

Chapter BREF
 1 Integrated approach

Nr	Description	Compliance	Remarks
1	First of all, attention must be paid to the overall energy efficiency of the processes before measures are taken to optimize the cooling system	yes	Energy Efficiency Plan (EEP)
2	Overall energy efficiency: reduce amount of non-recoverable heat (reuse heat)	yes	Er is sprake van bestaande installaties, daarnaast loopt het EEP ter verbetering
3	Selection for cooling configuration, by balancing the cooling requirements, site limitations and environmental requirements. Relevant site conditions, local climate, availability of water for cooling and discharge, available space and sensitivity of area	yes	Binnen de beperkingen van de locatie is dit uitgevoerd (EEP)
4	Next step aims to meet the BAT requirements: emphasis is on the selection of adequate material and equipment	yes	EEP
5	Check Table 4.1: Examples of process requirements and BAT (page 122) and Table 4.2: Examples of site characteristics and BAT (page 123)	yes	EEP

2. Applied cooling systems

6	Check Table 1: technical and thermodynamic characteristics of different cooling systems (page IV)	yes	Er wordt NVKL onderhoud aan de installaties uitgevoerd. Naast reguliere koelingen zijn de in navolgende tabel genoemde natte koelinstallaties aanwezig. Voor het legionellabeheersplan worden alle gegevens van de installaties geïnventariseerd en vastgelegd.								
			<table><tr><th>Poederfabriek/ MilkPrism</th><th>Boterfabriek</th></tr><tr><td>Koeltoren indampers 5: - Opgesteld op het dak - Open koeltoren</td><td>Koeltoren 1 koude-installatie - Opgesteld op het dak - Gesloten koeltoren</td></tr><tr><td>Koeltoren indampers 6 - Opgesteld op het dak - Open koeltoren</td><td>Koeltoren 2 koude-installatie - Opgesteld op het dak - Gesloten koeltoren</td></tr><tr><td>Koeltoren MilkPrism - Opgesteld op het dak - Gesloten koeltoren</td><td>Koeltoren 3 koude-installatie - Opgesteld op het dak - Gesloten koeltoren</td></tr></table>	Poederfabriek/ MilkPrism	Boterfabriek	Koeltoren indampers 5: - Opgesteld op het dak - Open koeltoren	Koeltoren 1 koude-installatie - Opgesteld op het dak - Gesloten koeltoren	Koeltoren indampers 6 - Opgesteld op het dak - Open koeltoren	Koeltoren 2 koude-installatie - Opgesteld op het dak - Gesloten koeltoren	Koeltoren MilkPrism - Opgesteld op het dak - Gesloten koeltoren	Koeltoren 3 koude-installatie - Opgesteld op het dak - Gesloten koeltoren
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7	Check Table 2: capacity and thermodynamic characteristics of different cooling systems	yes	Er wordt NVKL onderhoud aan de installaties uitgevoerd								

3 Environmental aspects of applied cooling systems
 Energy consumption

Water

Emissions of heat into the surface water

Emissions of substances into surface water

Use of biocides

Emissions to air

Noise

Risk aspects

Residues from cooling systems operation

8	Reduce resistance to water and airflow	yes	Betreft bestaande installaties, beïnvloeding ontwerpfase niet van toepassing. EEP is van toepassing op wijzigingen, regulier NVKL onderhoud voor goede afstelling
9	Apply high efficiency/low energy equipment	yes	Betreft bestaande installaties, beïnvloeding ontwerpfase niet van toepassing. EEP is van toepassing op wijzigingen
10	Reduce the amount of energy demanding equipment	yes	Betreft bestaande installaties, beïnvloeding ontwerpfase niet van toepassing. EEP is van toepassing op wijzigingen
11	Apply optimised cooling water treatment in once-through systems and wet cooling towers to keep surfaces clean and avoid scaling, fouling and corrosion	yes	Ontwerpfase is niet van toepassing. Voor kanaalwater worden geen additieven gebruikt en in- en uitlaat liggen zodanig dat intrekking van lozingswarmte niet aan de orde is. Verder zijn koelingen bestaande installaties met regulier NVKL onderhoud en EEP voor wijzigingen. Afvalwater hiervan wordt op chloor gemonitord en de installaties worden meegenomen in een legionellabeheersplan
12	Check Table 4.3: BAT for increasing overall energy efficiency (page 126)	yes	Er is geen grote installatie, installaties worden door de TD en NVKL onderhouden en ingeregeld op optimale afstelling, daarnaast EEP
13	For new installations a site should be selected for the availability of sufficient quantities of water and an adequate receiving water	n.v.t.	
14	Reducing the cooling demand by optimising the heat demand	yes	Energiezorg en EEP
15	Where water availability is limited, a technology should be chosen that enables different modes of operation requiring less water	yes	De installaties zijn ingesteld op minimum waterververbruik.
16	Reduction of large water intakes by applying and optimizing recirculating cooling where possible (this needs careful balancing with other factors)	yes	
17	Reduce entrainment and impingement of aquatic organisms by design and positioning of the intake and various devices	yes	
18	Check Table 4.4: BAT for reduction of water requirements (page 127) en Table 4.5: BAT for reduction of entrainment (page 128)	yes	ISO 14001 plus vergunning voor intrekken met huidige voorzieningen. Grondwater mag gebruikt worden omdat het een bestaande vergunde situatie betreft. Er wordt wel onderzocht of verdere minimalisatie van het gebruik mogelijk is. Op dit moment wordt onderzocht of condenswater voor suppleiwatervoorziening aangewend kan worden. Resultaten van dit onderzoek worden medio 2015 verwacht.
19	Possibilities to reduce the heat dissipated into the surface have to be taken into account by designing a cooling system	n.v.t.	Ontwerpfase niet van toepassing.
20	Reducing leakage and corrosion by selecting and applying cooling equipment that is constructed of material suitable for the environment in which it will operate (process conditions, media cooled and chemical characteristics)	yes	Constructie met geschikte materialen is geborgd doormiddel van interne richtlijnen van FrieslandCampina. Er is sprake van de food industrie, hiervoor gelden strengere eisen in aanvulling op de wetgeving
21	Application of corrosion resistant materials	yes	Constructie met geschikte materialen is geborgd doormiddel van interne richtlijnen van FrieslandCampina.
22	Optimisation by implementation of monitoring and controlled (automatic) dosage of biocides	yes	Afvalwater van koelinstallaties wordt op chloor gemonitord en de installaties worden meegenomen in een legionellabeheersplan Voor once through gebruik van kanaalwater is biocidengebruik niet aan de orde.
23	FO or FRO concentrations below 0,5 mg/l (hourly average) and below 0,1 mg/l as a daily average value	n.v.t.	Geen gebruik van zeewater.
24	Check Table 4.6: BAT for reduction of emissions to water by design and maintenance techniques (page 131) and Table 4.7: BAT for reduction of emissions to water by optimised cooling water treatment (page 133)	Yes	Ontwerpfase niet van toepassing, het betreft bestaande installaties (condensators, heaters etc.) en EEP voor wijzigingen, regulier NVKL onderhoud voor goede afstelling.
25	Proper maintenance to prevent leaking	yes	Installaties zijn ontworpen en geïnstalleerd conform PGS 13, er wordt NVKL onderhoud gepleegd.
26	Check Table 4.8: BAT for reduction of emissions to air (page 135)	yes	Er is sprake van bestaande installaties welke geëngeneerd zijn dat er zo min mogelijk druppels vrijkomen. Het is niet goed vast te stellen of de 0,01 % verlies gehaald wordt en dit is volgens de BREF is dit ook niet goed meetbaar.
27	Power levels vary between 70 dB(A) for natural draught and 120 dB(A) for mechanical towers	yes	
28	Check Table 4.9: BAT for the reduction of noise emissions (page 136)	yes	Zie akoestisch onderzoek.
29	Preventive maintenance and monitoring to prevent leakages and microbiological contamination	yes	Er wordt NVKL onderhoud aan de installaties uitgevoerd
30	Indirect cooling systems or special preventive measures when leakage could lead to discharges of large amounts of substances harmful to the aquatic environment	yes	Er wordt NVKL onderhoud aan de installaties uitgevoerd
31	Operate system according to its design	yes	ISO 14001
32	Adequate water treatment programme for prevention of the development of Legionellae pneumophila (Lp), the Lp risk has to be particularly addressed during maintenance operations	no	In samenwerking met een externe partij wordt een legionellabeheersplan conform artikel 3.16a van het activiteitenbesluit opgesteld. Dit beheersplan zal in december 2014 gereed zijn.
33	Applying less harmful conservation methods for equipment and selecting material that can be recycled after decommissioning or replacement can reduce environmental emissions	yes	Deze maatregel is optioneel voor verdergaande reductie, en door gebruik van te recylen materialen waarvoor behandeling niet nodig is (plastic, rvs etc.) wordt voldaan
34	Check Table 4.10: BAT to reduce the risk of leakage (page 137) and Table 4.11: BAT to reduce biological growth (page 138)	yes	ISO 14001 en NVKL onderhoud aan de installaties uitgevoerd

