	<h2>HEAVY HEATING OIL</h2>	valid issue: 24. 04. 2023 – version 12(1)
	<p>SAFETY DATA SHEET pursuant to (EC) Directive No. 1907/2006 (REACH) as amended and Commission Regulation (EU) No 2020/878</p>	revision: 28.04.2022 - issue 12 substitutes: 01.02.2018 - issue 11 original issue: 10.12.1999

SECTION 1. SUBSTANCE/MIXTURE AND COMPANY/PLANT IDENTIFICATION

1.1. Product identifier

- Trading name: Residual Oil Highsulphur, Slurry oil,
- Chemical name: Heating oil residual; Heavy heating oil
- Other names: TOT-R2 M / V; TOT-R3 M / V; TOT-Z M / V; Mazut, Long residue, Heavy heating oilR2, Heavy heating oil R3, Heavy heating oil1 Z (low-sulfurous; highsulfurous)
- REACH registration number: 01-2119474894-22-0086
- Index number: 649-024-00-9
- CAS number: 68476-33-5
- ES number: 270-675-6
- UFI code: not relevant

1.2. Designated use of the substance or mixture and its unrecommended uses

1.2.1. Designated use

Intermediate product for the production of chemicals, industrial fuel.

1.2.2. Unrecommended uses

No unrecommended uses were specified during the registration process; at the same time, the product must not be used in any other way than specified in Point 1.2.1 or Subsection 7.3.

1.3. Detailed information about the safety data sheet supplier

1.3.1. Business name and identification number

ORLEN Unipetrol RPA s.r.o., Záluží 1, 436 70 Litvínov, Czech Republic

Business Identification Number: 275 97 075

☎: 420 476 161 111

fax: 420 476 619 553

unipetrolrpa@orlenunipetrol.cz

www.orlenunipetrolrpa.cz

1.3.2. Business location

Litvínov Refinery

Záluží 1

436 01 Litvínov

tel.: +420 476 163 567

fax: +420 476 165 086

Kralupy Refinery

O. Wichterleho 809

278 01 Kralupy n/Vlt.

+420 315 718 500

+420 315 718 640


1.3.3. Email address of the technically competent persons who is responsible for the safety data sheet:

reach.unirpa@orlenunipetrol.cz

1.4. Emergency phone number

- CONTROLroom of ORLEN Unipetrol RPA s.r.o. ☎:+420 476 163 111 (NON STOP)
- Toxicological information center (TIS) ☎:+420 224 919 293 (NON STOP)
Na bojišti 1, 120 00 Prague 2, Czech Republic ☎:+420 224 915 402 (NON STOP)
e-mail: tis@vfn.cz
- Transportation information and accident system (TRINS) ☎:+420 476 163 111 (NON STOP)

Note: Emergency phone numbers for the EU countries are included in section 16

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SECTION 2. HAZARD IDENTIFICATION


2.1. Substance or mixture classification

The product is classified as hazardous pursuant to Directive (EC) No. 1272/2008 CLP:

PHYSICAL AND CHEMICAL CHARACTERISTICS	NO
ACUTE TOXICITY (INHALATION), CATEGORY 4; H332	Acute Tox. 4, H332
TOXIC FOR REPRODUCTION, CATEGORY 2; H361	Repr. 2, H361
CARCINOGENICITY, CATEGORY 1B; H350	Carc. 1B, H 350
TOXICITY FOR SPECIFIC TARGET ORGANS, CATEGORY 2; H373	STOT Rep. Exp. 2, H373
HAZARDOUS FOR WATER ENVIRONMENTS WITH LONG LASTING EFFECTS, CATEGORY 1; H410	Aquatic Chronic 1, H410
HAZARDOUS FOR WATER ENVIRONMENTS, CATEGORY 1; H400	Aquatic Chronic 1, H400

Notice: The full text of the H-statements marked with a code is given in Section 2.2.

2.2. Marking elements

<i>product identifiers</i>		HEAVY HEATING OIL RESIDUAL HEATING OIL; HEAVY HEATING OIL index number: 649-024-00-9
<i>warning hazard symbol</i>		
<i>signal word</i>		HAZARD
<i>H-sentences (standard hazard sentences)</i>	H332 H350 H361 H373 H410 H400	Harmful if inhaled. May cause cancer Suspected of damaging fertility or the unborn child May cause damage to organs through prolonged or repeated exposure Very toxic to aquatic life with long lasting effects. Very toxic to aquatic life.
<i>P-instructions (safe handling instructions)</i>	P201 P260 P273 P281 P308+P313 P501	Obtain special instructions before use. Do not breathe dust/fume/gas/mist/vapours/spray. Avoid release to the environment. Use personal protective equipment as required. IF exposed or concerned: Get medical advice/attention. Dispose of contents/container in compliance with the valid legislature
<i>additional information</i>		Only for professional users
ORLEN Unipetrol RPA s.r.o. Záluží 1, 436 70 Litvínov, Czech Republic ☎: +420 476 161 111, +420 476 163 111		

2.3. Other hazards

Information if a given substance or mixture complies with the criteria set for PBT or vPvB substances is included in subsection 12.5.

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Heavy heating oil is a complex mixture of hydrocarbons of a crude oil origin. Its boiling point is usually over 350 °C. The product can burn if heated above its ignition point. Its vapors are heavier than the air. That is why they accumulate and spread by the ground. Inhalation of high-concentration vapors can irritate airways and cause headaches, dizziness and sleepiness. Repeated exposure of skin can cause its dryness and cracking, thus encouraging dermal diseases. When you come in contact with the hot (heated) product, you may get burned. Heating oil vapors form an explosive mixture with the air.

Sulfan (hydrogen sulfide / H₂S) can accumulate in the space above the liquid in the product storage containers and can reach potentially dangerous concentrations.

The substance is not included in the Candidate List according to Article 59 (1) of the REACH Regulation due to endocrine disrupting properties.

The meaning of abbreviations used in this section is given in Section 16.

SECTION 3. COMPOSITION / INFORMATION ABOUT INDIVIDUAL COMPONENTS**3.1. Substances**

substance name:	HEAVY HEATING OIL
index number (index):	649-024-00-9
CAS number:	68476-33-5
ES number:	270-675-6

NOTE: The substance does not contain nanomaterials.

3.2. Mixtures

Not applicable, the product is a substance.

SECTION 4. FIRST AID INSTRUCTIONS**4.1. First aid description****4.1.1. General instructions**

When administering first aid, observe your own safety.

Call for the ambulance (☎155 Czech Republic, ☎120 EU) and observe the provided instructions until its arrival. Secure vitally important functions of the victim. If the victim is not breathing normally even when you tilt his/her head back, conduct resuscitation by pressing his/her chest approximately 5 cm deep with a frequency of 100-120 pushes per minute. If you are trained in rescue breathing, execute 2 inhalations after every 30 pushes of the chest. Do not interrupt the heart massage until the ambulance personnel arrives.

Do not give anything to consume to people who are unconscious or who are experiencing cramps. Put them in the recovery position.

4.1.2. Upon inhalation

Transport the victim to fresh air, do not let him/her become cold and seek medical assistance.

4.1.3. Upon contact with skin

Remove the contaminated clothes and footwear. Thoroughly wash the affected spots with water (ideally lukewarm) and soap. Should the irritation symptoms persist, seek professional medical assistance.

Do not remove the product upon being burned. Cover the affected location with a sterile gauze (or clean fabric) and immediately seek professional medical assistance.

4.1.4. If the product hits eyes


Immediately start rinsing your eyes with lids wide open with flowing lukewarm water. Do so for at least 15 minutes. Should the victim wear contact lenses, remove them prior to rinsing. Seek medical assistance.

