous emission</u>	<u>Result</u>	<u>Limit as per CPCB</u>
			<u>Method</u>
1.	Temperature of emission (°C)	134	...
2.	Barometric Pressure (mm of Hg)	762.0	...
3.	Velocity of gas (m/sec.)	17.57	...
4.	Quantity of Gas Flow (Nm3/hr)	373	...
5.	Concentration of Oxygen (%v/v)	13.2	...
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.272	≤ 3.5
7.	Concentration of Carbon Dioxide (%v/v)	6.0	...
8.	Concentration of Sulphur Dioxide (mg/Nm3)	26.3	...
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.326	≤ 4.7
10.	Concentration of Lead (mg/Nm3)	<0.005	...
11.	Concentration of Particulate matter (g/kW-hr)	0.143	≤ 0.3
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.063K	≤ 0.7
E.	<u>Pollution control device:</u>		<u>Remarks:</u> Nil
	Details of pollution control devices attached with the stack : Nil		

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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 Approved By
 Uttam Prodhan
 Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02192
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: ITF TENGAKHAT
		Sample Number	: MSKGL/ED/2025-26/12/01741
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
22.12.2025	26.12.2025	26.12.2025	01.01.2026

ANALYSIS RESULT

A.	<u>General information about stack :</u>			
1.	Stack connected to			: DRENCHING PUMP-116
2.	Emission due to			: HSD
3.	Material of construction of Stack			: MS
4.	Shape of Stack			: Circular
5.	Whether stack is provided with permanent platform & ladder			: Yes
6.	DG capacity			: 313 HP
B.	<u>Physical characteristics of stack :</u>			
1.	Height of the stack from ground level			: 4.578 m
2.	Diameter of the stack at sampling point			: 0.1016 m
3.	Area of Stack			: 0.00810 m ²
C.	<u>Analysis/Characteristic of stack:</u>			
	1. Fuel used : HSD			
D.	<u>Result of sampling & analysis of gaseous emission</u>	<u>Result</u>	<u>Limit as per CPCB</u>	<u>Method</u>
1.	Temperature of emission (°C)	138	...	USEPA Part 2, 25.09.1996
2.	Barometric Pressure (mm of Hg)	762.0	...	USEPA Part 2, 25.09.1996
3.	Velocity of gas (m/sec.)	18.16	...	USEPA Part 2, 25.09.1996
4.	Quantity of Gas Flow (Nm ³ /hr)	382	...	USEPA Part 2, 25.09.1996
5.	Concentration of Oxygen (%v/v)	13.6	...	IS:13270 :1992 Reaff, 2014
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.256	≤ 3.5	IS:13270 :1992 Reaff, 2014
7.	Concentration of Carbon Dioxide (%v/v)	5.8	...	IS:13270 :1992 Reaff, 2014
8.	Concentration of Sulphur Dioxide (mg/Nm ³)	24.9	...	USEPA-29, 25/06/1996
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.318	≤ 4.7	USEPA Part-7, 12/03/1996& USEPA 18 -25.09.1996
10.	Concentration of Lead (mg/Nm ³)	<0.005	...	USEPA-29, 25/06/1996
11.	Concentration of Particulate matter (g/kW-hr)	0.136	≤ 0.3	USEPA Part-17, 16/08/1996
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.081K	≤ 0.7	AS PER CPCB
E.	<u>Pollution control device:</u>			<u>Remarks:</u> Nil
	Details of pollution control devices attached with the stack : Nil			

Analyzed By:

Signature : 
 Name : Mr. Dipankar Mazumdar
 Designation : Technical Manager

Prepared By:

Signature : 
 Name : Mr. Dipankar Das
 Designation : Office Assistant

Authorized Signatory

For Mitra S.K. Private Limited

Signature : 
 Name : Mr. Ravi Shankar Roy
 Designation : Branch Manager

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 Approved By
 Uttam Prodhan
 Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02193
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: ITF TENGAKHAT
		Sample Number	: MSKGL/ED/2025-26/12/01742
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
22.12.2025	26.12.2025	26.12.2025	01.01.2026

ANALYSIS RESULT

A.	<u>General information about stack :</u>			
1.	Stack connected to	: DRENCHING PUMP-112		
2.	Emission due to	: HSD		
3.	Material of construction of Stack	: MS		
4.	Shape of Stack	: Circular		
5.	Whether stack is provided with permanent platform & ladder	: Yes		
6.	DG capacity	: 313 HP		
B.	<u>Physical characteristics of stack :</u>			
1.	Height of the stack from ground level	: 10.688 m		
2.	Diameter of the stack at sampling point	: 0.1016 m		
3.	Area of Stack	: 0.00810 m2		
C.	<u>Analysis/Characteristic of stack:</u>			
	1. Fuel used : HSD			
D.	<u>Result of sampling & analysis of gaseous emission</u>	<u>Result</u>	<u>Limit as per CPCB</u>	<u>Method</u>
1.	Temperature of emission (°C)	129	...	USEPA Part 2, 25.09.1996
2.	Barometric Pressure (mm of Hg)	762.0	...	USEPA Part 2, 25.09.1996
3.	Velocity of gas (m/sec.)	18.34	...	USEPA Part 2, 25.09.1996
4.	Quantity of Gas Flow (Nm3/hr)	394	...	USEPA Part 2, 25.09.1996
5.	Concentration of Oxygen (%v/v)	13.8	...	IS:13270 :1992 Reaff, 2014
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.264	≤ 3.5	IS:13270 :1992 Reaff, 2014
7.	Concentration of Carbon Dioxide (%v/v)	5.4	...	IS:13270 :1992 Reaff, 2014
8.	Concentration of Sulphur Dioxide (mg/Nm3)	25.1	...	USEPA-29, 25/06/1996
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.320	≤ 4.7	USEPA Part-7, 12/03/1996& USEPA 18 -25.09.1996
10.	Concentration of Lead (mg/Nm3)	<0.005	...	USEPA-29, 25/06/1996
11.	Concentration of Particulate matter (g/kW-hr)	0.139	≤ 0.3	USEPA Part-17, 16/08/1996
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.073K	≤ 0.7	AS PER CPCB
E.	<u>Pollution control device:</u>		<u>Remarks:</u> Nil	
	Details of pollution control devices attached with the stack : Nil			

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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Head Office: Shraichi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016. West Bengal, India.

Tel. : 91 33 40143000 / 22650006 / 22650007 Fax : 91 33 22650008

Email : info@mitrask.com. Website: www.mitrask.com

Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02194
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: ITF TENGAKHAT
		Sample Number	: MSKGL/ED/2025-26/12/01743
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
22.12.2025	26.12.2025	26.12.2025	01.01.2026

ANALYSIS RESULT

A.	General information about stack :		:
1.	Stack connected to	:	DRENCHING PUMP-113
2.	Emission due to	:	HSD
3.	Material of construction of Stack	:	MS
4.	Shape of Stack	:	Circular
5.	Whether stack is provided with permanent platform & ladder	:	Yes
6.	DG capacity	:	313 HP
B.	Physical characteristics of stack :		
1.	Height of the stack from ground level	:	10.688 m
2.	Diameter of the stack at sampling point	:	0.1016 m
3.	Area of Stack	:	0.00810 m2
C.	Analysis/Characteristic of stack:		
	1. Fuel used : HSD		
D.	Result of sampling & analysis of gaseous emission	Result	Limit as per CPCB
			Method
1.	Temperature of emission (°C)	134	...
2.	Barometric Pressure (mm of Hg)	762.0	...
3.	Velocity of gas (m/sec.)	17.59	...
4.	Quantity of Gas Flow (Nm3/hr)	373	...
5.	Concentration of Oxygen (%v/v)	13.2	...
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.261	≤ 3.5
7.	Concentration of Carbon Dioxide (%v/v)	6.2	...
8.	Concentration of Sulphur Dioxide (mg/Nm3)	25.6	...
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.328	≤ 4.7
10.	Concentration of Lead (mg/Nm3)	<0.005	...
11.	Concentration of Particulate matter (g/kW-hr)	0.132	≤ 0.3
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.094K	≤ 0.7
E.	Pollution control device:		Remarks: Nil
	Details of pollution control devices attached with the stack : Nil		

Analyzed By:

Signature :

Name : Mr. Dipankar Mazumdar

Designation : Technical Manager

Prepared By:

Signature :

Name : Mr. Dipankar Das

Designation : Office Assistant

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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 Tel. : 91 33 40143000 / 22650006 / 22650007 Fax : 91 33 22650008
 Email : info@mitrask.com. Website: www.mitrask.com


 Approved By
 Uttam Prodhan
 Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02195
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: ITF TENGAKHAT
		Sample Number	: MSKGL/ED/2025-26/12/01744
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
22.12.2025	26.12.2025	26.12.2025	01.01.2026

ANALYSIS RESULT

A.	General information about stack :		:
1.	Stack connected to	:	DRENCHING PUMP-108
2.	Emission due to	:	HSD
3.	Material of construction of Stack	:	MS
4.	Shape of Stack	:	Circular
5.	Whether stack is provided with permanent platform & ladder	:	Yes
6.	DG capacity	:	198 HP
B.	Physical characteristics of stack :		
1.	Height of the stack from ground level	:	3.6576 m
2.	Diameter of the stack at sampling point	:	0.1016 m
3.	Area of Stack	:	0.00810 m2
C.	Analysis/Characteristic of stack:		
	1. Fuel used : HSD		
D.	Result of sampling & analysis of gaseous emission	Result	Limit as per CPCB
			Method
1.	Temperature of emission (°C)	131	...
2.	Barometric Pressure (mm of Hg)	762.0	...
3.	Velocity of gas (m/sec.)	18.41	...
4.	Quantity of Gas Flow (Nm3/hr)	394	...
5.	Concentration of Oxygen (%v/v)	13.4	...
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.112	≤ 3.5
7.	Concentration of Carbon Dioxide (%v/v)	5.8	...
8.	Concentration of Sulphur Dioxide (mg/Nm3)	23.8	...
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.212	≤ 4.7
10.	Concentration of Lead (mg/Nm3)	<0.005	...
11.	Concentration of Particulate matter (g/kW-hr)	0.096	≤ 0.3
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.061K	≤ 0.7
E.	Pollution control device:		Remarks: Nil
	Details of pollution control devices attached with the stack : Nil		

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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 Email : info@mitrask.com. Website: www.mitrask.com

Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02196
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: ITF TENGAKHAT
		Sample Number	: MSKGL/ED/2025-26/12/01745
		Instrument ID	: I35-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
22.12.2025	26.12.2025	26.12.2025	01.01.2026

ANALYSIS RESULT

A.	<u>General information about stack :</u>		:	
1.	Stack connected to	: TEMPORARY DRENCHING PUMP		
2.	Emission due to	: HSD		
3.	Material of construction of Stack	: MS		
4.	Shape of Stack	: Circular		
5.	Whether stack is provided with permanent platform & ladder	: Yes		
6.	DG capacity	: 198 HP		
B.	<u>Physical characteristics of stack :</u>			
1.	Height of the stack from ground level	: 2.4384 m		
2.	Diameter of the stack at sampling point	: 0.1016 m		
3.	Area of Stack	: 0.00810 m ²		
C.	<u>Analysis/Characteristic of stack:</u>			
	1. Fuel used : HSD			
D.	<u>Result of sampling & analysis of gaseous emission</u>	<u>Result</u>	<u>Limit as per CPCB</u>	<u>Method</u>
1.	Temperature of emission (°C)	135	...	USEPA Part 2, 25.09.1996
2.	Barometric Pressure (mm of Hg)	762.0	...	USEPA Part 2, 25.09.1996
3.	Velocity of gas (m/sec.)	18.09	...	USEPA Part 2, 25.09.1996
4.	Quantity of Gas Flow (Nm ³ /hr)	215	...	USEPA Part 2, 25.09.1996
5.	Concentration of Oxygen (%v/v)	13.6	...	IS:13270 :1992 Reaff, 2014
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.126	≤ 3.5	IS:13270 :1992 Reaff, 2014
7.	Concentration of Carbon Dioxide (%v/v)	5.4	...	IS:13270 :1992 Reaff, 2014
8.	Concentration of Sulphur Dioxide (mg/Nm ³)	24.5	...	USEPA-29, 25/06/1996
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.248	≤ 4.7	USEPA Part-7, 12/03/1996& USEPA 18 -25.09.1996
10.	Concentration of Lead (mg/Nm ³)	<0.005	...	USEPA-29, 25/06/1996
11.	Concentration of Particulate matter (g/kW-hr)	0.116	≤ 0.3	USEPA Part-17, 16/08/1996
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.071K	≤ 0.7	AS PER CPCB
E.	<u>Pollution control device:</u>			<u>Remarks:</u> Nil
	Details of pollution control devices attached with the stack : Nil			

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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 Dy. CRS - R&D, OIL



भूजल निकासी हेतु अनापत्ति प्रमाण पत्र
NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION

PROJECT NAME			ITF - TENGAKHAT, OIL INDIA LIMITED				
PROJECT ADDRESS			ITF TENGAKHAT Located at WILTON 22/157 ORR, TENGAKHAT TALUK, DIBRUGARH, ASSAM		PIN CODE	786103	
STATE		ASSAM	DISTRICT		DIBRUGARH	TOWN/BLOCK	TENGAKHAT
COMMUNICATION ADDRESS							OIL INDIA LIMITED DULIAJAN, DIBRUGARH, ASSAM - 786602
ADDRESS OF CGWB REGIONAL OFFICE							Opposite ISBT, NH-37, Guwahati,KAMRUP METRO ASSAM 781005.
1. NOC NO.			NOC/IND/AS/2025/8792/N		2. DATE OF ISSUANCE		25/07/2025
3. APPLICATION NO.			IND/AS/2025/8792		4. APPLICATION TYPE		Industry
5. PROJECT STATUS			Existing Project		6. NOC TYPE		New
7. VALID FROM			08/07/2025		8. VALID UP TO		07/07/2028
9. WATER QUALITY TYPE			Fresh Water		10. AREA TYPE CATEGORY		Safe (GWRE - 2024)

11. Ground Water Abstraction Permitted					
GW Abstraction		Dewatering		Total	
m ³ /day	m ³ /year	m ³ /day	m ³ /year	m ³ /day	m ³ /year
100.00	36500.00	0.00	0.00	100.00	36500.00

12. Details of Ground Water Abstraction /Dewatering Structures														
EXISTING 2					PROPOSED 0					TOTAL 2				
DW	DCB	BW	TW	Pu	DW	DCB	BW	TW	Pu	DW	DCB	BW	TW	Pu
0	0	0	2	0	0	0	0	0	0	0	0	0	2	0

*DW-Dug Well; DCB-Dug-cum-Bore Well; BW-Bore Well; TW-Tube Well; Pu Pumps;

Validity of this NOC shall be subject to mandatory compliance of the following conditions:

Phase I (within 30 days)

1. Installation of tamper proof digital water flow meter with telemetry on all the abstraction structure(s) is mandatory for all users seeking No Objection Certificate. Intimation regarding their installation shall be updated in Self-Compliance Module (Phase-I) of BhuNeer APP portal within 30 days of grant of No Objection Certificate.

Phase II (within 11 months)

1. Proponents shall mandatorily get water flow meter calibrated from an authorized agency once in a year.

2. Construction of purpose-built observation wells (piezometers) for ground water level monitoring is mandatory as per Section 14 of Guidelines. Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in Annexure-II of the notified guidelines.

3. Proponents shall monitor quality of ground water from all the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analyzed in NABL accredited or Govt. approved laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.

Phase III (Biennial)

1. Industries shall undertake Biennial water audit through certified water auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means.

All the above-mentioned mandatory compliance conditions are to be filed online in BHUNEER APP (<https://cgwa-bhuneer.mowr.gov.in>) timely.

General Conditions:

1. Application for renewal can be submitted online from 90 days before the expiry of NOC. Ground water withdrawal, if any, after expiry of NOC shall be illegal & liable for legal action as per provisions of Environment (Protection) Act, 1986 and amendment thereto, if any.
2. This NOC is subject to prevailing Central/State Government rules/laws/norms or Court orders related to construction of tube well/ground water abstraction structure / recharge or conservation structure/discharge of effluents or any such matter as applicable.
3. This NOC is being issued without any prejudice to the directions of the Hon'ble NGT/court orders in cases related to ground water or any other related matters.
4. No additional ground water abstraction and/or de-watering structures shall be constructed for this purpose without prior approval of the Central Ground Water Authority (CGWA).
5. The proponent shall seek prior permission from CGWA for any increase in quantum of groundwater abstraction as permitted in NOC.
6. Proponents shall install roof top rain water harvesting in the premise as per the existing building bye laws.
7. Proponents, who have installed/constructed rain water harvesting and artificial recharge structures shall continue to regularly maintain the water conservation structures.
8. The project proponent shall take all necessary measures to prevent contamination of ground water in the premises failing which the firm shall be responsible for any consequences arising thereupon.
9. Industries which are likely to cause ground water pollution, e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, pharmaceutical, other hazardous units etc. (as per CPCB list), no recharge measures shall be taken up by such firms inside the plant premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the firm. The firm need to undertake necessary well head protection measures to ensure prevention of ground water pollution as per Annexure III of the notified guidelines
10. Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.
11. Wherever the NOC is for abstraction of saline water and the existing wells (s) is /are yielding fresh water, the same shall be sealed and new tubewell(s) tapping saline water zone shall be constructed within 3 months of the issuance of NOC. The firm shall also ensure safe disposal of saline residue, if any.
12. Unexpected variations in inflow of ground water into the mine pit, if any, shall be reported to the concerned Regional Director, Central Ground Water Board.
13. This NOC does not absolve the proponents of their obligation / requirement to obtain other statutory and administrative clearances from appropriate authorities.
14. This NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and take decisions independently of the NOC.
15. In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 6 months of taking over possession of the premises.
16. In case of new infrastructure projects having ground water abstraction of more than 20 m³/day, the firm/entity shall ensure implementation of dual water supply system in the projects.
17. In case of infrastructure projects, paved/parking area must be covered with interlocking/perforated tiles or other suitable measures to ensure groundwater infiltration/harvesting.

18. In case of coal and other base metal mining projects, the project proponent shall use the advance dewatering technology (by construction of series of dewatering abstraction structures) to avoid contamination of surface water.

19. In the self-compliance report, the PP shall submit details of Drilling Agency/ Agencies, which has/ have constructed BW(s)/ TW(s) along with undertaking to the effect that all necessary measures have been taken as per directions of Hon'ble Supreme Court provided in Annexure-VII of guidelines dated 24.09.2020 in respect of abandoned/ failed BW(s)/ TW(s)/Piezometer(s), if any. The PP is advised to engage registered drilling agency/agencies. In the event of any mishap/ unfortunate incident due to negligence in taking measures for prevention of accident due to falling in Bore Well, both PP and concerned drilling agency shall jointly be held responsible and penal action as per extant Government rules shall be taken.

20. Non-compliance of the conditions mentioned above is likely to result in the cancellation of NOC and legal action against the proponent. In case of violation of any NOC conditions, the applicant shall be liable to pay the penalties as per Section 16 of Guidelines

Ground water withdrawal and consumption report

Date	Borewell No.	Withdrawal Rate (KLPH)	Hours of running of Pump	Total withdrawal (Qty) (in KLs)	Remarks
01-03-2026	BH-02	10	5	50	Re-filling of Fire water storage tanks, overhead tanks (consumed for test run of drenching pumps & mock drills as well as domestic use)
02-03-2026	BH-01	10	4	40	
03-03-2026	BH-02	10	4	40	
04-03-2026	BH-04	50	1	50	
05-03-2026	BH-02	10	4	40	
06-03-2026	BH-04	50	1.5	75	
07-03-2026	BH-02	10	4	40	
08-03-2026	BH-04	50	1.5	75	
09-03-2026	BH-02	10	4	40	
10-03-2026	BH-01	10	5	50	
11-03-2026	BH-02	10	4	40	
12-03-2026	BH-04	50	1	50	
13-03-2026	BH-02	10	4	40	
14-03-2026	BH-04	50	1	50	
15-03-2026	BH-04	50	1	50	
16-03-2026	BH-02	10	4	40	
17-03-2026	BH-02	10	6	60	
18-03-2026	BH-02	10	3	30	
19-03-2026	BH-02	10	4	40	
20-03-2026	BH-04	50	1	50	
21-03-2026	BH-02	10	4	40	
22-03-2026	BH-01	10	5	50	
23-03-2026	BH-04	50	1.5	75	
24-03-2026	BH-02	10	2	20	
25-03-2026	BH-01	10	5	50	
26-03-2026	BH-02	10	4	40	
27-03-2026	BH-01	10	5	50	
28-03-2026	BH-02	10	6	60	
29-03-2026	BH-01	10	4	40	
30-03-2026	BH-02	10	3	30	
31-03-2026	BH-01	10	4	40	
Total withdrawal (in KLs)				1445	



ऑयल इंडिया लिमिटेड

(सकल संपत्ति का रक्षक)

Oil India Limited

(INCORPORATED IN INDIA)

OIL SPILL CONTINGENCY PLAN

**Prepared by
HSE Department
OIL INDIA LIMITED**



ऑयल इंडिया लिमिटेड
(भारत सरकार का उद्यम)
Oil India Limited
(A Government of India Enterprise)

Oil Spill Contingency Plan in OIL INDIA LIMITED

Approval

	Name	Signature
Approved by	Shri Ajit Chandra Haloi Chief General Manager (HSE)	
Reviewed by	Shri Gopal Govinda Rasu Dy. General Manager (HSE)	
Prepared by	Bhabananda Saikia Superintending Engineer (HSE)	

Date	Revision Details	Revision Number
01.06.2013	First Issue	00
23.11.2022	Second Issue	01

Executive Summary

Oil India Limited, by its nature of operation has storage, transportation and handling facilities of oil through tankages, pipelines and browsers, distributed in its area of operation. Oil Spill Contingency Plan (OSCP) is endeavoured to be practical document for preparedness for probable incidents of oil spillage and guidance for tackling an oil spill and recovery from the effects with some procedures laid down.

Having an OSCP fulfils the requirement of Indian Government commitments to the United Nation's conventions on Oil Spills and its response. Ministry of Environment, Forest and climate change (MoEF&CC) has also emphasized the same as per Indian Coast Guard's National Oil Spill Disaster Contingency Plan and various notifications to individual companies at the time of commencement of operations in the oil fields.

This OSCP is for On-shore operations only considering the geographical location of OIL's operation. The document defines the roles and responsibilities, procedures of response in tier-I spillage, escalation to tier -II and tier-III and operational readiness in its scope of applicability. The OSCP is prepared under the guidance of OISD-GDN- 200 guidelines of Indian Coast guard wherever applicable. American Petroleum Institute's documents are also referred. It is aligned with the Off Site Disaster Management Plan, ERDMP & Corporate Disaster Management Plan.



(A C Haloi)

Chief General Manager (HSE) - HoD

Date: 23.11.2022

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ABBREVIATIONS & ACCRONYMS

DCR	Disaster Control Room
DMP	Disaster Management Plan
DOP	Delegation of Power
ECR	Emergency Control Room
ECT	Emergency Control Team
ERDMP	Emergency Response and Disaster Management Plan
IM	Installation Manager
NOS	DCP National Oil Spill Disaster Contingency Plan.
OISD	Oil Industries Safety Directorate
OIL	Oil India Limited
OSC	On site Coordinator
OSCP	Oil Spill Contingency Plan
OSD	Oil Spill Dispersant
OSR	Oil Spill Response
POL	Petroleum Oil and Lubricants

1.0 SCOPE

This “Oil Spill Contingency Plan” is applicable to the Geographical Area of OIL’s onshore operation in FHQ Area, viz. producing districts of Assam & Arunachal Pradesh. However, it may be referred in other spheres also. The scope includes the containment, control, clean up and recovery of oil spillage that may arise from OIL’s exploration, drilling, production and transportation activities. It does not include the litigations, compensation etc.

2.0 OBJECTIVE

- To establish an effective system for detection and reporting of spills.
- To establish adequate measures for preparedness for tackling of oil spillage at various locations.
- To facilitate rapid and effective response to oil spillage.
- To establish adequate measures for crew, responders, and public health and safety, and protect the land and water environment.
- To establish appropriate response techniques to prevent, control and combat pollution and dispose-off the recovered material in an environmentally sound manner.
- To provide a training and develop awareness amongst the employees.
- To provide plan & programme for practice drill based on scenarios.
- To meet statutory requirements.
- To establish response procedures for oil spill.

3.0 INTERFACE WITH OTHER PLANS

This plan is developed in conjunction with the following documents:

- (i) OIL HSE Policy and Plan
- (ii) Off-site Disaster Management Plan, On-site Disaster Management Plan and ERDMP of OIL.
- (iii) National Oil Spill Disaster Contingency Plan (NOS-DCP) issued by the Coast Guard Headquarters.
- (iv) OISD GDN- 200 for Preparation of Oil Spill Response Contingency Plan.
- (v) OISD GDN- 165: Rescue and relief operations for POL truck tank accident.

4.0 PERCEIVED OIL SPILL RISKS AND SPILL QUANTITIES

4.1 Response to an oil spillage depends upon two factors: Quantity of oil spilled and Circumstances of the spill. Depending upon the scenario the response should be attempted. Broadly, the oil spill scenarios are categorized as:

1. Tier- I: Preparedness and response to small spill within capabilities of an individual installation/facility.
2. Tier-II: Preparedness and response to spill that requires the co-ordination of more than one source of equipment and personnel (or other than resources from OIL).
3. Tier-III: Major spill requiring the mobilization of all available national resources and depending upon the circumstances, will likely involve mobilization of regional and international systems.

4.2 Risk Assessment:

Factors on which the assessment is to be conducted are listed for guidance for implantation of this plan at Installation level:

1. Source of leakage;
2. Location;
3. Circumstances;
4. Quantity of leakage;
5. Financial Implication;
6. Regulatory Implication;
7. Weather condition;
8. Reputational risks;

Considering the factors listed above assessment of risks of oil spillage to be done at installation level. A copy of such document shall be prepared and kept for reference at every installation.

Main spill scenarios of spillage are briefed below for guidance. However, exhaustive assessment of risks to be made and kept for reference at installation level.

The facilities/ resources of Commercial, Social, Ecological and recreational value around an installation have to be identified by the Installation at installation level and keep a list of those at respective installation to supplement this plan.

4.2.1 Well Blow - out Incidents:

Various stages of drilling shall be assessed for -

- a. Exploratory wells:
- b. Developmental wells:
- c. Producing wells:

An oil spill due to Well Blow out is possible during Drilling activities when wells are drilled to meet exploration, development or production requirement. Well blowout is also possible during any subsequent “Well Intervention” of existing wells for Work - Over activities. In the event of an unfortunate well blow out, the situation will call for the immediate services of Well Control specialists. However, adherence to established drilling procedures, which includes proper use of Blowout Preventers (BOPs) of rated pressures, will adequately control the oil spill risk due to well blowouts. Available Contingency Plan for impending blowout to be followed.

4.2.2 Leakage from Couplings/ Joints/ Valves:

Spillage due to likely leak from sources, like, Hose Joints, Valves and Blinds, Swivel Joints, Flange Joints are to be assessed at installation level. Such Installations shall assess the risk of oil spill for the probable leakages from flanges of pipelines under it.

4.2.3. Spillage from Tanker:

Spillage from tank and bowsters may occur due to road accidents. To avoid risks of road accidents necessary legal and available best practices should be taken. Given a spillage, occur in spite, if information were received from other sources and agencies, the crew who are in the responsibility of emergency communication shall convey information to depot / terminal / installation immediately. OISD-GDN-165 to be referred in this respect.

4.4.4 Leakage from pipeline:

The pipeline carries highly inflammable crude oil & natural gas. Though utmost precautions are taken, sometimes the pipeline may leak, due to corrosion, miscreant activity, god's act, failure of safety devices etc. Since the pipelines are numerous and distributed in many geographical profiles, spillage of crude is highly situation and location specific. Given the numbers of pipelines, vastness of network, locations chance of spillage from a pipeline is highest.

4.4.5 Bursting of pipeline in the river Crossings/ Rail / road bridges / Aerial Crossings:

The bursting at these may be caused due to corrosion, by accidental hit by heavy equipment, by snapping of aerial crossings, accidental hit by heavy equipment, by snapping of aerial crossings pipe support strings, miscreant activity etc. This may result in huge oil spillage polluting the water.

4.4.6 War and Civil commotion:

Due to bombing during war or by terrorist or attempted pilferage, the pipeline may develop leak or burst. The oil spillage may be high and may result in fire.

4.4.7 Hurricane Damage to Pipeline at rail/road bridge/aerial crossing

Due to high velocity of wind, the pipe supports may be snapped. This may result in breakage of pipeline leading to oil spillage. If there is a heavy rainfall, due to high turbulence of water, there may not be any fire.

5. SPILL RESPONSE STRATEGY

5.1 OIL shall adhere to the applicable standards in its equipment. Oil Spill Response flow of information & responsibilities is given at Annexure-4 and Annexure-5, as per the plan, the responsibilities during oil spill response is well defined.

In any oil spill response, mobilization of resources depends on a number of factors. Those are:

- Different risk scenarios, quantity of spill, and spill tracking;
- Equipment need;

- Man power requirement;
- Communication channels;
- Operation;
- Data directory

5.2 The Station in-charges (or Installation Managers), from both probable upstream and downstream shall proceed to detect the exact location to find out the exact location of spillage on receipt of the information of spillage from any source. In the meantime, search party will process along the row and locate the spill site. This ground party will have a mobile fitted jeep, hand wheel of block valves, box key etc (Refer Annexure-6). They will locate the exact site and inform as per the information flow matrix Annexure-4 and Annexure-5. The On-site Co-ordinator (OSC) shall act as the controller of the incident, arrange for the mobilization of emergency equipment, men and materials and position at the site in his best capacity. OSC will establish radio link/communication between the sites and communicate as per the communication channel of Annexure-4 and Annexure-5 respectively.

5.3 OIL SPILL EQUIPMENT

The following spill control equipment should be in place in sufficient quantity as per the finding of assessment carried out as mentioned in 4.2 and record should be maintained in the following format :

(i) Sorbent & Sorbent booms (river standard)	(viii) Raft
(ii) Petroleum sorbent rolls	(ix) Drum
(iii) Petroleum sorbent pillars	(x) Pump
(iv) Skimmer	(xi) OCV
(v) Oil spill Dispersant (OSD)	(xii) Hand Boom
(vi) Tent	(xiii) HC Pads
(vii) Tags	(xiv) Life Jacket

Format:

RESOURCES	QTY.	LOCATION	CUSTODIAN DEPT.
1)			

Custodian Department shall procure the equipment and keep in a readily deployable position/condition.

6. RESPONSE PLANNING:

6.1 Reporting of oil spill incident:

Immediately upon notice of oil spill, "Incident Reporting" shall be done in the prescribed format (Format: Annexure- 2) to the following:

- Internal within the organisation through mail, and SMS.
- OISD when applicable
- Mutual Aid Partners (in case it is declared Tier-II)

IM shall ensure to inform internally to HoD-PSS Department for necessary support services. The reporting may be done as per Annexure-4 & Annexure-5 flow chart.