Chapter BREF	Nr	Description	Compliance	Remarks
Continuous environmental improvement	1	BAT is to implement and adhere to an energy efficiency management system (ENEMS) that incorporates, as appropriate to the local circumstances, the following features (see section 2.1)	yes	De zuivelindustrie heeft in 1994 op brancheniveau een Intentieverklaring afgesloten met de ministeries van VROM, EZ, V&W, de vertegenwoordiging van de provincies in het IPO, de VNG en de Unie van Waterschappen om te komen tot realisatie van het NMP voor de industrie. De zuivelindustrie heeft daarnaast een Meerjarenspraken (MJA) afgesloten met het ministerie van EZ over de doelstelling van een energie-efficiency-verbetering. FrieslandCampina in Lochem heeft in het kader van het Doelgroepenbeleid voor de locatie voor de periode 2013-2016 een ontwerp Energie-Efficiency-Plan opgesteld, waarin een programma van maatregelen wordt voorgesteld om te voldoen aan nieuwe eisen die voortvloeien uit het NMP en het MJA. Dit plan is beoordeeld door Agentschap.NL. Over de voortgang van dit EEP zal door de locatie jaarlijks gerapporteerd worden in het eMUV.
	a	Commitment of top management (commitment of the top management is regarded as a precondition for the successful application of energy efficiency management)	yes	
	b	definition of an energy efficiency policy for the installation by top management	yes	
	c	planning and establishing objectives and targets (see BAT 2.3 and 8)	yes	
	d	implementation and operation of procedures paying particular attention to: 1. structure and responsibility 2. training, awareness and competence (see BAT 13) 3. communication 4. employee involvement 5. documentation 6. efficient process control (see BAT 14) 7. maintenance programmes (see BAT 15) 8. energy preparedness and response 9. safeguarding compliance with energy efficiency-related legislation and agreements	yes	
	e	Benchmarking: the identification and assessment of energy efficiency indicators over time (see BAT 8), and the systematic and regular comparisons with sector, national or regional benchmarks for energy efficiency, where verified data are available, see section 2.1(e), 2.16 and BAT 9	n.v.t.	Hier is geen sprake van bij FrieslandCampina Lochem (valt onder MJA niet onder benchmarking) wel intern vergelijking met andere vestigingen
	f	checking performance and taking corrective action paying particular attention to: 1. Monitoring and measurement (see BAT 16) 2. Corrective and preventive action 3. Maintenance of records 4. Independent (where practicable) internal auditing in order to determine whether or not the energy efficiency management system conforms to planned arrangements and has been properly implemented and maintained (see BAT 4 en 5)	yes	
	g	review of the ENEMS and its continuing suitability, adequacy and effectiveness by top management	yes	
	h	when designing a new unit, taking into account the environmental impact from the eventual decommissioning of the unit	yes	
	i	development of energy efficient technologies, and to following developments	yes	
Continuous environmental improvement	2	BAT is to continuously minimise the environmental impact of an installation by planning actions and investments on an integrated basis and for the short, medium and long-term, considering the cost-benefits and cross-media effects	yes	EEP
Identification of energy efficiency aspects of an installation and opportunities for energy saving	3	BAT is to identify the aspects of an installation that influence energy efficiency by carrying out an audit. It is important that an audit is coherent with a systems approach (see BAT 7)	yes	De bedrijven van FrieslandCampina beschikken over een certificeerbaar milieuzorgsysteem waarvan energiezorg een integraal onderdeel is. Daarmee wordt voldaan aan de vereisten zoals vastgelegd in de basischek energiezorg. Door middel van interne audits en periodieke externe beoordeling wordt het systeem actueel gehouden. Energiezorg is daarmee is vast onderdeel van de bedrijfsvoering
	4	BAT is to ensure that an audit identifies the following aspects (see section 2.11) a energy use and type in the installation and its component systems and processes b energy-using equipment, type and quantity of energy used in the installation c possibilities to minimise energy use, such as controlling/reducing operating, ensuring insulation is optimised, optimising utilities d possibilities to use alternative sources or use of energy that is more efficient, in particular energy surplus to other processes and/or systems, see section 3.3 e possibilities to apply energy surplus to other processes and/or systems, see section 3.3 f possibilities to upgrade heat quality, see section 3.3.2	yes	De bedrijven van FrieslandCampina beschikken over een certificeerbaar milieuzorgsysteem waarvan energiezorg een integraal onderdeel is. Daarmee wordt voldaan aan de vereisten zoals vastgelegd in de basischek energiezorg. Door middel van interne audits en periodieke externe beoordeling wordt het systeem actueel gehouden. Energiezorg is daarmee is vast onderdeel van de bedrijfsvoering
Systems approach to energy management	5	BAT is to use appropriate tools or methodologies to assist with identifying and quantifying energy optimisation, such as: a energy models, databases and balances, see section 2.15 b a technique such as pinch methodology, see section 2.12, energy and enthalpy analysis, see section 2.13, or thermoeconomics, see section 2.14 c estimates and calculations, see sections 1.5 and 2.10.2	yes	EEP
	6	BAT is to identify opportunities to optimise energy recovery within the installation, between systems within the installation (see BAT 7) and/or with third party (or parties), such as described in sections 3.2, 3.3 and 3.4	yes	In het huidige en de voorgaande EEP's zijn en worden diverse haalbaarheidsstudies uitgevoerd en waar mogelijk heeft dit geresulteerd in maatregelen en/of zal dit in maatregelen resulteren. Daarnaast wordt er FMECA gestuurd onderhouden
	7	BAT is to optimise energy efficiency by taking a systems approach to energy management in the installation. System to be considered for optimising as a whole are, for example: heating systems, such as steam (see section 3.2) and hot water cooling and vacuum motor driven systems, such as compressed air (see section 3.7) and pumping (see section 3.8) drying, separation or concentration, see section 3.11 lighting see section 3.10	yes	Energiezorg en EEP
	8	BAT is to establish energy efficiency indicators by carrying out all of the following: a. Identifying suitable efficiency energy indicators for the installation, and where necessary, individual processes, systems and/or units, and measure their change over time or after the implementation of energy efficiency measures (see sections 1.3 and 1.3.4). b. Identifying and recording appropriate boundaries associated with the indicators (see section 1.3.5 and 1.5.1) c. Identifying and record factors that can cause variation in the energy efficiency of the relevant process, systems and/or units (see section 1.3.8 and 1.5.2)	yes	Energiezorg en EEP
Benchmarking	9	BAT is to carry out systematic and regular comparisons with sector, national or regional benchmarks, where validated data are available	n.v.t.	Hier is geen sprake van bij FrieslandCampina Lochem (valt onder MJA, niet onder benchmarking) wel intern vergelijking met andere vestigingen
Energy efficient design (EED)	10	BAT is to optimise energy efficiency when planning a new installation, unit or system or a significant upgrade (see section 2.3) by considering all of the following: a. the energy efficient design (EED) should be initiated at the early stages of the conceptual design/basic design phase, even though the planned investments may not be well-defined. The EED should be taken into account in the tendering process b. the development and/or selection of energy efficient technologies, see sections 2.1 (k) and 2.3.1 c. additional data collection may need to be carried out as part of the design project or separately to supplement existing data of fill gaps in knowledge d. the EED work should be carried out by an energy expert e. the initial mapping of energy consumption should also address which parties in the project organisation influence the future energy consumption, and optimise the energy efficiency design of the future plant with them. For example, the staff in the (existing) installation who may be responsible for specifying design parameters f. a risk assessment of tenders and other data should clarify which manufacturers will not benefit from optimising energy efficiency of their delivered products for the project. For example, strong price competition may result in manufacturers minimising heat recovery equipment.	yes	Energiezorg
	11	BAT is to seek to optimise the energy use between more than one process or system (see section 2.4), within the installation or with third party	yes	Energiezorg
Increased process integration	12	BAT is to maintain the impetus of energy efficiency programme by using a variety of techniques, such as: a. implementing a specific energy efficiency management system (see section 2.1 and BAT 1) b. accounting for energy usage based on real (metered) values, which places both the obligation and credit for energy efficiency on the user/bill payer, see sections 2.5, 2.10.3 and 2.15.3 c. the creation of financial profit centers for energy efficiency, see section 2.5 d. benchmarking (see section 2.16 and BAT 9) e. A fresh look at existing management systems, such as using Operational Excellence, see section 2.5 f. using change management techniques, see section 2.5	yes	EEP
Maintaining the impetus of energy efficiency initiatives				