4.1.5. Upon ingestion

NEVER INDUCE VOMITING! If the victim is vomiting on his/her own, hold his/her head below his/her hips, thus preventing inhalation of the vomit. Seek medical assistance as fast as possible.

4.2. The most important acute and delayed symptoms and effects

Depending on the exposure dose, the substance can cause headache, nausea, dizziness, breathing difficulties or

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even breathing stoppages, cramps and unconsciousness. Ingestion can cause vomiting and, as a result of that, the vomit can get into lungs (aspiration) and pulmonary edema can occur (chemical pneumonia), which can result in death. Direct contact with eyes or skin can cause their temporary irritation. Longer exposures of skin to the substance can degrease it.

4.3. Instructions related to immediate medical assistance and special treatment

Should the product hit eyes or enter airways, medical assistance has to be sought immediately.

SECTION 5. FIRE EXTINGUISHING MEASURES

5.1. Fire extinguishers

Suitable fire extinguishers: heavy foam, water spray or water mist.

Unsuitable fire extinguishers: direct water stream.

Extinguishing small fires: powder or foam fire extinguishers, dry sand or fire extinguishing foam.

5.2. Special hazards related to the given substance or mixture

Vapors are heavier than the air and they thus accumulate and spread by the ground. If they leak, they can backfire and subsequently explode and/or cause fire even relatively far from the given leak source. This risk is particularly present below the terrain level and in enclosed areas. Their burning can create toxic and irritating smokes that contain carbon monoxide and unburned carbohydrates.

5.3. Instructions for fire fighters

Limit penetration of the fire extinguishing liquid polluted with the given substance to the sewerage system, surface and underground water and soil to a minimum.

Cool the tanks containing the product with water spray because they can explode due to heat.

Do not use foam and water simultaneously since water decomposes the foam.

Protection equipment for the fire fighters: fully protective clothing and insulation breathing apparatus.

SECTION 6. ACCIDENTAL LEAK MEASURES

6.1. People protection measures, protective equipment and emergency procedures

Seal the accident location and prevent access to the endangered area. Stay on the windward side. Leaks of this product can cause fires. That is why you need to remove all possible ignition sources. Do not smoke and do not handle open flame. If possible, ensure adequate ventilation of the enclosed areas. Prevent contact with the substance and its vapors. When rectifying the given extraordinary event/accident consequences, use all the recommended personal protection equipment (see Subsection 8.2). Evacuate all people from the endangered area in the case of larger accidents. If initiated, the substance vapors below the terrain level and in enclosed areas (including the sewerage system space) can explode.


6.2. Measures for the protection of the environment

Eliminate any further leaks of the substance and fence off the location. Prevent the substances from leaking into the sewerage system and surface and underground water by covering the sewerage system inlets. Prevent the substance from leaking to soil.

6.3. Methods and material for leak limitation and for cleaning

Leaks of this product can cause fire. That is why you should use lights and electric devices that are of a non-explosive design and non-sparking tools. The leaked product should be collected into a suitable, inflammable porous/absorbent material (such as sand, soil, bergmeal, vermiculite) and removed for liquidation in closed containers. Destroy the product in compliance with the valid legal regulations related to waste (see Section 13).

When the product leaks into water in a relatively high quantity, use catchment immersion walls and gather the product from the water surface using surface collectors (separators) or cover the leaked product using a sorbent and remove the saturated sorbent from the surface by racking or vacuuming. Consult experts prior to using dispersing agents.

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6.4. References to other sections

For recommended personal protection aids, see Subsection 8.2 (“Limiting exposure”).
 For recommended waste removal procedures, see Section 13 (“Removal instructions”).

SECTION 7. HANDLING AND STORAGE

7.1. Safe handling measures

Handle the substance as well as empty tanks (they can contain product residues) in well ventilated areas and comply with all fire protection measures (no smoking, not working with open flame, removing all possible ignition sources). Do not conduct activities, such as welding, cutting, grinding, etc., in the proximity of the (even empty) packages. Do not use compressed air for filling, emptying or other handling of the tanks. Eliminate static electricity discharges.

General hygienic measures: Observe the personal hygiene rules. Immediately take off polluted parts of your clothing. Observe the personal hygiene rules. Immediately take off polluted parts of your clothing. Do not smoke, drink or eat while working! Thoroughly wash your hands and uncovered parts of your body by water and soap and, if necessary, apply a suitable reparation cream after work and before eating. Do not bring polluted clothes, footwear and protection equipment to eating areas.

7.2. Safe storage conditions for substances and mixtures, including incompatible substances and mixtures

The warehouses have to comply with the given building fire safety requirements and the electric devices have to be in compliance with the valid regulations. Store them in cool, well ventilated areas with adequate exhaust systems outside of the reach of all heat and ignition sources. Storage packages have to be properly closed, marked and grounded. We recommend soft and stainless steel as a suitable package material. Do not store them nearby incompatible materials, such as oxidation agents (oxygen, air, etc.), or other flammable materials.

Hydrogen sulfide (H₂S) can accumulate in the space above the liquid in the product storage containers and can reach potentially dangerous concentrations. It is not recommended to heat the product over 90 °C because of the possibility of an increased creation of the hydrogen sulfide.

7.3. Specific final use

The substance is designated for specific use as fuel and as an intermediate product, to which the recommendations stated in the attached exposure scenarios (“Using heating oil as an industrial intermediate product” and “Using heating oil as an industrial fuel”) apply. The scenarios form a part of this appendix to the safety data sheet.

SECTION 8. LIMITING EXPOSURE / PERSONAL PROTECTION EQUIPMENT

8.1. Control parameters

8.1.1. Limit worksite exposure values

Government Directive No. 361/2007 Coll., which determines the occupational health protection conditions, as amended, specifies the following acceptable exposure limits (PEL) and the highest acceptable concentrations (NPK-P) of chemical substances in the air in the Czech Republic:

Name	CAS number	PEL [mg.m ⁻³]	NPK-P [mg.m ⁻³]	Note
Mineral oils (aerosol)	68476-33-5	5	10	

Note 1: The meaning of the PEL and NPK-P abbreviations can be found in Section 16.

Note 2: The limit exposure values for the worksites throughout the EU countries are stated in Section 16.


8.1.2. DNEL/DMEL values

DNEL values used for the evaluation:

DNEL (dermal exposure): 25.5 µg/kg/day

DNEL (exposure by inhalation): 51 µg/kg/day or 0.1785 mg/m³

Note: The meaning of the DNEL and DMEL abbreviations can be found in Section 16.

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8.1.3. PNEC values

PNEC (secondary exposure, oral): 20.3 mg/kg

Note: The meaning of the DNEL and DMEL abbreviations can be found in Section 16.

Deriving particular PNEC values based on experimental data acquired by testing the modified water fraction that contains dissolved/emulsified/suspended shares of the tested substance (WAF- “Water accommodated Fraction”) is not suitable for UVCB substances of a carbohydrate type. The product environmental risk characteristics were thus determined using the statistic carbon HC5 extrapolation block method utilizing the PETROTOX v.3.05 model.

8.1.4. Recommended procedure for monitoring concentrations at work environments

Recommended procedure for monitoring concentrations at work environments: gas chromatography (GC) with a flame ionization detector (FID) or mass spectrometric detector (MS) pursuant to technical standards ČSN EN 689 and ČSN EN 482.

8.2. Limiting exposure

8.2.1. Technical protection measures for limiting exposure of people and of the environment

Protection against undesirable exposure of people and of the environment has to be ensured by maintaining a strict control over the substance utilizing technical means and procedural and control technologies that reduce emissions and subsequent exposure with the objective to prevent release of the vapors into free space, penetration of the substance in water environments and soil and possible exposure of people. Areas where the substance is handled or stored have to be furnished with impermeable floors and catchment basins for accidental leaks of the substance. Overall and local ventilation and effective exhaust are a must.