6.2 Isolation & Security:

OSC or IM shall ensure to isolate the line both in upstream & downstream if any. Ensure the safety of the area by providing security guards, prohibiting smoking and use of naked lights through Security Dept. Area to be cordoned off and safety signboards to be posted. IM's shall also ensure lock out and tag out of isolation valves at both the ends. IM shall obtain permission from the landowners with the support and co-ordination from HR-E/ PA and Land Department, if necessary for use of their private land in raising earth bunds cutting cellar to contain the leak. Apart from visual observation by the team under the OSC, aerial surveys shall be made if necessary. Eventually senior level executive (DGM & above) shall take over as the OSC and move to the spillage site with team comprising of representatives from various concerned departments like Security, PSS & Civil. He will have the overall responsibility & he will have authority over the members of the cross functional team. All the representatives shall work under his guidance and with co-ordination with the OSC. After assessing the situation with team, OSC shall appraise the Asset Manager and RCE. RCE shall be fully empowered to take decisions and activate ECT. Entire communication channel shall be guided by Annexure-4 and Annexure-5. OSC shall report to the management as per the format of Annexure-4 and Annexure-5. While Assessing OSC shall consider the factors as per 4.2.

As required by the circumstances the team will:

- Obtain a suitable slick-tracking model for the size of oil spill that has occurred and predict the likely developments of the incident.
- Mobilise clean-up teams and equipment as advised by OSC.
- Liaise with other departments.
- Arrange for contracted vessels to be equipped with any required equipment (i.e. PRP/OSD, booms, absorbent booms, mats etc.)
- Inform nearby installation operators if slick is identified to be moving out of the operating area.
- Keep OSC informed of major developments affecting clean-up operations onshore.
- Assess requirement of water and land transport and accordingly take action.
- Stand down only after instruction from OSC.
- Submit log of events to HoD-HSE.
- Arrange to return equipment/services availed from other sources.
- Commence procedures to ensure payments are made for emergency resources.

6.3 Retrieving oil spills:

Retrieve the oil into drums/tanks in the case of large oil spills using pneumatic pump for transport the oil from spoiled area to the tanks.

6.4 Firefighting:

Fire Tenders shall move immediately on receipt of call to the location and take position. Firefighting team shall be under the control of HoD-HSE put trailer pump or any other portable fire pump in service and act as per the scenario.

6.5 Repair:

Repair shall be attempted as soon as possible to avoid further spillage. Work out the methods of leak repair in consultations with Chief Coordinator and Operation Coordinator (Refer 8.2) giving accurate information on the extent of damage. However, recovery from the spillage shall not be delayed for the sake of repair. OSC shall always prioritize control and containment of spillage over repair of the leakage. Mobilization of men and materials required for the leak repair work as directed from Headquarters. OSC/IM shall carry out leak repair works as demanded by the situation on arrival of men and materials for that purpose.

Note:

01. In the event of a hurricane, communication may be completely disrupted. After stopping the pumping operations, the search party should approach from both upstream/ stations and isolate the line for stoppage of the leak.

02. In case of war or civil commotion, the control measures for different locations will be as discussed earlier taking the law and order authorities into confidence and under their guidance.

6.6 Strategy for oil and waste storage and disposal:

There are two major steps in oil spillage contingency. Those are Containment and Recovery. The oily waste can be either collected from the affected area. During onshore waste collection, it will be mostly oil with mud sand, pebbles, small plants etc. and chocolate mousse. During spill in water body, the waste collection would include oil, oily waste mixture, chocolate mousse, floating debris soaked in oil, floating vegetation etc.

The spilled oil shall be collected into drums/tanks in the case of large oil spills using pump for transport. Necessary oil tanker or bowser shall be kept nearby to the site and the collected oil shall be unloaded at the designated area in a safe & environmental friendly manner.

The hazardous waste is to be managed and handled as per Hazardous Wastes (Management and Handling) Amendment Rules, 2016.

7. EMERGENCY CONTROL TEAM (ECT)/ECR

The ECT/ECR will comprise of the following members under the leadership of ED-FHQ-A.

- Asset Manager/ Surface Manager
- HoD-PSS
- HoD – HSE
- HoD- Civil
- HoD– Admin.
- HoD-PA
- HoD-Finance and Accounts / GM (F&A)
- HoD-Contract
- HoD- Electrical
- HoD- Materials
- HoD- Security

They may appoint their representatives in senior executive level.

7.1 Important duties:

(A) On Site Co coordinator (OSC)

On Site Coordinator shall be the official Installation Manager (IM) under whose jurisdiction oil spill has taken place, shall be the person responsible for the oil spill response activities.

On Site Coordinator (OSC) is to assess the situation of the spill and shall take action as per following:

1. Effective and Safe deployment of oil spill response (OSR) equipment and deployment of trained OSR team.
2. Requisitioning of extra manpower from Support Manager through ECR.
3. Shall prepare the duty roster of personnel's and ensure that every one has understood his duty to be performed.
4. Shall ensure that each duty watch is suitably turned around as per demand of the situation.
5. Shall ensure that he is always in communication with his team /team leaders as well as Emergency Control Room (ECR) with the help of VHF /Walkie Talkie, Mobile Cell Phone.
6. Shall assess the oil spill scenario and requirement of consumable items for example Sorbent sheets, Sorbent booms, Dispersants etc. and initiating procurement action indicating approximate time when these items are required.

7. Shall ensure that all the actions carried out are logged suitably. (This would assist in analysing efficiency of men and machine both as well as provide scope for further improvement in various actions).
8. Shall route all his requirements of men and material including vehicles and watercrafts etc. through Incident Controller only.
9. Shall ensure safe recovery/return and accounting of all the items provided to him for the purpose.
10. Shall ensure that all his men are in possession of proper safety gears prior to starting of any operations i.e. Lifejacket, Life Buoy Lifeline, Raincoat, Torches, Working hand gloves etc.
11. Shall give regular feed back to ECT on the developments of oil scenario to formulate and decide future course of actions. Shall ensure action and anticipate the future requirement of men, material etc.

Sequential Steps

Immediate:

- Start personal log of events.
- Establish the following information:
 - Time spill occurred,
 - Position and shape of the slick,
 - Visual appearance and apparent thickness of the oil,
 - Percentage cover of the various thickness of oil,
 - Speed and direction of the slick,
 - Sensitive areas/vessels, etc. in its path,
 - Local weather conditions and sea state. - Investigate the source of leak / spillage
 - Co-ordinate with OSC in drawing a strategy and dealing with the Emergency.
 - Contact and aboard the vessel planned to have ERT and the OSR equipment.
- Determine whether resources available can handle the incident onshore/ offshore. If not, request activation of further mobilization of resources as per the Oil Spill Contingency Plan from ECT.
- Instruct boat (In case of water bodies) to take samples of spilled oil, if possible, for analysis and evaluation.
- Initiate production shut down depending on the conditions.
- For a spill capable of being controlled by the resources available offshore, contain and collect oil using OSR equipment.

General:

- Inform ECT as frequently as possible, but at least once every hour, of all actions and developments offshore.
- OSC shall ensure management report and overall containment, control, recovery, clean-up and deciding future strategies in consultation with ECT/ECR.

Standing Down:

- Send status report to ECR
- Ensure records of the event are gathered from all parties.
- Ensure all OSR equipment are cleaned after operation as per the maintenance schedule and store properly.
- Ensure borrowed equipment are returned as per contract and recovered oil is properly stored or disposed.
- Advise vessels suitably.
- Restore normal operation.
- Forward all log of events to ECT for HSE Manager's record and action.

(B) Head-Admin & Head – HSE shall themselves or by representatives suitable for liaison with government authority. They will act in consultation with the respective HOD's.

(C) Bio remediation – shall be done through third party. In this regard, rate contract shall be formed by PSS in consultation with HOD – HSE. HOD – PSS shall be the contract coordinator & single point contact for the same.

(D) Disposal of collected oil shall be done by respective asset through authorised recycle of oily waste & Asset Manager shall be accountable for the disposal. Hazardous waste rule, 2016 shall be strictly adhered to.

(E) Notices from authorities shall be taken care of by HOD - HSE. HOD – HSE shall be supplemented by necessary data by respective asset, PSS, admin department etc.

(F) Legal aid shall be initiated if necessary in the preview of HOD – Admin. All concerned shall supplement HOD Admin with necessary data, representation in this regard.

(G) HOD-PA shall take necessary action to manage media & public to ascertain company's reputation.

(H) HoD-Finance, HoD-Contract and HoD-Materials shall provide necessary support for urgent contract and procurement. Where there are financial implications, approval to be obtained from Competent Authority as per prevailing DoP. Framing of contracts to be done as per the prevailing procedures and DoP. However, the restrictions imposed (if any) for procurement

of items shall be eased, considering the urgent requirement of the spill response items, as they would be required only in emergency conditions.

8.0 RESPONSE ORGANIZATION

8.1 Initial Phase

In the initial phase only someone close enough to the scene of emergency can exercise emergency co-ordination. Accordingly, the Installation Manager (IM) will assume the role of Site Coordinator (OSC).

8.2 Intermediate Phase

The Chief Co-ordinator (CC) of the respective sphere (FHQ/PHQ/Project) may appoint a person (DGM/GM) under purview of the Disaster Management Plan (DMP), who is normally stationed at Base to take over the task at Site Control Room (SCR) as OSC. Alternatively, IM shall continue as the OSC until senior officers shall assume the duty of OSC at site, depending upon the gravity of the situation.

8.3 Function

The Coordinator will make an assessment of the situation; the type and quantity of assistance required and communicate the same to the his/her Zonal/Sectional in-charge who in turn will inform his Head of the Department/GM as the case may be for further information to the Chief Corporate Co-ordinator (CCC) of the DMP. The OSC will mobilize the resources available at site, deal with the situation and take such actions as directed by the Chief Co-ordinator at the FHQ/PHQ/Projects. He will transmit situation reports to the base disaster control room if necessitated at regular interval prefixing a numerical sequence to each message.

8.4 Site Control Room

- **Location:**

The Site Control Room (SCR) will function at the installation depending upon situation. In case the situation warrants activation of Onsite Disaster Management Plan, an alternate site control room will be set up at a safe distance at a place closest to the installation.

- **Mobilization:**

The Site Co-coordinator (OSC) will set up SCR as soon as he becomes aware of the emergency.

- **Function**

To prepare report on status of the emergency from time to time and take steps to fight the emergency. Determine the type of assistance required & mobilize the same through SCR.

8.5 Disaster Control Room (DCR)

- **Location**

A control room established at the base station of the sphere (FHQ/PHQ/Project) as the case may be will be termed as the Disaster Control Room.

- Mobilization

The GGM/ED (FHQ Affairs) who is the nodal officer of the spheres stationed at FHQ will open up Control Room/Set up control room as soon as he becomes aware of the emergency.

- Function

To prepare report on status of the emergency from time to time and take steps to fight the emergency. Determine the type of assistance required & mobilize the same through DCR.

8.6 Chief Coordinator (CC) at FHQ/PHQ/PROJECT level

FHQ/ PHQ/Project Head will be the Chief Co-ordinator where the emergency has taken place and will exercise control through GGM (FHQ Affairs) who is the Nodal Officer stationed at FHQ Alternate Chief Co-ordinator will be the next Senior Most in the FHQ/PHQ/Project.

In case the emergency within the installation is likely to have effect beyond the installation premises or an emergency outside the premises of the installation is likely to effect the operations of the installation, and Disaster Management Plan (Mutual Aid) is activated, CC shall inform Nodal Officer of FHQ to further intimate Corporate Disaster Management Group and request the intervention of Corporate Disaster Management group for activation of Corporate Level DMP if felt necessary. The Nodal Officer shall immediately inform the Nodal Officer of Corporate Disaster Management Group, CMD and Corporate Coordinators.

9.0 SITE SPECIFIC RESPONSE PLAN

9.1. Oil Spillage in Water Bodies:

In OIL's operational areas, there are hundreds of rivers, rivulets and water bodies. Thousands of people are economically dependent upon these water bodies and rivers. Although it is not possible to give detail for every spillage scenario, it is tried to give an overall idea to mitigate spillage in rivers and water bodies. Oil spills in rivers differ from spills that occur in the open ocean.

Some oils are denser than river water. Oil usually floats because it is less dense than the water it is floating on. (Density is the mass, or weight, of a substance divided by its volume.) The density of river water is usually about 1 gram per cubic centimetre (g/cc). Sometimes the density of an oil is so close to that of river water that the oil moves along the river partly underwater. When such oil finally moves into the ocean at the river mouth, it can re-float. This does not happen very often, but it is something we have to think about whenever oil is spilled in a river. If spilled oil sinks, it can be very difficult to

clean up. If something causes it to pool on the bottom (for example, it may be trapped behind a sunken vessel), then vacuum devices can be used to try to get the oil off the bottom. As you might guess, this method may not be very effective because vacuums may capture a lot of water and sand along with the oil.

Movement is usually downstream. Unlike in a bay or the open ocean, currents in a river are generally directed downstream (except very close to the mouth of the river, where it enters the ocean; here, a flood tide might actually reverse the flow of the surface water). The greater predictability of river currents makes it easier to forecast which way the oil will move. Wind blowing across the river also affects where the oil will come ashore. If the wind is blowing straight down the river (as might happen on a river with high banks), it often will travel quite far down the river before it comes in contact with a beach. In order for the oil to beach, the wind must blow the oil to one side of the river or the other.

Dams and locks influence oil movement. Rivers sometimes contain dams or locks that slow or divert water flow. Dams and locks also slow down the movement of spilled oil. In fact, oil tends to collect in areas next to dams or locks, where it can be picked up from the surface of the water by skimmers (devices that "skim" the oil off the water surface), sorbent pads (big square pads of an absorbing material that the oil will stick to), or sorbent booms.

Vegetation may grow right at the water's edge. Along many rivers, plants and trees grow right up to the river's edge. Those rivers do not have the open, sandy shores that you find along many parts of the open coast. It is much harder to remove oil from vegetation than from a hard-packed sand beach. Spill responders try to protect the plants by using booms, but if the vegetation gets oiled, responders often either cut, burn, or flush it with water to try to get the oil out.

Oil can interact with sediment carried by rivers. Rivers often carry a lot of sediment in their currents. That means when oil droplets drift into the water column of a river, the sediment has the potential to stick to the oil droplets. Eventually (depending on how strong flowing and full of sediment a river is) some of the oil-sediment combination may settle out to the bottom of the river, usually near the river mouth as the water slows down and reaches the ocean.

The trajectory (direction of movement) of oil spilled into a river is affected not only by the river currents -- which generally take the oil downstream -- but also by the wind. If the wind blows straight down the river, the oil may travel quite far down the river before it comes in contact with either bank. However, if the wind blows at an angle to the river, the oil is more likely to be blown towards one or the other riverbank.

When an oil spill occurs on water, it is critical to contain the spill as quickly as possible in order to minimize danger and potential damage to persons, property, and natural resources. Containment equipment is used to restrict the spread of oil and to allow for its recovery, removal, or dispersal. The most common type of equipment used to control the spread of oil is floating barriers, called booms.

Containment booms are used to control the spread of oil to reduce the possibility of polluting shorelines and other resources, as well as to concentrate oil in thicker surface layers, making recovery easier. In addition, booms may be used to divert and channel oil slicks along desired paths, making them easier to remove from the surface of the water. Although there is a great deal of variation in the design and construction of booms, all generally share four basic characteristics:

- An above-water “freeboard” to contain the oil and to help prevent waves from splashing oil over the top of the boom
- A flotation device
- A below-water skirt to contain the oil and help reduce the amount of oil lost under the boom
- A “longitudinal support,” usually a chain or cable running along the bottom of the skirt, that strengthens the boom against wind and wave action; may also serve as a weight or ballast to add stability and help keep the boom upright

When a spill occurs and no containment equipment is available, barriers can be improvised from whatever materials are at hand. Although they are most often used as temporary measures to hold or divert oil until equipment that is more sophisticated arrives, improvised booms can be an effective way to deal with oil spills, particularly in calm water such as streams, slow-moving rivers, or sheltered bays and inlets. Improvised booms are made from such common materials as wood, plastic pipe, inflated fire hoses, automobile tires, and empty oil drums. They can be as simple as a board placed across the surface of a slow-moving stream, or a berm built by bulldozers pushing a wall of sand out from the beach to divert oil from a sensitive section of shoreline.

RECOVERY OF OIL:

Once an oil spill has been contained, efforts to remove the oil from the water can begin. Three different types of equipment—booms, skimmers, and sorbents—are commonly used to recover oil from the surface.

Booms

When used in recovering oil, booms are often supported by a horizontal arm extending directly off one or both sides of a vessel. Sailing through the heaviest sections of the spill at low speeds, a vessel scoops the oil and traps it between the angle of the boom and the vessel's hull. In another variation, a boom is moored at the end points of a rigid arm extended from the vessel, forming a "U"- or "J"- shaped pocket in which oil can collect. In either case, the trapped oil can then be pumped out to holding tanks and returned to shore for proper disposal or recycling.

Skimmers

A skimmer is a device for recovery of spilled oil from the water's surface. Skimmers may be self-propelled and may be used from shore or operated from vessels. The efficiency of skimmers depends on weather conditions. In moderately rough or choppy water, skimmers tend to recover more water than oil. Three types of skimmers— weir, oleophilic, and suction—are described below. Each type offers advantages and drawbacks, depending on the type of oil being cleaned up, the conditions of the sea during clean-up efforts, and the presence of ice or debris in the water.

Sorbents

Sorbents are materials that soak up liquids. They can be used to recover oil through the mechanisms of absorption, adsorption, or both. Absorbents allow oil to penetrate into pore spaces in the material they are made of, while adsorbents attract oil to their surfaces but do not allow it to penetrate into the material. To be useful in combating oil spills, sorbents need to be both oleophilic and hydrophobic (water-repellent). Although they may be used as the sole clean-up method in small spills, sorbents are most often used to remove final traces of oil, or in areas that cannot be reached by skimmers. Once sorbents have been used to recover oil, they must be removed from the water and properly disposed of on land or cleaned for re-use. Any oil that is removed from sorbent materials must also be properly disposed of or recycled.

Dispersing agents

Dispersing agents, also called dispersants, are chemicals that contain surfactants, or compounds that act to break liquid substances such as oil into small droplets. In an oil spill, these droplets disperse into the water column, where they are subjected to natural processes—such as wind, waves, and currents—that help to break them down further. This helps to clear oil from the water surface, making it less likely that the oil slick will reach the shoreline. The effectiveness of a dispersant is determined by the composition of the oil it is being used to treat and the method and rate at which the dispersant is applied.

Bioremediation

Bioremediation technologies can help biodegradation processes work faster. Bioremediation refers to the act of adding materials to the environment, such as fertilizers or microorganisms, that will increase the rate at which natural biodegradation occurs. Furthermore, bioremediation is often used after all mechanical oil recovery methods have been used.

Shoreline Clean-up:

Both natural processes and physical methods aid in the removal and containment of oil from shorelines. Sometimes physical methods are used to enhance naturally occurring processes. Examples of a technology that uses both natural processes and physical methods to clean up an oil spill are biodegradation and bioremediation, which are described later.

9.2 Oil Spillage on land:

Manual recovery

Manual recovery is the most common method of shoreline clean up and involves teams of workers using rakes, shovels, and other tools to remove oil and debris. The oiled materials are collected in buckets and drums for transfer to a processing station. Workers may also use suction hoses, pumps, and vacuum trucks to recover spilled oil. While manual clean-up is a slow, painstaking process, it generates less waste than other techniques.

Berms / Trenches

Spills on land can be contained for recovery by building berms or dikes in the path of the oil flow, using either soil from the area, sand bags, or other construction materials. It is important to make sure the berm does not cause oil to back up and permeate the soil, where it could contaminate groundwater. If the water table is high and the oil will not permeate the soil, shallow trenches may be dug to collect oil for removal.

Land booms

Land booms look like large sausages. They are made from oil absorbent material causing them to act as a barrier. This prevents oil from leaving an area surrounded by land booms.

Hydrocarbon pads

Hydrocarbon pads are a type of oil absorbent pads. Each pad absorbs a large quantity of oil. They are effective where there is a pool of oil, which needs to be soaked up. Once the pads are saturated, they can be collected in sealed plastic bags for disposal.

Sorbents

It contains microbes, which are dormant until they come into contact with hydrocarbons. These microbes consume the oil, cleaning the soil of all evidence of the hydrocarbon spill. If the spill has seeped into the soil, it may be necessary to dig up the top layer and aerate the soil. Microbes function best when damp, so spraying the area with water also aids the clean-up operation.

Bio-remediation

Bioremediation technologies can help biodegradation processes work faster. Bioremediation refers to the act of adding materials to the environment, such as fertilizers or microorganisms, that will increase the rate at which natural biodegradation occurs. Furthermore, bioremediation is often used after all mechanical oil recovery methods have been used.

In-situ burning

In-situ burning of oil involves the ignition and controlled combustion of oil. It can be used when oil is spilled on a water body or on land. In-situ burning is typically used in conjunction with mechanical recovery on open water. Fire resistant booms are often used to collect and concentrate the oil into a slick that is thick enough to burn. Many factors influence the decision to use in-situ burning on inland or coastal waters including ***prevailing regulatory requirements***. Elements affecting the use of burning include water temperature, wind direction and speed, wave amplitude, slick thickness, oil type, and the amount of oil weathering and emulsification that have occurred. Weathering is a measure of the amount of oil already having escaped to the atmosphere through evaporation.

10.0 TERMINATION OF OPERATION

The termination of the operation shall be decided by the RCE on feedback received from ECT and OSC. Regulating authorities like SPCB, District Administration etc. shall also be contacted before coming to this decision. Competent authority may issue press release.

10.1 Standing down equipment, cleaning, maintenance and repair

10.1.1 Replacement

On completion of Pollution Response Operations, all the equipment, machineries and consumables shall be accounted for and checked for their serviceability. All equipment and machineries shall be thoroughly washed with fresh water as per the OEM's guidelines, necessary for maintenance and then the equipment stored, and secured in their respective places.

10.1.2 Preparing final detailed report

After completion of operations, the OSC shall prepare a detailed report covering all the aspects of the oil spill clean-up, which shall include success and failures, as well as lessons learnt, recommendations about equipment, man power, plans etc. The report is to be forwarded to Leader, ECT/ECR.

10.1.3 Reviewing plans and procedures from lessons learnt

The DCR will carry out deliberations on the report received from OSC and give its recommendations to HoD-HSE for putting it to ED/Management for necessary action.

10.2 Help from mutual aid partners

In case of the spill containment is beyond the internal resources the OSC may seek help from mutual aid partners to arrest the loss to bare minimum. In this regard, the approved document on “Offsite Emergency Response Plan” may be referred.

11.0 TRAINING SCHEDULES AND DRILL / EXERCISES

11.1 Oil spill response drills and exercises

OIL shall have regular internal exercises and testing, validation and updating of the OSCP to ensure that skills and awareness related to OSR are maintained to a state of operational readiness as well as the effectiveness of this plan. This will also check the functional ability of the ERT/ ECR. In order to have optimal utilisation of equipment with minimum wear and tear, quarterly exercises are recommended for testing of OSCP. Testing and exercises also provide management an opportunity to assess equipment, measure performance and obtain feedback from participants, update and correct the OSCP, show sincerity for protection of marine environment and company’s commitment on oil spill prevention and response.

Exercise and drills may involve any or a combination of the following:

- (i) Oil spill contingency plan
- (ii) Mock exercise activating oil spill response
- (iii) Equipment and personnel mobilization and deployment
- (iv) Joint exercise with other companies
- (v) Full-scale incident management exercise

Each exercise shall be debriefed to identify weaknesses in the OSCP and equipment, and appropriate remedial action shall be undertaken where required. The Head (S&E) shall ensure that amendments reflecting these actions are incorporated into this plan.

HoD-HSE shall suggest training courses & HR-L shall only provide training that all OSR Team personnel who would be handling / operating the OSR equipment and materials undergo specific training and gain confidence in handling and operation of the equipment, as they are to operate.

11.2 Improving contingency plans

After an oil spill has been controlled and cleaned up, or after an exercise, the companies, as well as the local, state, and central agencies that were involved in the emergency or exercise, should assess the usefulness of their contingency plans. Information gathered during the assessment, such as problems that had not been considered in the original plan and the successes or failures of clean-up techniques used, is used to revise and improve contingency plans. Lessons learned during oil spills and exercises are shared with other private, state, regional, and central agencies so that they too may learn from oil spills.

12.0 FURTHER REFERENCES AND OTHER ORGANIZATIONAL

References and other organizational documents to be consulted along with this Oil Spill Contingency Plan are:

- (i) Onsite and Off-site Disaster Management Plan of OIL
- (ii) Corporate Disaster Management Plan of OIL
- (iii) ERDMP wherever applicable.

ANNEXURE-1

CHARACTERISTIC AND BEHAVIOR OF OIL:

Characteristics of Oil being handled by the installation:

OIL is handling crude and gas. The types and characteristics of crude are:

Properties of crude are:

Properties of gas are:

Weathering process:

Rainy weather:

Sunny weather:

Facilities/ Resources at risk:

ANNEXURE – 2

OIL SPILL REPORT FORM

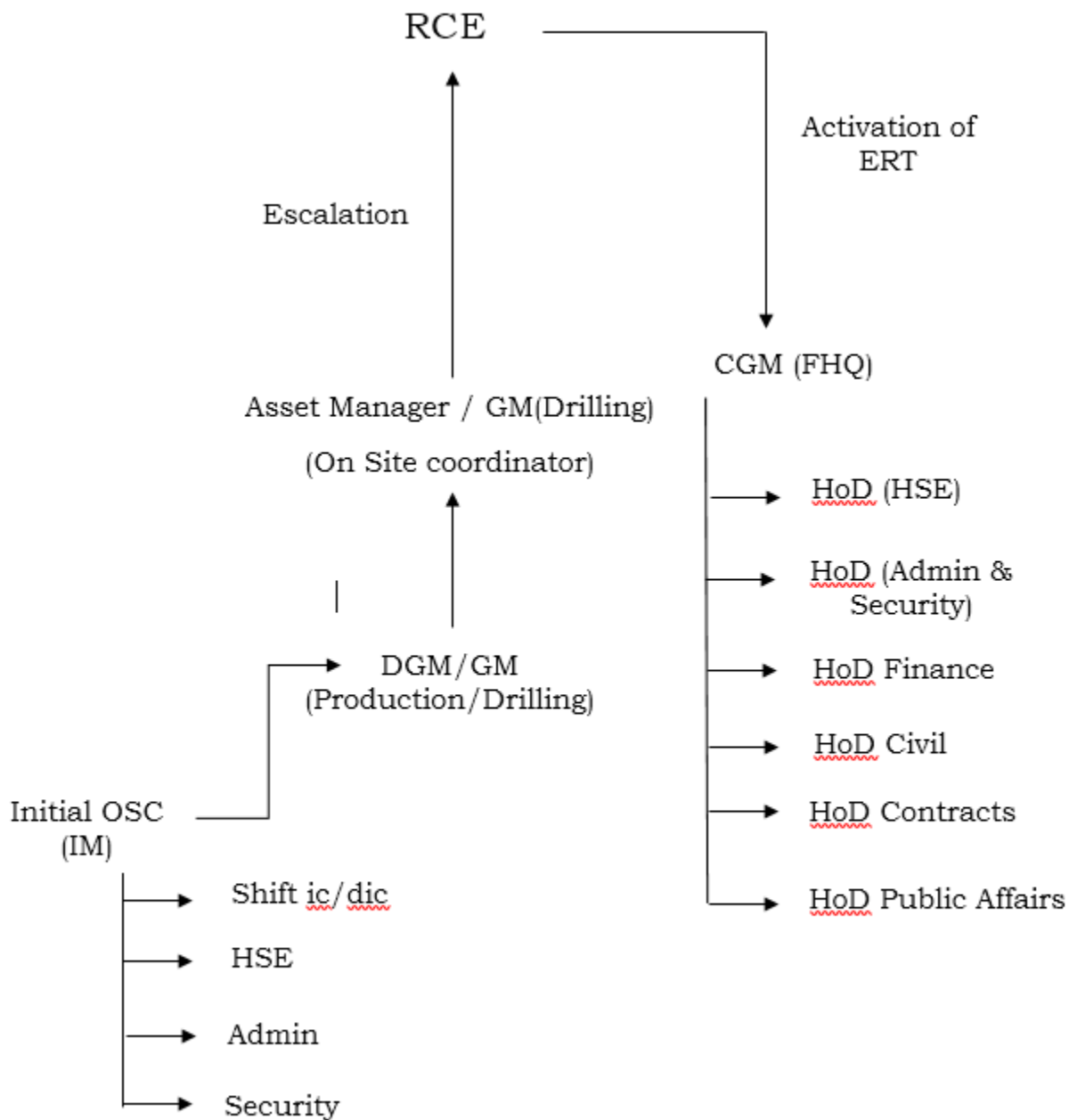
1. Name of person reporting incident:
2. Title / Designation:
3. Company:
4. Telephone / Fax numbers:
5. Date and time:
6. Spill Location:
7. Type and quantity of oil spilled:
8. Cause of Spill:
9. Response to spillage (if any):
10. Any other information:

ANNEXURE – 3

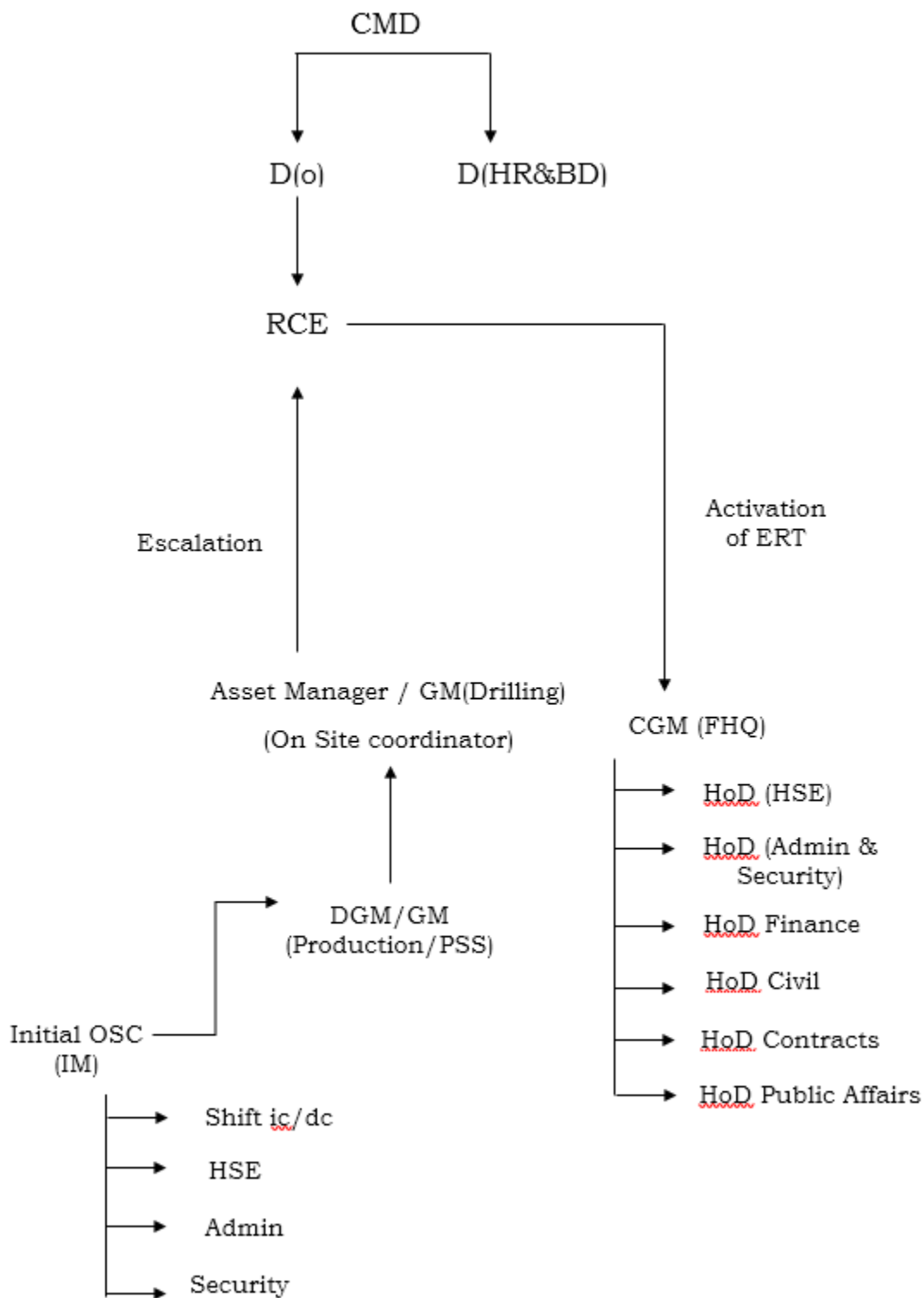
MANAGEMENT REPORT

- Present Location:
- No. of man power deployed:
- Use of OSD (if used):
- Equipment deployed:
- Weather condition:
- Amount of oil recovered:
- Amount of oil transferred for storage/disposal:
- Difficulties encountered:
- Any other:

ANNEXURE – 4
Communication Channel (TIER II)



ANNEXURE – 5
Communication Channel (TIER III)



ANNEXURE – 6

DO'S AND DON'TS

1. DO'S

- Release only authorized verified written information.
- Keep accurate records and logs of all enquiries and news coverage.
- Escort the press and government agencies to the nearest safe place on the Emergency site.
- Have designated spokesmen. Know what information can and cannot be released.