Chapter BREF	Nr	Description	Compliance	Remarks
Maintaining expertise	13	BAT is to maintain expertise in energy efficiency and energy-using systems by using techniques such as: a. recruitment of skilled staff and/or training of staff. Training can be delivered by in-house staff, by external experts or by formal courses or by self-study/development, see section 2.5 b. taking staff off-line periodically to perform fixed term/specific investigations (in their original installations or in others, see section 2.5) c. sharing in-house resources between sites, see section 2.5 d. use of appropriately skilled consultants for fixed term investigations, e.g. see section 2.11 e. outsourcing specialist systems and/or functions, e.g. see Annex 7.12	yes yes yes yes yes	Energiezorg en EEP
Effective process control	14	BAT is to ensure that effective control of processes is implemented by techniques such as: a. having systems in place to ensure that procedures are known, understood and complied with (see section 2.1d and 2.5) b. ensuring that the key performance parameters are identified, optimised for energy efficiency and monitored, see sections 2.8 and 2.10 c. documenting or recording these parameters (see section 2.1d, 2.5, 2.10 and 2.15)	yes yes yes yes	Energiezorg en EEP
Maintenance	15	BAT is to carry out maintenance at installations to optimise energy efficiency by applying all of the following: a. Clearly allocating responsibility for the planning and execution of maintenance b. establishing a structured programme for maintenance based on technical descriptions of the equipment, norms etc. as well as any equipment failures and consequences. Some maintenance activities may best be scheduled for plant shutdown periods c. supporting the maintenance programme by appropriate record keeping systems and diagnostic testing d. identifying from routine maintenance, breakdowns and/or abnormalities possible losses in energy efficiency, or where energy efficiency could be improved e. identifying leaks, broken equipment, worn bearing, etc. that affect or control energy usage, and rectifying them at the earliest opportunity	yes yes yes yes yes yes	Maatregelen richten zich op het wegnemen van de bronoorzaak, minimaliseren van het effect of monitoring en onderhoud. Daarnaast wordt er FMECA gestuurd onderhoud uitgevoerd
Monitoring and measurement	16	BAT is to establish and maintain documented procedures to monitor and measure, on a regular basis, the key characteristics of operations and activities that can have a significant impact on energy efficiency. Some suitable techniques are given in section 2.10	yes	ISO 14001
Combustion	17	BAT is to optimise the energy efficiency of combustion by one or a combination of the relevant techniques: a. those specific to sectors given in vertical BREFs b. those given in table 4.1 (page 283-285)	n.v.t. n.v.t. n.v.t.	Er is geen combustion power plant aanwezig
Steam systems	18	BAT for steam systems is to optimise the energy efficiency by using techniques such as: a. those specific to sectors given in vertical BREFs b. those given in table 4.2 (page 286-287)	yes yes	Zie BREF Large Combustion nr 10 Vervangen ketels en hoofdleidingen gepland binnen de EEP periode
Waste heat recovery	19	BAT is to maintain the efficiency of heat exchangers by both: a. Monitoring the efficiency periodically, and b. preventing or removing fouling	yes	In het huidige en de voorgaande EEP's zijn en worden diverse haalbaarheidsstudies uitgevoerd en waar mogelijk heeft dit geresulteerd in maatregelen en/of zal dit in maatregelen resulteren.
Cogeneration	20	BAT is to seek possibilities for cogeneration, inside and/or outside the installation (with a third party)	n.v.t.	Zie BREF Large Combustion nr 10
Electric power supply	21	BAT is to increase the power factor according to the requirements of the local electricity distributor by using techniques such as those in table 4.3 (page 289), according to applicability, see section 3.5.1)	partly	Er is sprake van bestaande installaties waardoor ontwerpverplichtingen niet van toepassing zijn. Softstarters zijn in de regel wel aanwezig.
	22	BAT is to check the power supply for harmonics and apply filters if required (see section 3.5.2)	yes	fmea risico inventarisatie
	23	BAT is to optimise the power supply efficiency by using techniques such as those in table 4.4 (page 289), according to applicability.	yes	Alle trafo's worden continue hoog belast. De afstand van nieuwe trafo's voor nieuwe ketels wordt geminimaliseerd, de afstand tot andere installaties is gegeven door de bestaande situatie.
Electric motor driven sub-systems	24	BAT is to optimise electric motors in the following order (see section 3.6) 1. optimise the entire system the motor(s) is part of (e.g. cooling system, see section 1.5.1) 2. Then optimise the motor(s) in the system according to the newly-determined load requirements, by applying one or more of the techniques in table 4.5 (page 290), according to applicability 3. when the energy-using systems have been optimised, then optimise the remaining (non-optimised) motors according to table 4.5 and the following criteria (see i and ii page 290)	yes partly yes	In het huidige en de voorgaande EEP's zijn en worden diverse haalbaarheidsstudies uitgevoerd en waar mogelijk heeft dit geresulteerd in maatregelen en/of zal dit in maatregelen resulteren. Er is sprake van bestaande apparatuur. Er vinden intern regelmatig optimalisatiestudies op basis van interne overwegingen van FrieslandCampina. Nieuw te plaatsen apparatuur moet voldoen aan interne FrieslandCampina richtlijnen en EHEDG richtlijnen (European Hygienic Engineering & Design Group).
Compressed air systems	25	BAT is to optimise compressed air systems (CAS) using the techniques such as those in table 4.6 (page 291), according to the applicability	yes	
Pumping systems	26	BAT is to optimise pumping systems by using the techniques in table 4.7 (page 292), according to the applicability (see section 3.8)	yes	Bij vervanging van installaties wordt stelselmatig herbeoordeeld of toepassing van variable speed drives of meerdere pompen toepassen een optie zijn
Ventilation systems	27	BAT is to optimise heating, ventilation and air conditioning systems by using techniques such as: a. for ventilation, heating and cooling, techniques in table 4.8 (page 294), according to applicability b. for heating, see sections 3.2 and 3.3.1, and BAT 26 c. for pumping, see section 3.8 and BAT 26 d. for cooling, chilling and heat exchangers, see ICS BREF, as well as section 3.3 and BAT 19 (in this document)	yes partly	In projecten wordt stelselmatig herbeoordeeld of heating, ventilation and air conditioning systems aan de technieken voldoen. Er is geen automatische ventilatiestop in het torengebouw aanwezig. De torens draaien nagenoeg volcontinu.
Lighting	28	BAT is to optimise artificial lighting systems by using techniques such as those in table 4.9 (page 295) according to applicability (see section 3.10)	partly	Er is beperkte aandacht voor lampen omdat deze een kleine bijdrage leveren aan het totaalverbruik. Onderzoek van andere relevantere installaties krijgt hogere prioriteit. (ISO 14001, EEP)
Drying, separation and concentration processes	29	BAT to optimise drying, separation and concentration processes by using techniques such as those in table 4.10 (page 296), according to applicability, and to seek opportunities to use mechanical separation in conjunction with thermal processes.	yes	In projecten wordt stelselmatig herbeoordeeld of drying, separation and concentration processen aan de technieken voldoen