8.2.2. Individual protective measures

Should there be a risk of an increased exposure while handling the product or should the exposure increase, for example, as a result of an accident or an extraordinary event, the employees have to have available personal protection equipment (PPE) for the protection of their airways, eyes, hands and skin, which correspond to the character of the conducted activities. They have to be also equipped with a suitable protection of their airways when the used technical means cannot guarantee compliance with the exposure limits specified for the given work environment or when the exposure of their airways could endanger their health. When using the protective equipment continuously while working, appropriate safety breaks have to be included, provided the character of the given PPE requires it. All PPE has to be continuously maintained in a usable condition. Should it become damaged or polluted, it has to be replaced immediately.

RECOMMENDED PERSONAL PROTECTION EQUIPMENT (PPE):

(particular types of the protective equipment have to be chosen based on the type of the conducted activity and based on the quantity and concentration of the given hazardous substance/mixture at the worksite)

- **airways protection:** protective mask that complies with EN 140 with a filter that is effective against the effects of organic vapors for areas with insufficient ventilation and/or local exhaust system; insulation breathing apparatus for rectifying the consequences of extraordinary events/accidents;
- **eyes / face protection:** protective goggles that comply with EN 166;
- **hands protection:** chemically resistant gloves tested pursuant to EN 374; the following are some of the suitable materials:

	<i>glove material</i>	<i>layer thickness</i>	<i>penetration time</i>
common work activities (staining possibility)	natural latex	1 mm	120 minutes
leak / accident repair	nitrile	0.4 mm	480 minutes

- **protection of other body parts:** antistatic and inflammable clothes, antistatic footwear;
- **heat hazard:** irrelevant when used as specified.
- **other measures:** we recommend to furnish the worksite with a safety shower and an eye rinsing mechanism.

8.2.3. Limiting the exposure of the environment


Prevent product leaks to the environment by employing all available means. See Section 6.2.

SECTION 9. PHYSICAL AND CHEMICAL CHARACTERISTICS

9.1. Information about the basic physical and chemical characteristics

The information has been adopted from the corresponding registration documentation, unless stated otherwise.

attribute	unit	value	source/method	note
state of matter		viscous liquid	CSR	at 20°C
colour		dark brown to black		
odour		characteristic		
melting point / freezing point	[°C]	<30	CSR	
initial boiling point / boiling point range	[°C]	160-750	CSR	influence of variable composition of UVCB
flammability		flammable liquid with a flash point above 60 ° C	CSR	
upper explosive limit	%	6,0	CSR	
lower explosive limit	%	1,0	CSR	
flash point	[°C]	64-310	CSR	
spontaneous ignition temperature	[°C]	220-550	CSR	
decomposition temperature		does not decompose at normal operating temperatures		CSR does not state
pH		not relevant (non-polar substances)		CSR does not state
viscosity kinematic	[mm ² .s ⁻¹]	≥ 3,0	CSR	at 100°C
solubility in water	[mg.l ⁻¹]	slight		CSR does not state
relative density	water=1	0,84-1,1	CSR	at 15°C
distributive coefficient: n-octanol/water	[log K _{oc}]	2,7 – <6,0	CSR	
vapour pressure	[Pa]	20-791	CSR	at 120°C
relative vapour density	air=1	>1	data not available	CSR does not state

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attribute	unit	value	source/method	note
particle characteristics		-		not applicable - it is a liquid

9.2. Other information

9.2.1. Information concerning physical hazard classes

Not available

9.2.2. Other safety characteristics

Not available.

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

The product is stable under normal conditions.

10.2. Chemical stability

The product is stable under normal conditions.

10.3. Possibility of hazardous chemical reactions

It can release carbon monoxide when burning in an environment with a lack of oxygen.

10.4. Conditions that have to be avoided

Concentrations within the explosion limits, presence of ignition sources, contact with open flame.

10.5. Incompatible materials

Oxidation agents.

10.6. Hazardous disintegration products

None under normal conditions; carbon monoxide and soot can be created when burning in an environment with a lack of oxygen.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information about toxicological effects

11.1.1. Toxicological effects of the substance/mixture

HAZARD CLASS	DATA FROM THE REGISTRATION DOCUMENTATION		EVALUATION
	DESCRIPTION	RESULT	
Acute toxicity	oral (OECD 401): inhalation (OECD 403): dermal (OECD 404):	LD ₅₀ > 5250 mg/kg LC ₅₀ > 4100 mg/m ³ LD ₅₀ > 2,000 mg/kg	it does not comply with the classification criteria
Causticity / irritant effect for skin	product tests and tests of the included components (OECD 404)	the product does not irritate skin	it does not comply with the classification criteria
Serious damage / eye irritation	product tests and tests of the included components (OECD 405)	the product does not irritate eyes	it does not comply with the classification criteria

HAZARD CLASS	DATA FROM THE REGISTRATION DOCUMENTATION		EVALUATION
	DESCRIPTION	RESULT	
Sensibility	product tests and tests of the included components (OECD 406)	the product and its components do not cause allergic reactions	it does not comply with the classification criteria
Mutagenicity in reproductive cells	OECD 476	positive test results in some cases	it complies with the classification criteria
Carcinogenicity	tests	recorded harmful effects	it complies with the classification criteria
Toxic for reproduction	1/ fertility: 2/ prenatal development toxicity:	1/ NOAEL=0.05mg/kg/day	the product that contains less than 3% of toluene does not comply with the classification criteria
STOT – one-time exposure	acute toxicity tests (oral, dermal, inhalation)	no toxic effects have been determined during the tests	it does not comply with the classification criteria
STOT – repeated exposure	1/ oral: 2/ inhalation:	The heavy heating oil components can cause system changes after repeated skin exposure	it complies with the classification criteria
Inhalation hazard		when the product is ingested or when it enters the airways while its kinematic viscosity is over 20.5 mm ² /s (40 °C), it does not damage lungs and does not cause death	it does not comply with the classification criteria

11.1.2. Information about probable exposure ways

The exposure can occur by inhalation, accidental ingestion or penetration of individual components through skin.

11.1.3. Symptoms and effects (acute, delayed and chronic after short-term as well as long-term exposure)


Depending on the exposure dose, the substance can cause headaches, sore throat, cough, breathing difficulties, chest pressure, disturbances of the central nervous system, nausea, sleepiness and dizziness. The related difficulties can be demonstrated by belly cramps, spontaneous vomiting or diarrhea. Direct contact with eyes or skin can cause temporary irritation manifested by reddening or swelling of the affected spot, or eye tearing, reddening and swelling. Longer exposures of skin to the substance can degrease it and cracks can appear. The substance can cause hereditary genetic changes and it can also cause or support the origin of cancer in humans. When handling the hot (heated) product, you can get burned, which is usually manifested by hurting and reddening of your skin or, in more serious cases, by blisters.

11.1.4. Interactive effects

No interactions occur if the product is used appropriately.

11.2. Information on other hazards

The Substance is not included in the Candidate List under Article 59 (1) of the REACH (due to endocrine disrupting properties or for any other reason).

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SECTION 12. ENVIRONMENTAL INFORMATION

12.1. Toxicity

Water environment	fish	LC ₅₀ (96 h, fish) = 79 mg/l	
	invertebrates	EL ₅₀ (48 h, invertebrates) = 0.22 mg/l	
	seaweed	EL ₅₀ (72 h, seaweed) = 0.32 mg/l	
Microbiological activity (waste water treatment plant)	activated sludge	LL ₅₀ > 1,000 mg/l	

Note: Significance of the LC₅₀, EL₅₀ and LL₅₀ abbreviations is included in Section 16.