2. DON'TS

- Speculate on the causes of the emergency.
- Speculate on the resumption of normal operations.
- Speculate on the outside effects of emergencies.
- Speculate on the value of losses and damage.
- Interfere with the legitimate duties of media executives
- Place blame of emergencies.
- Crowd in the affected area (those who have no role assigned in the disaster plan should stick to their jobs.)

ANNEXURE-7**SPILL RESPONSE METHODS**

(Courtesy: National Oceanic Atmospheric Administration: American Petroleum Institute)

This section describes methods previously categorized for use during response to oil spills in inland environments and habitats. The methods are used in the protection, recovery, and cleanup phases of a response. The main objective of *protection* is to keep oil out of a habitat or to reduce the amount that enters. *Recovery* consists of removing floating oil from the water surface. The *cleanup* phase consists of removing stranded oil from shoreline habitats via physical, chemical, and enhanced biological means. In most spill response situations, protection and oil recovery are the immediate goals. Combinations of protection, recovery, and cleanup methods are commonly used though these guidelines treat each method separately.

The following section includes a summary of the objective in using the method, a general description of the method, applicable habitat types, conditions under which the methods should be used, biological constraints commonly applied to the use of the method to protect sensitive resources, and the environmental effects expected from the proper use of the method. Some of the methods listed require special authorization for use during a spill; the appropriate agency must be contacted about the need for special approvals. We encourage you to refer to the references listed in Annexure A for further information.

Physical Response Methods

- | | |
|--------------------------------|--|
| 1. Natural Recovery | 11. Sediment Reworking |
| 2. Booming | 12. Vegetation Removal |
| 3. Skimming | 13. In-Situ Burning |
| 4. Barrier/Berm | 14. Flooding |
| 5. Physical Herding | 15. Low-Pressure, Cold-Water Flushing |
| 6. Manual Oil Removal/Cleaning | 16. High-Pressure, Cold-Water Flushing |
| 7. Mechanical Oil Removal | 17. Low-Pressure, Hot-Water Flushing |
| 8. Sorbents | 18. High-Pressure, Hot-Water Flushing |
| 9. Vacuum | 19. Steam Cleaning |
| 10. Debris Removal | 20. Sand Blasting |

Chemical Response Methods

- | | |
|-----------------------------|------------------------------------|
| 21 Dispersants | 22 Solidifiers |
| 23 Emulsion Treating Agents | 24 Chemical Shoreline Pretreatment |
| 25 Visco-Elastic Agents | 26 Shoreline Cleaning Agents |
| 27 Herding Agents | |

Biological Response Methods

- 28 Nutrient Enrichment
- 29 Natural Microbial Seeding

1. Natural Recovery

Objective:

No attempt to remove any stranded oil in order to minimize impact to the environment, or because there is no proven effective method for cleanup.

Description:

No action is taken, although monitoring of the incident continues.

Applicable Habitat Types: Can be used on all habitat types.

When to Use:

On remote or inaccessible habitats, when natural removal rates are very fast (e.g., the evaporation of gasoline), when the degree of oiling is light, or when cleanup actions will do more harm than natural removal.

Biological Constraints:

This method may be inappropriate for areas where high numbers of mobile animals (birds, terrestrial mammals) or endangered species use the body of water or shoreline.

Environmental Effects:

Same as from the oil alone.

2. Booming

Objective:

To control the movement of floating oil by containment, diversion, deflection, or exclusion.

Description:

Placement of a device (boom) on the water that forms a barrier to floating oil. *Containment* is deploying a boom to hold the oil until it can be removed. *Deflection* is moving oil away from sensitive areas. *Diversion* is moving oil toward recovery sites that have slower flow, better access, etc. *Exclusion* is placing boom to prevent oil from reaching sensitive areas. The ultimate goal is to recover the oil.

Applicable Habitat Types:

Can be used on all water environments. Booms begin to fail by entrainment when the effective current or towing speed exceeds 0.7 knots perpendicular to the boom.

When to Use:

Nearly all types of response to spills on water involve deploying boom to assist in the recovery of floating oil. Booms must be properly deployed and maintained, including removing accumulated debris. Containment booming of gasoline spills is usually not attempted, because of both fire and inhalation hazards to responders. However, when public health is at risk, booming of gasoline can be attempted with use of foam and extreme safety procedures. Deflection or exclusion booming of sensitive areas to prevent exposure to oil, including gasoline, can be an important protection action.

Biological Constraints:

Placement and maintenance of anchoring points should not cause excessive physical disruption. Boom must be maintained so that it does not trap oil improperly and cause more damage. Traffic to / from boom sites should not disturb wildlife.

Environmental Effects:

Minimal if surface disturbance by cleanup work force traffic is controlled.

3. Skimming

Objective:

To recover floating oil from the water surface.

Description:

Mechanized equipment is placed at the oil / water interface. There are five different types of skimmers: weir, suction, centrifugal, submersion, and oleophilic. They may operate

independently from shore, be mounted on vessels, or be completely self-propelled. All require collection and concentration of floating oil at the skimmer, usually using booms.

Large amounts of water are often collected and must be handled. Adequate storage of recovered oil / water mixture must be available.

Applicable Habitat Types:

Can be used on all water environments. Waves, currents, and debris reduce skimmer efficiencies.

When to Use:

When sufficient amounts of floating oil can be contained. Skimming of gasoline spills is usually not feasible, because of both fire and inhalation hazards to responders. However, when public health is at risk, skimming of gasoline can be attempted using foam and extreme safety procedures.

Biological Constraints:

Traffic to / from skimming sites should not disturb wildlife.

Environmental Effects

Minimal if surface disturbance by cleanup work force traffic is controlled.

4. Barriers/Berms

Objective:

To prevent entry of oil into a sensitive area or to divert oil to a collection area.

Description:

A physical barrier is placed across an area to prevent moving oil from passing. Barriers can consist of earthen berms, filter fences, air bubble barriers, or trenches. When it is necessary for water to pass, because of water volume or downstream needs, underflow dams (for low flow rates) or overflow dams are used.

Applicable Habitat Types:

In streams and dry valleys, where the width and depth of the area to be closed off are relatively small. Also, at the mouths of small creeks along lake shorelines, to prevent oil from being blown upstream.

When to Use:

When the flow of oil threatens sensitive habitats. If the barrier does not fail, it is the most effective strategy to exclude oil from an area.

Biological Constraints:

Place barriers away from sensitive areas, such as spawning sites. Downstream water requirements should be monitored to prevent dewatering of sensitive areas.

Environmental Effects:

May disrupt or contaminate sediments along banks or in channel. Dewatering or poor water quality downstream may affect aquatic organisms.

5. Physical Herding

Objective:

To free oil trapped in debris or vegetation on water; to direct the movement of floating oil towards containment and recovery devices; or to push oil away from sensitive areas.

Description:

Water or air streams and propeller wash generate a current to dislodge trapped oil and herd the released oil to containment and recovery area. May mix oil with water to form emulsified oil.

Applicable Habitat Types:

In lakes and ponds where there are little or no currents, along rivers and streams where the channel or banks are accessible, and in and around manmade structures such as wharves and piers.

When to Use:

In low-current or stagnant waterbodies, to herd oil in booms towards recovery devices. Along rivers and streams, when *mobile* oil has penetrated vegetated banks or accumulated in log jams or other debris, water spray and prop wash can mobilize the oil to flow downstream to collection points.

Biological Constraints:

None.

Environmental Effects:

May generate high levels of suspended sediments and mix them with the oil, resulting in deposition of contaminated sediments in benthic habitats.

6. Manual Oil Removal/Cleaning

Objective:

To remove surface oil with hand tools and manual labor.

Description:

Removal of surface oil by manual means (hands, rakes, shovels, buckets, rags, sorbent pads, etc.) and placing in containers. No mechanized equipment is used.

Applicable Habitat Types:

Can be used on all habitat types.

When to Use:

Light to moderate oiling conditions for stranded oil, or heavy oils on water that have formed semi-solid to solid masses that can be picked up manually.

Biological Constraints:

Foot traffic over sensitive areas (wetlands, floating vegetation, etc.) needs to be restricted or prevented. There may be periods when access should be avoided, such as during bird nesting.

Environmental Effects

Minimal if surface disturbance by crew movement and waste generation is controlled.

7. Mechanical Oil Removal

Objective:

Removal of oil from water surface, bottom sediments, and shorelines with heavy equipment.

Description:

Oil and oiled sediments are collected and removed using backhoes, dredges, graders, bulldozers, draglines, etc. On land, the oiled material is pushed into piles and transported offsite for treatment / disposal. On water, the equipment is operated from shore or barges to recover large amounts of heavy or solidified oil.

Applicable Habitat Types:

On land, possible wherever there are surface sediments accessible to heavy equipment. On water, used in lakes, rivers, etc., where oil accumulates.

When to Use:

When large amounts of oiled materials have to be collected and removed. Along shorelines, care should be taken to remove sediments only to the depth of oil penetration, which can be difficult

with heavy equipment. Should be used carefully where excessive sediment removal may erode the beach. Will need special permission to use in areas with known cultural resources.

Biological Constraints:

Heavy equipment may be restricted in sensitive habitats (e.g., wetlands, soft substrate) or areas containing endangered plants and animals.

Environmental Effects:

The equipment is heavy, with many support personnel required. May be detrimental if excessive sediments are removed without replacement. All organisms in the sediments will be affected, although the need to remove the oil may make this response method the best overall alternative. Runoff from exposed oil and fine-grained oily sediments can affect adjacent bodies of water.

8. Sorbents

Objective:

To remove floating oil by adsorption onto oleophilic material placed in water or at the waterline.

Description:

Sorbent material is placed *on the water surface*, allowing it to absorb oil as it is released by natural processes. Forms include sausage boom, rolls, sweeps, pads, and snares. Efficacy depends on the capacity of the particular sorbent, energy available for lifting oil off the substrate, and stickiness of the oil. Recovery of all sorbent material is mandatory.

Applicable Habitat Types:

Can be used on any habitat or environment type.

When to Use:

When the stranded oil is mobile and transport of oil is expected on or off the site. The oil must be viscous and thick enough to be released by the substrate and absorbed by the sorbent. Often used as a secondary treatment method after gross oil removal and in sensitive areas where access is restricted.

Biological Constraints:

Access for deploying and retrieving sorbents should not affect soft or sensitive habitats or wildlife. Sorbent use should be monitored to prevent overuse and generating large volumes of waste.

Environmental Effects:

Physical disturbance of habitat during deployment and retrieval. When the sorbents are no longer effective, oil may remain in critical habitats during sensitive periods.

9. Vacuum

Objective:

To remove free oil pooled on the substrate or from the water in sheltered areas.

Description:

A vacuum unit with a suction head recovers free oil. The equipment can range from small, portable units that fill individual 55-gallon drums to large supersuckers that are truck-mounted and can lift large rocks. Can be used with booms and flushing systems to move the oil toward the suction head. Removal rates from substrates can be extremely slow.

Applicable Habitat Types:

Any accessible habitat type. May be mounted on barges for water-based operations, on trucks backed to the recovery area, or hand-carried to remote sites.

When to Use:

When free, liquid oil is stranded on the substrate (usually in depressions), trapped in vegetation and is readily accessible, or concentrated on the water surface. Often used instead of skimmers for floating oil recovery. Usually requires shoreline access points. Used in recovery of gasoline spills only with special precautions such as: applying foam to suppress vapors, testing for flammable vapor, locating the vacuum truck a safe distance from spill, and venting the pump discharge safely.

Biological Constraints:

Special restrictions should be identified for areas where foot traffic and equipment operation should be limited, such as soft substrates. Operations in wetlands need to be very closely monitored, with a site-specific list of restrictions.

Environmental Effects:

Minimal if foot and vehicular traffic is controlled and minimal substrate is removed.

10. Debris Removal

Objective:

To remove contaminated debris from the shoreline or water surface.

Description:

Manual or mechanical removal of debris from the shore or water surface. Can include cutting up and removal of oiled logs.

Applicable Habitat Types:

Can be used on any habitat or environment type where safe access is allowed.

When to Use:

When driftwood and debris are heavily contaminated and provide a potential source of chronic oil release, an aesthetic problem, a source of contamination for other organisms in the area, or skimmer clogging problems.

Biological Constraints:

Disturbance to adjacent areas should be minimized. Foot traffic over sensitive areas (wetlands, spawning grounds) needs to be restricted. May be periods when access should be restricted (spawning periods, large numbers of migratory waterbirds).

Environmental Effects:

Physical disruption of substrate, especially when equipment must be deployed to recover a large quantity of debris.

11. Sediment Reworking

Objective:

To rework oiled sediments to break up the oil deposits, increase its surface area, and mix deep subsurface oil layers, which will expose the oil to natural removal processes and enhance the rate of oil degradation.

Description:

The oiled sediments are roto-tilled, disked, or otherwise mechanically mixed using heavy equipment. Along lake shores, oiled sediments may also be pushed lower on the shore to enhance natural cleanup from reworking by wave activity. The process may be aided with high-volume flushing of gravel.

Applicable Habitat Types:

On any sedimentary substrate that can support heavy equipment.

When to Use:

On sand to gravel beaches with subsurface oil, where sediment removal is not feasible (due to erosion concerns or disposal problems). Also where surface oil deposits have started to form

pavements or crusts. Appropriate for sites where the oil is stranded above the normal water level.

Biological Constraints:

Avoid use on shores near water intakes, fish-spawning areas, or near bird-nesting or concentration areas because of the potential for release of oil and oiled sediments into adjacent bodies of water.

Environmental Effects:

Due to the mixing of oil into sediments, this method could further expose organisms that live below the original layer of oil. Repeated mixing over time could delay re-establishing organisms. Runoff from treated sites could contaminate downslope areas.

12. Vegetation Removal

Objective:

To cut and remove oiled vegetation to prevent oiling of wildlife or chronic oil releases.

Description:

Manual cutting of oiled rooted vegetation using weed eaters. Cut vegetation is raked up. Floating vegetation is removed either manually or mechanically.

Applicable Habitat Types:

Wetlands composed of emergent, herbaceous vegetation and floating aquatic vegetation.

When to Use:

When the risk of oiled vegetation contaminating wildlife is greater than the value of the vegetation that is to be cut, and there is no less destructive method that removes or reduces the risk to acceptable levels.

Biological Constraints:

Operations must be strictly monitored to minimize the degree of root destruction and mixing of oil deeper into the sediments. Access in bird-nesting areas should be restricted during nesting seasons.

Environmental Effects:

Vegetation removal will destroy habitat for many animals. Cut areas will have reduced plant growth. Along exposed sections of shoreline, the vegetation may not regrow, eroding and destroying the habitat. Trampled areas will recover much more slowly.

13. In-Situ Burning

Objective:

To remove oil from the water surface or habitat by burning.

Description:

Oil floating on the water surface is collected into slicks at least 2-3 millimeters thick and ignited. The oil can be contained in fire resistant booms, or by natural barriers such as ice or the shore. On land, oil in the habitat is burned, usually when it is on a combustible substrate such as vegetation, logs, and other debris. Oil can be burned off non-flammable substrates using a burn promoter. On sedimentary substrates, it may be necessary to dig trenches for oil to accumulate in pools thick enough to burn efficiently. Heavy and emulsified oils are harder to ignite and sustain an efficient burn, but are still burnable.

Applicable Habitat Types:

On any habitat type except dry muddy substrates where heat may impact the biological productivity of the habitat.

When to Use:

On floating slicks, early in the spill event when the oil can kept thick enough (2-3 millimeters). On land, where there is heavy oil in sites not amenable or accessible to physical removal and it is important to immobilize the stranded oil quickly. In wetlands and mud habitats, a water layer minimizes impacts to sediments and roots. Many potential applications for spills in ice.

Biological Constraints:

Large volumes of smoke are generated, and its effect on nesting birds and populated areas should be evaluated.

Environmental Effects:

Temperature and air quality effects are likely to be localized and short-lived. Toxicological impact from burn residues have not been evaluated. There are few studies on the relative effects of burning oiled wetlands compared to other techniques or natural recovery, but the limited data indicate little impact of burning relative to natural recovery when the soils are saturated.

14. Flooding

Objective:

To wash oil stranded on the land surface to the water's edge for collection.

Description:

A perforated header pipe or hose is placed above the oiled shore or bank. Ambient water is pumped through the header pipe at low pressures and flows downslope to the water. On porous sediments,

water flows through the substrate, pushing loose oil ahead of it (or floats oil to the water's surface) then transports the oil down the slope for pickup. Flow is maintained to remove the majority of free oil. Oil is trapped by booms and is recovered by skimmers or other suitable equipment.

Applicable Habitat Types:

All habitat types.

When to Use:

In heavily oiled areas when the oil is still fluid and loosely adheres to the substrate, and where oil has penetrated into gravel sediments. This method is frequently used with other washing techniques (low- or high-pressure, cold water).

Biological Constraints:

Not appropriate where nearshore sediments contain rich biological communities.

Environmental Effects:

Habitat may be physically disturbed by foot traffic during operations and smothered by sediments washed down the slope. Oiled sediment may be transported to shallow nearshore areas, contaminating them and burying benthic organisms.

15. Low-Pressure, Cold-Water Flushing

Objective:

To remove liquid oil that has adhered to the substrate or manmade structures, pooled on the surface, or become trapped in vegetation.

Description:

Ambient water is sprayed at low pressures (<50 psi), usually from hand-held hoses, to lift oil from the substrate and direct it to the water's edge for pickup. Can be used with a flooding system to prevent released oil from re-adhering to the substrate.

Applicable Habitat Types:

On heavily oiled substrates, riprap, and seawalls where the oil is still liquid. In wetlands and along vegetated banks where free oil is trapped in vegetation.

When to Use:

Where free, liquid oil is stranded onshore or floating in very shallow areas.

Biological Constraints:

Not appropriate where nearshore sediments contain rich biological communities. May need to restrict use so that the oil / water effluent does not drain across sensitive habitats. Use from boats

will prevent foot traffic in soft substrates and vegetation. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable.

16. High-Pressure, Cold-Water Flushing

Objective:

To remove oil that has adhered to hard substrates or manmade structures.

Description:

Similar to low-pressure flushing except that water pressure is 100-1,000 psi. High-pressure spray will more effectively remove sticky or viscous oils. If water volumes are low, sorbents are placed directly below the treatment area to recover oil.

Applicable Habitat Types:

Bedrock, manmade structures, and gravel habitats.

When to Use:

When low-pressure flushing is not effective at removing adhered oil, which must be removed to prevent continued oil release or for aesthetic reasons. When a directed water jet can remove oil from hard-to-reach sites.

Biological Constraints:

May need to restrict flushing so that the oil / water effluent does not drain across sensitive habitats. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

May drive oil deeper into the substrate if water jet is improperly applied. If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable.

17. Low-Pressure, Hot-Water Flushing

Objective:

To remove non-liquid oil that has adhered to the substrate or manmade structures, or pooled on the surface.

Description:

Hot water (90°F up to 170°F) is sprayed with hoses at low pressures (<50 psi) to liquefy and lift oil from the substrate and direct it to the water's edge for pickup. Used with flooding to prevent released oil from re-adhering to the substrate.

Applicable Habitat Types:

On heavily oiled bedrock, sand to gravel substrates, and manmade structures.

When to Use:

Where heavy, but relatively fresh oil is stranded onshore. The strategy is to heat the oil to above its pour point, so it will flow. Less effective on sticky oils.

Biological Constraints:

Avoid wetlands or nearshore sediments with rich biological communities. Use should be restricted so that the hot oil / water effluent does not contact sensitive habitats. Boat use will prevent foot traffic in soft substrates and vegetation. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

Hot water can kill all organisms in direct contact. If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable during the response.

18. High-Pressure, Hot-Water Flushing

Objective:

To mobilize weathered and viscous oil adhered to surfaces.

Description:

Hot water (90°F up to 170°F) is sprayed with hand wands at pressures greater than 100 psi. Used without water flooding, this procedure requires immediate use of vacuum or sorbents to recover the oil / water runoff. When used with a flooding system, the oil is flushed to the water surface for collection by skimmers or sorbents.

Applicable Habitat Types:

Gravel habitats, bedrock, and manmade structures.

When to Use:

When oil has weathered to the point that even warm water at low pressure no longer

effectively removes oil, to prevent continued release of oil. To remove viscous oil from manmade structures for aesthetic reasons.

Biological Constraints:

Use should be restricted so that the oil / water effluent does not drain across sensitive habitats (damage can result from exposure to oil, oiled sediments, and hot water). Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

All attached organisms and plants in the direct spray zone will be removed or killed, even when used properly. Oiled sediment may be transported to shallow nearshore areas, contaminating them and burying benthic organisms.

19. Steam Cleaning

Objective:

To remove heavy residual oil from solid substrates.

Description:

Steam or very hot water (170°F to 212°F) is sprayed with hand wands at high pressure. Water volumes are very low compared to flushing methods.

Applicable Habitat Types:

Manmade structures such as seawalls and riprap.

When to Use:

When heavy oil residue remaining on a shoreline needs to be cleaned for aesthetic reasons, and when hot-water wash is not effective.

Biological Constraints:

Not to be used in areas of soft substrate, vegetation, or high biological abundance directly on or below the structure.

Environmental Effects:

Complete destruction of all organisms in the spray zone. Difficult to recover all released oil.

20. Sand Blasting

Objective:

To remove heavy residual oil from solid substrates.

Description:

Use of sandblasting equipment to remove oil from the substrate. May include recovery of used (oiled) sand in some cases.

Applicable Habitat Types:

Manmade structures such as seawalls and riprap.

When to Use:

When heavy oil residue is remaining on the shoreline, which needs to be cleaned for aesthetic reasons, and even steam cleaning is not effective.

Biological Constraints:

Not to be used in areas of soft substrate, vegetation, or high biological abundance directly below or adjacent to the structures.

Environmental Effects:

Complete destruction of all organisms in the blast zone. Possible smothering of downstream organisms with sand. When the used sand is not recovered, introduces oiled sediments into the adjacent habitat.

21. Dispersants

Objective:

To remove floating oil from the water surface and disperse it into the water column, to reduce impact to sensitive shoreline habitats and animals that use the water surface.

Description:

Specially formulated products containing surface-active agents are sprayed at concentrations of about 5 percent by volume of the oil onto the slicks by aircraft or from boats. The products can be applied undiluted or mixed with water. The dispersants reduce the oil / water surficial tension and decrease the energy needed for the slick to break into small particles and mix into the water column. Some turbulence is needed to mix the dispersant into the oil and to mix the treated oil into the water.

Applicable Habitat Types:

Open water and large rivers with sufficient depth and volume for mixing and dilution.

When to Use:

When the impact of the floating oil has been determined to be greater than the impact of mixing of oil into the water column.

Biological Constraints:

Use in shallow water could affect benthic resources. The potential impact of dispersed oil on water intakes should be thoroughly considered prior to use.

Environmental Effects:

May increase effects on water-column organisms, particularly plankton and larval fish. Dispersion will only be partially effective, so some water surface impact will still occur.

22. Emulsion-Treating Agents

Objective:

To break or destabilize emulsified oil into separate oil and water phases. Can also be used to prevent emulsion formation.

Description:

Emulsion-treating agents are surfactants that are applied to emulsified oil at low concentrations (0.1-2 percent). They can be injected into skimmer reservoirs to break the emulsion to separate excess water from recovered oil. They also can be sprayed (similar to dispersants) directly onto slicks to break or prevent emulsions.

Applicable Habitat Types:

On all water environments where emulsified oil is present.

When to Use:

For recovered oil, where storage capacities are very limited, to separate the oil and water so that the water can be treated and discharged. On floating slicks, where emulsified oil can reduce skimmer efficiency.

Biological Constraints:

There is insufficient information to evaluate at this time.

Environmental Effects:

Because this is a new application approach, there are very few data available to evaluate environmental effects. Effective dosages are one to two orders of magnitude lower than dispersants. Environmental concerns regarding application to slicks are: how treatment might adversely change the physical or chemical properties of the oil; whether the oil will be more readily dispersed; and how the treated oil will behave upon contact with birds, mammals, and shorelines.

23. Visco-Elastic Agents

Objective:

To impart visco-elastic properties to floating oil and increase skimming rates.

Description:

Chemical agent is applied as a liquid spray or a slurry onto the oil in the proper dosage. Some mixing is required and is usually provided by the water spray during application. Treated oil is rendered visco-elastic, but still fluid, gelatinous, or semi-solid; there is no chemical change in the oil. The primary purpose is to increase the efficiency in skimmer removal rates while minimizing amount of water. Increases the recovery by drum skimmers, but can clog weir-type skimmers.

Applicable Habitat Types:

On all water environments where oil can be contained for recovery with skimmers. Not for use near wetlands or debris because of an increase in adhesive behavior of the treated oil.

When to Use:

When recovery efficiency of skimmers needs to be increased. Must be used with booming or other physical containment. Not for use on heavy oils, which are already highly viscous.

Biological Constraints:

Not suitable for vegetated shores or where there is extensive debris mixed in the oil. Should be avoided when birds or other wildlife that may be more adversely affected by the treated oil cannot be kept away from the treated oil.

Environmental Effects:

May enhance the smothering effect of oil on organisms. Therefore, the treatment should be considered only where recovery of the treated oil is likely.

24. Herding Agents

Objective:

To collect or herd oil into a smaller area and thicker slick in order to increase recovery. Also can be used to herd oil away from sensitive areas or used inside containment booms when it is necessary to move the boom.

Description:

Chemical agents, which are insoluble surfactants and have a high spreading pressure, are applied in small quantities (1-2 gallons per lineal mile) to the clean water surrounding the edge of a fresh

oil slick. They contain the oil, prevent spreading, but do not hold the spill in place. Hand-held, vessel-mounted, or aircraft systems can be used. Must be applied early in spill, when oil is still fluid.

Applicable Habitat Types:

On all stillwater environments.

When to Use:

Potential use for collection and protection. For collection, used to push slicks out from under docks and piers where it has become trapped, or in harbors, where the equipment is readily accessible for use early in the spill. For protection in low-current areas, use to push slicks away from sensitive resources such as wetlands. Not effective in fast currents, rough seas, or rainfall.

Biological Constraints:

Not suitable for use in very shallow water or fish-spawning areas.

Environmental Effects:

Direct acute toxicity to surface layer organisms possible, though available products vary greatly in their aquatic toxicity.

25. Solidifiers

Objective:

To change the physical state of spilled oil from a liquid to a solid to reduce impact of oil to shorelines.

Description:

Chemical agents (polymers) are applied to oil at rates of 10-45 percent, solidifying the oil in minutes to hours. Various broadcast systems, such as leaf blowers, water cannons, or fire suppression systems, can be modified to apply the product over large areas. Can be applied to both floating and stranded oil.

Applicable Habitat Types:

All water environments, bedrock, sediments, and manmade structures.

When to Use:

When immobilization of the oil is desired, to prevent refloating from a shoreline, penetration into the substrate, or further spreading. However, the oil may not fully solidify unless the product is well mixed with the oil, and may result in a mix of solid and untreated oil.

Generally not used on spills of heavy oil because the product cannot be readily mixed into viscous

oils.

Biological Constraints:

Must be able to recover all treated material.

Environmental Effects:

Available products are insoluble and have very low aquatic toxicity. Unrecovered solidified oil may have longer impact because of slow weathering rates. Physical disturbance is likely during application and recovery.

26. Chemical Shoreline Pre-treatment

Objective:

To prevent oil from adhering to or penetrating the substrate.

Description:

Various types of film-forming agents or wetting agents are applied to habitats in advance of the oil to prevent oil adhesion and penetration. Application must occur just prior to stranding of the oil so timing is critical. It should be noted that there are no products now being sold as shoreline pretreatment agents.

Applicable Habitat Types:

Bedrock, sand and gravel habitats, and manmade structures.

When to Use:

When oil is projected to impact an applicable shoreline, particularly those that have high recreational or aesthetic value. However, lack of information on the availability, effects, and effectiveness of products greatly limits their use.

Biological Constraints:

Unknown at this time but there are likely to be constraints based on product toxicity and persistence.

Environmental Effects:

Unknown at this time since there are no commercially available products. There are concerns about toxicity and smothering since these products could be applied directly on clean substrates.

27. Shoreline Cleaning Agents

Objective:

To increase the efficiency of oil removal from contaminated substrates.

Description:

Special formulations are applied to the substrate, as a presoak and / or flushing solution, to soften or lift weathered or heavy oils to enhance flushing methods. The intent is to lower the water temperature and pressure required to mobilize the oil from the substrate during flushing.

Applicable Habitat Types:

On any habitat where water flooding and flushing procedures are applicable.