FC Checklisten BREF compleet definitief

Chapter BREF	Nr	Description	Compliance	Remarks																
5.1.4.4 Frying	64	BAT is to recirculate and burn exhaust gasses	n.v.t.																	
5.1.4.5 Preservation in cans, bottles and jars	65	Apply automated can, bottle and jar seasoning filling systems in incorporating closed-circuit recycling of spilled liquids	n.v.t.																	
	66	Use can, bottle and jar cleaning tanks with floating oil recovery when preserving oil, food canned in vegetable oils or oily foods	n.v.t.																	
5.1.4.6 Evaporation	67	use multi-effect evaporators optimising vapour recompression related to heat and power availability in the installation to concentrate liquids	yes																	
5.1.4.7 Freezing and refrigeration	68	Prevent emissions of substances that deplete the ozone layer by, e.g. not using halogenated substances as refrigerants	yes	Bij FrieslandCampina Lochem worden diverse koelkasten en -systemen toegepast. Alle systemen worden door gecertificeerde instanties (NVKL) onderhouden.																
	69	Avoid keeping air conditioned and refrigerated areas colder than necessary																		
	70	Optimise the condensation pressure																		
	71	Regularly defrost the entire system																		
	72	Keep the condensers clean																		
	73	Make sure that the air entering the condensers is as cold as possible																		
	74	Optimise the condensation temperature																		
	75	Use automatic defrosting of cooling evaporators																		
	76	Operate without automatic defrosting during short production stops																		
	77	Minimise transmission and ventilation losses from cooled rooms and coldstores																		
5.1.4.8 Cooling	78	Optimise the operation of cooling water systems to avoid excessive blowdown of the cooling tower	yes																	
	79	Install a plate heat-exchanger for precooling ice-water with ammonia, prior to final cooling in an accumulating ice-water tank with a coil evaporator	no	Bestaande installatie. Koude melk koelt wel in tegenstroom melk af in installatie.																
	80	Recover heat from cooling equipment	no	Bestaande installatie.																
5.1.4.9 Packing	81	Optimise the design of packaging, including the weight and volume of material and the recycled content, to reduce the quantity used and to minimise water	yes	Verpakkingen worden ingekocht onder raamwerkovereenkomsten, waarin duurzaamheid en milieu zijn meegenomen.																
	82	Purchase materials in bulk	yes																	
	83	Collect packaging material separately	yes	Voor zover noodzakelijk en praktisch uitvoerbaar worden de verschillende materialen gescheiden ingezameld, tijdelijk opgeslagen en periodiek afgevoerd.																
	84	Minimise overflowing during packing	yes																	
5.1.4.10 Energy generation and use	85	for installations where there is a use for the heat and power produced, use combined heat and power generation in new or substantially altered installation or those renewing their energy systems	no	zie BREF grote stookinstallaties nr 10.																
	86	Use heat pumps for heat recovery from various sources	no	Bestaande situatie, opties voor warmterugwinning worden waar haalbaar meegenomen in het EEP.																
	87	Switch equipment off when it is not needed	yes																	
	88	Minimise the loads on motors	partly	Motoren zijn klasse ie2, vanaf 7.5 kW ie3.																
	89	Minimise motor losses	partly	Motoren zijn klasse ie2, vanaf 7.5 kW ie3.																
	90	Use variable speed drivers to reduce the load on fans and pumps	partly	Motoren zijn klasse ie2, vanaf 7.5 kW ie3.																
	91	Apply thermal insulation, e.g. of pipes, vessels and equipment used to carry, store or treat substances above or below ambient temperature and to equipment used for processes involving heating and cooling	yes																	
	92	Apply frequency controllers on motors	partly	Deel van het motorenpark is uitgerust met frequentieregelaars. Bij upgrade of vervanging worden standaard frequentieregelaars toegepast.																
5.1.4.11 Water use	93	If groundwater is used, BAT is to pump up only the quantities of water that are actually required	yes	Het bedrijf beschikt over eigen voorzieningen voor grondwaterwinning. De huidige vergunde hoeveelheid die onttrokken mag worden bedraagt 560.000 m3/jaar. Door het maximaliseren van het condensaat gebruik, wordt voor de gewijzigde situatie verwacht dat het gebruik van bronwater binnen de huidige vergunde hoeveelheid van 560.000m3 zal blijven. De vergunde hoeveelheid in het kader van de grondwaterwet lijkt toereikend te zijn.																
5.1.4.12 Compressed air systems	94	review the pressure level and reduce if possible	yes																	
	95	optimise air inlet temperature	yes																	
	96	fit silencers at air inlets and exhaust to reduce noise levels	yes																	
5.1.4.13 Steam systems	97	Maximise condensate return	yes																	
	98	Avoid losses of flash steam from condensate return	yes																	
	99	Isolate unused pipework	yes																	
	100	Improve steam trapping	yes																	
	101	Repair steam leaks	yes																	
	102	Minimise boiler blowdown	yes																	
5.1.5 Minimisation of air emissions	103	Apply and maintain an air emission control strategy incorporating:	yes																	
	104	* definition of the problem	yes																	
	105	* an inventory of site emissions, including, e.g. abnormal operation	yes																	
	106	* measuring the major emissions	yes																	
	107	* assessing and selecting the air emission control techniques	yes																	
	108	Collect waste gases, odours and dusts at source and duct them to the treatment or abatement equipment	n.v.t.																	
	109	Optimise the start-up and shut-down procedures for the air emissions abatement equipment to ensure that it is always operating effectively at all of the times when abatement is required	n.v.t.	Er zijn alleen passieve filters zonder startup/shutdown																
	110	Achieve following levels by applying abatement techniques:	yes																	
	111	* <20 mg/m3 for dry dust																		
	112	* 35-60 mg/Nm3 for wet/slurry dust																		
	113	* <50 mg/Nm3 TOC																		
	114	* unless specified otherwise																		
	115	Apply abatement techniques where process-integrated BAT do not eliminate odour nuisance	n.v.t.	De productieprocessen op de locatie Lochem laten zich in het algemeen kenmerken als scheidingsprocessen van droge stof en water. Tijdens deze processen worden grond- en hulpstoffen niet chemisch omgezet tot een eindproduct. Geconcludeerd kan worden dat de productieprocessen in Lochem geen bron van geurmissie zijn.																
5.1.6 Waste water treatment	116	For the treatment of waste water from FDM installations, BAT is to use a suitable combination of the following:	yes	FrieslandCampina Lochem heeft eigen voorzieningen inclusief vetafscheider voor inzameling en beheer van afvalwater en het afvalwater wordt vanuit deze eigen afvalwater voorzieningen rechtstreeks geloosd op de voorzieningen van het Waterschap Rijn & IJssel.																
	117	* apply an initial screening of solids	yes																	
	118	* remove fat using a fat trap, if the waste water contains animal or vegetable FOG	yes	Er is sprake van alkalisch afvalwater maar op basis van onderzoek wordt dit aangepast.																
	119	* apply flow and load equalisation	no																	
	120	* apply neutralisation to strongly acid or alkaline waste water	partly																	
	121	* apply sedimentation to waste water containing SS	yes																	
	122	* apply dissolved air flotation	no																	
	123	* apply biological treatment	yes																	
	124	* use CH4 gas produced during anaerobic treatment for the production of heat and/or power	n.v.t.																	
	125	The emission levels given in table 5.1 (below this document) are indicative of the emission levels that would be achieved with those techniques generally considered to represent BAT. They do not necessarily represent levels currently achieved within the industry but are based on the expert judgement of the TWG.	n.v.t.	Rechtstreekse lozing op RWZI Waterschap Rijn & IJssel vergund middels Waterwetvergunning.																
		<table><tr><th>Parameter</th><th>Concentration (mg/l)</th></tr><tr><td>BOD5</td><td><25</td></tr><tr><td>COD</td><td><125</td></tr><tr><td>TSS</td><td><50</td></tr><tr><td>pH</td><td>6 - 9</td></tr><tr><td>Oil and grease</td><td><10</td></tr><tr><td>Total nitrogen</td><td><10</td></tr><tr><td>Total phosphorus</td><td>0.4 - 5</td></tr></table> table 5.1	Parameter	Concentration (mg/l)	BOD5	<25	COD	<125	TSS	<50	pH	6 - 9	Oil and grease	<10	Total nitrogen	<10	Total phosphorus	0.4 - 5		
Parameter	Concentration (mg/l)																			
BOD5	<25																			
COD	<125																			
TSS	<50																			
pH	6 - 9																			
Oil and grease	<10																			
Total nitrogen	<10																			
Total phosphorus	0.4 - 5																			
	126	When further treatment is required to either achieve the levels of table 5.1 or to meet special discharge limits, the following techniques are available:	n.v.t.																	
	127	* remove nitrogen biologically																		
	128	* apply precipitation to remove phosphorus, simultaneously with the activated sludge treatment, where applied																		
	129	* use filtration for waste water polishing																		
	130	* remove dangerous and priority hazardous substances																		
	131	* apply membrane filtration																		
	132	BAT is to re-use water after it has been sterilised and disinfected, avoiding the use of active chlorine, when the quality of the waste water is suitable for re-use in FDM processing	n.v.t.	Water uit de indampers en spoelwater wordt hergebruikt in reiniging. Afvalwater wordt niet op site gezuiverd en kan dus ook niet hergebruikt worden.																
	133	BAT is to treat waste water sludge using one or a combination of the following techniques:	n.v.t.																	
	134	* stabilisation																		
	135	* thickening																		
	136	* dewatering																		
	137	* drying, if natural heat or heat recovered from processes in the installation can be used																		