12.2. Persistence and degradability

Not many particular data are available for assessing persistence and bioaccumulation of specific PAH photodegradation products. Nevertheless, the accompanying photo-modification, usually occurring due to oxygenation, should increase sensitivity to biotransformation in a similar way it has been observed after phase I metabolism by the above mentioned oxygenation. This minimizes the risk of persistence and bioaccumulation of these compounds.

Because of the complex composition of this substance, its potential biodegradability cannot be estimated using quantitative models of the relations between the structure and biodegradability.

12.3. Bioaccumulation potential

No other evaluation of carbohydrate metabolites is required for the purpose of the PBT evaluation and risk assessment.

12.4. Mobility in the soil

Log Koc values were calculated for individual product components. They range between 1.71 and 14.70.

12.5. PBT and vPvB assessment results

It is not suitable to compare this UVCB substance of a hydrocarbon type with the criteria pursuant to Appendix XIII to Directive (EC) No. 1907/2006 REACH, as a whole. That is why individual components were assessed with the conclusion that the product complies neither with the persistence, bioaccumulation and toxicity criteria, nor with the high persistence and high bioaccumulation criteria pursuant to Appendix XIII to Directive (EC) No. 1907/2006 REACH. That is the reason why the product is not identified as a PBT substance (P-persistent, B-bioaccumulative, T-toxic) or vPvB substance (vP-highly persistent, vB-highly bioaccumulative).

12.6. Endocrine disrupting properties

The Substance is not included in the Candidate List under Article 59 (1) of the REACH due to endocrine disrupting properties.

12.7. Other negative impacts

It creates a homogenous layer on water surface, which prevents oxygen access. Pursuant to Appendix 1 to Water Act No. 254/2001 Coll., the product is considered hazardous and harmful substance.

It does not contain ozone-harming substances pursuant to the Montreal Protocol and its Copenhagen Amendment.

SECTION 13. REMOVAL INSTRUCTIONS

13.1. Waste management methods

When product residues need to be removed (for example, unused or leaked product), the valid European Union legislature, national legislature and valid local regulations have to be observed. Hand the waste over for removal to an appropriately qualified person with the appropriate authorization.

Recommended waste classification pursuant to Regulation No. 93/2016 Coll. (Waste Catalogue)

13.1.1. Catalogue number

Catalogue number for the product that has become waste:

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- 13 07 01* Heating oil and motor diesel
07 01 04* Other organic solvents, washing liquids and mother lyes.
16 03 05* Organic waste containing dangerous substances

Catalogue number for the leaked product absorbed by an absorption agent (such as vapex):

15 02 02* Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances.

Catalogue number for soil polluted with the leaked product:

17 05 03* Soil and stones containing dangerous substances.

13.1.2. Recommended waste removal method

Hand the unused product residues over for removal to an appropriately qualified person with the appropriate authorization. Recommended removal method: Energy utilization (combustion).

13.1.3. Substance liquidation methods

Waste and unused residues are liquidated in compliance with the valid waste legislature, usually by incineration in incineration plants designed for this purpose. Disposal to dump sites is not suitable.

13.1.4. Contaminated packaging liquidation methods

Heating oil is usually supplied in railroad cars or road tankers. Decontamination and liquidation of such packaging material is governed by the ADR/RID regulations.

NOTE: the stated information applies to the delivered, still unused material. Should an already used material become waste, it is up to the waste originator to assign a code to it pursuant to the given field and usage process and to determine its liquidation method.

SECTION 14. TRANSPORT INFORMATION**14.1. UN number or ID-number**

3082

14.2. Official (UN) transport name

SUSTANCE THAT ENDANGERS THE ENVIRONMENT, LIQUID, J.N.

14.3. Transport hazard class/classes

9

14.4. Packaging group

III

14.5. Environmental hazardENDANGERING THE ENVIRONMENT
ENVIRONMENTALLY HAZARDOUS**14.6. Special safety measures for the users**

None.

14.7. Maritime bulk transport according to IMO instruments

Name and marking pursuant to ADN/IMDG:

SUSTANCE THAT ENDANGERS THE ENVIRONMENT, LIQUID, J.N

UN number: 3082

Packaging group: III

Class: 9

Marine pollutant: yes


14.8. Other information

Hazard number: 90

Classification code: M6

Safety symbol: 9



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SECTION 15. REGULATION INFORMATION

15.1. Regulations related to safety, health and the environment / specific legal regulations related to the given substance or mixture

15.1.1. European Union

EP and Council (EC) Directive No. 1907/2006 (REACH) as amended

REGISTRATION (HEAD II OF THE REACH DIRECTIVE):

the product has been fully registered as a substance

APPROVAL PROCESS (HEAD VII OF THE REACH DIRECTIVE)

the product is not listed on the list of substances included in Appendix XIV of Directive (EC) No. 1907/2006 REACH and the approval obligation thus does not apply to it

LIMITATIONS (HEAD VIII OF THE REACH DIRECTIVE):

the product must not be placed on the market for being sold to the public, with the exception of cosmetic products, medicines and fuels defined in more detail in record 28 of Appendix XVII of Directive (EC) No. 1907/2006 REACH

EP and Council (EC) Directive No. 1272/2008 (CLP), as amended

the product has been classified in compliance with the above stated directive; the obligations related to packaging and package marking of hazardous chemical substances apply to the product only if it is put on the market in packages that are subject to the marking obligation pursuant to Directive CLP

EP and Council (EC) Directive No. 649/2012 on exporting and importing hazardous chemical substances, as amended

the product is not subject to any special export or import limitations

15.1.2. Czech Republic

Act No. 350/2011 Coll. on chemical substances and chemical mixtures, as amended

the CHLAP system notification obligation does not apply to the product

Act No. 258/2000 Coll., on Protection of Public Health, as amended

the obligation to prepare corresponding Handling Rules applies to the product

Act No. 254/2001 Coll., on Waters, as amended

Act No. 201/2012 Coll., on Air Protection, as amended

Act No. 541/2020 Coll., on Waste, as amended

Regulation No. 93/2016 Coll., on the Waste Catalogue, as amended

Government Directive No. 361/2007 Coll., which determines occupational health protection conditions, as amended

Act No. 224/2015 Coll., on prevention of serious accidents caused by selected dangerous chemicals or chemical mixtures, as amended

15.2. Chemical safety assessment

The chemical safety assessment was conducted as a part of the substance registration process. The substance complies with the classification criteria for hazardous substances pursuant to Directive (EC) No. 1272/2008 CLP. Exposure assessment as well as the subsequent risk characterization step have been conducted.

SECTION 16. OTHER INFORMATION

Changes made during the revision

Changes in this version of the safety data sheet are indicated by a black and red vertical line to the left of the text. 24.4.2023 In section 9, the term “ignition point” was replaced by the term “flash point”.