When to Use:

When the oil has weathered to the point where it cannot be removed using warm to hot water. This approach may be most applicable where flushing effectiveness decreases as the oil weathers.

Biological Constraints:

The released oil should be recovered rather than dispersed into the water column. Use may be restricted where suspended sediment concentrations are high, near wetlands, and near sensitive nearshore resources.

Environmental Effects:

If more oil is dispersed into the water column, there could be more oil sorbed onto suspended sediments and transferred to nearshore habitats, particularly along sheltered shorelines. The toxicity of shoreline cleaners is similar to the toxicity of dispersants.

28. Nutrient Enrichment

Objective:

To speed the rates of natural microbial degradation of oil by adding nutrients (generally nitrogen and phosphorus).

Description:

Nutrients are applied to the habitat in one of several methods: soluble inorganic formulations, which are dissolved in water and applied as a spray, requiring frequent applications; slow-release formulations, which are applied as a solid; and oleophilic formulations, which adhere to the oil itself and are sprayed directly on the oiled areas.

Applicable Habitat Types:

Could be used on any habitat type where safe access is allowed and nutrients are deficient.

When to Use:

On moderately to heavily oiled substrates, after other techniques have been used to remove as much oil as possible; on lightly oiled shorelines where other techniques are destructive or not effective; and where nutrients limit natural degradation. Most effective on diesel-type and medium oils that do not have large amounts of high molecular weight, slowly degrading components. Less effective where oil residues are thick. Not considered for gasoline spills, which will be completely removed by evaporation at faster timeframes than by microbial degradation.

Biological Constraints:

Not suitable in shallow water or restricted waterbodies where nutrient overloading may lead to eutrophication, or where toxicity of nutrients, particularly ammonia, is of concern.

Contact toxicity of oleophilic formulations may restrict areas of direct application. Toxicity tests should be evaluated carefully, as other chemicals in the product could be toxic to aquatic organisms.

Environmental Effects:

Very little information is available on effects in freshwater.

29. Natural Microbe Seeding

Objective:

To speed the rates of microbial degradation of oil by adding live microbes with enhanced oil-degrading abilities.

Description:

Formulations containing hydrocarbon-degrading microbes (usually with fertilizers) are added to the oiled area. The argument is made that indigenous microorganisms will be killed by the oil or will be slow to degrade the oil, so new microbial species need to be added to speed the process of biodegradation. Little information is currently available to show whether natural microbe seeding increases biodegradation more than nutrient enrichment alone.

Applicable Habitat Types:

Could be used on any habitat type where safe access is allowed and additional microbes are needed.

When to Use:

On moderate to heavily oiled substrates, after other techniques have been used to remove as much

oil as possible; on lightly oiled shorelines where other techniques are destructive or not effective; and where existing microorganisms are not present or effective. Most effective on diesel-type and medium oils that do not have large amounts of high molecular weight, slowly degrading components. Less effective where oil residues are thick. Not considered for gasoline spills, which will evaporate faster than they would degrade.

Biological Constraints:

If product contains fertilizers, not suitable in shallow water or restricted bodies of water where nutrient overloading may lead to eutrophication, or where toxicity of nutrients, particularly ammonia, is of concern. Toxicity tests should be evaluated carefully, as other chemicals in the product could be toxic to aquatic organisms

Environmental Effects:

Very little information is available on effects in freshwater.

SPECIAL CONSIDERATIONS

This section summarizes the following selected topics of special concern in freshwater habitats:

- Public health concerns;
- Conditions under which oil might sink;
- Oil behavior in ice conditions;
- Oil behavior and cleanup in permafrost; and
- Firefighting foam.

PUBLIC HEALTH CONCERNS

The human-health concerns associated with oil spills entail risks to the public from exposure to the oil and to responders during cleanup activities. In freshwater areas, the risks of exposure of the public are of special concern, because of the potential for contamination of public drinking water supplies and the proximity of populated areas to spill sites. Human- health risks from spilled oil occur along three potential pathways: ingestion, dermal contact, and inhalation. Ingestion pathways include drinking contaminated water and eating tainted food (e.g., fish, birds, and mammals).

Water intakes in relatively shallow lakes and rivers may be highly susceptible to contamination during oil spills. Response procedures may thus include temporarily closing the intakes, protectively booming the intake area, bringing on-line additional treatment equipment at the water-treatment plant, and / or monitoring water quality for the contaminants of concern. The low-molecular weight, aromatic compounds (benzene, ethylbenzene, toluene, and xylene) are

usually of greatest concern, because of their much higher water solubility, compared to the other compounds in oil. These four compounds usually represent 70-95 percent of the water-soluble fraction (typically about 25-40 ppm) in crude oils. Water-treatment plants that have granular activated carbon filtration systems can remove low levels of oil contamination, especially the aromatic compounds, which can cause taste and odor problems at very low concentrations.

The potential for direct contact of oil on skin is greatest during cleanup, and measures should be taken to keep the public away from all spill response operations. Inhalation of volatile compounds from spills of crude oil and light, refined products poses a risk to the public in adjacent areas. However, these risks are greatest with long-term exposure.

Fire risks are mostly associated with volatile, refined products such as gasoline. Response operations at these spills must be conducted with caution. Often, the best response to spills of volatile products is to allow the product to evaporate, while diverting the slicks away from populated areas and sensitive habitats.

CONDITIONS UNDER WHICH OIL MIGHT SINK IN FRESH WATER

Most oil spills result in floating oil slicks. There are very specific conditions that can cause an oil spill to sink rather than float in freshwater settings.

1 The oil has a specific gravity greater than 1.00 at the ambient temperature.

Specific gravity is the ratio of the density of a material to freshwater. Although nearly all crude oils and most refined products have a specific gravity less than 1.00 and will therefore float, some of the residual refined products (e.g., very heavy fuel oils, asphalt) are so heavy that their specific gravity is greater than 1.00. Spills of these oils can sink immediately and flow along with the bottom currents or as droplets in the water column. However, very small changes in water density can refloat sinking oil. There have been several spills in the freshwater sections of a river where the oil originally sank and moved along the bottom. However, at the fresh / salt mixing zone, where the water density increased with salinity, some of the oil rose to the surface. In other spills, oil has been reported to sink with very cold temperatures at night, only to refloat after the water absorbs heat from the sun.

2 The oil has a specific gravity just under 1.00 but forms a very stable emulsion.

Water-in-oil emulsions can contain up to 80 percent water, which increases the specific gravity accordingly. Also, during the emulsification process, some sediment can be incorporated into the emulsion, either from the suspended sediments in the water mixed into the oil, or those adhered to the floating slick. Only a very small amount of sediment is needed to sink oil. Usually residual refined products (e.g., No. 6 fuel oil, Bunker C) have a specific gravity of 0.99 or greater.

3 The oil comes ashore, picks up sediment, and then is eroded from the shore.

Medium and heavy oils can adsorb to sediment when they strand, making the mixture heavier than water. However, the oil / sediment mixture must be eroded from the shoreline, usually by waves, which tend to break up the oil slicks. The oiled sediment can be deposited in the nearshore zone, but as small tarballs or widely scattered contaminated sediment, rather than a layer of sunken oil. In some instances, the tarballs can stick to each other, forming a tar mat just offshore.

4 The oil is a blend of light and heavy refined products, and the light fraction is lost by evaporation.

Many intermediate fuel oils are actually mixtures of No. 2 and No. 6 oils. If the spill conditions were such that the light oil component completely evaporated, and the heavy oil was particularly heavy, the weathered oil might sink.

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FORM 3

[See rules 6(5), 13(7), 14(6), 16(5) and 20 (1)]

FORMAT FOR MAINTAINING RECORDS OF HAZARDOUS AND OTHER WASTES

1. Name and address of the facility: **ITF TENGAKHAT**
2. Date of issuance of authorisation and its reference number:
3. Description of hazardous and other wastes handled (Generated or Received)

Date	Type of waste with category as per Schedules I, II and III of these rules	Total quantity (Metric Tonnes)	Method of Storage	Destined to or received from
31/03/2026	Cotton rags/jute	8kg	stored in plastic drum	—
31/03/2026	Empty chemical drum	72 nos.	stored in drum stacking area.	—
31/03/2026	Sledge filling drum	32 nos.	stored in MS drum	—

* Fill up above table separately for indigenous and imported waste.

4. Date wise description of management of hazardous and other wastes including products sent and to whom in case of recyclers or pre-processor or utiliser:
5. Date of environmental monitoring (as per authorisation or guidelines of Central Pollution Control Board):

Date... 31.03.2026
Place... ITF, Tengakhata.

Signature of occupier

INSTALLATION MANAGER ITF
OIL INDIA LIMITED

FORM 3

[See rules 6(5), 13(7), 14(6), 16(5) and 20 (1)]

FORMAT FOR MAINTAINING RECORDS OF HAZARDOUS AND OTHER WASTES

1. Name and address of the facility: **ITF TENGAKHAT**
2. Date of issuance of authorisation and its reference number:
3. Description of hazardous and other wastes handled (Generated or Received)

Date	Type of waste with category as per Schedules I, II and III of these rules	Total quantity (Metric Tonnes)	Method of Storage	Destined to or received from
28/02/2026	Cotton rags / Jute	7kg	stored in plastic drum	
28/02/2026	Empty chemical drum	70 nos	stored in drum stacking area	

* Fill up above table separately for indigenous and imported waste.

4. Date wise description of management of hazardous and other wastes including products sent and to whom in case of recyclers or pre-processor or utiliser:
5. Date of environmental monitoring (as per authorisation or guidelines of Central Pollution Control Board):

Signature of occupier

Date... 28.02.2026
Place... ITF - Tengakhata

INSTALLATION MANAGER ITF
OIL INDIA LIMITED

FORM 3

[See rules 6(5), 13(7), 14(6), 16(5) and 20 (1)]

FORMAT FOR MAINTAINING RECORDS OF HAZARDOUS AND OTHER WASTES

1. Name and address of the facility: **ITF TENGAKHAT**
2. Date of issuance of authorisation and its reference number:
3. Description of hazardous and other wastes handled (Generated or Received)

Date	Type of waste with category as per Schedules I, II and III of these rules	Total quantity (Metric Tonnes)	Method of Storage	Destined to or received from
31/04/2026	Cotton rags /Jute	8kg	Stored in plastic drum	
31/04/2026	Empty chemical drum	6 nos	stored in drum stacking area	

* Fill up above table separately for indigenous and imported waste.

4. Date wise description of management of hazardous and other wastes including products sent and to whom in case of recyclers or pre-processor or utiliser:
5. Date of environmental monitoring (as per authorisation or guidelines of Central Pollution Control Board):

Signature of occupier

INSTALLATION MANAGER ITF
OIL INDIA LIMITED

Date... 31.03.2026
Place... ITF, Tengakhath

FORM 10
[See rule 19 (1)]

MANIFEST FOR HAZARDOUS AND OTHER WASTE

1.	Sender's name and mailing address (including Phone No. and e-mail)	OIL INDIA (ITF Tengakhat)		
2.	Sender's authorisation No.	:	WB/T-311/21-22/323 dt 13.10.22	
3.	Manifest Document No.	:	AR/25-26/257	
4.	Transporter's name and address: (including Phone No. and e-mail)	M/s Anham Oil Gas Products & services (OIL Contract No: 6119162) Nt L		
5.	Type of vehicle	:	(Truck/Tanker/Special Vehicle)	
6.	Transporter's registration No.	:		
7.	Vehicle registration No.	:	AS06CC 0274	
8.	Receiver's name and mailing address (including Phone No. and e-mail)	SPP, Dikom		
9.	Receiver's authorisation No.	:	WB/T-338/22-23/290/1900	
10.	Waste description	:	Oily Sludge	
11.	Total quantity No. of Containers	:	m ³ or MT 22 Nos.	
12.	Physical form	:	(Solid/Semi-Solid/Sludge/Oily/Tarry/Slurry/Liquid)	
13.	Special handling instructions and additional information	:	1. Follow Safety Rules 2. Use Proper PPE	
14.	Sender's Certificate	I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are categorised, packed, marked, and labelled, and are in all respects in proper conditions for transport by road according to applicable national government regulations.		
Name and stamp:		Signature:	Month	Day Year
ANIL KR JANGHU		[Signature]		03-11-2025
15.	Transporter acknowledgement of receipt of			
Name and stamp:		Signature:	Month	Day Year
Gurun Phukan		G. Phukan		11-10-2025
16.	Receiver's certification for receipt of hazardous and other waste			
Name and stamp:		Signature:	Month	Day Year
Gurun Phukan		G. Phukan		11-10-2025

NOISE LEVEL MEASUREMENT REPORT

LOCATION : ITF Tengakhat

(Production Installation – OCS/EPS/QPS)

Date : 23.12.2025

Time : 03.00 PM

Sl. No.	Noise Level Measurement at	Measurement in dB(A)	Threshold limit value for Noise as per OISD-166		Recommendation
1	Control Room / Operator Room	Door Open Door Closed	Duration per day(hours)	Sound Level (dBA)	
2	Middle of Group Area		8	90	
3	At the Entrance		6	92	
4	Security Hut		4	95	
5	Meter Shed		3	97	
6	Tank Area		2	100	
7	Air Compressor		1 - ½	102	
			1	105	
			½	110	
			¼ or less	115	

Sl. No.	Noise Level Measurement at	Noise level at source in dB(A)	At a distance from the shed								In dB(A)				Near boundary of the installation in dB(A)	Remarks
			5 mtrs				10 mtrs				15 mtrs					
			North	South	East	West	North	South	East	West	North	South	East	West		
1	CODP	94	84	85	84	85	75	74	75	74					East -- 57 West -- 59 North -- 56 South -- 57	
2	FWDP	83	78	77	78	78	71	70	70	71						
3	Drenching pump	94	85	86	85	86	74	75	75	75						
4	Emulsion Treater	74	70	71	70	71										
5	Indirect Heater	79	72	73	72	73										
6	Chemical Dosing Pump	67	63	62	62	63										
7	Power house															
8	SCADA Room															
9	Water Pump House															

Sound Level Meter : Make - H7C

Noise level measurement taken by : Ditu Mohan

S/N - SL1350

Authorised Person
Mitra SK Pvt.Ltd.

Approved by
Mr. Uttam Prodhan
Suptdg Research Scientist
Oil India Ltd, Duliajan

Authorised Person
Oil India Ltd.



ऑयल इंडिया
OIL INDIA

HSE Department

Oil India Limited

Duliajan, Dibrugarh, 786602, Assam

Phone : 0374-2800542

Email: safety@oilindia.in

संदर्भ सं./Ref. No:HSE/E/43C-1/1481(A)

दिनांक/Date:29.11.2025

From	:	Executive Director (HSE & ESG)
To	:	Deputy Director General of Forests (Central), Sub Office, Guwahati (under Regional Office, Shillong), 4th Floor, Housefed Building, Rukminigaon, Guwahati-781022. (Email : iro.guwahati-mefcc@gov.in , iro.moefcc.ghy@gmail.com)
Subject	:	Submission of Half-yearly (April 2025 to September 2025) compliance reports of the conditions stipulated in the Environment Clearance (EC) granted to Oil India Limited.

Sir,

Reference to above subject, please find enclosed herewith the Half-yearly (**April 2025 to September 2025**) compliance reports of the conditions stipulated in the Environment Clearance (EC) granted to Oil India Limited. List of the EC are tabulated below:

S.No	EC Identification No/File No.	Name of the EC proposal
1.	J-11011/463/2008-I A II(I) DATED 16.01.2012	Baghjan - STF crude Oil Pipeline & Gas Transmission pipeline from Baghjan to CGGS & OTP near W/50.
2.	J-11011/413/2008-I A II(I) DATED 24.01.2011	Augmentation capacity of Intermediate Tank Farm (ITF) at Tengakhat
3.	J-11011/413/2008-I A II(I) DATED 24.01.2011	Hapjan Savitri Crude Oil Pipeline in Tengakhat Nahakatiya -Jorajan area.

This is for your kind information please.

Thanking you.

Yours faithfully,
For Oil India Limited

Arindam Bhattacharyya
(Arindam Bhattacharyya)

Executive Director (HSE & ESG)

Nodal Officer (EC, FC, NBWL)

For Resident Chief Executive

Executive Director (HSE & ESG)

नोडल अधिकारी (ईसी/एफसी/एनबीएल)

Nodal Officer (EC/FC/NBWL)

ऑयल इंडिया लिमिटेड
Oil India Limited

Encl: As above

Copy:

1. Director, Monitoring Cell, MoEF, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi-110003.
2. Zonal Office, Central Pollution Control Board, "TUM-SIR", Lower Motinagar, Near Fire Brigade Headquarter, Shillong-793014.
3. Chairman, Assam Pollution Control Board, Bamunimaidan, Guwahati-781021, Assam.



HSE Department
Oil India Limited
Duliajan, Dibrugarh, 786602, Assam
Phone : 0374-2800542
Email: safety@oilindia.in

संदर्भ सं./Ref. No.: HSE/E/21(B)/928

दिनांक/Date: 01.09.2025

From	:	ED (HSE & ESG)
To	:	The Member Secretary, Pollution Control Board, Assam, Bamunimaidam, Guwahati- 781021.
Subject	:	Submission of Environmental Statement (Form-V) under Environment (Protection) Rules, 1986.

Sir,

With reference to the above subject, we are submitting herewith the Environmental Statement (Form-V) for the financial year ending on 31st March 2025 pertaining to the operations of Oil India Limited in the districts of Dibrugarh, Tinsukia, Sivsagar and Charaideo in Assam.

Thanking you.

Yours faithfully,
For **Oil India Limited**


01/09/2025
(R.K. Singh)

**ED (HSE & ESG)-Officiating
Nodal Officer (EC, FC, NBWL)
For Resident Chief Executive**

Encl: As above.

- Copy:**
1. Regional Executive Engineer,
Pollution Control Board Assam,
Back Side of ASTC Bus Station,
Chowkidinghee, Dibrugarh,
PIN: 786001.
 2. Executive Engineer,
Regional Laboratory cum Office,
Pollution Control Board Assam,
Melachakar, Sivsagar,
PIN: 785640.
 3. Executive Engineer,
Regional Office,
Pollution Control Board Assam,
Rangagora Rd, Borguri, Tinsukia,
PIN: 786126

FORM – V
(See Rule 14)
ENVIRONMENTAL STATEMENT FOR THE FINANCIAL YEAR ENDING THE 31st
MARCH, 2025

PART – A

(i) **Name and address of the owner/occupier of the industry operation or process.**

OIL INDIA LIMITED
P.O. DULIAJAN
DIST. DIBRUGARH
ASSAM -786602.

Note: Environmental Statement (Form – V) is pertaining to the operations of Oil India Limited in the districts of Dibrugarh, Tinsukia, Sivasagar and Charaideo in Assam.

(ii) **Industry category:** Red - Oil and gas extraction (on-shore extraction through drilling wells)

(iii) **Production capacity – Units**

OIL's production target is fixed as per the Memorandum of Understanding (MoU) with Ministry of Petroleum and Natural Gas, Govt. of India, which varies from year to year.

Production details during F.Y. 2024-25:

- **Crude Oil:** 3.380 MMT.
- **Natural Gas:** 2935.529832 MMSCM
- **LPG:** 30,525 MT.

(iv) **Year of establishment:**

OIL INDIA LTD. was formed in 1961 as a joint venture with M/S. Burma Oil Company, UK and on 14th Oct. 1981, OIL became a fully owned Govt. of India Enterprise.

(v) **Date of last Environmental Statement submitted:** 24.09.2024.

PART – B
WATER AND RAW MATERIAL CONSUMPTION

(I) Water consumption m³/d:

S.No	Purpose	Water Consumption (m ³ / day)
1.	Process & Cooling	14469.04
2.	Domestic	15956.16
TOTAL		30425.20

Name of Products	Process water consumption per unit of product output	
	During F.Y. 2023-24	During F.Y. 2024-25
(1)	(2)	(3)
Hydrocarbon (Crude Oil, Natural Gas, LPG)	0.96 m ³ /MT (Approx.)	0.94 m ³ /MT (Approx.)

(II) Raw material consumption

*Name of raw materials	Name of products	Consumption of raw material per unit	
		During F.Y. 2023-24	During F.Y. 2024-25
No raw materials are used as Oil India Limited is engaged in Exploratory and Development drilling activities & production of Crude Oil and Natural Gas. However, chemicals such as Bentonite are used for preparation of Water based drilling mud.			

PART – C

POLLUTION DISCHARGED TO ENVIRONMENT/UNIT OF OUTPUT

(Parameter as specified in the consent issued)

Pollutants	Quantity of Pollutants Discharged (mass/day)	Concentrations of pollutants in discharges (mass/volume)	Percentage of variation from prescribed standards with reasons
(a) Water	NIL. There is no discharge of pollutants from drilling locations and Production Installations. Wastewater generated from drilling locations is treated in Effluent Treatment Plant (ETP) and reused	- Quality of ETP treated water from the drilling locations is analyzed frequently. (Test report is enclosed as Annexure – I). - Quality of Formation	No variation is observed. All parameters of treated effluent and Formation water are within the permissible limits.

	back in the drilling operation. The formation water generated after separation from crude oil and treatment is pumped back to the underground formation (depth greater than 1600 m) through formation water disposal wells.	water is analyzed frequently (Test report enclosed as <i>Annexure- II</i>)	
(b) Air	No major air pollutants are emitted from Oil & Gas exploratory and development drilling and production activities except Stack Gas emissions at drilling locations and Production Installations & Flaring at Oil Collecting Stations.	Stack Gas and Ambient Air Quality (AAQ) monitoring is carried out frequently at drilling locations and Production Installations (Test reports enclosed as <i>Annexure- III</i>)	No variation is observed. All parameters of Stack Gas emissions and Ambient Air are within the permissible limits.

PART – D

HAZARDOUS WASTES

(As specified under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016)

Hazardous Wastes	Category of Hazardous Waste as per Schedule - I of HW Rules, 2016	Total Quantity generated	
		During F.Y. 2023-24	During F.Y. 2024-25
a) From process	S.No. 2.2 Sludge containing Oil	3541.99 MT	3849.99MT
	S.No. 5.1 Used or Spent Oil	55 KL	50 KL
	S.No. 33.1 Empty barrels/containers/liners contaminated with hazardous chemicals/wastes	11150 Nos.	13000 Nos.

	S.No. 33.2 Contaminated cotton rags or other cleaning materials	5.58 MT	9.40 MT
b) From pollution control facilities	S.No. 33.5 Chemical sludge from waste water treatment	98.44 KL	197.46 KL

PART – E
SOLID WASTES

Solid Wastes	Total Quantity	
	During F.Y. 2023-24	During F.Y. 2024-25
(a) From process Drill Cuttings	15,200 m ³ (Approx.)	13200 m ³ (Approx.)
(b) From pollution control facilities	NIL	
(c) (1) Quantity recycled or re-utilized within the unit. (2) Sold (3) Disposed	N/A N/A N/A	

PART – F

PLEASE SPECIFY THE CHARACTERIZATION (IN TERMS OF COMPOSITION AND QUANTUM) OF HAZARDOUS AS WELL AS SOLID WASTES AND INDICATE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTES.

(I) Hazardous Wastes:

Name of the Hazardous Waste	Quantity generated during F.Y. 2024-25	Disposal Practices
a) Sludge containing Oil	3849.99MT	Sent to Sludge Processing Plant for oil recovery followed by Bioremediation

b) Used or Spent Oil	50 KL	Stored in barrels under covered shed and sold to authorized recyclers through auction
c) Empty barrels/containers/liners contaminated with hazardous chemicals/wastes	13000 Nos.	Sold to authorized recyclers through auction
d) Contaminated cotton rags or other cleaning materials	9.40 MT	Bioremediation
e) Chemical sludge from waste water treatment	197.46 KL	Disposed in HDPE lined pits

(I) Solid Wastes:

Name of the Solid Waste	Quantity generated during F.Y. 2024-25	Disposal Practices
a) Drill Cuttings	13,200 m ³ (Approx.)	Disposed in HDPE lined pits

PART – G

IMPACT OF THE POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES AND ON THE COST OF PRODUCTION

- Acoustic enclosures have been provided around all gensets to reduce noise levels.
- Recovery of drilling mud from drill cuttings by using a combination of Vertical Cutting Dryer (VCD) and a high-performance centrifuge.
- Wastewater generated from drilling locations is collected in HDPE lined pits, treated in Effluent Treatment Plant (ETP) with Reverse Osmosis unit and the treated effluent is reused back in the drilling operation.
- Formation water generated from Production Installations is treated in Effluent Treatment Plant (ETP) before disposal in the abandoned/ water disposal wells.
- Processing of oily sludge for recovery of Crude oil and further treatment of sludge through Bioremediation.
- Construction of central concrete pit for disposal of waste mud.
- Treatment of Biomedical waste through incinerator.

PART – H

ADDITIONAL MEASURES / INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION, ABATEMENT OF POLLUTION, PREVENTION OF POLLUTION

- Municipal Solid waste treatment plant has been setup for treatment of municipal and solid waste generated at Duliajan Township.
- RCC concrete pit has been constructed for the environmental sound disposal of leftover drilling fluid.
- MoU signed with the Digboi Forest Division, Assam, to carry out afforestation on 100 hectares of degraded forestland.
- Memorandum of Understanding (MoU) in progress with upcoming TSDF facility by Mumbai waste management limited for disposal of hazardous waste generated by our installations and drilling sites.

PART – I

ANY OTHER PARTICULARS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT.

- Zero Routine Flare: Construction of pipelines and installation of Booster compressors led to 59% reduction in flare compared to previous year.
- Replacement of conventional energy intensive equipment (LED lights, BLDC fans etc.) with energy efficient equipment.
- Dynamic Gas Blending (DGB) retrofit kits have been installed on drilling rig engines, enabling them to operate on 100% diesel or a diesel- natural gas mix with up to 70% natural gas substitution. This system reduces environment impact by using flared gas as fuel, effectively substituting diesel and promoting cleaner energy use.

STATUS OF COMPLIANCE OF EC CONDITIONS

- **Installation:** Hapjan Savitri Pipeline
- **Period:** 01/10/2025 to 31/03/2026
- **EC No:** J-11011/413/2008-I A II(I) DATED 24.01.2011

Specific Condition		
Sl No.	EC Condition	Compliance status/Remark
i.	Environmental clearance is subject to obtaining prior clearance from wildlife angle including clearance from the Standing Committee of the National Board for Wildlife regarding impact of the proposed project on the Padumani Wildlife Sanctuary (8.2 km from new BUS at Mahum), Borjhan Wildlife Sanctuary (5 km from STF) and 3 recently declared Wildlife sanctuaries (declared on 20th October, 1999) besides Dibru-Saikhowa National Park (9 km from BUS) located within 10 km. area as applicable.	Not applicable. The project does not attract wildlife clearance.
ii.	Grant of environmental clearance does not necessarily imply that wildlife clearance shall be granted to the project. The proposal for wildlife clearance shall be considered by the respective authorities on their merits and decision taken. The investment made in the project, if any, based on environmental clearance so granted, in anticipation of the clearance from wildlife angle shall be at the cost and risk of the project proponent and Ministry of Environmental & Forests shall not be responsible in this regard in any manner.	Noted
iii.	Ambient air quality shall be monitored for PM10, SO2, NOx, and non-methane hydrocarbon (NMHC) as per the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R No. 826(E) dated 16 th November 2009.	Complied Environment Monitoring is carried out regularly by MoEF&CC/NABL approved laboratory. All the results are observed to be within norms. Ambient air quality report for the compliance period Oct 25 to Mar 26 is attached as Annexure -1
iv.	The stacks of adequate height shall be provided to control emissions from all the sources including DG sets, steam generators etc. as per the regulatory requirements and emissions from stacks shall meet the MOEF/CPCB guidelines.	Complied. Emissions from the stack are within norms. Stack report attached as annexure 2

Sl. No.	EC Condition	Compliance status/Remark
v.	The company shall make the arrangement for control of noise from the DG sets and meet DG set norms notified by the MoEF.	Complied Not applicable for Hapjan Savitri pipeline. Power consumption requirement is met through captive power plant.
vi.	Total ground water requirement for OCS, STF, ITF and BUS shall not exceed 128 m ³ /day/well and prior permission shall be obtained from the Central Ground Water authority/state Ground Water Board (CGWA/SGWB). A copy of the permission shall be submitted to the Ministry's Regional Office at Shillong. Effluent Treatment Plant (ETP) shall be installed to control oil content and other parameters as per Assam Pollution Control board (APCB) and/or Environment (Protection) Act whichever is more stringent. Treated wastewater shall be passed through multi-media filters to remove solids and clarified water shall be collected into storage tubes before pumping to disposal wells. Oily waste water shall be treated in oil separator to remove oil content in the effluent. Domestic effluent shall be treated in septic tank followed by soak pit. The treated effluent shall be monitored regularly.	Complied Not applicable for Hapjan Savitri pipeline as we are not withdrawing ground water for the proposed project.
n	Tank bottom sludge from crude oil tanks of OCS shall be stored in secured covered impermeable concrete sludge pit located outside the proposed installation before safe disposal through approved/registered recyclers. Waste oil and used batteries shall be sold to authorized recyclers/re-processors. Secured land fill shall be as per the design approved by the CPCB and obtain authorization from the Assam SPCB. Copy of authorization shall be submitted to Ministry's Regional Office at Shillong.	Not applicable for Hapjan Savitri pipeline project.
viii.	Total storage capacity of the tanks shall not exceed 40,000 KL after expansion. Capacity of the each of the storage tank shall not exceed 20,000 KL. Instead of fixed roof tanks, floating roof tanks shall be provided.	Not applicable for Hapjan Savitri pipeline project.
ix.	A comprehensive Oil Spill Contingency plan (OSCP) shall be prepared to handle all major, moderate and minor spill.	Complied. Attached as annexure 3
x.	All the OCS shall have facilities for knocking out water from the formation fluid. The Formation	Not applicable for Hapjan Savitri pipeline

Sl. No.	EC Condition	Compliance status/Remark
	water from Electrostatic, Emulsion Treater (EET) shall be disposed to the disposal wells only after ensuring all the parameters within permissible limit of Assam PCB and / or prescribed under E(P) Act whichever is more stringent.	
xi.	Use of browser for the transportation of oil shall be stopped as soon as pipeline is installed.	Complied. Pipeline work completed.
xii.	M/s OIL shall prepare a remediation plan (both bio- remediation) where solid is contaminated due to spillage of oil in existing units and submit to MOEF.	Complied Remediation plan facility at Dikom is valid until 5.12.2027
xiii.	An immediate action shall be ensured to control and treat oil spill or oil sludge using suitable method. Remaining oil shall be remediated through bioremediation / Phyto-remediation etc. The recyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers.	Complied Sludge Processing Plant of having a processing capacity of 20 KLPD is in operation for processing/ treatment. Herein, Hydrocarbon is recovered from the sludge by mechanized process using tricanting method (Industrial Centrifuge) and accordingly, recovered liquid is pumped to nearby Oil Collecting Station. Emergency Response Plan to mitigate oil spillage and its control is in place and bioremediation is carried out for remaining oil. Hence complied.
xiv.	All the solid/hazardous waste including bottom sludge shall be handled as per the rules and guidelines under Manufacture, Storage and Import of Hazardous chemicals Rules, 1989 as amended in October, 1994 and January, 2000. All the oily sludge from ITF, STF, and BUS OCS shall be stored in secured land fill (SLF) as per CPCB guidelines.	Complied as per the Rules. Secured, covered, impermeable sludge storage facility is available.
xv.	Handling and disposal of hazardous wastes shall be in accordance with the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008. Authorization from the Assam SPCB shall be obtained for collections/treatment/storage/disposal of hazardous wastes.	Complied

xvi.	The project authorities shall patrol and inspect the pipeline regularly for detection of faults as per OISD guidelines and continuous monitoring of pipeline operations by adopting non- destructive method (S) of testing. Pearson survey and continuous potentialsurvey shall be carried out a regular interval to ensure the adequacy of cathodic protection system.	Complied Our pipelines are integrated into a centralized SCADA (Supervisory Control and Data Acquisition) system, providing real-time monitoring of pressure and flow parameters. This allows for instantaneous leak detection and automatic shutdown in the event of any deviation from standard operating limits
xvii.	The project authorities shall install SCADA system for safe operation of pipeline and leak Detection Systems (LDS). Additional sectionalizing valves in the residential area and	Complied SCADA system has been installed at the installation to monitor the leak for safe operation of pipeline. Hence complied.