Chapter BREF

5.1.7 Accidental releases

Nr	Description	Compliance	Remarks
138	In general, to prevent accidents and minimize their harm to the environment as a whole, BAT is to do the following:	yes	ISO 14001 en bedrijfsnoodplan is aanwezig (instructies en voorzieningen en randvoorwaarden)
139	* identify potential sources of incidents/accidental releases that could harm the environment		
140	* assess the probability of the identified potential incidents/accidental releases occurring and their severity if they do occur, i.e. to carry out a risk assessment		
141	* identify those potential incidents/accidental releases for which additional controls are required to prevent them from occurring		
142	* identify and implement the control measures needed to prevent accidents and minimise their harm to the environment		
143	* develop, implement and regularly test an emergency plan		
144	* investigate all accidents and near misses and keep records		

5.2.5 Additional BAT for dairies

145	1 partially homogenise milk (see Section 4.7.5.3)	yes	
146	2 replace batch pasteurisers with continuous ones (see Section 4.7.5.5)	yes	
147	3 use regenerative heat exchange in pasteurisation (see Section 4.7.5.6)	yes	
148	4 reduce the required frequency of cleaning of centrifugal separators by improving the preliminary milk filtration and clarification (see Section 4.7.5.7)	yes	
149	5 use just-in-time 'component filling' to avoid losses and minimise water pollution (see Section 4.7.5.12)	n.v.t.	Er wordt geen melk afgevuuld als product
150	6 maximise the recovery of diluted, but otherwise uncontaminated, product from CIP initial rinses, HTST start-up, shut-down and change-over and from the rinsing of other equipment and pipework by online detection of transition points between the product and the water phase (see Section 4.7.5.10). This can be done by, e.g. measuring the volume using flow (see Section 4.1.8.4) or density transmitters; measuring the density using conductivity transmitters (see Section 4.1.8.5.2) and using scattered light turbidity sensors (see Section 4.1.8.5.3) to differentiate water from the product	yes	
151	7 for large dairies with highly branched tubing, use several small CIP systems instead of a centralised CIP system (see Section 4.3.9)	yes	
152	8 re-use cooling water, used cleaning water, condensates from drying and evaporation, permeates generated in membrane separation processes and final rinse-water after the treatment, if any required, to ensure the level of hygiene necessary for the re-use application (see Section 4.7.5.16)	yes	
153	9 achieve the levels given in Table 5.2 (see Section 5.2.5.1), Table 5.3 (see Section 5.2.5.2) and Table 5.4 (see Section 5.2.5.5). These are indicative of the levels that can be achieved by applying in-process BAT. They are based on achieved levels reported by the TWG. The ranges reported reflect a variety of conditions under which installations operate. Energy consumption levels may vary due to, e.g. production volumes. Warm climates may use more energy for cooling and vice versa. Water consumption and waste water emission levels may vary due to, e.g. different product portfolios, batch sizes and cleaning. The waste water emission level may be lower compared to the water consumption level because many dairies measure the intake of cooling water, often from their own wells, but then discharge it unmeasured. In warm climates water may be lost due to evaporation.	n.v.t.	Zie betreffende secties.

5.2.5.2 Additional BAT for milk powder production

154	1 to produce powdered milk use multi-effect evaporators (see Section 4.2.9.1), optimizing vapour recompression (see Section 4.2.9.2) related to heat and power availability in the installation, to concentrate liquid milk before spray drying, followed by FBD, e.g. integrated FDB (see Section 4.7.5.8)	yes							
155	2 apply an early warning fire alarm, e.g. CO detector, to reduce the risks of explosion in spray driers (see Section 4.7.5.8)	yes							
156	3 achieve the consumption and emission levels shown in Table 5.3 (see Sections 3.3.5.1.1, 3.3.5.1.2, 3.3.5.4 and 5.2.5 paragraph 9)								
	<table><tr><td>Energy consumption (dW/kg)</td><td>Water consumption (d/l)</td><td>Waste water (d/l)</td></tr><tr><td>0.7-0.9</td><td>0.8-1.3</td><td>0.8-1.5</td></tr></table> <p>Table 5.3: Consumption and emission levels associated with the production of milk powder from 1 litre of received milk.</p>	Energy consumption (dW/kg)	Water consumption (d/l)	Waste water (d/l)	0.7-0.9	0.8-1.3	0.8-1.5		
Energy consumption (dW/kg)	Water consumption (d/l)	Waste water (d/l)							
0.7-0.9	0.8-1.3	0.8-1.5							

5.2.5.3 Additional BAT for buttermaking

157	1 remove residual butter from pipework using a cooled butter block pushed by compressed air (see Section 4.3.4)	yes	Op een beperkt aantal leidingen.
158	2 rinse the cream heater with skimmed milk before cleaning it (see Section 4.7.5.13.1).	n.v.t.	Er wordt water gebruikt maar de afgevoerde stroom wordt nabehandeld tot product boterrolle, dus geen productverlies

Chapter BREF

Nr	Description	Compliance	Remarks
	Except for the Environmental Management System (EMS), BAT are not specified for the common processes described in this chapter (3), but the various common processes and techniques are for consideration in the determination of BAT and, therefore, contribute to those BAT described in Chapters 4 to 8. Additionally, as the techniques described in this chapter are also suitable for reducing overall emissions, they can also influence the way existing plants can be improved. Chapter 3 should be used in conjunction with Chapters 4 to 8 to give a complete picture of a fossil fuel-fired combustion installation and to highlight the ways in which the impact on the environment as a whole can be reduced.		

chapter 3

1	Management systems. (BAT)	yes	
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chapter 7

7.1.9 Control of NOX emissions from gas-fired boilers (descriptive)

2	The boilers and firing systems are in general designed for low NOX firing. Basically there are three different ways to reduce NOX emissions: • application of low NOX burners. The conditions for low NOX emissions is a low temperature in the primary combustion zone and a sufficient long retention time of the fluegases in the furnace for a complete burnout. This will reduce the flame temperature • Flue-gas recirculation is a method that can be effective if a large percentage of the emission is thermal NOX. It reduces both the flame temperature and the concentration of oxygen as well • two stage combustion reduces the reaction between oxygen and nitrogen in the air during the combustion process. Substantially low NOX emissions can be achieved by supply of the air at three stages around the individual burner and supplementing air above the individual burners and a precise dosing of these air streams. The NOX emissions, which are standard for gas-fired boilers, are lower than 100 mg/Nm3.	yes	De bestaande installatie voldoet niet aan de NO _x eisen en wordt in 2016 vervangen voor een installatie die voldoet. Vanaf 1 januari 2017 moeten alle middelgrote stookinstallaties voldoen aan de emissie-eisen in het Activiteitenbesluit, met een strengere eis dan de BREF
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7.1.11 Control of noise emissions (descriptive)

3	The large equipment used in gas-fired power plants can give rise to emissions of noise, and/or noises due to vibrating machinery. In these cases, the noise emissions may be abated in the following way: • by locating gas turbines, steam turbines and generators in enclosures • by ventilating enclosures with low noise fans • by adding cladding to the steam turbine support structure • by fitting high level stack silencers • by locating boiler feed pumps in enclosures • by building a pump house around the pumps for circulating the cooling water • by operating moderate noise fans in the cooling towers (it should be noted that the noise emissions from once-through cooling water systems are less than from cooling towers).	yes	Relevante installaties worden nog (binnen) geplaatst en zullen voldoen.
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7.5.1 Supply and handling of gaseous fuels and additives