Abbreviated words and abbreviations used in the text

ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road
CAS	Registration number assigned by the “Chemical Abstracts Service“ of the ”American Chemical Society“
CLP	Directive (EC) No. 1272/2008 on Classification, Labelling and Packaging of Chemical Substances and Mixtures, implemented into the European legislature by GHS (United Nations’ Globally Harmonized System)
CMR	Carcinogenic, mutagenic or toxic for reproduction

ČSN EN (ISO)	European standard incorporated into the system of the Czech technical standards
CSR	Chemical Safety Report
DMEL	Exposure level that corresponds to a low and possibly theoretical risk, which should be considered an acceptable risk (for threshold-less effects, i.e. no exposure level without an effect exists)
DNEL	Exposure level derived from toxicological data, during which no negative impacts on the health of people occur
DW	Data waiving
EC ₅₀	Effect concentration that results in immobilization of 50% of individuals
ErC ₅₀	Effect concentration that results in a 50% reduction of the seaweed growth speed
ECHA	European Chemicals Agency
EL ₅₀	Effective loading speed that is necessary for a 50% immobilization
ES	Official number of the chemical substance in the European Union: EINECS from the European Inventory of Existing Commercial Substances, or ELINCS from the European List of Notified Chemical Substances, or NLP from the “No Longer Polymer” list of substances
HSDB	Hazardous Substances Data Bank
IATA	International Air Transport Association
IBC	International regulation for the construction and equipment of boats that transport hazardous chemicals in bulk (“Intermediate Bulk Container”)
IC ₅₀	Inhibition concentration that results in inhibition of 50% of individuals
ICAO	International Civil Aviation Organization
ICE	“Intervention in Chemical Transport Emergencies” program
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organisation
ISO	International Organization for Standardization
LC ₅₀ /LD ₅₀	Lethal concentration/level that results in death of 50% of individuals
LL ₅₀	Introduction speed of the tested substance that results in a 50% mortality rate
LOEC/LOEL	Lowest Observed Effect Concentration/Level
log K _{oc}	Logarithm for the partition coefficient of carbon and water in soil
log K _{ow}	Logarithm for the n-octanol/water partition coefficient
MARPOL	International convention on preventing pollution from boats
nf	Not feasible
NOAEC/NOAEL	Highest “no observed adverse effect concentration/level”
NOEC/NOEL	Highest “no observed effect concentration/level”
NPK-P	Highest acceptable chemical substance concentration in the air (substance concentration that employees can be exposed for a maximum of 15 minutes; nevertheless, this concentration must never be exceeded)
OECD	Organization for Economic Co-operation and Development
PPA	Personal protective aids
UN	United Nations

(Q)SAR	Theoretical mathematic model, using of which can be used for determining the given substance characteristics based on the chemical substance structure and activity (“Quantitative Structure-Activity Relationship”)
PBT, vPvB	Persistent, bioaccumulative and toxic, highly persistent and highly bioaccumulative
PEL	Acceptable exposure limit of a given chemical substance in the air (exposure value that employees can be exposed to during the entire shift time (8 hours) even all their lives without endangering their health)
PNEC	Estimated concentration, during which hazardous effects in the given environmental component do not occur
REACH	Directive (EC) No. 1907/2006 on the Registration, Evaluation and Authorisation of Chemicals
RID	Regulation Concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
STOT	Specific Target Organ Toxicity
SU	Scientifically Unjustified
TRINS	Transportation information and accident system
UACRON	Chemical database (The University of Akron).
UN number	Four-digit substance or item identification number adopted from the UN ample regulations
UVCB	Substances of Unknown or Variable composition, Complex reaction products or Biological materials

Data sources used for preparing safety data sheets

Appendixes I, IV, VI and VII to Directive (EC) No. 1272/2008 CLP, as amended
 First aid principles upon exposure to chemical substances (doc. MUDr. Daniela Pelclová and col.)
 Registration documentation of the substances pursuant to Directive (EC) No. 1907/2006 REACH
 Decision of the European Agency for Chemical Substances ECHA No. SUB-C-2114383158-42-01/F on the registration pursuant to Directive (EC) No. 1907/2006 REACH
 Certificate No. 10-286-612/VUOS – Research Institute of Organic Syntheses

Training instructions

People who handle the product have to be acquainted with the related handling risks and with the requirements related to the protection of health and of the environment (see the corresponding stipulations of the Labor Code).

Access to information

Pursuant to Article 35 of Directive (EC) No. 1907/2006 REACH, all employers have to allow access to the information stated on the safety data sheets to all employees who use the given product or who are exposed to its effects while working, as well as to representatives of these employees.

Limit worksite exposure values for the EU countries (see Point 8.1.1)









heavy heating oil data (CAS number 68476-33-5)

Name	Country	8-hour limit [mg.m ⁻³]	short-term limit [mg.m ⁻³]
Heavy heating oil	European Union (Regulation 2000/39/ES)	no limit values for the given substances have been defined	
	Hungary		
	Germany		
	Poland		

8-hour limit: measured and calculated value in relation to an eight-hour reference period as a time-weighted average
 short-term limit: exposure limit value, which should not be exceeded and which corresponds to 15 minutes

Emergency phone numbers for the EU countries (see Section 1.4)

National centers (NON STOP)		TOXICOLOGY (first aid information)	ICE (SDS information)	
Belgium		+32/70245245	Belintra	+32/35699232
Bulgaria		+359/29154378		
Croatia		+385/12348342		
Czech Republic		+420/224-919293; 915402	TRINS	+420/47 6163111; 6163267
Denmark		+45/82121212	PIBF/RVK	+45/45906000
Estonia		+372/6269379		
Finland		+358/9471977		
France		+33/(0)140054848	Transaid	+33/298331010
Ireland		+353/18092566		
Italy		+39/063054343	SET	+39/0362512868
Cyprus		+357/1401		
Lithuania		+370/52362052		
Latvia		+371/67042473		
Luxembourg		+32/70245245 (see Belgium)		
Hungary		+36/80201199	VERIK	+36/23552205
Malta		+356/21450000		
Germany		+49/3019240	TUIS	+49/6216043333
Holland		+31/302748888	TRC	+31/102468642
Poland		+48/226196654	SPOT	+48/243657032
Portugal		+351/808250143		


National centers (NON STOP)		TOXICOLOGY (first aid information)	ICE (SDS information)	
Austria		+43/14064343	TUIS	+49/6216043333
Greece		+30/2107793777		
Romania		+40/212106282		
Slovakia		+421/254774166	DINS	+421/317754112; 2771
Slovenia		+386/41635500		
Spain		+34/915620420	CERET	+34 915373 248; 238
Sweden		+46/(0)104566700	KEMIAKUTEN	+46/8337043; 170970
Great Britain		8448920111	Chemsafe	+44/123 5836002; 5753363

Declaration: The safety data sheet has been prepared in compliance with Directive (EC) No. 1907/2006 REACH. It contains information that is necessary for ensuring occupational health and safety and protection of the environment. This information has been stated in good spirits, it corresponds to the current level of knowledge and experience and complies with our valid legal regulations. The stated information does not replace the corresponding qualitative specification and it cannot be considered a guarantee of suitability and usability of this product for a particular application. It is the responsibility of the product user to assess accuracy of the information for particular applications, during which the product characteristics can be influenced by various factors. The consumer is responsible for complying with the valid regional legal regulations.

APPENDIX TO THE SAFETY DATA SHEET

EXPOSURE SCENARIO PURSUANT TO ARTICLE 31 OF DIRECTIVE OF THE EUROPEAN PARLIAMENT AND COUNCIL (EC) NO. 1907/2006 (REACH)

The appendix includes exposure scenarios applied from Chapter 9 of the Chemical Safety Report submitted as a part of the heavy heating oil registration process, which have been prepared for heat oil production and the identified uses.

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9. EXPOSURE ASSESSMENT

The revision of the Exposure Assessments below originates from ECHA Final Decisions. The issues addressed in these Decisions are elaborated in the Appendix **Response to Final Decisions from ECHA to update the PNECs** attached in IUCLID Section 13.