Sl. No.	EC Condition	Compliance status/Remark
	sensitive installations shall be provided to prevent the spillage of the oil in the event of pipeline failure. Intelligent pigging facility shall be provided for the entire pipeline system for internal corrosion monitoring.	
xviii.	M/S OIL shall ensure smokeless flaring in case of ground flaring. The company shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. At the place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseousemissions during operation. To prevent fire and explosion at Oil and Gas facility, potential ignition sources shall be kept to a minimum and adequate separation distance between potential ignition sources and flammable materials shall be in place.	Complied Complete combustion is ensured by adequate supply of air. To avoid liquid carrying over during plant upset, knockout drums are equipped to handle oil spillage. Paved surface with proper draining to avoid water logging. Also remote ignition is at place.
xix.	The flare system shall be designed as per good oil fieldpractices and oil industry Safety Directorate (OISD) guidelines.	Complied
xx.	The firefighting facilities shall be designed as per OISD-117 guidelines. For fighting prolonged fires, thecompany shall firm up a plan for assured water supply from nearby ground water/surface water sources.	Complied

xxi.	Comprehensive Risk assessment and Consequence Analysis for all the activities regarding impact of the proposed project on the Secondary Tank Farm (STF), Oil Collecting Station (OCS), Intermediate Tank Farm (ITF), Browser Unloading station (BUS) and pipeline shall be carried out. Action plan to implement the recommendations shall be submitted to the ministry and proper implementation shall be ensured.	Complied Risk analysis for the installation has been carried out internally and risk register is being maintained. Hence complied. HAZOP, QRA, CA are being carried out as per OISD GDN 206 & ATR also being prepared are being verified by OISD, DGMS during audits.
xxii.	Occupational health surveillance of the workers shall be carried out as per the prevailing Acts and Rules.	Complied during the project execution.
xxiii.	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA/EMP report.	Complied with the environmental protection measures and safeguards recommended in the EIA/EMP report.
xxiv.	The surface facilities shall be installed as per applicable codes and standards, international practices and applicable local regulations.	Complied. All the surface facilities are installed as per applicable codes and standards, international practices and

Sl. No.	EC Condition	Compliance status/Remark
		applicable local regulations such as API, ASTM, OISD, OMR, APCB & CPCB etc.
xxv.	The design, material of construction, assembly, inspection, testing and safety aspects of operation and maintenance of pipeline and transporting the natural gas/oil shall be governed by ASME/ANSI B 31.8/B31.4 and OISD standard 141.	Complied
xxvi.	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Complied
General Condition		
Sl No.	EC Condition	Compliance status/Remark
.		

i.	The project authorities must strictly adhere to the stipulations made by the Assam State Pollution Control Board (ASPCB), State Government and any other statutory authority.	Complied
ii.	No further expansion or modifications in the project shall be carried out without prior approval of the Ministry of environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Complied No further expansion has been carried out.
iii.	The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous chemicals Rules, 2000 as amended subsequently. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire safety Inspectorate etc. must be obtained, wherever applicable.	Complied

Sl. No.	EC Condition	Compliance status/Remark
iv.	The project authorities must strictly comply with the rules and regulation with regarding to handling and disposal of Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/disposal of hazardous wastes.	Complied
v.	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generations. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70dBA (night time).	Complied. Noise monitoring report attached as Annexure 4
vi.	A separate Environment Management Cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	Complied

vii.	The project authorities shall provide adequate funds both recurring and non- recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose.	Complied
viii.	The Regional Office of this Ministry/Central Pollution Control Board/ Assam State Pollution Control Board shall monitor the stipulated conditions. A six-monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	Complied
ix.	A copy of clearance letter shall be sent by the proponent to concern Panchayat, Zila Parishad / Municipal Corporation, Urban Local Body and local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.	Complied

Sl. No.	EC Condition	Compliance status/Remark
x.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF, the respective Zonal Office of CPCB and the Assam SPCB. The Criteria pollutant levels namely; SPM, RSPM, SO ₂ , NO _x , HC (Methane & Non-methane), VOCs (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	Complied Compliance status including monitored data is regularly uploaded on company's website and sent to concerned government authorities. Monitored data is also enclosed herewith.

xi.	The Project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environment conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional of MOEF, the respective Zonal Office ofCPCB and the Assam SPCB. The Regional Office of this Ministry/ CPCB/ Assam SPCB shall monitor the stipulated conditions.	Complied EC compliance report for the period April 2025 to Sept 2025 was submitted to Sub-RO, Guwahati, Zonal Office CPCB, Shillong and, Chairman - Pollution Control Board Assam vide L.No. Ref. No.:HSE/E/43C-1/1481(A) dated 29.11.2025 . Also, copy of the EC and Six-monthly compliance report are uploaded to OIL website under the link https://www.oil-india.com/environmental-compliance-reports Cover letter of the same is attached as annexure 5
xii.	The environment statement for each financial year ending 31st march in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amendedsubsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail.	Complied. Environment Statement (Form – V) for the F.Y. 2025-26 was submitted to Pollution Control Board, Assam Ref. No.: HSE/E/21(B)/928 dated: 01.09.2025 Copy of the same is enclosed as Annexure 6
xiii.	The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the Assam SPCB and may also be seen at Website of the Ministry of Environment and Forest at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspaper that are widely circulated in the region of which one shall be forwarded to the Regional Office.	Complied.

Sl. No.	EC Condition	Compliance status/Remark
xiv.	Project authorities shall inform the Regional Office aswell as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date ofcommencing the land development work.	Complied

Ambient Air Quality Monitoring Report

Name & Address of the Customer :		Report No. : MSK/2025-26/02148			
"M/s OIL INDIA LIMITED", Duliajan, Dibrugarh, Assam-786602		Report Date : 09.01.2026			
		Sample Description : Ambient Air			
		Sample Number : MSKGL/ED/2025-26/12/02005			
		Sampling Location : OCS HAPJAN			
Instrument ID : RDS 1317-DTK-2008/ FPS 92-DTL-2021		GPS Reading : N 27°51'38", E 95°42'53"			
Ref. No.:W.O. NO.- 8129283 of Contract No. 6119277					
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date		
24.12.2025	27.12.2025	27.12.2025	03.01.2026		
Enviromental Conditions During Sampling & Transport Condition :Temperature : 24°C, Rain fall : No					
Analysis Result					
Sl. No.	Test Parameter	Method	Unit	Results	CPCB Limit
1.	Particulate Matter (PM ₁₀)	IS : 5182 (Part-23)-2006	(µg/m ³)	72.6	100
2.	Particulate Matter (PM _{2.5})	IS : 5182 (Part-24)	(µg/m ³)	40.2	60
3.	Sulphur Dioxide (SO ₂)	IS : 5182 (Part-2)-2001	(µg/m ³)	7.6	80
4.	Nitrogen Dioxide (NO ₂)	IS : 5182 (Part-6)-2006	(µg/m ³)	23.1	80
5.	Carbon Monoxide (CO)	IS 5182 : (Part-10) :1999	(mg/m ³)	0.74	2
6.	Ozone (O ₃)	IS:5182 (Part-IX)-1974 Reaffirmed-2019	(µg/m ³)	21.5	180
7.	Ammonia (NH ₃)	IS 5182 (Part 25) : 2018	(µg/m ³)	<20.0	400
8.	Lead (Pb)	USEPA IO-3.4	(µg/m ³)	<0.01	1
9.	Nickel (Ni)	USEPA IO-3.4	(ng/m ³)	<5.0	20
10.	Arsenic (As)	USEPA IO-3.4	(ng/m ³)	<1.0	6
11.	Benzene (C ₆ H ₆)	IS 5182 : (Part 11) :2006	(µg/m ³)	<4.2	5
12.	Benzo(a)Pyrene (BaP)	IS 5182 : (Part 12) :2004	(ng/m ³)	<0.5	1
13.	Mercury (Hg)	USEPA IO-5.0	(µg/m ³)	<0.002	...
14.	Methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	1.97	...
15.	Non-methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	<0.5	...
16.	Total Hydrocarbon	IS 5182 : (Part 17)	ppm	1.97	...
17.	Volatile Organic Compounds (VOC)	IS 5182 : (PART-11):2006	(µg/m ³)	<4.2	...
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality					

Analyzed By:

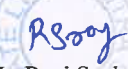
Signature : 
 Name : Mr. Dipankar Mazumdar
 Designation : Technical Manager

Prepared By:

Signature : 
 Name : Mr. Dipankar Das
 Designation : Office Assistant

Authorized Signatory

For Mitra S.K. Private Limited

Signature : 
 Name : Mr. Ravi Sankar Roy
 Designation : Branch Manager

- The results relate only to the item(s) tested.
- This Test Report shall not be reproduced except in full, without the permission of Mitra S.K. Private Limited.
- Our Lab is Approved by NABL & MOEF, Lab Address : P-48 Udayan Industrial Estate, 3 Pagladanga Road Kol-700015

Head Office: Shrachi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016. West Bengal, India.
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 Email : info@mitrask.com. Website: www.mitrask.com


 Approved By
 Uttam Prodhhan
 Dy. CRS - R&D, OIL

Ambient Air Quality Monitoring Report

Name & Address of the Customer :		Report No. : MSK/2025-26/01595			
"M/s OIL INDIA LIMITED", Duliajan, Dibrugarh, Assam-786602		Report Date : 20.11.2025			
		Sample Description : Ambient Air			
		Sample Number : MSKGL/ED/2025-26/11/00571			
		Sampling Location: OCS JORAJAN			
		Instrument ID : RDS 01-DTK-2017/ FPS-1126A22			
Ref. No.:W.O. NO.- 8129283 of Contract No. 6119277		GPS Reading : N 27°51'38", E 95°42'53"			
Date of Sampling	Sample Received Date	Analysis Start Date		Analysis Complete Date	
06.11.2025	10.11.2025	10.11.2025		17.11.2025	
Enviromental Conditions During Sampling & Transport Condition : Temperature : 27°C, Rain fall : No					
Analysis Result					
Sl. No.	Test Parameter	Method	Unit	Results	CPCB Limit
1.	Particulate Matter (PM ₁₀)	IS : 5182 (Part-23)-2006	(µg/m ³)	62.8	100
2.	Particulate Matter (PM _{2.5})	IS : 5182 (Part-24)	(µg/m ³)	34.1	60
3.	Sulphur Dioxide (SO ₂)	IS : 5182 (Part-2)-2001	(µg/m ³)	<6.0	80
4.	Nitrogen Dioxide (NO ₂)	IS : 5182 (Part-6)-2006	(µg/m ³)	19.3	80
5.	Carbon Monoxide (CO)	IS 5182 : (Part-10) :1999	(mg/m ³)	0.54	2
6.	Ozone (O ₃)	IS:5182 (Part-IX)-1974 Reaffirmed-2019	(µg/m ³)	23.7	180
7.	Ammonia (NH ₃)	IS 5182 (Part 25) : 2018	(µg/m ³)	<20.0	400
8.	Lead (Pb)	USEPA IO-3.4	(µg/m ³)	<0.01	1
9.	Nickel (Ni)	USEPA IO-3.4	(ng/m ³)	<5.0	20
10.	Arsenic (As)	USEPA IO-3.4	(ng/m ³)	<1.0	6
11.	Benzene (C ₆ H ₆)	IS 5182 : (Part 11) :2006	(µg/m ³)	<4.2	5
12.	Benzo(a)Pyrene (BaP)	IS 5182 : (Part 12) :2004	(ng/m ³)	<0.5	1
13.	Mercury (Hg)	USEPA IO-5.0	(µg/m ³)	<0.002	...
14.	Methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	1.97	...
15.	Non-methane (Hydrocarbon)	IS 5182 : (Part 17)	ppm	<0.5	...
16.	Total Hydrocarbon	IS 5182 : (Part 17)	ppm	1.97	...
17.	Volatile Organic Compounds (VOC)	IS 5182 : (PART-11):2006	(µg/m ³)	<4.2	...
Limit as per CPCB notification, New Delhi, 18th Nov, 2009. for Ambient air quality					

Analyzed By:

Signature : 
 Name : Mr. Dipankar Mazumdar
 Designation : Technical Manager

Prepared By:

Signature : 
 Name : Mr. Dipankar Das
 Designation : Office Assistant

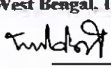
Authorized Signatory

For Mitra S.K. Private Limited

Signature : 
 Name : Mr. Ravi Sankar Roy
 Designation : Branch Manager

- The results relate only to the item(s) tested.
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- Our Lab is Approved by ISO/IEC 17025: 2017 & Assam PCB, Lab Address: House No 9, 2nd Floor, Arunachal Path, R.G. Baruah Road, Guwahati-781021(Assam)

Head Office: Shrachi Centre (5th floor), 74B, A.J.C. Bose Road, Kolkata - 700 016. West Bengal, India.
 Tel. : 91 33 40143000 / 22650006 / 22650007 Fax : 91 33 22650008
 Email : info@mitrask.com. Website: www.mitrask.com


Approved by
 Uttam Prodhan

Suptdg. Research Scientist, R&D Dept.,
 Oil India Ltd., Duliajan, Assam

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02202
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: OCS HAPJAN
		Sample Number	: MSKGL/ED/2025-26/12/02037
		Instrument ID	: I35-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
24.12.2025	27.12.2025	27.12.2025	03.01.2026

ANALYSIS RESULT

A.	General information about stack :			:
1.	Stack connected to	:	CODP-2	
2.	Emission due to	:	NG	
3.	Material of construction of Stack	:	MS	
4.	Shape of Stack	:	Circular	
5.	Whether stack is provided with permanent platform & ladder	:	Yes	
6.	DG capacity	:	157 HP	
B.	Physical characteristics of stack :			
1.	Height of the stack from ground level	:	2.4384 m	
2.	Diameter of the stack at sampling point	:	0.1016 m	
3.	Area of Stack	:	0.00810 m ²	
C.	Analysis/Characteristic of stack:			
	1. Fuel used : NG			
D.	Result of sampling & analysis of gaseous emission	Result	Limit as per CPCB	Method
1.	Temperature of emission (°C)	149	...	USEPA Part 2, 25.09.1996
2.	Barometric Pressure (mm of Hg)	762.0	...	USEPA Part 2, 25.09.1996
3.	Velocity of gas (m/sec.)	19.24	...	USEPA Part 2, 25.09.1996
4.	Quantity of Gas Flow (Nm ³ /hr)	394	...	USEPA Part 2, 25.09.1996
5.	Concentration of Oxygen (%v/v)	13.8	...	IS:13270 :1992 Reaff, 2014
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.112	≤ 3.5	IS:13270 :1992 Reaff, 2014
7.	Concentration of Carbon Dioxide (%v/v)	5.4	...	IS:13270 :1992 Reaff, 2014
8.	Concentration of Sulphur Dioxide (mg/Nm ³)	23.5	...	USEPA-29, 25/06/1996
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.166	≤ 4.7	USEPA Part-7, 12/03/1996 & USEPA 18 -25.09.1996
10.	Concentration of Lead (mg/Nm ³)	<0.005	...	USEPA-29, 25/06/1996
11.	Concentration of Particulate matter (g/kW-hr)	0.078	≤ 0.3	USEPA Part-17, 16/08/1996
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.014K	≤ 0.7	AS PER CPCB
E.	Pollution control device:			Remarks: Nil
	Details of pollution control devices attached with the stack : Nil			

Analyzed By:

Signature :

Name : Mr. Dipankar Mazumdar

Designation. : Technical Manager

Prepared By:

Signature :

Name : Mr. Dipankar Das

Designation. : Office Assistant

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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Email : info@mitrask.com. Website: www.mitrask.com

Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

Name & Address of the Customer		Report No.	: MSK/2025-26/02203
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: OCS HAPJAN
		Sample Number	: MSKGL/ED/2025-26/12/02038
		Instrument ID	: 135-H-19
Ref. No.:W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
24.12.2025	27.12.2025	27.12.2025	03.01.2026

Approved By
Uttam Prodhan
Dy. CRS – R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02204
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: OCS HAPJAN
		Sample Number	: MSKGL/ED/2025-26/12/02039
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
24.12.2025	27.12.2025	27.12.2025	03.01.2026

ANALYSIS RESULT

A.	General information about stack :			:
1.	Stack connected to	:	DRENCHING PUMP-2	
2.	Emission due to	:	HSD	
3.	Material of construction of Stack	:	MS	
4.	Shape of Stack	:	Circular	
5.	Whether stack is provided with permanent platform & ladder	:	Yes	
6.	DG capacity	:	310 HP	
B.	Physical characteristics of stack :			
1.	Height of the stack from ground level	:	2.4384 m	
2.	Diameter of the stack at sampling point	:	0.1016 m	
3.	Area of Stack	:	0.00810 m ²	
C.	Analysis/Characteristic of stack:			
	1. Fuel used : HSD			
D.	Result of sampling & analysis of gaseous emission	Result	Limit as per CPCB	Method
1.	Temperature of emission (°C)	135	...	USEPA Part 2, 25.09.1996
2.	Barometric Pressure (mm of Hg)	762.0	...	USEPA Part 2, 25.09.1996
3.	Velocity of gas (m/sec.)	18.53	...	USEPA Part 2, 25.09.1996
4.	Quantity of Gas Flow (Nm ³ /hr)	393	...	USEPA Part 2, 25.09.1996
5.	Concentration of Oxygen (%v/v)	13.4	...	IS:13270 :1992 Reaff, 2014
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.216	≤ 3.5	IS:13270 :1992 Reaff, 2014
7.	Concentration of Carbon Dioxide (%v/v)	5.8	...	IS:13270 :1992 Reaff, 2014
8.	Concentration of Sulphur Dioxide (mg/Nm ³)	26.3	...	USEPA-29, 25/06/1996
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.326	≤ 4.7	USEPA Part-7, 12/03/1996 & USEPA 18 -25.09.1996
10.	Concentration of Lead (mg/Nm ³)	<0.005	...	USEPA-29, 25/06/1996
11.	Concentration of Particulate matter (g/kW-hr)	0.126	≤ 0.3	USEPA Part-17, 16/08/1996
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.091K	≤ 0.7	AS PER CPCB
E.	Pollution control device:			Remarks: Nil
	Details of pollution control devices attached with the stack : Nil			

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation. : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation. : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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Email : info@mitrask.com. Website: www.mitrask.com



Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02205
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 09.01.2026
		Nature of Sample	: Stack Emission
		Sample Mark	: OCS HAPJAN
		Sample Number	: MSKGL/ED/2025-26/12/02040
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
24.12.2025	27.12.2025	27.12.2025	03.01.2026

ANALYSIS RESULT

A.	General information about stack :		:
1.	Stack connected to	:	GENSENT-1
2.	Emission due to	:	HSD
3.	Material of construction of Stack	:	MS
4.	Shape of Stack	:	Circular
5.	Whether stack is provided with permanent platform & ladder	:	Yes
6.	DG capacity	:	285 KVA
B.	Physical characteristics of stack :		
1.	Height of the stack from ground level	:	3.048 m
2.	Diameter of the stack at sampling point	:	0.1016 m
3.	Area of Stack	:	0.00810 m2
C.	Analysis/Characteristic of stack:		
	1. Fuel used : HSD		
D.	Result of sampling & analysis of gaseous emission	Result	Limit as per CPCB
1.	Temperature of emission (°C)	124	...
2.	Barometric Pressure (mm of Hg)	762.0	...
3.	Velocity of gas (m/sec.)	16.91	...
4.	Quantity of Gas Flow (Nm3/hr)	368	...
5.	Concentration of Oxygen (%v/v)	13.6	...
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.198	≤ 3.5
7.	Concentration of Carbon Dioxide (%v/v)	5.4	...
8.	Concentration of Sulphur Dioxide (mg/Nm3)	25.1	...
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.292	≤ 4.7
10.	Concentration of Lead (mg/Nm3)	<0.005	...
11.	Concentration of Particulate matter (g/kW-hr)	0.118	≤ 0.3
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.016K	≤ 0.7
E.	Pollution control device:		Remarks: Nil
	Details of pollution control devices attached with the stack : Nil		

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02080A23
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 19.12.2025
		Nature of Sample	: Stack Emission
		Sample Mark	: OCS JORAJAN
		Sample Number	: MSKGL/ED/2025-26/12/01938
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
03.12.2025	06.12.2025	06.12.2025	13.12.2025

ANALYSIS RESULT

A.	<u>General information about stack :</u>	:		
1.	Stack connected to	: CODP-1		
2.	Emission due to	: NG		
3.	Material of construction of Stack	: MS		
4.	Shape of Stack	: Circular		
5.	Whether stack is provided with permanent platform & ladder	: Yes		
6.	DG capacity	: 157 HP		
B.	<u>Physical characteristics of stack :</u>			
1.	Height of the stack from ground level	: 2.1336 m		
2.	Diameter of the stack at sampling point	: 0.1016 m		
3.	Area of Stack	: 0.00810 m2		
C.	<u>Analysis/Characteristic of stack:</u>			
	1. Fuel used : NG			
D.	<u>Result of sampling & analysis of gaseous emission</u>	<u>Result</u>	<u>Limit as per CPCB</u>	<u>Method</u>
1.	Temperature of emission (°C)	144	...	USEPA Part 2, 25.09.1996
2.	Barometric Pressure (mm of Hg)	762.0	...	USEPA Part 2, 25.09.1996
3.	Velocity of gas (m/sec.)	19.16	...	USEPA Part 2, 25.09.1996
4.	Quantity of Gas Flow (Nm3/hr)	397	...	USEPA Part 2, 25.09.1996
5.	Concentration of Oxygen (%v/v)	13.8	...	IS:13270 :1992 Reaff, 2014
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.118	≤ 3.5	IS:13270 :1992 Reaff, 2014
7.	Concentration of Carbon Dioxide (%v/v)	6.2	...	IS:13270 :1992 Reaff, 2014
8.	Concentration of Sulphur Dioxide (mg/Nm3)	24.2	...	USEPA-29, 25/06/1996
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.176	≤ 4.7	USEPA Part-7, 12/03/1996& USEPA 18 -25.09.1996
10.	Concentration of Lead (mg/Nm3)	<0.005	...	USEPA-29, 25/06/1996
11.	Concentration of Particulate matter (g/kW-hr)	0.098	≤ 0.3	USEPA Part-17, 16/08/1996
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.013K	≤ 0.7	AS PER CPCB
E.	<u>Pollution control device:</u>	<u>Remarks:</u> Nil		
	Details of pollution control devices attached with the stack : Nil			

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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Email : info@mitrask.com. Website: www.mitrask.com



Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02080A24
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 19.12.2025
		Nature of Sample	: Stack Emission
		Sample Mark	: OCS JORAJAN
		Sample Number	: MSKGL/ED/2025-26/12/01939
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
03.12.2025	06.12.2025	06.12.2025	13.12.2025

ANALYSIS RESULT

A.	General information about stack :		:
1.	Stack connected to	:	DRENCHING PUMP-1
2.	Emission due to	:	HSD
3.	Material of construction of Stack	:	MS
4.	Shape of Stack	:	Circular
5.	Whether stack is provided with permanent platform & ladder	:	Yes
6.	DG capacity	:	231 HP
B.	Physical characteristics of stack :		
1.	Height of the stack from ground level	:	2.4384 m
2.	Diameter of the stack at sampling point	:	0.1016 m
3.	Area of Stack	:	0.00810 m2
C.	Analysis/Characteristic of stack:		
	1. Fuel used : HSD		
D.	Result of sampling & analysis of gaseous emission	Result	Limit as per CPCB
1.	Temperature of emission (°C)	131	...
2.	Barometric Pressure (mm of Hg)	762.0	...
3.	Velocity of gas (m/sec.)	17.95	...
4.	Quantity of Gas Flow (Nm3/hr)	384	...
5.	Concentration of Oxygen (%v/v)	13.4	...
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.186	≤ 3.5
7.	Concentration of Carbon Dioxide (%v/v)	5.4	...
8.	Concentration of Sulphur Dioxide (mg/Nm3)	25.6	...
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.248	≤ 4.7
10.	Concentration of Lead (mg/Nm3)	<0.005	...
11.	Concentration of Particulate matter (g/kW-hr)	0.101	≤ 0.3
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.099K	≤ 0.7
E.	Pollution control device:		Remarks: Nil
	Details of pollution control devices attached with the stack : Nil		

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation. : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation. : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL

STACK GAS MONITORING REPORT

Name & Address of the Customer		Report No.	: MSK/2025-26/02080A25
"M/s OIL INDIA LIMITED" Duliajan, Dibrugarh, Assam-786602		Report Date	: 19.12.2025
		Nature of Sample	: Stack Emission
		Sample Mark	: OCS JORAJAN
		Sample Number	: MSKGL/ED/2025-26/12/01940
		Instrument ID	: 135-H-19
Ref. No.: W.O. NO.- 8129283 of Contract No. 6119277			
Date of Sampling	Sample Received Date	Analysis Start Date	Analysis Complete Date
03.12.2025	06.12.2025	06.12.2025	13.12.2025

ANALYSIS RESULT

A.	<u>General information about stack :</u>		:	
1.	Stack connected to	:	GENSET-1	
2.	Emission due to	:	NG	
3.	Material of construction of Stack	:	MS	
4.	Shape of Stack	:	Circular	
5.	Whether stack is provided with permanent platform & ladder	:	Yes	
6.	DG capacity	:	125 KVA	
B.	<u>Physical characteristics of stack :</u>			
1.	Height of the stack from ground level	:	2.4384 m	
2.	Diameter of the stack at sampling point	:	0.1016 m	
3.	Area of Stack	:	0.00810 m2	
C.	<u>Analysis/Characteristic of stack:</u>			
	1. Fuel used : NG			
D.	<u>Result of sampling & analysis of gaseous emission</u>	<u>Result</u>	<u>Limit as per CPCB</u>	<u>Method</u>
1.	Temperature of emission (°C)	119	...	USEPA Part 2, 25.09.1996
2.	Barometric Pressure (mm of Hg)	762.0	...	USEPA Part 2, 25.09.1996
3.	Velocity of gas (m/sec.)	16.30	...	USEPA Part 2, 25.09.1996
4.	Quantity of Gas Flow (Nm3/hr)	359	...	USEPA Part 2, 25.09.1996
5.	Concentration of Oxygen (%v/v)	13.2	...	IS:13270 :1992 Reaff, 2014
6.	Concentration of Carbon Monoxide (g/kW-hr)	0.094	≤ 3.5	IS:13270 :1992 Reaff, 2014
7.	Concentration of Carbon Dioxide (%v/v)	5.6	...	IS:13270 :1992 Reaff, 2014
8.	Concentration of Sulphur Dioxide (mg/Nm3)	22.3	...	USEPA-29, 25/06/1996
9.	Concentration of Nitrogen Oxide & Hydrocarbons (g/kW-hr)	0.143	≤ 4.7	USEPA Part-7, 12/03/1996& USEPA 18 -25.09.1996
10.	Concentration of Lead (mg/Nm3)	<0.005	...	USEPA-29, 25/06/1996
11.	Concentration of Particulate matter (g/kW-hr)	0.088	≤ 0.3	USEPA Part-17, 16/08/1996
12.	Smoke Limit (Light Absorption Coefficient, m-1)	0.011K	≤ 0.7	AS PER CPCB
E.	<u>Pollution control device:</u>			<u>Remarks:</u> Nil
	Details of pollution control devices attached with the stack : Nil			

Analyzed By:

Prepared By:

Authorized Signatory

For Mitra S.K. Private Limited

Signature :

Name : Mr. Dipankar Mazumdar

Designation : Technical Manager

Signature :

Name : Mr. Dipankar Das

Designation : Office Assistant

Signature :

Name : Mr. Ravi Shankar Roy

Designation : Branch Manager

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Approved By

Uttam Prodhan

Dy. CRS - R&D, OIL



ऑयल इंडिया लिमिटेड

(सकल संपत्ति का रक्षक)

Oil India Limited

(INCORPORATED IN INDIA)

OIL SPILL CONTINGENCY PLAN

**Prepared by
HSE Department
OIL INDIA LIMITED**



ऑयल इंडिया लिमिटेड

(भारत सरकार का उद्यम)

Oil India Limited

(A Government of India Enterprise)

Oil Spill Contingency Plan in OIL INDIA LIMITED

Approval

	Name	Signature
Approved by	Shri Ajit Chandra Haloi Chief General Manager (HSE)	
Reviewed by	Shri Gopal Govinda Rasu Dy. General Manager (HSE)	
Prepared by	Bhabananda Saikia Superintending Engineer (HSE)	

Date	Revision Details	Revision Number
01.06.2013	First Issue	00
23.11.2022	Second Issue	01

Executive Summary

Oil India Limited, by its nature of operation has storage, transportation and handling facilities of oil through tankages, pipelines and browsers, distributed in its area of operation. Oil Spill Contingency Plan (OSCP) is endeavoured to be practical document for preparedness for probable incidents of oil spillage and guidance for tackling an oil spill and recovery from the effects with some procedures laid down.

Having an OSCP fulfils the requirement of Indian Government commitments to the United Nation's conventions on Oil Spills and its response. Ministry of Environment, Forest and climate change (MoEF&CC) has also emphasized the same as per Indian Coast Guard's National Oil Spill Disaster Contingency Plan and various notifications to individual companies at the time of commencement of operations in the oil fields.

This OSCP is for On-shore operations only considering the geographical location of OIL's operation. The document defines the roles and responsibilities, procedures of response in tier-I spillage, escalation to tier -II and tier-III and operational readiness in its scope of applicability. The OSCP is prepared under the guidance of OISD-GDN- 200 guidelines of Indian Coast guard wherever applicable. American Petroleum Institute's documents are also referred. It is aligned with the Off Site Disaster Management Plan, ERDMP & Corporate Disaster Management Plan.