	BAT in preventing releases related to the supply and handling of gaseous fuels, but also for storage and handling of additives such as ammonia etc. are summarised in Table 7.34.		
4	Using fuel gas leak detection and alarms	yes	Nog te plaatsen relevante installaties zullen voldoen
5	Using expansion turbines to recover energy content of the pressurised fuel gases	no	Expansieturbines zijn niet haalbaar omdat de gasflow van deze installatie te laag is
6	Preheating the fuel gas by using waste heat from the boiler or gas turbine	no	Onderzocht, gasstroom is te klein om hiermee energie te besparen.
7	For handling and storage of pure liquefied ammonia > 100m3 should be constructed as double wall and should be located subterraneously; reservoirs of 100 m3 and smaller should be manufactured including annealing process	n.v.t.	geen gebruik van vloeibaar ammonia voor verbranding
8	Combined cycle operation and co-generation of heat and power is, therefore, to be considered as the first BAT option, i.e. whenever the local heat demand is great enough to warrant the construction of such a system.	n.v.t.	CHP and Heat storage zijn onderzocht en blijken niet haalbaar. Er is veel dynamiek in stoomvraag, elektriciteitsverbruik echter niet. Dit betekent dat stoom afgeblazen zou moeten worden, of de elektriciteitsvraag van het net zeer grillig zou worden.
9	The use of an advanced computerised control system in order to achieve a high boiler performance with increased combustion conditions that support the reduction of emissions are also considered as BAT.	yes	Nog te plaatsen relevante installaties zullen voldoen
10	The technical measures described in Section 2.7.8 should be taken into account as part of BAT options to improve the efficiency of existing plants. By applying the techniques and the measures listed in Section 7.4.2, to improve the thermal efficiency such as double reheat, and using the most advanced high temperature materials for gas turbines and boilers, energy efficiencies associated with the use of BAT can be achieved.	partly	CHP and Heat storage zijn onderzocht en blijkt niet haalbaar. Er is veel dynamiek in stoomvraag, elektriciteitsverbruik echter niet. Dit betekent dat stoom afgeblazen zou moeten worden, of de elektriciteitsvraag van het net zeer grillig zou worden.
11	In addition, the following measures also need to be taken into consideration to increase the efficiency: • combustion: minimising the heat loss due to unburned gases • the highest possible pressure and temperature of the working medium gas or steam • the highest possible pressure drop in the low pressure end of the steam turbine through the lowest possible temperature of the cooling water (fresh water cooling) for boilers and CCGT plants • minimising the heat loss through the flue-gas (utilisation of residual heat or district heating) • minimising the heat loss through conduction and radiation with insulation • minimising the internal energy consumption by taking appropriate measures, e.g. scorchification of the evaporator, greater efficiency of the feed water pump, etc.) • preheating the fuel gas and/or the boiler feed water with steam • improved blade geometry of the turbines.	yes	Nog te plaatsen relevante installaties zullen voldoen. Er is geen turbine aanwezig.

7.5.3 Dust and SO2 emissions from gas fired combustion plants

12	For gas-fired combustion plants using natural gas as a fuel, emissions of dust and SO2 are very low. The emission levels of dust by using natural gas as a fuel are normally well below 5 mg/Nm3 and SO2 emissions are well below 10 mg/Nm3 (15 % O2), without any additional technical measures being applied.	yes	Nog te plaatsen relevante installaties zullen voldoen. Er wordt gestookt op Nederlands aardgas en bij reguliere verbranding wordt hierdoor aan de norm voldaan. Daarnaast worden installaties conform scio onderhouden waardoor optimale verbranding geborgd wordt
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7.5.4 NOX and CO emissions from gas-fired combustion plants

13	In general, for gas turbines, gas engines and gas fired boilers, reduction of nitrogen oxides (NOX) is considered to be BAT. The nitrogen compounds of interest are nitric oxide (NO) and nitrogen dioxide (NO2), collectively referred to as NOX. For new gas turbines, dry low NOX premix burners (DLN) are BAT. Most existing gas turbines can be converted to the dry low NOX premix burner (DLN) technique, but sometimes the use of water and steam injection can be a better solution. This needs to be decided case by case.	yes	De bestaande installatie voldoet niet aan de NOX eisen en wordt in 2016 vervangen voor een installatie die voldoet. Vanaf 1 januari 2017 moeten alle middelgrote stookinstallaties voldoen aan de emissie-eisen in het Activiteitenbesluit, met een strengere eis dan de BREF. Er zijn geen turbines
14	For existing gas turbines, water and steam injection or conversion to the DLN technique is BAT. Gas turbines of unchanged combustion design, but with higher inlet temperatures, have higher efficiencies and higher NOX values. In this context, it should be noted that with a higher efficiency the specific NOX emission per kWh are still lower.	n.v.t.	
15	The BAT conclusion for the prevention and control of NOX and CO emissions and the associated emission levels are summarised in Table 7.36 and Table 7.37. (zie tab 2)	yes	Legal requirements are more stringent than BAT regulation.