Table 9.1. Identified Use Description and Exposure Scenario Number Key

IU	Category	Identified Use Name	Sector	ES Number	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Article Category (AC)	Environmental Release Category (ERC)	Specific Environmental Release Category (SpERC)
1	Heavy Fuel Oil Components	01 – Manufacture of Substance	Manufacture	ES 9.1.1	NA	NA	1, 2, 3, 8a, 8b, 15	NA	1	ESVOC SpERC 1.1.v1
2	Heavy Fuel Oil Components	01b – Use of Substance as Intermediate	Industrial	ES 9.2.1	8, 9	NA	1, 2, 3, 8a, 8b, 15	NA	6a	ESVOC SpERC 6.1a.v1
3	Heavy Fuel Oil Components	01a – Distribution of Substance	Industrial	ES 9.3.1	NA	NA	1, 2, 3, 8a, 8b, 15	NA	4, 5, 6a, 6b, 6c, 6d, 7	ESVOC SpERC 1.1b.v1
4	Heavy Fuel Oil Components	02 Formulation & (Re)packing of Substances and Mixtures	Formulation	ES 9.4.1	NA	NA	1, 2, 3, 8a, 8b, 15	NA	2	ESVOC SpERC 2.2.v1
7	Heavy Fuel Oil Components	12a – Use as a Fuel: Industrial	Industrial	ES 9.5.1	NA	NA	1, 2, 3, 8a, 8b, 16	NA	7	ESVOC SpERC 7.12a.v1
8	Heavy Fuel Oil Components	12b – Use as a Fuel: Professional	Professional	ES 9.6.1	NA	NA	1, 2, 3, 8a, 8b, 16	NA	9a, 9b	ESVOC SpERC 9.12b.v1



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9	Heavy Fuel Oil Components	15 Use in Road and Construction	Professional	ES 9.7.1	NA	NA	8a, 8b	NA	8d, 8f	ESVOC SpERC 8.15.v1
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IU	Category	Identified Use Name	Sector	ES Number	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Article Category (AC)	Environmental Release Category (ERC)	Specific Environmental Release Category (SpERC)
		Applications: Professional								

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The process of mapping uses and characterising risks has often identified a series of supporting measures that may further contribute to the management of exposure. The measures are identified in *blue* text in the Appendices contained in section 10. These measures are not contained within the Exposure Scenarios (ES) as they do not need to be implemented in order to achieve satisfactory exposure control. However, they are identified within the CSA in order that stakeholders are able to benefit from access to other exposure control information that has been obtained during the process of CSA/ES development.

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9.1. Manufacture of Substance

9.1.1. Exposure Scenario

Section 1 Exposure Scenario – Manufacture of Substance	
Title	
Manufacture of Substance	
Use Descriptor	
Sector(s) of Use	NA
Process Categories	1, 2, 3, 8a, 8b, 15
Environmental Release Categories	1
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
Processes, tasks, activities covered	
Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure <0.5 kPa at STP. OC3.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented G1.
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens) G18	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general / local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean / flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. G20
CS15 General exposures (closed systems).	Handle substance within a closed system E47. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS2 Process sampling. +OC9 Outdoor	Sample via a closed loop or other system to avoid exposure E8. Avoid carrying out activities involving exposure for more than 15 minutes OC26.



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	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS85 Bulk product storage.	Store substance within a closed system E84 . Avoid carrying out activities involving exposure for more than 4 hours OC28 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS36 Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure E12 . Wear suitable gloves tested to EN374 PPE15 .
CS510 Marine vessel/barge (un)loading	Avoid carrying out activities involving exposure for more than 4 hours OC28 . Transfer via enclosed lines E52 . Clear transfer lines prior to decoupling E39 . Retain drain downs in sealed storage pending disposal or for subsequent recycle ENV4 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS511 Road tanker/Railcar loading	Ensure material transfers are under containment or extract ventilation E66 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS39 Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance E55 . Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17 . Retain drain downs in sealed storage pending disposal or for subsequent recycle ENV4 .

Section 2.2 Control of environmental exposure

Product characteristics

Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.5E+7
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	6.0E+5
Maximum daily site tonnage (kg/day)	2.0E+6

Frequency and duration of use

Continuous release [FD2].	
Emission days (days/year)	300

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	1.0E-4
Release fraction to wastewater from process (initial release prior to RMM)	7.5E-7
Release fraction to soil from process (initial release prior to RMM)	0.0001

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites thus conservative process release estimates used [TCS1].

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by Freshwater Sediment [TCR1b]	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR10].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)	87.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0.0

Organisation measures to prevent/limit release from site

Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or

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reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	89.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	89.0
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	2.3E+6
Assumed domestic sewage treatment plant flow (m ³ /d)	10000
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated. [ETW4]	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated. [ERW2]	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.	
Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4]. Scaled assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file in IUCLID Section 13 – "Site-Specific Production" worksheet [DSU6]. For refinery sites where scaling revealed a condition of unsafe use (i.e., RCRs > 1), a site-specific chemical safety assessment was required [DSU8]. Consequently a Tier 2 assessment was performed in an attempt to refine conservative exposure assumptions and improve risk estimates. The Tier 2 analysis demonstrates that four refineries have RCRs > 1 (see PETRORISK file in IUCLID section 13 – "Site-Specific Product HFO T2" worksheet and the Appendix PETRORISK Higher Tier in IUCLID section 13). Effluent analysis has been performed for these four refineries taking into account the results of the 2013 Concawe Effluent Speciation Project and the site-specific volumes produced as reported in the Volume & Use Inventory that covers 2013 data. The results of the Tier 3 analyses are presented in the PETRORISK file in IUCLID section 13 – "Site-Specific Product HFO T3" worksheet and in the Appendix PETRORISK Higher Tier in IUCLID section 13. Applying these site-specific correction demonstrates that these refinery emissions do not lead to any exceedances of the RCR > 1 criterion.	

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9.1.2. Exposure Estimation

9.1.2.1. Human Health

See Appendix 2.a and 2.b.

9.1.2.2. Environment

See *PETRORISK* file in *IUCLID* Section 13 – "LocalCSR" worksheet

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9.2. Use of Substance as Intermediate

9.2.1. Exposure Scenario

Section 1 Exposure Scenario – Use of Substance as Intermediate	
Title	
Use as Substance as Intermediate	
Use Descriptor	
Sector(s) of Use	8, 9
Process Categories	1, 2, 3, 8a, 8b, 15
Environmental Release Categories	6a
Specific Environmental Release Category	ESVOC SpERC 6.1a.v1
Processes, tasks, activities covered	
Use of substance as an intermediate within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure <0.5 kPa at STP. OC3 .
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Amount used	Not applicable
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Human factors not influenced by risk management	Not applicable
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7 . Assumes a good basic standard of occupational hygiene is implemented G1 .
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens) G18	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general / local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean / flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. G20
CS15 General exposures (closed systems).	Handle substance within a closed system E47 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS15 General exposures (closed systems). + CS2 Process sampling. +OC9	Handle substance within a closed system E47 . Sample via a closed loop or other system to avoid exposure E8 . Avoid carrying out activities involving exposure for more than 15 minutes OC26 . Wear chemically

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Outdoor	resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS85 Bulk product storage.	Store substance within a closed system E84 . Avoid carrying out activities involving exposure for more than 4 hours OC28 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS36 Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure E12 . Wear suitable gloves tested to EN374 PPE15 .
CS510 Marine vessel/barge (un)loading	Avoid carrying out activities involving exposure for more than 4 hours OC28 . Transfer via enclosed lines E52 . Clear transfer lines prior to de-coupling E39 . Retain drain downs in sealed storage pending disposal or for subsequent recycle ENVT4 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS511 Road tanker/Railcar loading	Avoid carrying out activities involving exposure for more than 1 hour OC27 , or: G9 Ensure material transfers are under containment or extract ventilation E66 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS39 Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance E55 . Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17 . Retain drain downs in sealed storage pending disposal or for subsequent recycle ENVT4 .
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.1E+7
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	1.5E+4
Maximum daily site tonnage (kg/day)	5.0E+4
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0E-5
Release fraction to wastewater from process (initial release prior to RMM)	6.8E-6
Release fraction to soil from process (initial release prior to RMM)	0.001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by Freshwater Sediment [TCR1b] Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14]. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR10].	
Treat air emission to provide a typical removal efficiency of (%)	80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency ≥ (%)	88.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%)	0.0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or	

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reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	89.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	89.0
Maximum allowable site tonnage (M _{safe}) based on release following total wastewater treatment removal (kg/d)	5.3E+4
Assumed domestic sewage treatment plant flow (m ³ /d)	2000
Conditions and measures related to external treatment of waste for disposal	
This substance is consumed during use and no waste of the substance is generated. [ETW5]	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated. [ERW3]	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.	
Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html)	

9.2.2. Exposure Estimation

9.2.2.1. Human Health

See Appendix 2.a and 2.b.

