FS Section	Content field	Explanation of content	CSR[1]	eSDS
1. Title	**1.1 Title of SPERC**	Use as a chemical intermediate	Y	Y
	1.2 SPERC code	ESVOC SPERC 6.1a.v3	Y	Y
2. Scope	**2.1 Substance/Product Domain**			
	Substance types / functions / properties included or excluded	Applicable to petroleum substances and petrochemicals.	Y	N
	Additional specification of product types covered:	Includes a variety of aliphatic and aromatic hydrocarbons, ketones, alcohols, acetates, glycols, glycol ethers, and glycol ether acetates.	Y	N
	Inclusion of sub-SPERCs	Yes	N	N
	2.2 Process domain			
	Description of activities/processes:	Use of the substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).	Y	Y
	2.3 List of applicable Use Descriptors			
	LCS	IS – Use at industrial sites	Y	Y
	SU	SU8 - Manufacture of fine chemicals	Y	Y
	PC	PC29 – Pharmaceuticals PC32 – Polymer preparations and compounds	Y	Y
3. Operational conditions	**3.1 Conditions of use**			
	Location of use	Indoor	Y	Y
	Water contact during use	Yes	Y	Y
	Connected to a standard municipal biological STP	Yes	Y	Y
	Rigorously contained system with minimisation of release to the environment	No	Y	N
	Further operational conditions impacting on releases to the environment	Volatile compounds subject to air emission controls. Wastewater emissions generated from equipment cleaning with water.	Y	Y
	3.2 Waste Handling and Disposal			
	Waste Handling and Disposal:	Residual raw materials and are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications (EU, 2016). Wastewater generated during cleaning and maintenance operations is directed to a waste water treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapours. All unrecovered waste is handled as an industrial waste that can be incinerated or in some cases re-distilled. EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain.	Y	N

[1] Explanations that are more detailed can be provided for the CSR..

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf		
4. Obligatory RMMs onsite	**RMM limiting release to air:**	No obligatory RMMs.	Y	Y
	RMM Efficiency (air):	Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor. See the background document for more information.	Y	Y
	Reference for RMM Efficiency (air):	EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf	Y	N
	RMM limiting release to water:	Oil-water separation (e.g. *via* oil water separators, oil skimmers, or dissolved air flotation) is required.	Y	Y
	RMM Efficiency (water):	The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance.	Y	Y
	Reference for RMM Efficiency (water):	EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf	Y	N
	RMM limiting release to soil:	The sludge generated from wastewater treatment is not applied to agricultural soil.	Y	Y
	RMM Efficiency (soil):	Not applicable	Y	Y
	Reference for RMM Efficiency (soil):	ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf	Y	N
5.3.4 Release Factor – waste	**5.1 Substance use rate**			
	Amount of substance use per day:	50,000 kg/day	Y	Y
	Fraction of EU tonnage used in region:	100%	Y	N
	Fraction of Regional tonnage used locally:	100%	Y	N
	Justification / information source:	ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf	Y	N
	5.2 Days emitting			
	Number of emission days per year:	300 (default value)	Y	Y
	Justification / information source:	ECHA, 2016. Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf	Y	N
	5.3 Release factors			
	sub-SPERC identifier:	ESVOC 6.1a.a.v3 VP >10000 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 6a		

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	2.5%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000001%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.b.v3 VP >10000 Pa; WS 0.001-0.01 mg/l	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	2.5%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe,	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 6.1a.c.v3 VP >10000 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	2.5%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 6.1a.d.v3 VP >10000 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	2.5%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 6.1a.e.v3 VP >10000 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	2.5%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.f.v3 VP >10000 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	2.5%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.03%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.g.v3 VP >10000 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	2.5%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.3%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.h.v3 VP >10000 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	2.5%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	1.0%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980).	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.i.v3 VP 1000-10000 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000001%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.j.v3 VP 1000-10000 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.k.v3 VP 1000-10000 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.I.v3 VP 1000-10000 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.m.v3 VP 1000-10000 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.n.v3 VP 1000-10000 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.03%	Y	Y

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.o.v3 VP 1000-10000 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.3%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.p.v3 VP 1000-10000 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM).	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)		
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	1.0%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.q.v3 VP 100-1000 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000001%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.r.v3 VP 100-1000 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 0.001-0.01 mg/l	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.s.v3 VP 100-1000 Pa; WS 0.01-0.1 mg/l	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe,	Y	N

FS Section	Content field	Explanation of content	CSR[i]	eSDS
		Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 6.1a.I.t3 VP 100-1000 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 6.1a.u.v3 VP 100-1000 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 6.1a.v.v3 VP 100-1000 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.03%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.w.v3 VP 100-1000 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.3%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.x.v3 VP 100-1000 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	1.0%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.y.v3 VP 10-100 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000001%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980).	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.z.v3 VP 10-100 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.aa.v3 VP 10-100 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y

FS Section	Content field	Explanation of content	CSR	eSDS
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.bb.v3 VP 10-100 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.cc.v3 VP 10-100 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.dd.v3 VP 10-100 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.03%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.ee.v3 VP 10-100 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.3%	Y	Y

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.ff.v3 VP 10-100 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	1.0%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.gg.v3 VP 1-10 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM).	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)		
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000001%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.hh.v3 VP 1-10 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.ii.v3 VP 1-10 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 0.01-0.1 mg/l	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.jj.t3 VP 1-10 Pa; WS 0.1-1.0 mg/l	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe,	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 6.1a.kk.v3 VP 1-10 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 6.1a.II.v3 VP 1-10 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.03%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 6.1a.mm.v3 VP 1-10 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.3%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.nn.v3 VP 1-10 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	1.0%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.oo.v3 VP <1 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000001%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC.	Y	N

FS Section	Content field	Explanation of content	CSR[i]	eSDS
		USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.pp.v3 VP <1 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980).	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.qq.v3 VP <1 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
		leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.rr.t3 VP <1 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.ss.v3 VP <1 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.tt.v3 VP <1 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.03%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m^3/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.uu.v3 VP <1 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.3%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 6.1a.vv.v3 VP <1 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 6a		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.2, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	1.0%	Y	Y

FS Section	Content field	Explanation of content	CSR[1]	eSDS
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation associated with the production of petrochemicals from different feedstocks. The volume of effluent wastewater generated at 11 different chemical production facilities was typically 10 m³/tonne or less (Trobisch, 1972). This value provided the basis for calculating a water release factor for each solubility category. Trobisch, K., 1972. Measures against water pollution in industries producing petrochemicals including polymers. Pure and Applied Chemistry 29, 57-66.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.02%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (USEPA, 1980). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. USEPA, 1980. Organic Chemical Manufacturing Volume 10: Selected Processes. EPA-450/3-80-028e U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, NC. https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9101OKIA.TXT.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
References to SPERC Background Document				
	Reference to Background Document	ESIG/ESVOC (2023). SpERC Background Document. Specific Environmental Release Categories (SpERCs) for the industrial manufacture, formulation, and intermediate use of petrochemicals and petrochemical-borne substances. European Solvents Industry Group. Brussels, Belgium.	Y	N