(A C Haloi)

Chief General Manager (HSE) - HoD

Date: 23.11.2022

INDICES

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ABBREVIATIONS & ACCRONYMS

DCR	Disaster Control Room
DMP	Disaster Management Plan
DOP	Delegation of Power
ECR	Emergency Control Room
ECT	Emergency Control Team
ERDMP	Emergency Response and Disaster Management Plan
IM	Installation Manager
NOS	DCP National Oil Spill Disaster Contingency Plan.
OISD	Oil Industries Safety Directorate
OIL	Oil India Limited
OSC	On site Coordinator
OSCP	Oil Spill Contingency Plan
OSD	Oil Spill Dispersant
OSR	Oil Spill Response
POL	Petroleum Oil and Lubricants

1.0 SCOPE

This “Oil Spill Contingency Plan” is applicable to the Geographical Area of OIL’s onshore operation in FHQ Area, viz. producing districts of Assam & Arunachal Pradesh. However, it may be referred in other spheres also. The scope includes the containment, control, clean up and recovery of oil spillage that may arise from OIL’s exploration, drilling, production and transportation activities. It does not include the litigations, compensation etc.

2.0 OBJECTIVE

- To establish an effective system for detection and reporting of spills.
- To establish adequate measures for preparedness for tackling of oil spillage at various locations.
- To facilitate rapid and effective response to oil spillage.
- To establish adequate measures for crew, responders, and public health and safety, and protect the land and water environment.
- To establish appropriate response techniques to prevent, control and combat pollution and dispose-off the recovered material in an environmentally sound manner.
- To provide a training and develop awareness amongst the employees.
- To provide plan & programme for practice drill based on scenarios.
- To meet statutory requirements.
- To establish response procedures for oil spill.

3.0 INTERFACE WITH OTHER PLANS

This plan is developed in conjunction with the following documents:

- (i) OIL HSE Policy and Plan
- (ii) Off-site Disaster Management Plan, On-site Disaster Management Plan and ERDMP of OIL.
- (iii) National Oil Spill Disaster Contingency Plan (NOS-DCP) issued by the Coast Guard Headquarters.
- (iv) OISD GDN- 200 for Preparation of Oil Spill Response Contingency Plan.
- (v) OISD GDN- 165: Rescue and relief operations for POL truck tank accident.

4.0 PERCEIVED OIL SPILL RISKS AND SPILL QUANTITIES

4.1 Response to an oil spillage depends upon two factors: Quantity of oil spilled and Circumstances of the spill. Depending upon the scenario the response should be attempted. Broadly, the oil spill scenarios are categorized as:

1. Tier- I: Preparedness and response to small spill within capabilities of an individual installation/facility.
2. Tier-II: Preparedness and response to spill that requires the co-ordination of more than one source of equipment and personnel (or other than resources from OIL).
3. Tier-III: Major spill requiring the mobilization of all available national resources and depending upon the circumstances, will likely involve mobilization of regional and international systems.

4.2 Risk Assessment:

Factors on which the assessment is to be conducted are listed for guidance for implantation of this plan at Installation level:

1. Source of leakage;
2. Location;
3. Circumstances;
4. Quantity of leakage;
5. Financial Implication;
6. Regulatory Implication;
7. Weather condition;
8. Reputational risks;

Considering the factors listed above assessment of risks of oil spillage to be done at installation level. A copy of such document shall be prepared and kept for reference at every installation.

Main spill scenarios of spillage are briefed below for guidance. However, exhaustive assessment of risks to be made and kept for reference at installation level.

The facilities/ resources of Commercial, Social, Ecological and recreational value around an installation have to be identified by the Installation at installation level and keep a list of those at respective installation to supplement this plan.

4.2.1 Well Blow - out Incidents:

Various stages of drilling shall be assessed for -

- a. Exploratory wells:
- b. Developmental wells:
- c. Producing wells:

An oil spill due to Well Blow out is possible during Drilling activities when wells are drilled to meet exploration, development or production requirement. Well blowout is also possible during any subsequent “Well Intervention” of existing wells for Work - Over activities. In the event of an unfortunate well blow out, the situation will call for the immediate services of Well Control specialists. However, adherence to established drilling procedures, which includes proper use of Blowout Preventers (BOPs) of rated pressures, will adequately control the oil spill risk due to well blowouts. Available Contingency Plan for impending blowout to be followed.

4.2.2 Leakage from Couplings/ Joints/ Valves:

Spillage due to likely leak from sources, like, Hose Joints, Valves and Blinds, Swivel Joints, Flange Joints are to be assessed at installation level. Such Installations shall assess the risk of oil spill for the probable leakages from flanges of pipelines under it.

4.2.3. Spillage from Tanker:

Spillage from tank and bowzers may occur due to road accidents. To avoid risks of road accidents necessary legal and available best practices should be taken. Given a spillage, occur in spite, if information were received from other sources and agencies, the crew who are in the responsibility of emergency communication shall convey information to depot / terminal / installation immediately. OISD-GDN-165 to be referred in this respect.

4.4.4 Leakage from pipeline:

The pipeline carries highly inflammable crude oil & natural gas. Though utmost precautions are taken, sometimes the pipeline may leak, due to corrosion, miscreant activity, god's act, failure of safety devices etc. Since the pipelines are numerous and distributed in many geographical profiles, spillage of crude is highly situation and location specific. Given the numbers of pipelines, vastness of network, locations chance of spillage from a pipeline is highest.

4.4.5 Bursting of pipeline in the river Crossings/ Rail / road bridges / Aerial Crossings:

The bursting at these may be caused due to corrosion, by accidental hit by heavy equipment, by snapping of aerial crossings, accidental hit by heavy equipment, by snapping of aerial crossings pipe support strings, miscreant activity etc. This may result in huge oil spillage polluting the water.

4.4.6 War and Civil commotion:

Due to bombing during war or by terrorist or attempted pilferage, the pipeline may develop leak or burst. The oil spillage may be high and may result in fire.

4.4.7 Hurricane Damage to Pipeline at rail/road bridge/aerial crossing

Due to high velocity of wind, the pipe supports may be snapped. This may result in breakage of pipeline leading to oil spillage. If there is a heavy rainfall, due to high turbulence of water, there may not be any fire.

5. SPILL RESPONSE STRATEGY

5.1 OIL shall adhere to the applicable standards in its equipment. Oil Spill Response flow of information & responsibilities is given at Annexure-4 and Annexure-5, as per the plan, the responsibilities during oil spill response is well defined.

In any oil spill response, mobilization of resources depends on a number of factors. Those are:

- Different risk scenarios, quantity of spill, and spill tracking;
- Equipment need;

- Man power requirement;
- Communication channels;
- Operation;
- Data directory

5.2 The Station in-charges (or Installation Managers), from both probable upstream and downstream shall proceed to detect the exact location to find out the exact location of spillage on receipt of the information of spillage from any source. In the meantime, search party will process along the row and locate the spill site. This ground party will have a mobile fitted jeep, hand wheel of block valves, box key etc (Refer Annexure-6). They will locate the exact site and inform as per the information flow matrix Annexure-4 and Annexure-5. The On-site Co-ordinator (OSC) shall act as the controller of the incident, arrange for the mobilization of emergency equipment, men and materials and position at the site in his best capacity. OSC will establish radio link/communication between the sites and communicate as per the communication channel of Annexure-4 and Annexure-5 respectively.

5.3 OIL SPILL EQUIPMENT

The following spill control equipment should be in place in sufficient quantity as per the finding of assessment carried out as mentioned in 4.2 and record should be maintained in the following format :

(i) Sorbent & Sorbent booms (river standard)	(viii) Raft
(ii) Petroleum sorbent rolls	(ix) Drum
(iii) Petroleum sorbent pillars	(x) Pump
(iv) Skimmer	(xi) OCV
(v) Oil spill Dispersant (OSD)	(xii) Hand Boom
(vi) Tent	(xiii) HC Pads
(vii) Tags	(xiv) Life Jacket

Format:

RESOURCES	QTY.	LOCATION	CUSTODIAN DEPT.
1)			

Custodian Department shall procure the equipment and keep in a readily deployable position/condition.

6. RESPONSE PLANNING:

6.1 Reporting of oil spill incident:

Immediately upon notice of oil spill, “Incident Reporting” shall be done in the prescribed format (Format: Annexure- 2) to the following:

- Internal within the organisation through mail, and SMS.
- OISD when applicable
- Mutual Aid Partners (in case it is declared Tier-II)

IM shall ensure to inform internally to HoD-PSS Department for necessary support services. The reporting may be done as per Annexure-4 & Annexure-5 flow chart.

6.2 Isolation & Security:

OSC or IM shall ensure to isolate the line both in upstream & downstream if any. Ensure the safety of the area by providing security guards, prohibiting smoking and use of naked lights through Security Dept. Area to be cordoned off and safety signboards to be posted. IM's shall also ensure lock out and tag out of isolation valves at both the ends. IM shall obtain permission from the landowners with the support and co-ordination from HR-E/ PA and Land Department, if necessary for use of their private land in raising earth bunds cutting cellar to contain the leak. Apart from visual observation by the team under the OSC, aerial surveys shall be made if necessary. Eventually senior level executive (DGM & above) shall take over as the OSC and move to the spillage site with team comprising of representatives from various concerned departments like Security, PSS & Civil. He will have the overall responsibility & he will have authority over the members of the cross functional team. All the representatives shall work under his guidance and with co-ordination with the OSC. After assessing the situation with team, OSC shall appraise the Asset Manager and RCE. RCE shall be fully empowered to take decisions and activate ECT. Entire communication channel shall be guided by Annexure-4 and Annexure-5. OSC shall report to the management as per the format of Annexure-4 and Annexure-5. While Assessing OSC shall consider the factors as per 4.2.

As required by the circumstances the team will:

- Obtain a suitable slick-tracking model for the size of oil spill that has occurred and predict the likely developments of the incident.
- Mobilise clean-up teams and equipment as advised by OSC.
- Liaise with other departments.
- Arrange for contracted vessels to be equipped with any required equipment (i.e. PRP/OSD, booms, absorbent booms, mats etc.)
- Inform nearby installation operators if slick is identified to be moving out of the operating area.
- Keep OSC informed of major developments affecting clean-up operations onshore.
- Assess requirement of water and land transport and accordingly take action.
- Stand down only after instruction from OSC.
- Submit log of events to HoD-HSE.
- Arrange to return equipment/services availed from other sources.
- Commence procedures to ensure payments are made for emergency resources.

6.3 Retrieving oil spills:

Retrieve the oil into drums/tanks in the case of large oil spills using pneumatic pump for transport the oil from spoiled area to the tanks.

6.4 Firefighting:

Fire Tenders shall move immediately on receipt of call to the location and take position. Firefighting team shall be under the control of HoD-HSE put trailer pump or any other portable fire pump in service and act as per the scenario.

6.5 Repair:

Repair shall be attempted as soon as possible to avoid further spillage. Work out the methods of leak repair in consultations with Chief Coordinator and Operation Coordinator (Refer 8.2) giving accurate information on the extent of damage. However, recovery from the spillage shall not be delayed for the sake of repair. OSC shall always prioritize control and containment of spillage over repair of the leakage. Mobilization of men and materials required for the leak repair work as directed from Headquarters. OSC/IM shall carry out leak repair works as demanded by the situation on arrival of men and materials for that purpose.

Note:

01. In the event of a hurricane, communication may be completely disrupted. After stopping the pumping operations, the search party should approach from both upstream/ stations and isolate the line for stoppage of the leak.

02. In case of war or civil commotion, the control measures for different locations will be as discussed earlier taking the law and order authorities into confidence and under their guidance.

6.6 Strategy for oil and waste storage and disposal:

There are two major steps in oil spillage contingency. Those are Containment and Recovery. The oily waste can be either collected from the affected area. During onshore waste collection, it will be mostly oil with mud sand, pebbles, small plants etc. and chocolate mousse. During spill in water body, the waste collection would include oil, oily waste mixture, chocolate mousse, floating debris soaked in oil, floating vegetation etc.

The spilled oil shall be collected into drums/tanks in the case of large oil spills using pump for transport. Necessary oil tanker or bowser shall be kept nearby to the site and the collected oil shall be unloaded at the designated area in a safe & environmental friendly manner.

The hazardous waste is to be managed and handled as per Hazardous Wastes (Management and Handling) Amendment Rules, 2016.

7. EMERGENCY CONTROL TEAM (ECT)/ECR

The ECT/ECR will comprise of the following members under the leadership of ED-FHQ-A.

- Asset Manager/ Surface Manager
- HoD-PSS
- HoD – HSE
- HoD- Civil
- HoD– Admin.
- HoD-PA
- HoD-Finance and Accounts / GM (F&A)
- HoD-Contract
- HoD- Electrical
- HoD- Materials
- HoD- Security

They may appoint their representatives in senior executive level.

7.1 Important duties:

(A) On Site Co coordinator (OSC)

On Site Coordinator shall be the official Installation Manager (IM) under whose jurisdiction oil spill has taken place, shall be the person responsible for the oil spill response activities.

On Site Coordinator (OSC) is to assess the situation of the spill and shall take action as per following:

1. Effective and Safe deployment of oil spill response (OSR) equipment and deployment of trained OSR team.
2. Requisitioning of extra manpower from Support Manager through ECR.
3. Shall prepare the duty roster of personnel's and ensure that every one has understood his duty to be performed.
4. Shall ensure that each duty watch is suitably turned around as per demand of the situation.
5. Shall ensure that he is always in communication with his team /team leaders as well as Emergency Control Room (ECR) with the help of VHF /Walkie Talkie, Mobile Cell Phone.
6. Shall assess the oil spill scenario and requirement of consumable items for example Sorbent sheets, Sorbent booms, Dispersants etc. and initiating procurement action indicating approximate time when these items are required.

7. Shall ensure that all the actions carried out are logged suitably. (This would assist in analysing efficiency of men and machine both as well as provide scope for further improvement in various actions).
8. Shall route all his requirements of men and material including vehicles and watercrafts etc. through Incident Controller only.
9. Shall ensure safe recovery/return and accounting of all the items provided to him for the purpose.
10. Shall ensure that all his men are in possession of proper safety gears prior to starting of any operations i.e. Lifejacket, Life Buoy Lifeline, Raincoat, Torches, Working hand gloves etc.
11. Shall give regular feed back to ECT on the developments of oil scenario to formulate and decide future course of actions. Shall ensure action and anticipate the future requirement of men, material etc.

Sequential Steps

Immediate:

- Start personal log of events.
- Establish the following information:
 - Time spill occurred,
 - Position and shape of the slick,
 - Visual appearance and apparent thickness of the oil,
 - Percentage cover of the various thickness of oil,
 - Speed and direction of the slick,
 - Sensitive areas/vessels, etc. in its path,
 - Local weather conditions and sea state. - Investigate the source of leak / spillage
 - Co-ordinate with OSC in drawing a strategy and dealing with the Emergency.
 - Contact and aboard the vessel planned to have ERT and the OSR equipment.
- Determine whether resources available can handle the incident onshore/ offshore. If not, request activation of further mobilization of resources as per the Oil Spill Contingency Plan from ECT.
- Instruct boat (In case of water bodies) to take samples of spilled oil, if possible, for analysis and evaluation.
- Initiate production shut down depending on the conditions.
- For a spill capable of being controlled by the resources available offshore, contain and collect oil using OSR equipment.

General:

- Inform ECT as frequently as possible, but at least once every hour, of all actions and developments offshore.
- OSC shall ensure management report and overall containment, control, recovery, clean-up and deciding future strategies in consultation with ECT/ECR.

Standing Down:

- Send status report to ECR
- Ensure records of the event are gathered from all parties.
- Ensure all OSR equipment are cleaned after operation as per the maintenance schedule and store properly.
- Ensure borrowed equipment are returned as per contract and recovered oil is properly stored or disposed.
- Advise vessels suitably.
- Restore normal operation.
- Forward all log of events to ECT for HSE Manager's record and action.

(B) Head-Admin & Head – HSE shall themselves or by representatives suitable for liaison with government authority. They will act in consultation with the respective HOD's.

(C) Bio remediation – shall be done through third party. In this regard, rate contract shall be formed by PSS in consultation with HOD – HSE. HOD – PSS shall be the contract coordinator & single point contact for the same.

(D) Disposal of collected oil shall be done by respective asset through authorised recycle of oily waste & Asset Manager shall be accountable for the disposal. Hazardous waste rule, 2016 shall be strictly adhered to.

(E) Notices from authorities shall be taken care of by HOD - HSE. HOD – HSE shall be supplemented by necessary data by respective asset, PSS, admin department etc.

(F) Legal aid shall be initiated if necessary in the preview of HOD – Admin. All concerned shall supplement HOD Admin with necessary data, representation in this regard.

(G) HOD-PA shall take necessary action to manage media & public to ascertain company's reputation.

(H) HoD-Finance, HoD-Contract and HoD-Materials shall provide necessary support for urgent contract and procurement. Where there are financial implications, approval to be obtained from Competent Authority as per prevailing DoP. Framing of contracts to be done as per the prevailing procedures and DoP. However, the restrictions imposed (if any) for procurement

of items shall be eased, considering the urgent requirement of the spill response items, as they would be required only in emergency conditions.

8.0 RESPONSE ORGANIZATION

8.1 Initial Phase

In the initial phase only someone close enough to the scene of emergency can exercise emergency co-ordination. Accordingly, the Installation Manager (IM) will assume the role of Site Coordinator (OSC).

8.2 Intermediate Phase

The Chief Co-ordinator (CC) of the respective sphere (FHQ/PHQ/Project) may appoint a person (DGM/GM) under purview of the Disaster Management Plan (DMP), who is normally stationed at Base to take over the task at Site Control Room (SCR) as OSC. Alternatively, IM shall continue as the OSC until senior officers shall assume the duty of OSC at site, depending upon the gravity of the situation.

8.3 Function

The Coordinator will make an assessment of the situation; the type and quantity of assistance required and communicate the same to the his/her Zonal/Sectional in-charge who in turn will inform his Head of the Department/GM as the case may be for further information to the Chief Corporate Co-ordinator (CCC) of the DMP. The OSC will mobilize the resources available at site, deal with the situation and take such actions as directed by the Chief Co-ordinator at the FHQ/PHQ/Projects. He will transmit situation reports to the base disaster control room if necessitated at regular interval prefixing a numerical sequence to each message.

8.4 Site Control Room

- **Location:**

The Site Control Room (SCR) will function at the installation depending upon situation. In case the situation warrants activation of Onsite Disaster Management Plan, an alternate site control room will be set up at a safe distance at a place closest to the installation.

- **Mobilization:**

The Site Co-coordinator (OSC) will set up SCR as soon as he becomes aware of the emergency.

- **Function**

To prepare report on status of the emergency from time to time and take steps to fight the emergency. Determine the type of assistance required & mobilize the same through SCR.

8.5 Disaster Control Room (DCR)

- **Location**

A control room established at the base station of the sphere (FHQ/PHQ/Project) as the case may be will be termed as the Disaster Control Room.

- **Mobilization**

The GGM/ED (FHQ Affairs) who is the nodal officer of the spheres stationed at FHQ will open up Control Room/Set up control room as soon as he becomes aware of the emergency.

- **Function**

To prepare report on status of the emergency from time to time and take steps to fight the emergency. Determine the type of assistance required & mobilize the same through DCR.

8.6 Chief Coordinator (CC) at FHQ/PHQ/PROJECT level

FHQ/ PHQ/Project Head will be the Chief Co-ordinator where the emergency has taken place and will exercise control through GGM (FHQ Affairs) who is the Nodal Officer stationed at FHQ Alternate Chief Co-ordinator will be the next Senior Most in the FHQ/PHQ/Project.

In case the emergency within the installation is likely to have effect beyond the installation premises or an emergency outside the premises of the installation is likely to effect the operations of the installation, and Disaster Management Plan (Mutual Aid) is activated, CC shall inform Nodal Officer of FHQ to further intimate Corporate Disaster Management Group and request the intervention of Corporate Disaster Management group for activation of Corporate Level DMP if felt necessary. The Nodal Officer shall immediately inform the Nodal Officer of Corporate Disaster Management Group, CMD and Corporate Coordinators.

9.0 SITE SPECIFIC RESPONSE PLAN

9.1. Oil Spillage in Water Bodies:

In OIL's operational areas, there are hundreds of rivers, rivulets and water bodies. Thousands of people are economically dependent upon these water bodies and rivers. Although it is not possible to give detail for every spillage scenario, it is tried to give an overall idea to mitigate spillage in rivers and water bodies. Oil spills in rivers differ from spills that occur in the open ocean.

Some oils are denser than river water. Oil usually floats because it is less dense than the water it is floating on. (Density is the mass, or weight, of a substance divided by its volume.) The density of river water is usually about 1 gram per cubic centimetre (g/cc). Sometimes the density of an oil is so close to that of river water that the oil moves along the river partly underwater. When such oil finally moves into the ocean at the river mouth, it can re-float. This does not happen very often, but it is something we have to think about whenever oil is spilled in a river. If spilled oil sinks, it can be very difficult to

clean up. If something causes it to pool on the bottom (for example, it may be trapped behind a sunken vessel), then vacuum devices can be used to try to get the oil off the bottom. As you might guess, this method may not be very effective because vacuums may capture a lot of water and sand along with the oil.

Movement is usually downstream. Unlike in a bay or the open ocean, currents in a river are generally directed downstream (except very close to the mouth of the river, where it enters the ocean; here, a flood tide might actually reverse the flow of the surface water). The greater predictability of river currents makes it easier to forecast which way the oil will move. Wind blowing across the river also affects where the oil will come ashore. If the wind is blowing straight down the river (as might happen on a river with high banks), it often will travel quite far down the river before it comes in contact with a beach. In order for the oil to beach, the wind must blow the oil to one side of the river or the other.

Dams and locks influence oil movement. Rivers sometimes contain dams or locks that slow or divert water flow. Dams and locks also slow down the movement of spilled oil. In fact, oil tends to collect in areas next to dams or locks, where it can be picked up from the surface of the water by skimmers (devices that "skim" the oil off the water surface), sorbent pads (big square pads of an absorbing material that the oil will stick to), or sorbent booms.

Vegetation may grow right at the water's edge. Along many rivers, plants and trees grow right up to the river's edge. Those rivers do not have the open, sandy shores that you find along many parts of the open coast. It is much harder to remove oil from vegetation than from a hard-packed sand beach. Spill responders try to protect the plants by using booms, but if the vegetation gets oiled, responders often either cut, burn, or flush it with water to try to get the oil out.

Oil can interact with sediment carried by rivers. Rivers often carry a lot of sediment in their currents. That means when oil droplets drift into the water column of a river, the sediment has the potential to stick to the oil droplets. Eventually (depending on how strong flowing and full of sediment a river is) some of the oil-sediment combination may settle out to the bottom of the river, usually near the river mouth as the water slows down and reaches the ocean.

The trajectory (direction of movement) of oil spilled into a river is affected not only by the river currents -- which generally take the oil downstream -- but also by the wind. If the wind blows straight down the river, the oil may travel quite far down the river before it comes in contact with either bank. However, if the wind blows at an angle to the river, the oil is more likely to be blown towards one or the other riverbank.

When an oil spill occurs on water, it is critical to contain the spill as quickly as possible in order to minimize danger and potential damage to persons, property, and natural resources. Containment equipment is used to restrict the spread of oil and to allow for its recovery, removal, or dispersal. The most common type of equipment used to control the spread of oil is floating barriers, called booms.

Containment booms are used to control the spread of oil to reduce the possibility of polluting shorelines and other resources, as well as to concentrate oil in thicker surface layers, making recovery easier. In addition, booms may be used to divert and channel oil slicks along desired paths, making them easier to remove from the surface of the water. Although there is a great deal of variation in the design and construction of booms, all generally share four basic characteristics:

- An above-water “freeboard” to contain the oil and to help prevent waves from splashing oil over the top of the boom
- A flotation device
- A below-water skirt to contain the oil and help reduce the amount of oil lost under the boom
- A “longitudinal support,” usually a chain or cable running along the bottom of the skirt, that strengthens the boom against wind and wave action; may also serve as a weight or ballast to add stability and help keep the boom upright

When a spill occurs and no containment equipment is available, barriers can be improvised from whatever materials are at hand. Although they are most often used as temporary measures to hold or divert oil until equipment that is more sophisticated arrives, improvised booms can be an effective way to deal with oil spills, particularly in calm water such as streams, slow-moving rivers, or sheltered bays and inlets. Improvised booms are made from such common materials as wood, plastic pipe, inflated fire hoses, automobile tires, and empty oil drums. They can be as simple as a board placed across the surface of a slow-moving stream, or a berm built by bulldozers pushing a wall of sand out from the beach to divert oil from a sensitive section of shoreline.

RECOVERY OF OIL:

Once an oil spill has been contained, efforts to remove the oil from the water can begin. Three different types of equipment—booms, skimmers, and sorbents—are commonly used to recover oil from the surface.

Booms

When used in recovering oil, booms are often supported by a horizontal arm extending directly off one or both sides of a vessel. Sailing through the heaviest sections of the spill at low speeds, a vessel scoops the oil and traps it between the angle of the boom and the vessel's hull. In another variation, a boom is moored at the end points of a rigid arm extended from the vessel, forming a "U"- or "J"- shaped pocket in which oil can collect. In either case, the trapped oil can then be pumped out to holding tanks and returned to shore for proper disposal or recycling.

Skimmers

A skimmer is a device for recovery of spilled oil from the water's surface. Skimmers may be self-propelled and may be used from shore or operated from vessels. The efficiency of skimmers depends on weather conditions. In moderately rough or choppy water, skimmers tend to recover more water than oil. Three types of skimmers— weir, oleophilic, and suction—are described below. Each type offers advantages and drawbacks, depending on the type of oil being cleaned up, the conditions of the sea during clean-up efforts, and the presence of ice or debris in the water.

Sorbents

Sorbents are materials that soak up liquids. They can be used to recover oil through the mechanisms of absorption, adsorption, or both. Absorbents allow oil to penetrate into pore spaces in the material they are made of, while adsorbents attract oil to their surfaces but do not allow it to penetrate into the material. To be useful in combating oil spills, sorbents need to be both oleophilic and hydrophobic (water-repellent). Although they may be used as the sole clean-up method in small spills, sorbents are most often used to remove final traces of oil, or in areas that cannot be reached by skimmers. Once sorbents have been used to recover oil, they must be removed from the water and properly disposed of on land or cleaned for re-use. Any oil that is removed from sorbent materials must also be properly disposed of or recycled.

Dispersing agents

Dispersing agents, also called dispersants, are chemicals that contain surfactants, or compounds that act to break liquid substances such as oil into small droplets. In an oil spill, these droplets disperse into the water column, where they are subjected to natural processes—such as wind, waves, and currents—that help to break them down further. This helps to clear oil from the water surface, making it less likely that the oil slick will reach the shoreline. The effectiveness of a dispersant is determined by the composition of the oil it is being used to treat and the method and rate at which the dispersant is applied.

Bioremediation

Bioremediation technologies can help biodegradation processes work faster. Bioremediation refers to the act of adding materials to the environment, such as fertilizers or microorganisms, that will increase the rate at which natural biodegradation occurs. Furthermore, bioremediation is often used after all mechanical oil recovery methods have been used.

Shoreline Clean-up:

Both natural processes and physical methods aid in the removal and containment of oil from shorelines. Sometimes physical methods are used to enhance naturally occurring processes. Examples of a technology that uses both natural processes and physical methods to clean up an oil spill are biodegradation and bioremediation, which are described later.

9.2 Oil Spillage on land:

Manual recovery

Manual recovery is the most common method of shoreline clean up and involves teams of workers using rakes, shovels, and other tools to remove oil and debris. The oiled materials are collected in buckets and drums for transfer to a processing station. Workers may also use suction hoses, pumps, and vacuum trucks to recover spilled oil. While manual clean-up is a slow, painstaking process, it generates less waste than other techniques.

Berms / Trenches

Spills on land can be contained for recovery by building berms or dikes in the path of the oil flow, using either soil from the area, sand bags, or other construction materials. It is important to make sure the berm does not cause oil to back up and permeate the soil, where it could contaminate groundwater. If the water table is high and the oil will not permeate the soil, shallow trenches may be dug to collect oil for removal.

Land booms

Land booms look like large sausages. They are made from oil absorbent material causing them to act as a barrier. This prevents oil from leaving an area surrounded by land booms.

Hydrocarbon pads

Hydrocarbon pads are a type of oil absorbent pads. Each pad absorbs a large quantity of oil. They are effective where there is a pool of oil, which needs to be soaked up. Once the pads are saturated, they can be collected in sealed plastic bags for disposal.

Sorbents

It contains microbes, which are dormant until they come into contact with hydrocarbons. These microbes consume the oil, cleaning the soil of all evidence of the hydrocarbon spill. If the spill has seeped into the soil, it may be necessary to dig up the top layer and aerate the soil. Microbes function best when damp, so spraying the area with water also aids the clean-up operation.

Bio-remediation

Bioremediation technologies can help biodegradation processes work faster. Bioremediation refers to the act of adding materials to the environment, such as fertilizers or microorganisms, that will increase the rate at which natural biodegradation occurs. Furthermore, bioremediation is often used after all mechanical oil recovery methods have been used.

In-situ burning

In-situ burning of oil involves the ignition and controlled combustion of oil. It can be used when oil is spilled on a water body or on land. In-situ burning is typically used in conjunction with mechanical recovery on open water. Fire resistant booms are often used to collect and concentrate the oil into a slick that is thick enough to burn. Many factors influence the decision to use in-situ burning on inland or coastal waters including ***prevailing regulatory requirements***. Elements affecting the use of burning include water temperature, wind direction and speed, wave amplitude, slick thickness, oil type, and the amount of oil weathering and emulsification that have occurred. Weathering is a measure of the amount of oil already having escaped to the atmosphere through evaporation.

10.0 TERMINATION OF OPERATION

The termination of the operation shall be decided by the RCE on feedback received from ECT and OSC. Regulating authorities like SPCB, District Administration etc. shall also be contacted before coming to this decision. Competent authority may issue press release.

10.1 Standing down equipment, cleaning, maintenance and repair

10.1.1 Replacement

On completion of Pollution Response Operations, all the equipment, machineries and consumables shall be accounted for and checked for their serviceability. All equipment and machineries shall be thoroughly washed with fresh water as per the OEM's guidelines, necessary for maintenance and then the equipment stored, and secured in their respective places.

10.1.2 Preparing final detailed report

After completion of operations, the OSC shall prepare a detailed report covering all the aspects of the oil spill clean-up, which shall include success and failures, as well as lessons learnt, recommendations about equipment, man power, plans etc. The report is to be forwarded to Leader, ECT/ECR.

10.1.3 Reviewing plans and procedures from lessons learnt

The DCR will carry out deliberations on the report received from OSC and give its recommendations to HoD-HSE for putting it to ED/Management for necessary action.

10.2 Help from mutual aid partners

In case of the spill containment is beyond the internal resources the OSC may seek help from mutual aid partners to arrest the loss to bare minimum. In this regard, the approved document on “Offsite Emergency Response Plan” may be referred.