9.2.2.2. Environment

See *PETRORISK* file in *IUCLID* Section 13 – "LocalCSR" worksheet

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9.3. Distribution of Substance

9.3.1. Exposure Scenario

Section 1 Exposure Scenario – Distribution of Substance	
Title	
Distribution of Substance	
Use Descriptor	
Sector(s) of Use	NA
Process Categories	1, 2, 3, 8a, 8b, 15
Environmental Release Categories	4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, tasks, activities covered	
Bulk loading (including marine vessel/barge, rail/road car and IBC loading) of substance within closed or contained systems, including incidental exposures during its sampling, storage, unloading, maintenance and associated laboratory activities.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP. OC3.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. G15. Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens) G18	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general / local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean / flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. G20
CS2 Process sampling. + OC9 Outdoor	Sample via a closed loop or other system to avoid exposure E8. Avoid carrying out activities involving exposure for more than 15 minutes OC26. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS15 General exposures (closed systems).	Handle substance within a closed system E47. Avoid carrying out activities involving exposure for more than 4 hours OC28. Sample via a closed loop or other system to avoid exposure E8. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.

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CS85 Bulk product storage.	Store substance within a closed system E84. Avoid carrying out activities involving exposure for more than 4 hours OC28. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS137 Product sampling	Sample via a closed loop or other system to avoid exposure E8. Avoid carrying out activities involving exposure for more than 15 minutes OC26. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS36 Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure E12. Wear suitable gloves tested to EN374 PPE15.
CS510 Marine vessel/barge (un)loading	Avoid carrying out activities involving exposure for more than 4 hours OC28. Transfer via enclosed lines E52. Clear transfer lines prior to de-coupling E39. Retain drain downs in sealed storage pending disposal or for subsequent recycle ENVT4. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS511 Road tanker/Railcar loading	Ensure material transfers are under containment or extract ventilation E66. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS39 Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance E55. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17. Retain drain downs in sealed storage pending disposal or for subsequent recycle ENVT4.
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.2E+7
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	4.5E+4
Maximum daily site tonnage (kg/day)	1.5E+5
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	2.0E-6
Release fraction to wastewater from process (initial release prior to RMM)	1.0E-7
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by Freshwater Sediment [TCR1b]	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR10].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)	61.2
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0.0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or	

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reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	89.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	89.0
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	5.3E+5
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.[ETW3]	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.	
Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

9.3.2. Exposure Estimation

9.3.2.1. Human Health

See Appendix 2.a and 2.b.

9.3.2.2. Environment

See *PETRORISK* file in *IUCLID* Section 13 – "LocalCSR" worksheet

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9.4. Formulation & (Re)packing of Substances and Mixtures

9.4.1. Exposure Scenario

Section 1 Exposure Scenario – Formulation & (Re)packing of Substances and Mixtures	
Title	
Formulation & (Re)packing of Substances and Mixtures	
Use Descriptor	
Sector(s) of Use	NA
Process Categories	1, 2, 3, 8a, 8b, 15
Environmental Release Categories	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP. OC3.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. G15. Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens) G18	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general / local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean / flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. G20
CS15 General exposures (closed systems). + CS2 Process sampling.	Handle substance within a closed system E47. Sample via a closed loop or other system to avoid exposure E8. Avoid carrying out activities involving exposure for more than 15 minutes OC26. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS15 General exposures (closed systems).	Handle substance within a closed system E47. Sample via a closed loop or other system to avoid exposure E8. Avoid carrying out activities involving exposure for more than 4 hours OC28. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee

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	training PPE16.
CS85 Bulk product storage.	Store substance within a closed system E84. Avoid carrying out activities involving exposure for more than 4 hours OC28. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS137 Product sampling	Sample via a closed loop or other system to avoid exposure E8. Avoid carrying out activities involving exposure for more than 15 minutes OC26. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS36 Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure E12. Wear suitable gloves tested to EN374 PPE15.
CS510 Marine vessel/barge (un)loading	Transfer via enclosed lines E52 Avoid carrying out activities involving exposure for more than 4 hours OC28. Clear transfer lines prior to de-coupling E39. Retain drain downs in sealed storage pending disposal or for subsequent recycle ENVT4. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS511 Road tanker/Railcar loading	Ensure material transfers are under containment or extract ventilation E66. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS8 Drum/batch transfers	Ensure material transfers are under containment or extract ventilation E66. Provide a general ventilation (not less than 3 to 5 air changes per hour) E11, or G9; Ensure operation is undertaken outdoors. E69. Avoid carrying out activities involving exposure for more than 1 hour OC27. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS39 Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance E55. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17. Retain drain downs in sealed storage pending disposal or for subsequent recycle ENVT4.
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	1.2E+7
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	3.0E+4
Maximum daily site tonnage (kg/day)	1.0E+5
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (after typical onsite RMMs, consistent with EU Solvent Emissions Directive requirements)	2.0E-7
Release fraction to wastewater from process (initial release prior to RMM)	3.4E-6
Release fraction to soil from process (initial release prior to RMM)	0.0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by Freshwater Sediment [TCR1b]	

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Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR10].	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)	88.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0.0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	89.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	89.0
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	1.1E+5
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations.[ETW3]	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.	
Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

9.4.2. Exposure Estimation

9.4.2.1. Human Health

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See Appendix 2.a and 2.b.

9.4.2.2. Environment

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9.5. Use as a Fuel: Industrial

9.5.1. Exposure Scenario

Section 1 Exposure Scenario – Use as a Fuel: Industrial	
Title	
Use as a Fuel: Industrial	
Use Descriptor	
Sector(s) of Use	NA
Process Categories	1, 2, 3, 8a, 8b, 16
Environmental Release Categories	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP. OC3.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. G15. Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens) G18	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general / local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean / flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. G20
CS15 General exposures (closed systems).	Handle substance within a closed system E47. Sample via a closed loop or other system to avoid exposure E8. Avoid carrying out activities involving exposure for more than 4 hours OC28. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS15 General exposures (closed systems). + CS137 Product sampling.	Handle substance within a closed system E47. Sample via a closed loop or other system to avoid exposure E8. Avoid carrying out activities involving exposure for more than 1 hour OC27. Provide a good standard of controlled ventilation (10 to 15 air changes per hour) E40. Wear

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	chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS502 Bulk closed unloading + OC9 Outdoor	Transfer via enclosed lines E52 . Avoid carrying out activities involving exposure for more than 4 hours OC28 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS8 Drum/batch transfers	Ensure material transfers are under containment or extract ventilation E66 , or (G9): Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11 . Avoid carrying out activities involving exposure for more than 1 hour OC27 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS 117 Operation of solids filtering equipment	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11 . Avoid carrying out activities involving exposure for more than 4 hours OC28 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS85 Bulk product storage.	Store substance within a closed system E84 . Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11 . Avoid carrying out activities involving exposure for more than 4 hours OC28 . Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
GEST 12I Use as a fuel. CS 107 (closed system)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16 .
CS39 Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance E55 . Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17 . Retain drain downs in sealed storage pending disposal or for subsequent recycle ENV4 .