Chapter BREF	Nr	Description	Compliance	Remarks
5.1 Storage of liquids and liquefied gases				
5.1.1 Tanks				
5.1.1.1 General principles to prevent & reduce emissions				
Tank design	1	Take into account physico-chemical properties of the substance being stored	yes	Ten behoeve van de reiniging van de procesinstallaties wordt in hoofdzaak gebruik gemaakt van natriumloog en salpeterzuur.
	2	Protection against deviations from normal process conditions (safety instructions, interlock systems, pressure relief devices, leak detection and containment, etc.)	yes	Hiervoor zijn aan het bedrijf opslagplaatsen aanwezig. Om deze opslag voorziening te laten voldoen aan de huidige eisen en interne voorschriften is een investeringsstrategie opgesteld.
	3	Selection of appropriate equipment material. E.g. construction material, valve quality	yes	
	4	Which maintenance and inspection plan is needed and what equipment has to be installed to create easy access and layout	yes	
	5	Take into account emergency situations (distances to other tanks, facilities and to the boundary, fire protection, access for emergency services such as the fire brigade)	yes	
	6	See Annex 8.19 for a typical checklist	yes	
	7	Determine pro-active maintenance schedule. Develop risk based inspection plans	yes	
	8	Location should be carefully selected to build a new tank. Water protection areas and water catchment areas should be avoided	yes	
	9	Operate tanks above ground at atmospheric pressure. For flammable liquid storage underground tanks at sites with limited space is also allowed. For liquefied gases, underground, mounted storage or spheres can be considered depending on the storage volume	yes	
	10	Apply tank colour with a reflectivity of thermal or light radiation of at least 70 % or install a solar shield for aboveground tanks which contain volatile substances	yes	
	11	Abate emissions from tank storage, transfer and handling that have significant negative environmental effect	yes	
	12	BAT is to calculate the VOC emissions regularly on sites where significant VOC emissions are to be expected	n.v.t.	
	13	Dedicated systems are BAT. With short and medium-term storage of different products this is not applicable	yes	
Inspection and maintenance				
Location and lay-out				
Tank colour				
Emissions minimization principle in tank				
Monitoring of VOC				
Dedicated systems				
5.1.1.2 Tank specific considerations				
Open top tanks				
External floating roof tank (storage of	14	If emissions to air are likely to occur, BAT is to cover tank with floating cover, flexible or tent cover or a rigid cover.	n.v.t.	
	15	To prevent deposition it's BAT to install mixing equipment	n.v.t.	
	16	BAT Emission reduction level for a large tank is 97 %. Depending on the type of seal installed reduction levels can be achieved up to	n.v.t.	
	17	BAT is to install direct contact floating roofs (double deck), existing non-contact floating roofs (pontoon) are also BAT	n.v.t.	
Fixed Roof Tanks (flammable liquids, products with high toxicity)	18	In regions where adverse wheatear conditions are common, application of a dome is BAT	n.v.t.	
	19	For liquids containing a high level of particles, BAT is to mix tank to avoid depositions which could call for an additional cleaning step	n.v.t.	
	20	BAT is to apply a vapour treatment installation for the storage of volatile substances which are toxic, very toxic or carcinogenic, mutagenic and reproductive toxic (CMR) categories 1 and 2	yes	
	21	For other substances BAT is to apply a vapour installation or to install an internal floating roof. Direct contact floating roofs and non-contact floating roofs are BAT. NL: apply for substance with Vapour of 1 kPa (20 °C) and volume of tank > 50 m3	yes	
Atmospheric horizontal tanks	22	For tanks < 50 m3 BAT is to install pressure relief valve with highest possible value consistent with the tank design criteria	yes	
	23	BAT is to mix the stored substance to prevent deposition for liquids containing a high level of particles (e.g. crude oil)	n.v.t.	
	24	BAT is to apply a vapour treatment installation for the storage of volatile substances which are toxic, very toxic or CMR categories 1 and 2	n.v.t.	
	25	BAT is to do all, or a combination, of the following techniques for other substances, depending on the substances stored:	n.v.t.	
Pressurised storage (the only significant emissions to air from normal operation are from draining)	* apply pressure vacuum relief valves			
	* up rate to 56 mbar			
	* apply vapour balancing			
	* apply a vapour holding tank			
Lifter roof tanks	* apply vapour treatment			
	26	BAT for draining depends on the tank type, but may be the application of a closed drain system connected to a vapour treatment installation	n.v.t.	
	27	Apply a flexible diaphragm tank equipped with pressure/vacuum relief valves	n.v.t.	
	28	Apply a lifter roof tank equipped with pressure/vacuum relief valves and connected to a vapour treatment installation	n.v.t.	
Refrigerated tanks				
Underground and mounded tanks	29	There are no significant emissions from normal operation	yes	
	30	Volatile substances which are toxic (T) very toxic (T+) or carcinogenic, mutagenic and reproductive toxic (CMR) cat 1 and 2. BAT is to install vapour treatment installation	n.v.t.	
	31	BAT is to install pressure vacuum relief valves, vapour balancing, vapour holding tank, vapour treatment	n.v.t.	
5.1.1.3 Preventing incidents and accidents				
Safety and risk management				
Operational procedures and training	32	BAT is to implement a safety management system to prevent incidents and accidents	yes	Het zorgstelsel richt zich op de beheersing van de milieugerelateerde risico's die zich voordoen bij de werkzaamheden in het bedrijf. De beheersing is hierbij zodanig geregeld dat de eventuele milieueffecten geminimaliseerd worden.
	33	BAT is to implement and follow adequate organisational measures and to enable training and instruction of employees for safe and responsible operation of the installation	yes	Maatregelen richten zich op het wegnemen van de bronzoorzaak, minimaliseren van het effect of monitoring en onderhouden.
Corrosion prevention				
	34	BAT is to prevent corrosion by:	yes	In de nabije toekomst zal de opslag van bulkchemicaliën worden aangepast zodat deze voldoet aan de huidige wet & regelgeving. Bij deze wijziging zijn bodem beschermende voorzieningen beoogd waarmee het bodemrisico tot een aanvaardbaar niveau conform de Nederlandse richtlijn bodembescherming wordt gerealiseerd.
	* selecting construction material that is resistant to the product stored			
	* applying proper construction methods			
	* preventing rainwater or groundwater entering the tank and if necessary, removing water that has accumulated in the tank			
Stress corrosion cracking	* applying rainwater management to bund drainage			
	* applying preventive maintenance, and			
	* where applicable, adding corrosion inhibitors, or applying cathodic protection on the inside of the tank			
	35	BAT is to prevent SCC by:	yes	
Operational procedures and instrumentation to prevent overfill	* stress relieving by post-weld heat treatment			
	* applying a risk based inspection			
	36	BAT is to install high level or high pressure instrumentation with alarm settings and / or auto closing of valves	yes	
	37	Presence of proper operator instructions how to prevent overfill		
Instrumentation and automation to detect	38	Sufficient space is available to receive a batch filling		
	39	BAT is to install leak detection on storage tanks containing liquids that can potentially cause soil pollution	yes	
Risk-based approach to emissions to soil below tanks	40	One of the following techniques are BAT: Release prevention barrier system, inventory checks, acoustic emission method and soil vapour monitoring	yes	
	41	BAT is to achieve "negligible risk level" of soil pollution from bottom and bottom-wall connections of aboveground storage tanks	yes	
Soil protection around tanks - containment	42	BAT is to provide secondary containment for aboveground tanks containing substances with potential risk for significant soil pollution or pollution adjacent watercourses	yes	
	43	BAT is:	yes	
	* tank bunds around single wall tanks			
	* double wall tanks			
Containment of contaminated extinguishant	* cup-tanks			
	* double wall tanks with monitored bottom discharge			
	44	Risk based approach to decide if total bund must be built form impervious material or partially	yes	
	45	Impervious barriers include flexible membrane (HDPE), clay mat, an asphalt surface or a concrete surface	partly	De maatregelen in het plan van aanpak in de bodemrisicoanalyse zijn eind 2015 gereed.
	46	For chlorinated hydrocarbon solvents (CHC) in single walled tanks, BAT is to apply CHC-proof laminates to concrete barriers (and containments) based on phenolic or furan resins.	n.v.t.	
	47	BAT for underground and mounded tanks containing products that can potentially cause soil apply a double walled tank with leak detection or to apply a single walled tank with secondary containment and apply leak detection	partly	
	48	For toxic, carcinogenic or other hazardous substances, BAT is to apply full containment	yes	
5.1.2 Storage of packaged dangerous substances				
Safety and risk management				
Training and responsibility	49	BAT is to implement a safety management system to prevent incidents and accidents	yes	Er zijn een aantal opslaglocaties voor verpakte gevaarlijke stoffen aanwezig conform pgs 15
	50	BAT is to appoint a person responsible for the operation of the store.	yes	
Storage area	51	Install one person who is well trained and retrained. This person will be responsible of informing other staff about risks and emergency plans and action	yes	
	52	Apply a storage building and/or an outdoor storage area with a roof. For storing quantities of less than 2500 litres or kilograms dangerous substances a storage cell can be applied	yes	Er is 1 magazijn/meester, welke verantwoordelijk is voor voorraadbeheer en de juiste opslag van deze stoffen.
Separation and segregation	53	BAT is to separate the storage area or building of packaged dangerous substances from other storage, from ignition sources and from other buildings on- and off-site applying a sufficient distance, sometimes in combination with fire-resistant walls.	yes	Ten bestrijding van calamiteiten beschikt FrieslandCampina Lochem over een actueel Bedrijfsnoodplan.
	54	BAT is to separate and/or segregate incompatible substances	yes	Nabij de opslag zijn de benodigde handbrandblussers aanwezig.
Containment of leakage and contaminated extinguishant	55	Install a liquid-tight reservoir that can contain all or a part of the dangerous liquids stored above such a reservoir depended of the risk and eco sensitivity of the environment.	yes	Voor deze handbrandblussers is een onderhouds-/keuringscontract afgesloten
	56	Install a liquid tight extinguish and collecting provision in storage buildings and storage areas.	yes	
Fire-fighting equipment	57	BAT is to apply a suitable protection level of fire prevention and fire-fighting measures	yes	
	58	BAT is to prevent ignition at source	yes	
Preventing ignition				
5.1.3 Basins and Lagoons				
	59	Storage of basins and lagoons for manure slurry in agricultural premises and water and other non-flammable or volatile liquids in	n.v.t.	
	60	Where emissions to air from normal operation are significant, BAT is to cover basins and lagoons with plastic cover, floating cover or a rigid cover	n.v.t.	
	61	In case of overflowing due to rainfall when the basin is not covered, enough free board must be applied 750 mm is common.	n.v.t.	
	62	Risk of soil contamination BAT is to apply a impervious barrier e.g. flexible membrane, sufficient clay layer or concrete	n.v.t.	