11.0 TRAINING SCHEDULES AND DRILL / EXERCISES

11.1 Oil spill response drills and exercises

OIL shall have regular internal exercises and testing, validation and updating of the OSCP to ensure that skills and awareness related to OSR are maintained to a state of operational readiness as well as the effectiveness of this plan. This will also check the functional ability of the ERT/ ECR. In order to have optimal utilisation of equipment with minimum wear and tear, quarterly exercises are recommended for testing of OSCP. Testing and exercises also provide management an opportunity to assess equipment, measure performance and obtain feedback from participants, update and correct the OSCP, show sincerity for protection of marine environment and company’s commitment on oil spill prevention and response.

Exercise and drills may involve any or a combination of the following:

- (i) Oil spill contingency plan
- (ii) Mock exercise activating oil spill response
- (iii) Equipment and personnel mobilization and deployment
- (iv) Joint exercise with other companies
- (v) Full-scale incident management exercise

Each exercise shall be debriefed to identify weaknesses in the OSCP and equipment, and appropriate remedial action shall be undertaken where required. The Head (S&E) shall ensure that amendments reflecting these actions are incorporated into this plan.

HoD-HSE shall suggest training courses & HR-L shall only provide training that all OSR Team personnel who would be handling / operating the OSR equipment and materials undergo specific training and gain confidence in handling and operation of the equipment, as they are to operate.

11.2 Improving contingency plans

After an oil spill has been controlled and cleaned up, or after an exercise, the companies, as well as the local, state, and central agencies that were involved in the emergency or exercise, should assess the usefulness of their contingency plans. Information gathered during the assessment, such as problems that had not been considered in the original plan and the successes or failures of clean-up techniques used, is used to revise and improve contingency plans. Lessons learned during oil spills and exercises are shared with other private, state, regional, and central agencies so that they too may learn from oil spills.

12.0 FURTHER REFERENCES AND OTHER ORGANIZATIONAL

References and other organizational documents to be consulted along with this Oil Spill Contingency Plan are:

- (i) Onsite and Off-site Disaster Management Plan of OIL
- (ii) Corporate Disaster Management Plan of OIL
- (iii) ERDMP wherever applicable.

ANNEXURE-1

CHARACTERISTIC AND BEHAVIOR OF OIL:

Characteristics of Oil being handled by the installation:

OIL is handling crude and gas. The types and characteristics of crude are:

Properties of crude are:

Properties of gas are:

Weathering process:

Rainy weather:

Sunny weather:

Facilities/ Resources at risk:

ANNEXURE – 2

OIL SPILL REPORT FORM

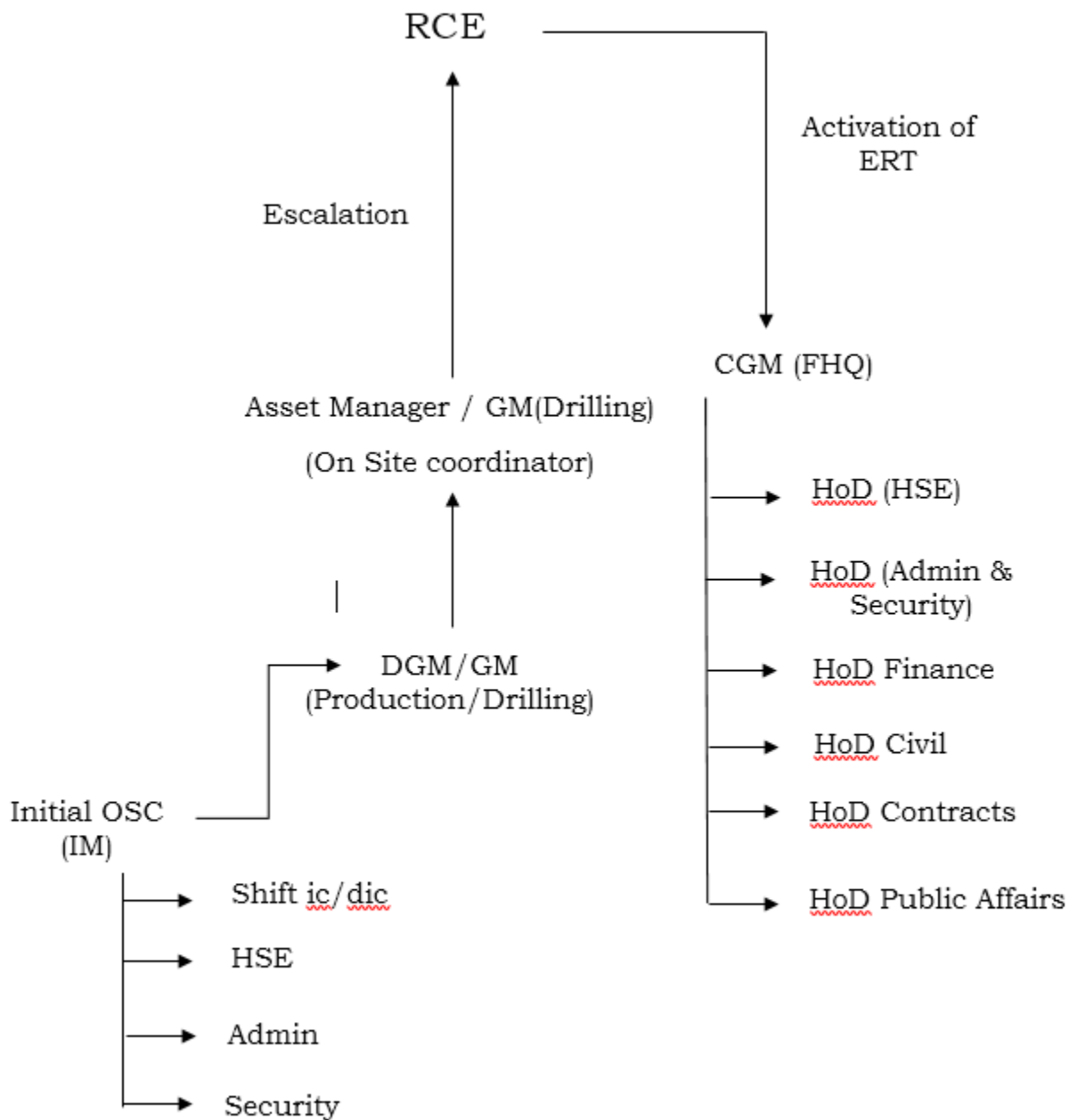
1. Name of person reporting incident:
2. Title / Designation:
3. Company:
4. Telephone / Fax numbers:
5. Date and time:
6. Spill Location:
7. Type and quantity of oil spilled:
8. Cause of Spill:
9. Response to spillage (if any):
10. Any other information:

ANNEXURE – 3

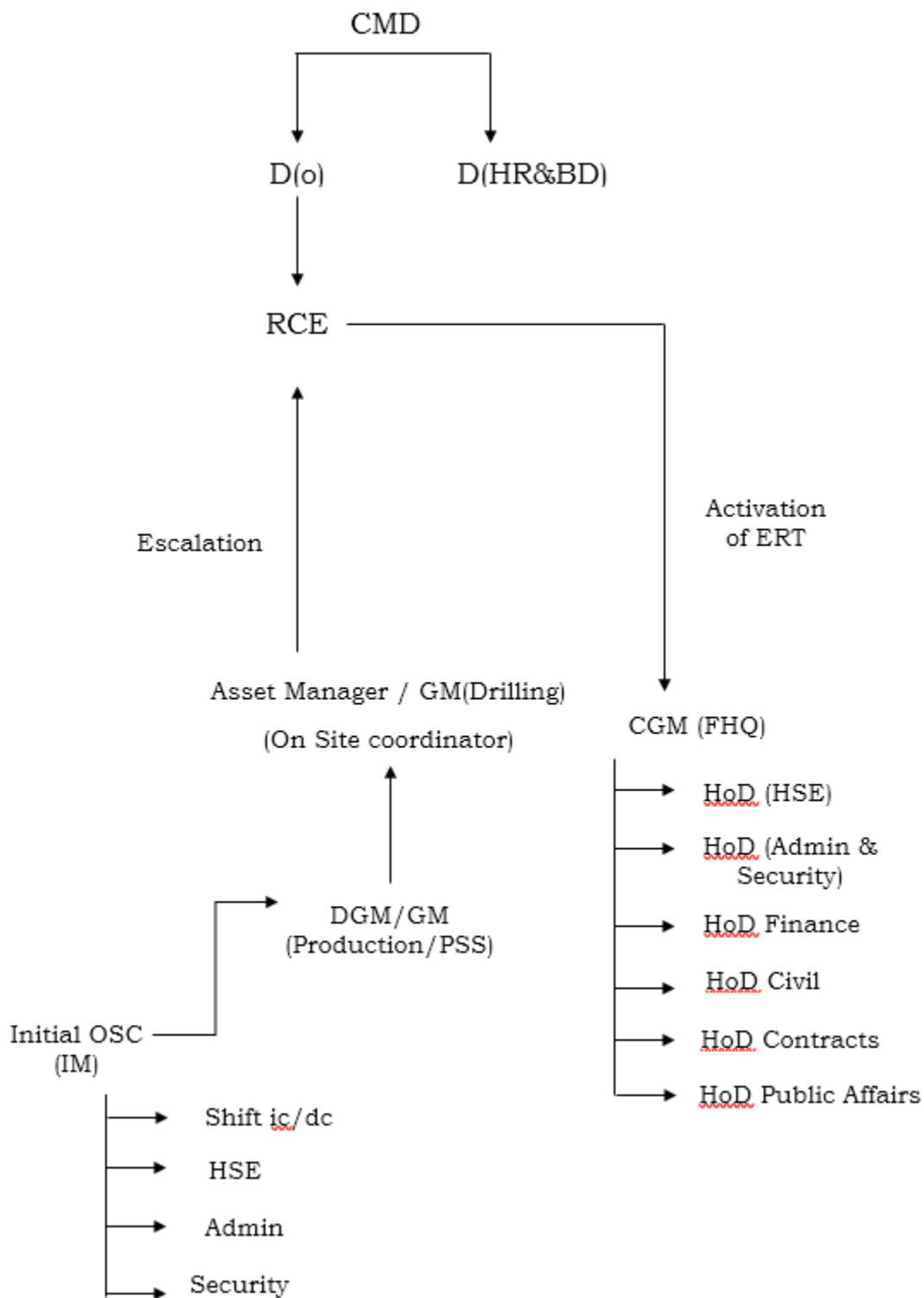
MANAGEMENT REPORT

- Present Location:
- No. of man power deployed:
- Use of OSD (if used):
- Equipment deployed:
- Weather condition:
- Amount of oil recovered:
- Amount of oil transferred for storage/disposal:
- Difficulties encountered:
- Any other:

ANNEXURE – 4
Communication Channel (TIER II)



ANNEXURE – 5
Communication Channel (TIER III)



ANNEXURE – 6

DO'S AND DON'TS

1. DO'S

- Release only authorized verified written information.
- Keep accurate records and logs of all enquiries and news coverage.
- Escort the press and government agencies to the nearest safe place on the Emergency site.
- Have designated spokesmen. Know what information can and cannot be released.

2. DON'TS

- Speculate on the causes of the emergency.
- Speculate on the resumption of normal operations.
- Speculate on the outside effects of emergencies.
- Speculate on the value of losses and damage.
- Interfere with the legitimate duties of media executives
- Place blame of emergencies.
- Crowd in the affected area (those who have no role assigned in the disaster plan should stick to their jobs.)

ANNEXURE-7**SPILL RESPONSE METHODS**

(Courtesy: National Oceanic Atmospheric Administration: American Petroleum Institute)

This section describes methods previously categorized for use during response to oil spills in inland environments and habitats. The methods are used in the protection, recovery, and cleanup phases of a response. The main objective of *protection* is to keep oil out of a habitat or to reduce the amount that enters. *Recovery* consists of removing floating oil from the water surface. The *cleanup* phase consists of removing stranded oil from shoreline habitats via physical, chemical, and enhanced biological means. In most spill response situations, protection and oil recovery are the immediate goals. Combinations of protection, recovery, and cleanup methods are commonly used though these guidelines treat each method separately.

The following section includes a summary of the objective in using the method, a general description of the method, applicable habitat types, conditions under which the methods should be used, biological constraints commonly applied to the use of the method to protect sensitive resources, and the environmental effects expected from the proper use of the method. Some of the methods listed require special authorization for use during a spill; the appropriate agency must be contacted about the need for special approvals. We encourage you to refer to the references listed in Annexure A for further information.

Physical Response Methods

- | | |
|--------------------------------|--|
| 1. Natural Recovery | 11. Sediment Reworking |
| 2. Booming | 12. Vegetation Removal |
| 3. Skimming | 13. In-Situ Burning |
| 4. Barrier/Berm | 14. Flooding |
| 5. Physical Herding | 15. Low-Pressure, Cold-Water Flushing |
| 6. Manual Oil Removal/Cleaning | 16. High-Pressure, Cold-Water Flushing |
| 7. Mechanical Oil Removal | 17. Low-Pressure, Hot-Water Flushing |
| 8. Sorbents | 18. High-Pressure, Hot-Water Flushing |
| 9. Vacuum | 19. Steam Cleaning |
| 10. Debris Removal | 20. Sand Blasting |

Chemical Response Methods

- | | |
|-----------------------------|------------------------------------|
| 21 Dispersants | 22 Solidifiers |
| 23 Emulsion Treating Agents | 24 Chemical Shoreline Pretreatment |
| 25 Visco-Elastic Agents | 26 Shoreline Cleaning Agents |
| 27 Herding Agents | |

Biological Response Methods

- 28 Nutrient Enrichment
- 29 Natural Microbial Seeding

1. Natural Recovery

Objective:

No attempt to remove any stranded oil in order to minimize impact to the environment, or because there is no proven effective method for cleanup.

Description:

No action is taken, although monitoring of the incident continues.

Applicable Habitat Types: Can be used on all habitat types.

When to Use:

On remote or inaccessible habitats, when natural removal rates are very fast (e.g., the evaporation of gasoline), when the degree of oiling is light, or when cleanup actions will do more harm than natural removal.

Biological Constraints:

This method may be inappropriate for areas where high numbers of mobile animals (birds, terrestrial mammals) or endangered species use the body of water or shoreline.

Environmental Effects:

Same as from the oil alone.

2. Booming

Objective:

To control the movement of floating oil by containment, diversion, deflection, or exclusion.

Description:

Placement of a device (boom) on the water that forms a barrier to floating oil. *Containment* is deploying a boom to hold the oil until it can be removed. *Deflection* is moving oil away from sensitive areas. *Diversion* is moving oil toward recovery sites that have slower flow, better access, etc. *Exclusion* is placing boom to prevent oil from reaching sensitive areas. The ultimate goal is to recover the oil.

Applicable Habitat Types:

Can be used on all water environments. Booms begin to fail by entrainment when the effective current or towing speed exceeds 0.7 knots perpendicular to the boom.

When to Use:

Nearly all types of response to spills on water involve deploying boom to assist in the recovery of floating oil. Booms must be properly deployed and maintained, including removing accumulated debris. Containment booming of gasoline spills is usually not attempted, because of both fire and inhalation hazards to responders. However, when public health is at risk, booming of gasoline can be attempted with use of foam and extreme safety procedures. Deflection or exclusion booming of sensitive areas to prevent exposure to oil, including gasoline, can be an important protection action.

Biological Constraints:

Placement and maintenance of anchoring points should not cause excessive physical disruption. Boom must be maintained so that it does not trap oil improperly and cause more damage. Traffic to / from boom sites should not disturb wildlife.

Environmental Effects:

Minimal if surface disturbance by cleanup work force traffic is controlled.

3. Skimming

Objective:

To recover floating oil from the water surface.

Description:

Mechanized equipment is placed at the oil / water interface. There are five different types of skimmers: weir, suction, centrifugal, submersion, and oleophilic. They may operate

independently from shore, be mounted on vessels, or be completely self-propelled. All require collection and concentration of floating oil at the skimmer, usually using booms.

Large amounts of water are often collected and must be handled. Adequate storage of recovered oil / water mixture must be available.

Applicable Habitat Types:

Can be used on all water environments. Waves, currents, and debris reduce skimmer efficiencies.

When to Use:

When sufficient amounts of floating oil can be contained. Skimming of gasoline spills is usually not feasible, because of both fire and inhalation hazards to responders. However, when public health is at risk, skimming of gasoline can be attempted using foam and extreme safety procedures.

Biological Constraints:

Traffic to / from skimming sites should not disturb wildlife.

Environmental Effects

Minimal if surface disturbance by cleanup work force traffic is controlled.

4. Barriers/Berms

Objective:

To prevent entry of oil into a sensitive area or to divert oil to a collection area.

Description:

A physical barrier is placed across an area to prevent moving oil from passing. Barriers can consist of earthen berms, filter fences, air bubble barriers, or trenches. When it is necessary for water to pass, because of water volume or downstream needs, underflow dams (for low flow rates) or overflow dams are used.

Applicable Habitat Types:

In streams and dry valleys, where the width and depth of the area to be closed off are relatively small. Also, at the mouths of small creeks along lake shorelines, to prevent oil from being blown upstream.

When to Use:

When the flow of oil threatens sensitive habitats. If the barrier does not fail, it is the most effective strategy to exclude oil from an area.

Biological Constraints:

Place barriers away from sensitive areas, such as spawning sites. Downstream water requirements should be monitored to prevent dewatering of sensitive areas.

Environmental Effects:

May disrupt or contaminate sediments along banks or in channel. Dewatering or poor water quality downstream may affect aquatic organisms.

5. Physical Herding

Objective:

To free oil trapped in debris or vegetation on water; to direct the movement of floating oil towards containment and recovery devices; or to push oil away from sensitive areas.

Description:

Water or air streams and propeller wash generate a current to dislodge trapped oil and herd the released oil to containment and recovery area. May mix oil with water to form emulsified oil.

Applicable Habitat Types:

In lakes and ponds where there are little or no currents, along rivers and streams where the channel or banks are accessible, and in and around manmade structures such as wharves and piers.

When to Use:

In low-current or stagnant waterbodies, to herd oil in booms towards recovery devices. Along rivers and streams, when *mobile* oil has penetrated vegetated banks or accumulated in log jams or other debris, water spray and prop wash can mobilize the oil to flow downstream to collection points.

Biological Constraints:

None.

Environmental Effects:

May generate high levels of suspended sediments and mix them with the oil, resulting in deposition of contaminated sediments in benthic habitats.

6. Manual Oil Removal/Cleaning

Objective:

To remove surface oil with hand tools and manual labor.

Description:

Removal of surface oil by manual means (hands, rakes, shovels, buckets, rags, sorbent pads, etc.) and placing in containers. No mechanized equipment is used.

Applicable Habitat Types:

Can be used on all habitat types.

When to Use:

Light to moderate oiling conditions for stranded oil, or heavy oils on water that have formed semi-solid to solid masses that can be picked up manually.

Biological Constraints:

Foot traffic over sensitive areas (wetlands, floating vegetation, etc.) needs to be restricted or prevented. There may be periods when access should be avoided, such as during bird nesting.

Environmental Effects

Minimal if surface disturbance by crew movement and waste generation is controlled.

7. Mechanical Oil Removal

Objective:

Removal of oil from water surface, bottom sediments, and shorelines with heavy equipment.

Description:

Oil and oiled sediments are collected and removed using backhoes, dredges, graders, bulldozers, draglines, etc. On land, the oiled material is pushed into piles and transported offsite for treatment / disposal. On water, the equipment is operated from shore or barges to recover large amounts of heavy or solidified oil.

Applicable Habitat Types:

On land, possible wherever there are surface sediments accessible to heavy equipment. On water, used in lakes, rivers, etc., where oil accumulates.

When to Use:

When large amounts of oiled materials have to be collected and removed. Along shorelines, care should be taken to remove sediments only to the depth of oil penetration, which can be difficult

with heavy equipment. Should be used carefully where excessive sediment removal may erode the beach. Will need special permission to use in areas with known cultural resources.

Biological Constraints:

Heavy equipment may be restricted in sensitive habitats (e.g., wetlands, soft substrate) or areas containing endangered plants and animals.

Environmental Effects:

The equipment is heavy, with many support personnel required. May be detrimental if excessive sediments are removed without replacement. All organisms in the sediments will be affected, although the need to remove the oil may make this response method the best overall alternative. Runoff from exposed oil and fine-grained oily sediments can affect adjacent bodies of water.

8. Sorbents

Objective:

To remove floating oil by adsorption onto oleophilic material placed in water or at the waterline.

Description:

Sorbent material is placed *on the water surface*, allowing it to absorb oil as it is released by natural processes. Forms include sausage boom, rolls, sweeps, pads, and snares. Efficacy depends on the capacity of the particular sorbent, energy available for lifting oil off the substrate, and stickiness of the oil. Recovery of all sorbent material is mandatory.

Applicable Habitat Types:

Can be used on any habitat or environment type.

When to Use:

When the stranded oil is mobile and transport of oil is expected on or off the site. The oil must be viscous and thick enough to be released by the substrate and absorbed by the sorbent. Often used as a secondary treatment method after gross oil removal and in sensitive areas where access is restricted.

Biological Constraints:

Access for deploying and retrieving sorbents should not affect soft or sensitive habitats or wildlife. Sorbent use should be monitored to prevent overuse and generating large volumes of waste.

Environmental Effects:

Physical disturbance of habitat during deployment and retrieval. When the sorbents are no longer effective, oil may remain in critical habitats during sensitive periods.

9. Vacuum

Objective:

To remove free oil pooled on the substrate or from the water in sheltered areas.

Description:

A vacuum unit with a suction head recovers free oil. The equipment can range from small, portable units that fill individual 55-gallon drums to large supersuckers that are truck-mounted and can lift large rocks. Can be used with booms and flushing systems to move the oil toward the suction head. Removal rates from substrates can be extremely slow.

Applicable Habitat Types:

Any accessible habitat type. May be mounted on barges for water-based operations, on trucks backed to the recovery area, or hand-carried to remote sites.

When to Use:

When free, liquid oil is stranded on the substrate (usually in depressions), trapped in vegetation and is readily accessible, or concentrated on the water surface. Often used instead of skimmers for floating oil recovery. Usually requires shoreline access points. Used in recovery of gasoline spills only with special precautions such as: applying foam to suppress vapors, testing for flammable vapor, locating the vacuum truck a safe distance from spill, and venting the pump discharge safely.

Biological Constraints:

Special restrictions should be identified for areas where foot traffic and equipment operation should be limited, such as soft substrates. Operations in wetlands need to be very closely monitored, with a site-specific list of restrictions.

Environmental Effects:

Minimal if foot and vehicular traffic is controlled and minimal substrate is removed.

10. Debris Removal

Objective:

To remove contaminated debris from the shoreline or water surface.

Description:

Manual or mechanical removal of debris from the shore or water surface. Can include cutting up and removal of oiled logs.

Applicable Habitat Types:

Can be used on any habitat or environment type where safe access is allowed.

When to Use:

When driftwood and debris are heavily contaminated and provide a potential source of chronic oil release, an aesthetic problem, a source of contamination for other organisms in the area, or skimmer clogging problems.

Biological Constraints:

Disturbance to adjacent areas should be minimized. Foot traffic over sensitive areas (wetlands, spawning grounds) needs to be restricted. May be periods when access should be restricted (spawning periods, large numbers of migratory waterbirds).

Environmental Effects:

Physical disruption of substrate, especially when equipment must be deployed to recover a large quantity of debris.

11. Sediment Reworking

Objective:

To rework oiled sediments to break up the oil deposits, increase its surface area, and mix deep subsurface oil layers, which will expose the oil to natural removal processes and enhance the rate of oil degradation.

Description:

The oiled sediments are roto-tilled, disked, or otherwise mechanically mixed using heavy equipment. Along lake shores, oiled sediments may also be pushed lower on the shore to enhance natural cleanup from reworking by wave activity. The process may be aided with high-volume flushing of gravel.

Applicable Habitat Types:

On any sedimentary substrate that can support heavy equipment.

When to Use:

On sand to gravel beaches with subsurface oil, where sediment removal is not feasible (due to erosion concerns or disposal problems). Also where surface oil deposits have started to form

pavements or crusts. Appropriate for sites where the oil is stranded above the normal water level.

Biological Constraints:

Avoid use on shores near water intakes, fish-spawning areas, or near bird-nesting or concentration areas because of the potential for release of oil and oiled sediments into adjacent bodies of water.

Environmental Effects:

Due to the mixing of oil into sediments, this method could further expose organisms that live below the original layer of oil. Repeated mixing over time could delay re-establishing organisms. Runoff from treated sites could contaminate downslope areas.

12. Vegetation Removal

Objective:

To cut and remove oiled vegetation to prevent oiling of wildlife or chronic oil releases.

Description:

Manual cutting of oiled rooted vegetation using weed eaters. Cut vegetation is raked up. Floating vegetation is removed either manually or mechanically.

Applicable Habitat Types:

Wetlands composed of emergent, herbaceous vegetation and floating aquatic vegetation.

When to Use:

When the risk of oiled vegetation contaminating wildlife is greater than the value of the vegetation that is to be cut, and there is no less destructive method that removes or reduces the risk to acceptable levels.

Biological Constraints:

Operations must be strictly monitored to minimize the degree of root destruction and mixing of oil deeper into the sediments. Access in bird-nesting areas should be restricted during nesting seasons.

Environmental Effects:

Vegetation removal will destroy habitat for many animals. Cut areas will have reduced plant growth. Along exposed sections of shoreline, the vegetation may not regrow, eroding and destroying the habitat. Trampled areas will recover much more slowly.

13. In-Situ Burning

Objective:

To remove oil from the water surface or habitat by burning.

Description:

Oil floating on the water surface is collected into slicks at least 2-3 millimeters thick and ignited. The oil can be contained in fire resistant booms, or by natural barriers such as ice or the shore. On land, oil in the habitat is burned, usually when it is on a combustible substrate such as vegetation, logs, and other debris. Oil can be burned off non-flammable substrates using a burn promoter. On sedimentary substrates, it may be necessary to dig trenches for oil to accumulate in pools thick enough to burn efficiently. Heavy and emulsified oils are harder to ignite and sustain an efficient burn, but are still burnable.

Applicable Habitat Types:

On any habitat type except dry muddy substrates where heat may impact the biological productivity of the habitat.

When to Use:

On floating slicks, early in the spill event when the oil can kept thick enough (2-3 millimeters). On land, where there is heavy oil in sites not amenable or accessible to physical removal and it is important to immobilize the stranded oil quickly. In wetlands and mud habitats, a water layer minimizes impacts to sediments and roots. Many potential applications for spills in ice.

Biological Constraints:

Large volumes of smoke are generated, and its effect on nesting birds and populated areas should be evaluated.

Environmental Effects:

Temperature and air quality effects are likely to be localized and short-lived. Toxicological impact from burn residues have not been evaluated. There are few studies on the relative effects of burning oiled wetlands compared to other techniques or natural recovery, but the limited data indicate little impact of burning relative to natural recovery when the soils are saturated.

14. Flooding

Objective:

To wash oil stranded on the land surface to the water's edge for collection.

Description:

A perforated header pipe or hose is placed above the oiled shore or bank. Ambient water is pumped through the header pipe at low pressures and flows downslope to the water. On porous sediments,

water flows through the substrate, pushing loose oil ahead of it (or floats oil to the water's surface) then transports the oil down the slope for pickup. Flow is maintained to remove the majority of free oil. Oil is trapped by booms and is recovered by skimmers or other suitable equipment.

Applicable Habitat Types:

All habitat types.

When to Use:

In heavily oiled areas when the oil is still fluid and loosely adheres to the substrate, and where oil has penetrated into gravel sediments. This method is frequently used with other washing techniques (low- or high-pressure, cold water).

Biological Constraints:

Not appropriate where nearshore sediments contain rich biological communities.

Environmental Effects:

Habitat may be physically disturbed by foot traffic during operations and smothered by sediments washed down the slope. Oiled sediment may be transported to shallow nearshore areas, contaminating them and burying benthic organisms.

15. Low-Pressure, Cold-Water Flushing

Objective:

To remove liquid oil that has adhered to the substrate or manmade structures, pooled on the surface, or become trapped in vegetation.

Description:

Ambient water is sprayed at low pressures (<50 psi), usually from hand-held hoses, to lift oil from the substrate and direct it to the water's edge for pickup. Can be used with a flooding system to prevent released oil from re-adhering to the substrate.

Applicable Habitat Types:

On heavily oiled substrates, riprap, and seawalls where the oil is still liquid. In wetlands and along vegetated banks where free oil is trapped in vegetation.

When to Use:

Where free, liquid oil is stranded onshore or floating in very shallow areas.

Biological Constraints:

Not appropriate where nearshore sediments contain rich biological communities. May need to restrict use so that the oil / water effluent does not drain across sensitive habitats. Use from boats

will prevent foot traffic in soft substrates and vegetation. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable.

16. High-Pressure, Cold-Water Flushing

Objective:

To remove oil that has adhered to hard substrates or manmade structures.

Description:

Similar to low-pressure flushing except that water pressure is 100-1,000 psi. High-pressure spray will more effectively remove sticky or viscous oils. If water volumes are low, sorbents are placed directly below the treatment area to recover oil.

Applicable Habitat Types:

Bedrock, manmade structures, and gravel habitats.

When to Use:

When low-pressure flushing is not effective at removing adhered oil, which must be removed to prevent continued oil release or for aesthetic reasons. When a directed water jet can remove oil from hard-to-reach sites.

Biological Constraints:

May need to restrict flushing so that the oil / water effluent does not drain across sensitive habitats. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

May drive oil deeper into the substrate if water jet is improperly applied. If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable.

17. Low-Pressure, Hot-Water Flushing

Objective:

To remove non-liquid oil that has adhered to the substrate or manmade structures, or pooled on the surface.

Description:

Hot water (90°F up to 170°F) is sprayed with hoses at low pressures (<50 psi) to liquefy and lift oil from the substrate and direct it to the water's edge for pickup. Used with flooding to prevent released oil from re-adhering to the substrate.

Applicable Habitat Types:

On heavily oiled bedrock, sand to gravel substrates, and manmade structures.

When to Use:

Where heavy, but relatively fresh oil is stranded onshore. The strategy is to heat the oil to above its pour point, so it will flow. Less effective on sticky oils.

Biological Constraints:

Avoid wetlands or nearshore sediments with rich biological communities. Use should be restricted so that the hot oil / water effluent does not contact sensitive habitats. Boat use will prevent foot traffic in soft substrates and vegetation. Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

Hot water can kill all organisms in direct contact. If containment methods are not sufficient, contamination may be flushed into downstream areas. Some trampling of substrate and vegetation is unavoidable during the response.

18. High-Pressure, Hot-Water Flushing

Objective:

To mobilize weathered and viscous oil adhered to surfaces.

Description:

Hot water (90°F up to 170°F) is sprayed with hand wands at pressures greater than 100 psi. Used without water flooding, this procedure requires immediate use of vacuum or sorbents to recover the oil / water runoff. When used with a flooding system, the oil is flushed to the water surface for collection by skimmers or sorbents.

Applicable Habitat Types:

Gravel habitats, bedrock, and manmade structures.

When to Use:

When oil has weathered to the point that even warm water at low pressure no longer

effectively removes oil, to prevent continued release of oil. To remove viscous oil from manmade structures for aesthetic reasons.