Section 2.2 Control of environmental exposure

Product characteristics

Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	7.6E+6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	1.5E+6
Maximum daily site tonnage (kg/day)	5.0E+6

Frequency and duration of use

Continuous release [FD2].	
Emission days (days/year)	300

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM)	5.0E-4
Release fraction to wastewater from process (initial release prior to RMM)	0.00001
Release fraction to soil from process (initial release prior to RMM)	0

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites thus conservative process release estimates used [TCS1].

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by Freshwater Sediment [TCR1b]
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR10].

Treat air emission to provide a typical removal efficiency of (%)	95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)	88.6



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If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0.0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	89.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	89.0
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	5.2E+6
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2]. External treatment and disposal of waste should comply with applicable local and/or national regulations.[ETW3]	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated. [ERW3]	
Section 3 Exposure Estimation	
3.1. Health	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22 .	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23 .	
Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33 . Available hazard data do not support the need for a DNEL to be established for other health effects. G36 . Risk Management Measures are based on qualitative risk characterisation. G37 .	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

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9.5.2. Exposure Estimation

9.5.2.1. Human Health

See Appendix 2.a and 2.b.

9.5.2.2. Environment

See *PETRORISK* file in *IUGLID* Section 13 – "LocalCSR" worksheet

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9.6. Use as a Fuel: Professional

9.6.1. Exposure Scenario

Section 1 Exposure Scenario – Use as a Fuel: Professional	
Title	
Use as a Fuel: Professional	
Use Descriptor	
Sector(s) of Use	NA
Process Categories	1, 2, 3, 8a, 8b, 16
Environmental Release Categories	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP. OC3.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Assumes use at not more than 20°C above ambient temperatures, unless stated differently. G15. Assumes a good basic standard of occupational hygiene is implemented G1
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
General measures (carcinogens) G18	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general / local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean / flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. G20
CS15 General exposures (closed systems). + CS137 Product sampling.	Handle substance within a closed system E47. Sample via a closed loop or other system to avoid exposure E8. Avoid carrying out activities involving exposure for more than 1 hour OC27. Provide a good standard of controlled ventilation (10 to 15 air changes per hour) E40. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17.
CS15 General exposures (closed systems).	Handle substance within a closed system E47. Sample via a closed loop or other system to avoid exposure E8. Avoid carrying out activities involving exposure for more than 1 hour OC27. Provide a good standard

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	of controlled ventilation (10 to 15 air changes per hour) E40. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS502 Bulk closed unloading	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) E40. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16. Avoid carrying out activities involving exposure for more than 1 hour OC27. , or G9: Ensure material transfers are under containment or extract ventilation E66.
CS8 Drum/batch transfers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) E40. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16. Avoid carrying out activities involving exposure for more than 1 hour OC27. , or G9: Ensure material transfers are under containment or extract ventilation E66.
CS507 Refuelling	Ensure material transfers are under containment or extract ventilation E66. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16. Avoid carrying out activities involving exposure for more than 1 hour OC27.
GEST 12I Use as a fuel. CS 107 (closed system)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training PPE16.
CS39 Equipment cleaning and maintenance	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) E11. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training PPE17. Drain down system prior to equipment break-in or maintenance E65. Retain drain downs in sealed storage pending disposal or for subsequent recycle ENVT4. Clear spills immediately C&H13.

Section 2.2 Control of environmental exposure

Product characteristics

Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].

Amounts used

Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.6E+6
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	1.3E+3
Maximum daily site tonnage (kg/day)	3.5E+3

Frequency and duration of use

Continuous release [FD2].	
Emission days (days/year)	365

Environmental factors not influenced by risk management

Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure

Release fraction to air from wide dispersive use (regional use only) [OOC7]	1.0E-4
Release fraction to wastewater wide dispersive use [OOC8]	0.00001
Release fraction to soil from wide dispersive use (regional use only) [OOC9]	0.00001

Technical conditions and measures at process level (source) to prevent release

Common practices vary across sites thus conservative process release estimates used [TCS1].

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk from environmental exposure is driven by Freshwater Sediment [TCR1b]	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR10].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide	66.1

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the required removal efficiency \geq (%)	
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0.0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	89.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	89.0
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	1.1E+4
Assumed domestic sewage treatment plant flow (m ³ /d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1]. Combustion emissions considered in regional exposure assessment [ETW2]. External treatment and disposal of waste should comply with applicable local and/or national regulations.[ETW3]	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated. [ERW3]	
Section 3 Exposure Estimation	
3.1. Health	
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.	
Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].	

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9.6.2. Exposure Estimation

9.6.2.1. Human Health

See Appendix 2.a and 2.b.

9.6.2.2. Environment

See *PETRORISK* file in *IUCLID* Section 13 – "LocalCSR" worksheet

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9.7. Use in Road and Construction Applications: Professional

9.7.1. Exposure Scenario

Section 1 Exposure Scenario – Use in Road and Construction Applications: Professional	
Title	
Use in Road and Construction Applications: Professional	
Use Descriptor	
Sector(s) of Use	
Process Categories	8a, 8b
Environmental Release Categories	8d, 8f
Specific Environmental Release Category	ESVOC SpERC 8.15.v1
Processes, tasks, activities covered	
Covers the use of surface coatings and binders within closed or contained systems, including incidental exposures during material transfers and filling operations.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	Liquid, vapour pressure <0.5 kPa at STP. OC3.
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) G13
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented G1.
Contributing Scenarios	
Specific Risk Management Measures and Operating Conditions	
General measures (carcinogens) G18	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general / local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean / flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. G20
CS3 Material transfers	Ensure material transfers are under containment or extract ventilation E66 Avoid carrying out activities involving exposure for more than 15 minutes OC26. Limit the substance content in the product to 1 % OC16. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls PPE18.
CS39 Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance E55 Retain drain down in sealed storage pending disposal or for subsequent recycle ENVT4. Deal with spills immediately. C&H13. Avoid carrying out activities involving exposure for more than 15 minutes OC26. Limit the substance content in the product to 1 % OC16. Wear chemically

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	resistant gloves (tested to EN374) in combination with intensive management supervision controls PPE18. Retain drain downs in sealed storage pending disposal or for subsequent recycle ENVT4.
Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].	
Amounts used	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	2.4E+3
Fraction of Regional tonnage used locally	1
Annual site tonnage (tonnes/year)	1.2E+0
Maximum daily site tonnage (kg/day)	3.3E+0
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional use only) [OOC7]	0.95
Release fraction to wastewater wide dispersive use [OOC8]	0.01
Release fraction to soil from wide dispersive use (regional use only) [OOC9]	0.04
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by Freshwater Sediment [TCR1b] If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR10].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)	65.6
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0.0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2]. Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater [STP1].	
Estimated substance removal from wastewater via domestic sewage treatment (%)	89.0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	89.0
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	1.0E+1
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations. [ETW3]	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]	
Section 3 Exposure Estimation	
3.1. Health	

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The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. G21.
3.2. Environment
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].
Section 4 Guidance to check compliance with the Exposure Scenario
4.1. Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. G22.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.
Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. G33. Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Risk Management Measures are based on qualitative risk characterisation. G37.
4.2. Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1]. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2]. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination [DSU3]. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].


9.7.2. Exposure Estimation

9.7.2.1. Human Health

See Appendix 2.a and 2.b.

9.7.2.2. Environment

See *PETRORISK* file in *IUCLID* Section 13 – "LocalCSR" worksheet

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9.8. Regional Environment Exposure Estimation
See *PETRORISK* file in *IUCLID* Section 13 – "RegionalCSR" worksheet