Biological Constraints:

Use should be restricted so that the oil / water effluent does not drain across sensitive habitats (damage can result from exposure to oil, oiled sediments, and hot water). Released oil must be recovered to prevent further oiling of adjacent areas.

Environmental Effects:

All attached organisms and plants in the direct spray zone will be removed or killed, even when used properly. Oiled sediment may be transported to shallow nearshore areas, contaminating them and burying benthic organisms.

19. Steam Cleaning

Objective:

To remove heavy residual oil from solid substrates.

Description:

Steam or very hot water (170°F to 212°F) is sprayed with hand wands at high pressure. Water volumes are very low compared to flushing methods.

Applicable Habitat Types:

Manmade structures such as seawalls and riprap.

When to Use:

When heavy oil residue remaining on a shoreline needs to be cleaned for aesthetic reasons, and when hot-water wash is not effective.

Biological Constraints:

Not to be used in areas of soft substrate, vegetation, or high biological abundance directly on or below the structure.

Environmental Effects:

Complete destruction of all organisms in the spray zone. Difficult to recover all released oil.

20. Sand Blasting

Objective:

To remove heavy residual oil from solid substrates.

Description:

Use of sandblasting equipment to remove oil from the substrate. May include recovery of used (oiled) sand in some cases.

Applicable Habitat Types:

Manmade structures such as seawalls and riprap.

When to Use:

When heavy oil residue is remaining on the shoreline, which needs to be cleaned for aesthetic reasons, and even steam cleaning is not effective.

Biological Constraints:

Not to be used in areas of soft substrate, vegetation, or high biological abundance directly below or adjacent to the structures.

Environmental Effects:

Complete destruction of all organisms in the blast zone. Possible smothering of downstream organisms with sand. When the used sand is not recovered, introduces oiled sediments into the adjacent habitat.

21. Dispersants

Objective:

To remove floating oil from the water surface and disperse it into the water column, to reduce impact to sensitive shoreline habitats and animals that use the water surface.

Description:

Specially formulated products containing surface-active agents are sprayed at concentrations of about 5 percent by volume of the oil onto the slicks by aircraft or from boats. The products can be applied undiluted or mixed with water. The dispersants reduce the oil / water surficial tension and decrease the energy needed for the slick to break into small particles and mix into the water column. Some turbulence is needed to mix the dispersant into the oil and to mix the treated oil into the water.

Applicable Habitat Types:

Open water and large rivers with sufficient depth and volume for mixing and dilution.

When to Use:

When the impact of the floating oil has been determined to be greater than the impact of mixing of oil into the water column.

Biological Constraints:

Use in shallow water could affect benthic resources. The potential impact of dispersed oil on water intakes should be thoroughly considered prior to use.

Environmental Effects:

May increase effects on water-column organisms, particularly plankton and larval fish. Dispersion will only be partially effective, so some water surface impact will still occur.

22. Emulsion-Treating Agents

Objective:

To break or destabilize emulsified oil into separate oil and water phases. Can also be used to prevent emulsion formation.

Description:

Emulsion-treating agents are surfactants that are applied to emulsified oil at low concentrations (0.1-2 percent). They can be injected into skimmer reservoirs to break the emulsion to separate excess water from recovered oil. They also can be sprayed (similar to dispersants) directly onto slicks to break or prevent emulsions.

Applicable Habitat Types:

On all water environments where emulsified oil is present.

When to Use:

For recovered oil, where storage capacities are very limited, to separate the oil and water so that the water can be treated and discharged. On floating slicks, where emulsified oil can reduce skimmer efficiency.

Biological Constraints:

There is insufficient information to evaluate at this time.

Environmental Effects:

Because this is a new application approach, there are very few data available to evaluate environmental effects. Effective dosages are one to two orders of magnitude lower than dispersants. Environmental concerns regarding application to slicks are: how treatment might adversely change the physical or chemical properties of the oil; whether the oil will be more readily dispersed; and how the treated oil will behave upon contact with birds, mammals, and shorelines.

23. Visco-Elastic Agents

Objective:

To impart visco-elastic properties to floating oil and increase skimming rates.

Description:

Chemical agent is applied as a liquid spray or a slurry onto the oil in the proper dosage. Some mixing is required and is usually provided by the water spray during application. Treated oil is rendered visco-elastic, but still fluid, gelatinous, or semi-solid; there is no chemical change in the oil. The primary purpose is to increase the efficiency in skimmer removal rates while minimizing amount of water. Increases the recovery by drum skimmers, but can clog weir-type skimmers.

Applicable Habitat Types:

On all water environments where oil can be contained for recovery with skimmers. Not for use near wetlands or debris because of an increase in adhesive behavior of the treated oil.

When to Use:

When recovery efficiency of skimmers needs to be increased. Must be used with booming or other physical containment. Not for use on heavy oils, which are already highly viscous.

Biological Constraints:

Not suitable for vegetated shores or where there is extensive debris mixed in the oil. Should be avoided when birds or other wildlife that may be more adversely affected by the treated oil cannot be kept away from the treated oil.

Environmental Effects:

May enhance the smothering effect of oil on organisms. Therefore, the treatment should be considered only where recovery of the treated oil is likely.

24. Herding Agents

Objective:

To collect or herd oil into a smaller area and thicker slick in order to increase recovery. Also can be used to herd oil away from sensitive areas or used inside containment booms when it is necessary to move the boom.

Description:

Chemical agents, which are insoluble surfactants and have a high spreading pressure, are applied in small quantities (1-2 gallons per lineal mile) to the clean water surrounding the edge of a fresh

oil slick. They contain the oil, prevent spreading, but do not hold the spill in place. Hand-held, vessel-mounted, or aircraft systems can be used. Must be applied early in spill, when oil is still fluid.

Applicable Habitat Types:

On all stillwater environments.

When to Use:

Potential use for collection and protection. For collection, used to push slicks out from under docks and piers where it has become trapped, or in harbors, where the equipment is readily accessible for use early in the spill. For protection in low-current areas, use to push slicks away from sensitive resources such as wetlands. Not effective in fast currents, rough seas, or rainfall.

Biological Constraints:

Not suitable for use in very shallow water or fish-spawning areas.

Environmental Effects:

Direct acute toxicity to surface layer organisms possible, though available products vary greatly in their aquatic toxicity.

25. Solidifiers

Objective:

To change the physical state of spilled oil from a liquid to a solid to reduce impact of oil to shorelines.

Description:

Chemical agents (polymers) are applied to oil at rates of 10-45 percent, solidifying the oil in minutes to hours. Various broadcast systems, such as leaf blowers, water cannons, or fire suppression systems, can be modified to apply the product over large areas. Can be applied to both floating and stranded oil.

Applicable Habitat Types:

All water environments, bedrock, sediments, and manmade structures.

When to Use:

When immobilization of the oil is desired, to prevent refloating from a shoreline, penetration into the substrate, or further spreading. However, the oil may not fully solidify unless the product is well mixed with the oil, and may result in a mix of solid and untreated oil.

Generally not used on spills of heavy oil because the product cannot be readily mixed into viscous

oils.

Biological Constraints:

Must be able to recover all treated material.

Environmental Effects:

Available products are insoluble and have very low aquatic toxicity. Unrecovered solidified oil may have longer impact because of slow weathering rates. Physical disturbance is likely during application and recovery.

26. Chemical Shoreline Pre-treatment

Objective:

To prevent oil from adhering to or penetrating the substrate.

Description:

Various types of film-forming agents or wetting agents are applied to habitats in advance of the oil to prevent oil adhesion and penetration. Application must occur just prior to stranding of the oil so timing is critical. It should be noted that there are no products now being sold as shoreline pretreatment agents.

Applicable Habitat Types:

Bedrock, sand and gravel habitats, and manmade structures.

When to Use:

When oil is projected to impact an applicable shoreline, particularly those that have high recreational or aesthetic value. However, lack of information on the availability, effects, and effectiveness of products greatly limits their use.

Biological Constraints:

Unknown at this time but there are likely to be constraints based on product toxicity and persistence.

Environmental Effects:

Unknown at this time since there are no commercially available products. There are concerns about toxicity and smothering since these products could be applied directly on clean substrates.

27. Shoreline Cleaning Agents

Objective:

To increase the efficiency of oil removal from contaminated substrates.

Description:

Special formulations are applied to the substrate, as a presoak and / or flushing solution, to soften or lift weathered or heavy oils to enhance flushing methods. The intent is to lower the water temperature and pressure required to mobilize the oil from the substrate during flushing.

Applicable Habitat Types:

On any habitat where water flooding and flushing procedures are applicable.

When to Use:

When the oil has weathered to the point where it cannot be removed using warm to hot water. This approach may be most applicable where flushing effectiveness decreases as the oil weathers.

Biological Constraints:

The released oil should be recovered rather than dispersed into the water column. Use may be restricted where suspended sediment concentrations are high, near wetlands, and near sensitive nearshore resources.

Environmental Effects:

If more oil is dispersed into the water column, there could be more oil sorbed onto suspended sediments and transferred to nearshore habitats, particularly along sheltered shorelines. The toxicity of shoreline cleaners is similar to the toxicity of dispersants.

28. Nutrient Enrichment

Objective:

To speed the rates of natural microbial degradation of oil by adding nutrients (generally nitrogen and phosphorus).

Description:

Nutrients are applied to the habitat in one of several methods: soluble inorganic formulations, which are dissolved in water and applied as a spray, requiring frequent applications; slow-release formulations, which are applied as a solid; and oleophilic formulations, which adhere to the oil itself and are sprayed directly on the oiled areas.

Applicable Habitat Types:

Could be used on any habitat type where safe access is allowed and nutrients are deficient.

When to Use:

On moderately to heavily oiled substrates, after other techniques have been used to remove as much oil as possible; on lightly oiled shorelines where other techniques are destructive or not effective; and where nutrients limit natural degradation. Most effective on diesel-type and medium oils that do not have large amounts of high molecular weight, slowly degrading components. Less effective where oil residues are thick. Not considered for gasoline spills, which will be completely removed by evaporation at faster timeframes than by microbial degradation.

Biological Constraints:

Not suitable in shallow water or restricted waterbodies where nutrient overloading may lead to eutrophication, or where toxicity of nutrients, particularly ammonia, is of concern.

Contact toxicity of oleophilic formulations may restrict areas of direct application. Toxicity tests should be evaluated carefully, as other chemicals in the product could be toxic to aquatic organisms.

Environmental Effects:

Very little information is available on effects in freshwater.

29. Natural Microbe Seeding

Objective:

To speed the rates of microbial degradation of oil by adding live microbes with enhanced oil-degrading abilities.

Description:

Formulations containing hydrocarbon-degrading microbes (usually with fertilizers) are added to the oiled area. The argument is made that indigenous microorganisms will be killed by the oil or will be slow to degrade the oil, so new microbial species need to be added to speed the process of biodegradation. Little information is currently available to show whether natural microbe seeding increases biodegradation more than nutrient enrichment alone.

Applicable Habitat Types:

Could be used on any habitat type where safe access is allowed and additional microbes are needed.

When to Use:

On moderate to heavily oiled substrates, after other techniques have been used to remove as much

oil as possible; on lightly oiled shorelines where other techniques are destructive or not effective; and where existing microorganisms are not present or effective. Most effective on diesel-type and medium oils that do not have large amounts of high molecular weight, slowly degrading components. Less effective where oil residues are thick. Not considered for gasoline spills, which will evaporate faster than they would degrade.

Biological Constraints:

If product contains fertilizers, not suitable in shallow water or restricted bodies of water where nutrient overloading may lead to eutrophication, or where toxicity of nutrients, particularly ammonia, is of concern. Toxicity tests should be evaluated carefully, as other chemicals in the product could be toxic to aquatic organisms

Environmental Effects:

Very little information is available on effects in freshwater.

SPECIAL CONSIDERATIONS

This section summarizes the following selected topics of special concern in freshwater habitats:

- Public health concerns;
- Conditions under which oil might sink;
- Oil behavior in ice conditions;
- Oil behavior and cleanup in permafrost; and
- Firefighting foam.

PUBLIC HEALTH CONCERNS

The human-health concerns associated with oil spills entail risks to the public from exposure to the oil and to responders during cleanup activities. In freshwater areas, the risks of exposure of the public are of special concern, because of the potential for contamination of public drinking water supplies and the proximity of populated areas to spill sites. Human- health risks from spilled oil occur along three potential pathways: ingestion, dermal contact, and inhalation. Ingestion pathways include drinking contaminated water and eating tainted food (e.g., fish, birds, and mammals).

Water intakes in relatively shallow lakes and rivers may be highly susceptible to contamination during oil spills. Response procedures may thus include temporarily closing the intakes, protectively booming the intake area, bringing on-line additional treatment equipment at the water-treatment plant, and / or monitoring water quality for the contaminants of concern. The low-molecular weight, aromatic compounds (benzene, ethylbenzene, toluene, and xylene) are

usually of greatest concern, because of their much higher water solubility, compared to the other compounds in oil. These four compounds usually represent 70-95 percent of the water-soluble fraction (typically about 25-40 ppm) in crude oils. Water-treatment plants that have granular activated carbon filtration systems can remove low levels of oil contamination, especially the aromatic compounds, which can cause taste and odor problems at very low concentrations.

The potential for direct contact of oil on skin is greatest during cleanup, and measures should be taken to keep the public away from all spill response operations. Inhalation of volatile compounds from spills of crude oil and light, refined products poses a risk to the public in adjacent areas. However, these risks are greatest with long-term exposure.

Fire risks are mostly associated with volatile, refined products such as gasoline. Response operations at these spills must be conducted with caution. Often, the best response to spills of volatile products is to allow the product to evaporate, while diverting the slicks away from populated areas and sensitive habitats.

CONDITIONS UNDER WHICH OIL MIGHT SINK IN FRESH WATER

Most oil spills result in floating oil slicks. There are very specific conditions that can cause an oil spill to sink rather than float in freshwater settings.

1 The oil has a specific gravity greater than 1.00 at the ambient temperature.

Specific gravity is the ratio of the density of a material to freshwater. Although nearly all crude oils and most refined products have a specific gravity less than 1.00 and will therefore float, some of the residual refined products (e.g., very heavy fuel oils, asphalt) are so heavy that their specific gravity is greater than 1.00. Spills of these oils can sink immediately and flow along with the bottom currents or as droplets in the water column. However, very small changes in water density can refloat sinking oil. There have been several spills in the freshwater sections of a river where the oil originally sank and moved along the bottom. However, at the fresh / salt mixing zone, where the water density increased with salinity, some of the oil rose to the surface. In other spills, oil has been reported to sink with very cold temperatures at night, only to refloat after the water absorbs heat from the sun.

2 The oil has a specific gravity just under 1.00 but forms a very stable emulsion.

Water-in-oil emulsions can contain up to 80 percent water, which increases the specific gravity accordingly. Also, during the emulsification process, some sediment can be incorporated into the emulsion, either from the suspended sediments in the water mixed into the oil, or those adhered to the floating slick. Only a very small amount of sediment is needed to sink oil. Usually residual refined products (e.g., No. 6 fuel oil, Bunker C) have a specific gravity of 0.99 or greater.

3 The oil comes ashore, picks up sediment, and then is eroded from the shore.

Medium and heavy oils can adsorb to sediment when they strand, making the mixture heavier than water. However, the oil / sediment mixture must be eroded from the shoreline, usually by waves, which tend to break up the oil slicks. The oiled sediment can be deposited in the nearshore zone, but as small tarballs or widely scattered contaminated sediment, rather than a layer of sunken oil. In some instances, the tarballs can stick to each other, forming a tar mat just offshore.

4 The oil is a blend of light and heavy refined products, and the light fraction is lost by evaporation.

Many intermediate fuel oils are actually mixtures of No. 2 and No. 6 oils. If the spill conditions were such that the light oil component completely evaporated, and the heavy oil was particularly heavy, the weathered oil might sink.

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NOISE LEVEL MEASUREMENT REPORT

LOCATION : OCS HAPJAN

(Production Installation – OCS/EPS/QPS)

Date : 24.12.2025

Time : 03.00 PM

Sl. No.	Noise Level Measurement at	Measurement in dB(A)	Threshold limit value for Noise as per OISD-166		Recommendation
1	Control Room / Operator Room	Door Open Door Closed	54 51	Duration per day(hours) Sound Level (dBA)	
2	Middle of Group Area		65	8	90
3	At the Entrance		61	6	92
4	Security Hut		60	4	95
5	Meter Shed		65	3	97
6	Tank Area		60	2	100
7	Air Compressor			1 - ½	102
				1	105
				½	110
				¼ or less	115

Sl. No.	Noise Level Measurement at	Noise level at source in dB(A)	At a distance from the shed												Near boundary of the installation in dB(A)	Remarks
							In dB(A)									
			5 mtrs				10 mtrs				15 mtrs					
			North	South	East	West	North	South	East	West	North	South	East	West		
1	CODP	95	86	87	85	85	76	77	75	75					East – 60 West – 64 North – 62 South – 60	
2	FWDP	86	77	78	77	78										
3	Drenching pump	94	85	86	85	85	75	75	-	76						
4	Emulsion Treater	64	57	58	57	57										
5	Indirect Heater	62	58	57	58	58										
6	Chemical Dosing Pump	65	60	61	60	60										
7	Power house	93	84	83	83	84										
8	SCADA Room	57	55	55	57	57										
9	Water Pump House															

Sound Level Meter : Make - HTC

S/N - SL1350

Noise level measurement taken by : Jitu Mishra

Authorised Person
Mitra SK Pvt. Ltd.

Approved by
Mr. Uttam Prodhon
Suptdg Research Scientist
Oil India Ltd, Duliajan

Authorised Person
Oil India Ltd.

NOISE LEVEL MEASUREMENT REPORT

LOCATION : OCS Dorian

(Production Installation – OCS/EPS/QPS)

Date : 02.12.2025

Time : 02.00PM

Sl. No.	Noise Level Measurement at		Measurement in dB(A)	Threshold limit value for Noise as per OISD-166		Recommendation
1	Control Room / Operator Room	Door Open	51	Duration per day(hours)	Sound Level (dBA)	
		Door Closed	49			
2	Middle of Group Area		64	8	90	
3	At the Entrance		56	6	92	
4	Security Hut		56	4	95	
5	Meter Shed		63	3	97	
6	Tank Area		61	2	100	
7	Air Compressor			1 - ½	102	
				1	105	
				½	110	
				¼ or less	115	

Sl. No.	Noise Level Measurement at	Noise level at source in dB(A)	At a distance from the shed								In dB(A)				Near boundary of the installation in dB(A)	Remarks
			5 mtrs				10 mtrs				15 mtrs					
			North	South	East	West	North	South	East	West	North	South	East	West		
1	CODP	93	84	85	85	86	75	76	75	75					East – 63 West – 57 North – 59 South – 60	
2	FWDP	86	78	77	78	78										
3	Drenching pump	94	86	87	86	87	75	77	76	77						
4	Emulsion Treater	74	63	62	62	62										
5	Indirect Heater	72	61	62	63	61										
6	Chemical Dosing Pump	67	60	61	60	61										
7	Power house	83	80	81	81	80	70	71	72	71						
8	SCADA Room															
9	Water Pump House															

Sound Level Meter : Make - H TC

S/N - SL1350

Noise level measurement taken by : Situ Mohan

Authorised Person
Mitra SK Pvt.Ltd.

Approved by
Mr. Uttam Prodhon
Suptdg Research Scientist
Oil India Ltd, Duliajan

Authorised Person
Oil India Ltd.



ऑयल इंडिया
OIL INDIA

HSE Department

Oil India Limited

Duliajan, Dibrugarh, 786602, Assam

Phone : 0374-2800542

Email: safety@oilindia.in

संदर्भ सं./Ref. No:HSE/E/43C-1/1481(A)

दिनांक/Date:29.11.2025

From	:	Executive Director (HSE & ESG)
To	:	Deputy Director General of Forests (Central), Sub Office, Guwahati (under Regional Office, Shillong), 4th Floor, Housefed Building, Rukminigaon, Guwahati-781022. (Email : iro.guwahati-mefcc@gov.in , iro.moefcc.ghy@gmail.com)
Subject	:	Submission of Half-yearly (April 2025 to September 2025) compliance reports of the conditions stipulated in the Environment Clearance (EC) granted to Oil India Limited.

Sir,

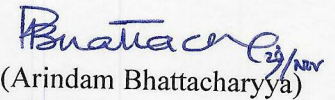
Reference to above subject, please find enclosed herewith the Half-yearly (**April 2025 to September 2025**) compliance reports of the conditions stipulated in the Environment Clearance (EC) granted to Oil India Limited. List of the EC are tabulated below:

S.No	EC Identification No/File No.	Name of the EC proposal
1.	J-11011/463/2008-I A II(I) DATED 16.01.2012	Baghjan - STF crude Oil Pipeline & Gas Transmission pipeline from Baghjan to CGGS & OTP near W/50.
2.	J-11011/413/2008-I A II(I) DATED 24.01.2011	Augmentation capacity of Intermediate Tank Farm (ITF) at Tengakhat
3.	J-11011/413/2008-I A II(I) DATED 24.01.2011	Hapjan Savitri Crude Oil Pipeline in Tengakhat Nahakatiya -Jorajan area.

This is for your kind information please.

Thanking you.

Yours faithfully,
For Oil India Limited


(Arindam Bhattacharyya)

Executive Director (HSE & ESG)

Nodal Officer (EC, FC, NBWL)

For Resident Chief Executive

Executive Director (HSE & ESG)

नोडल अधिकारी (ईसी/एफसी/एनबीएल)

Nodal Officer (EC/FC/NBWL)

ऑयल इंडिया लिमिटेड
Oil India Limited

Encl: As above

Copy:

1. Director, Monitoring Cell, MoEF, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi-110003.
2. Zonal Office, Central Pollution Control Board, "TUM-SIR", Lower Motinagar, Near Fire Brigade Headquarter, Shillong-793014.
3. Chairman, Assam Pollution Control Board, Bamunimaidan, Guwahati-781021, Assam.



HSE Department
Oil India Limited
Duliajan, Dibrugarh, 786602, Assam
Phone : 0374-2800542
Email: safety@oilindia.in

संदर्भ सं./Ref. No.: HSE/E/21(B)/928

दिनांक/Date: 01.09.2025

From	:	ED (HSE & ESG)
To	:	The Member Secretary, Pollution Control Board, Assam, Bamunimaidam, Guwahati- 781021.
Subject	:	Submission of Environmental Statement (Form-V) under Environment (Protection) Rules, 1986.

Sir,

With reference to the above subject, we are submitting herewith the Environmental Statement (Form-V) for the financial year ending on 31st March 2025 pertaining to the operations of Oil India Limited in the districts of Dibrugarh, Tinsukia, Sivsagar and Charaideo in Assam.

Thanking you.

Yours faithfully,
For **Oil India Limited**


01/09/2025
(R.K. Singh)

**ED (HSE & ESG)-Officiating
Nodal Officer (EC, FC, NBWL)
For Resident Chief Executive**

Encl: As above.

- Copy:**
1. Regional Executive Engineer,
Pollution Control Board Assam,
Back Side of ASTC Bus Station,
Chowkidinghee, Dibrugarh,
PIN: 786001.
 2. Executive Engineer,
Regional Laboratory cum Office,
Pollution Control Board Assam,
Melachakar, Sivsagar,
PIN: 785640.
 3. Executive Engineer,
Regional Office,
Pollution Control Board Assam,
Rangagora Rd, Borguri, Tinsukia,
PIN: 786126

FORM – V
(See Rule 14)
ENVIRONMENTAL STATEMENT FOR THE FINANCIAL YEAR ENDING THE 31st
MARCH, 2025

PART – A

(i) **Name and address of the owner/occupier of the industry operation or process.**

OIL INDIA LIMITED
P.O. DULIAJAN
DIST. DIBRUGARH
ASSAM -786602.

Note: Environmental Statement (Form – V) is pertaining to the operations of Oil India Limited in the districts of Dibrugarh, Tinsukia, Sivasagar and Charaideo in Assam.

(ii) **Industry category:** Red - Oil and gas extraction (on-shore extraction through drilling wells)

(iii) **Production capacity – Units**

OIL's production target is fixed as per the Memorandum of Understanding (MoU) with Ministry of Petroleum and Natural Gas, Govt. of India, which varies from year to year.

Production details during F.Y. 2024-25:

- **Crude Oil:** 3.380 MMT.
- **Natural Gas:** 2935.529832 MMSCM
- **LPG:** 30,525 MT.

(iv) **Year of establishment:**

OIL INDIA LTD. was formed in 1961 as a joint venture with M/S. Burma Oil Company, UK and on 14th Oct. 1981, OIL became a fully owned Govt. of India Enterprise.

(v) **Date of last Environmental Statement submitted:** 24.09.2024.

PART – B
WATER AND RAW MATERIAL CONSUMPTION

(I) Water consumption m³/d:

S.No	Purpose	Water Consumption (m ³ / day)
1.	Process & Cooling	14469.04
2.	Domestic	15956.16
TOTAL		30425.20

Name of Products	Process water consumption per unit of product output	
	During F.Y. 2023-24	During F.Y. 2024-25
(1)	(2)	(3)
Hydrocarbon (Crude Oil, Natural Gas, LPG)	0.96 m ³ /MT (Approx.)	0.94 m ³ /MT (Approx.)

(II) Raw material consumption

*Name of raw materials	Name of products	Consumption of raw material per unit	
		During F.Y. 2023-24	During F.Y. 2024-25
No raw materials are used as Oil India Limited is engaged in Exploratory and Development drilling activities & production of Crude Oil and Natural Gas. However, chemicals such as Bentonite are used for preparation of Water based drilling mud.			

PART – C

POLLUTION DISCHARGED TO ENVIRONMENT/UNIT OF OUTPUT

(Parameter as specified in the consent issued)

Pollutants	Quantity of Pollutants Discharged (mass/day)	Concentrations of pollutants in discharges (mass/volume)	Percentage of variation from prescribed standards with reasons
(a) Water	NIL. There is no discharge of pollutants from drilling locations and Production Installations. Wastewater generated from drilling locations is treated in Effluent Treatment Plant (ETP) and reused	- Quality of ETP treated water from the drilling locations is analyzed frequently. (Test report is enclosed as Annexure – I). - Quality of Formation	No variation is observed. All parameters of treated effluent and Formation water are within the permissible limits.

	back in the drilling operation. The formation water generated after separation from crude oil and treatment is pumped back to the underground formation (depth greater than 1600 m) through formation water disposal wells.	water is analyzed frequently (Test report enclosed as Annexure- II)	
(b) Air	No major air pollutants are emitted from Oil & Gas exploratory and development drilling and production activities except Stack Gas emissions at drilling locations and Production Installations & Flaring at Oil Collecting Stations.	Stack Gas and Ambient Air Quality (AAQ) monitoring is carried out frequently at drilling locations and Production Installations (Test reports enclosed as Annexure- III)	No variation is observed. All parameters of Stack Gas emissions and Ambient Air are within the permissible limits.

PART – D

HAZARDOUS WASTES

(As specified under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016)

Hazardous Wastes	Category of Hazardous Waste as per Schedule - I of HW Rules, 2016	Total Quantity generated	
		During F.Y. 2023-24	During F.Y. 2024-25
a) From process	S.No. 2.2 Sludge containing Oil	3541.99 MT	3849.99MT
	S.No. 5.1 Used or Spent Oil	55 KL	50 KL
	S.No. 33.1 Empty barrels/containers/liners contaminated with hazardous chemicals/wastes	11150 Nos.	13000 Nos.

	S.No. 33.2 Contaminated cotton rags or other cleaning materials	5.58 MT	9.40 MT
b) From pollution control facilities	S.No. 33.5 Chemical sludge from waste water treatment	98.44 KL	197.46 KL

PART – E
SOLID WASTES

Solid Wastes	Total Quantity	
	During F.Y. 2023-24	During F.Y. 2024-25
(a) From process Drill Cuttings	15,200 m ³ (Approx.)	13200 m ³ (Approx.)
(b) From pollution control facilities	NIL	
(c) (1) Quantity recycled or re-utilized within the unit. (2) Sold (3) Disposed	N/A N/A N/A	

PART – F

PLEASE SPECIFY THE CHARACTERIZATION (IN TERMS OF COMPOSITION AND QUANTUM) OF HAZARDOUS AS WELL AS SOLID WASTES AND INDICATE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTES.

(I) Hazardous Wastes:

Name of the Hazardous Waste	Quantity generated during F.Y. 2024-25	Disposal Practices
a) Sludge containing Oil	3849.99MT	Sent to Sludge Processing Plant for oil recovery followed by Bioremediation

b) Used or Spent Oil	50 KL	Stored in barrels under covered shed and sold to authorized recyclers through auction
c) Empty barrels/containers/liners contaminated with hazardous chemicals/wastes	13000 Nos.	Sold to authorized recyclers through auction
d) Contaminated cotton rags or other cleaning materials	9.40 MT	Bioremediation
e) Chemical sludge from waste water treatment	197.46 KL	Disposed in HDPE lined pits

(I) Solid Wastes:

Name of the Solid Waste	Quantity generated during F.Y. 2024-25	Disposal Practices
a) Drill Cuttings	13,200 m ³ (Approx.)	Disposed in HDPE lined pits

PART – G

IMPACT OF THE POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES AND ON THE COST OF PRODUCTION

- Acoustic enclosures have been provided around all gensets to reduce noise levels.
- Recovery of drilling mud from drill cuttings by using a combination of Vertical Cutting Dryer (VCD) and a high-performance centrifuge.
- Wastewater generated from drilling locations is collected in HDPE lined pits, treated in Effluent Treatment Plant (ETP) with Reverse Osmosis unit and the treated effluent is reused back in the drilling operation.
- Formation water generated from Production Installations is treated in Effluent Treatment Plant (ETP) before disposal in the abandoned/ water disposal wells.
- Processing of oily sludge for recovery of Crude oil and further treatment of sludge through Bioremediation.
- Construction of central concrete pit for disposal of waste mud.
- Treatment of Biomedical waste through incinerator.

PART – H

ADDITIONAL MEASURES / INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION, ABATEMENT OF POLLUTION, PREVENTION OF POLLUTION

- Municipal Solid waste treatment plant has been setup for treatment of municipal and solid waste generated at Duliajan Township.
- RCC concrete pit has been constructed for the environmental sound disposal of leftover drilling fluid.
- MoU signed with the Digboi Forest Division, Assam, to carry out afforestation on 100 hectares of degraded forestland.
- Memorandum of Understanding (MoU) in progress with upcoming TSDF facility by Mumbai waste management limited for disposal of hazardous waste generated by our installations and drilling sites.

PART – I

ANY OTHER PARTICULARS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT.

- Zero Routine Flare: Construction of pipelines and installation of Booster compressors led to 59% reduction in flare compared to previous year.
- Replacement of conventional energy intensive equipment (LED lights, BLDC fans etc.) with energy efficient equipment.
- Dynamic Gas Blending (DGB) retrofit kits have been installed on drilling rig engines, enabling them to operate on 100% diesel or a diesel- natural gas mix with up to 70% natural gas substitution. This system reduces environment impact by using flared gas as fuel, effectively substituting diesel and promoting cleaner energy use.