Chapter BREF	Nr	Description	Compliance	Remarks
5.1.4 Atmospheric mined caverns	63	BAT is to apply vapour balancing	n.v.t.	
	64	BAT is to apply storage for large quantities of hydrocarbons where the site geology is suitable.	n.v.t.	
	65	Apply a safety management system	n.v.t.	
	66	Monitoring program: Monitoring hydraulic flow pattern around the caverns by means of groundwater measurements, piezometers and/or pressure cells, seepage water flow rate metering	n.v.t.	
	67	Monitoring cavern stability by seismic monitoring	n.v.t.	
	68	Apply water quality follow-up procedures by regular sampling and analysis	n.v.t.	
	69	Corrosion monitoring including periodic casing evaluation	n.v.t.	
	70	To prevent stored product from escaping the cavern, the hydrostatic groundwater pressure of the surroundings must be always greater than the stored product in the cavern.	n.v.t.	
	71	To prevent seepage water to enter the cavern, apart from proper design, cement injection is applied additionally.	n.v.t.	
	72	If seepage water is pumped out of the cavern, waste water treatment must be applied.	n.v.t.	
	73	Automated overfill protection is BAT	n.v.t.	
5.1.5 Pressurized mined caverns	75	see 5.1.4	n.v.t.	
	76	Install down hole safety valves, to prevent problems in case of a surface emergency event	n.v.t.	
5.1.6 Salt leached caverns	77	see 5.1.4	n.v.t.	
	78	Small traces of hydrocarbons may be present at the brine/hydrocarbon interface due to filling and emptying of the caverns. Separation these hydrocarbons in a brine treatment unit and to collect and dispose of them safely	n.v.t.	
5.1.7 Floating storage	79	not BAT	n.v.t.	
5.2 Transfer and handling of liquids and liquefied gases				
5.2.1 general measures				
Inspection and maintenance	80	Install proactive inspection and maintenance plan	yes	Het zorgsysteem richt zich op de beheersing van de milieugerelateerde risico's die zich voordoen bij de werkzaamheden in het bedrijf. De beheersing is hierbij zodanig geregeld dat de eventuele milieueffecten geminimaliseerd worden. Maatregelen richten zich op het weg nemen van de bron/oorzaak, minimaliseren van het effect of monitoring en onderhoud.
Leak detection and repair programme	81	Install leak detection and repair program	yes	
Emissions minimisation principle in tank storage	82	Abate emissions from tank storage, transfer and handling that have a significant negative environmental effect	n.v.t.	
Safety and risk management	83	Apply a safety and risk management system	yes	
Operational procedures and training	84	Implement and follow adequate organisational measures and to enable the training and instruction of employees for safe and responsible operation of the installation	yes	
5.2.2 Considerations				
5.2.2.1 Piping				
	85	Apply aboveground closed piping in new situation	yes	Grotendeels sprake van bestaand leidingwerk. Bij vervanging, retrofit of upgrade wordt leidingwerk conform interne richtlijnen aangelegd. De interne richtlijnen borgen dat aan de hier genoemde uitgangspunten voldaan wordt bij nieuw te plaatsen onderdelen. Onderhoud vindt plaats conform dezelfde interne richtlijnen.
	86	Minimize number of flanges by replacing them by welded connections within the limitation of operational requirements for equipment maintenance or transfer system flexibility	yes	
	87	BAT for bolted flange connections include: * fitting blind flanges to infrequently used fittings to prevent accidental opening * using end caps or plugs on open-ended lines and not valves * ensuring gaskets are selected appropriate to the process application * ensuring the gasket is installed correctly * ensuring the flange joint is assembled and loaded correctly	yes	
		* in case of toxic, carcinogenic or other hazardous substances are transferred, fitting high integrity gaskets, such as spiral wound, hemm-profile or ring joints		
	88	BAT is to prevent corrosion by: * select construction material that is resistant to the product * applying proper construction methods * applying preventive maintenance * where applicable apply an internal coating or adding corrosion inhibitors	yes	
	89	BAT is to apply a one, two or three layer coating system depending to site-specific conditions (e.g. close to sea) to prevent piping from external corrosion.	yes	
5.2.2.3 Valves				
	90	Correct selection of the packing material and construction for the process application	yes	
	91	Focus monitoring schemes at the valves most at risk (such as rising stem control valves in continuous operation)	yes	
	92	Applying rotating control valves or variable speed pumps instead of rising stem control	yes	
	93	Where toxic, carcinogenic or other hazardous substances are involve, fit diaphragm, bellows, double walked valves	yes	
	94	Route relief valves back into the transfer or storage system or to a vapour treatment system	yes	
5.2.2.4 Pumps and compressors				
Installation and maintenance of pumps and compressors	95	Design, installation and operation of the pump or compressor heavily influence the life potential and reliability of the sealing system.	n.v.t.	
	96	Fix pump or compressor unit to base-plate or frame	yes	
	97	Connect pipe forces within producers' recommendations	yes	
	98	Proper design of suction pipe work to minimize hydraulic imbalance	n.v.t.	
	99	Align shaft and casing to producer's recommendations	yes	
	100	Align driver/pump and compressor within producers' recommendations	yes	
	101	Correct level of balance of rotating parts	yes	
	102	Effective priming of pumps and compressors prior to start-up	yes	
	103	Operation of pumps and compressors within performance range	yes	
	104	The level of net positive suction head available should always be in excess of the pump or compressor	yes	
	105	Regular monitoring and maintenance of both rotating equipment and seal systems, combined with a repair or replacement programme	yes	
Sealing systems in pumps	106	BAT is to use the correct selection of pump and seal types for the process application preferably pumps that are technologically designed to be tight such as: canned motor pumps, magnetically coupled pumps, pumps with multiple mechanical seals and seals dry to the atmosphere, diaphragm pumps or bellow pump.	yes	
Sealing systems in compressors	107	BAT for compressors transferring non-toxic gases is to apply gas lubricated mechanical seals	yes	
	108	BAT for compressors, transferring toxic gases is to apply double seals with a liquid or gas barrier and to purge the process side of the containment seal with an inert buffer gas	n.v.t.	
5.2.2.5 Sampling connections				
	109	BAT for sample points for volatile products, is to apply a ram type sampling valve or a needle valve and a block valve. Where sampling lines require purging, BAT is to apply closed-top sampling lines	n.v.t.	
	110	BAT is to apply a triple tandem system in very high pressure systems	n.v.t.	
5.3 Storage of solids				
	111	BAT is to apply enclosed storage by using for example silos, bunkers, hoppers and containers	yes	
5.3.1 Open storage				Melkpoeder wordt via afgesloten (niet open air) systemen geladen en gelost
	112	When open storage is unavoidable, it's BAT to carry out regular or continuous inspections to see if dust emissions occur and to check if preventive measures are in good working order	n.v.t.	
	113	Following the weather forecast by e.g. using meteorological instruments on site, will help to identify when moistening of the heaps (Ex coal storage) is needed and when not (in case of rain)	n.v.t.	
	114	BAT for long term open storage are one, or a proper combination of the following techniques: *Moistening the surface with durable dust-binding substances *Covering the surfaces with tarpaulins *Solidification of the surface *Grassing-over of the surface	n.v.t.	
	115	BAT for short term open storage are one, or a proper combination of the following techniques: *moistening the surface using durable dust-binding substances *moistening the surface with water *covering the surface e.g. with tarpaulins	n.v.t.	
	116	Placing longitudinal axis of the heap parallel with the prevailing wind	n.v.t.	
	117	Applying protective plantings, windbreak fences or upwind mounds to lower the wind velocity	n.v.t.	
	118	Applying only one heap instead of several heaps as far as possible, with two heaps storing the same amount as one, the free surface increases with 26 %	n.v.t.	
	119	Placing retaining walls close together	n.v.t.	
Long and short term storage	120	Applying storage with retaining walls reduces the free surface, leading to a reduction of diffuse dust emissions; this reduction is maximized if the wall is placed upwind of the heap	n.v.t.	

Chapter BREF

5.3.2 Enclosed storage

Nr	Description	Compliance	Remarks
121	BAT for silos is to apply a proper design to provide stability and prevent the silo from collapsing	yes	Er loopt een programma explosieveiligheid. Daar wordt voornamelijk gekeken naar explosieveiligheid van procesapparatuur, omdat daar het grootste risico ligt
122	BAT is to apply dust abatement and a BAT associated emission level of 1 - 10 mg/m ³ , depending on the nature/type of substance stored	yes	
123	For a silo containing organic solids, BAT is to apply an explosion resistant silo, equipped with a relief valve that closes rapidly after the explosion to prevent oxygen entering the silo	no	

5.3.3 Storage of packaged dangerous solids

124	see 5.1.2	n.v.t.	
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5.4 Transfer and handling of solids

5.4.1 General approaches

125	Prevent dust dispersion due to loading and unloading activities in the open air, by scheduling the transfer as much as possible when the wind speed is low	n.v.t.	Melkpoeder wordt via afgesloten (niet open air) systemen geladen en gelost
126	BAT is to make transport distances as short as possible and to apply, wherever possible, continuous transport modes (conveyor transport instead of trucks)	n.v.t.	
127	When using a mechanical shovel, it is BAT to minimize the drop height and choose the best position during discharge	n.v.t.	
128	Minimize dust swirl up through adjusting speed of vehicles on site which necessarily drive through the solids spread on the ground	n.v.t.	
129	Apply hard surfaces to roads, to be able to easily clean the road. Minimize dust swirl up	n.v.t.	
130	Clean roads with hard surfaces	n.v.t.	
131	Cleaning of vehicle tires	n.v.t.	
132	Moistening of product when not compromising product quality, plant safety, nor water resources, to minimize dust	n.v.t.	
133	For loading and unloading activities, BAT is to minimize the speed of descent and the free fall height of the product	n.v.t.	
134	Minimizing speed of descent by installing baffles in the fill pipes, applying a loading head at the end of the pipe or tube to regulate the output speed, apply a cascade, apply minimum slope angle with chutes	n.v.t.	
135	Minimizing free fall height of the product the outlet of the discharger should reach down onto the bottom of the cargo space or onto the material already piled up. BAT is to install height adjustable fill pipes, height adjustable fill tubes and height adjustable cascade tubes	n.v.t.	

5.4.2 Considerations on transfer techniques

Grabs

136	BAT for new grabs is to use grabs with the following properties: geometric shape and optimal load capacity; grab volume is always higher than the volume that is given by the grab curve; the surface is smooth to avoid material adhering; good closure capacity during permanent operation	n.v.t.	Melkpoeder wordt via afgesloten (niet open air) systemen geladen en gelost
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Conveyors and transfer chutes

137	Design transfer chutes of conveyor systems in a way spillage is reduced to a minimum	n.v.t.
138	For slightly drift sensitive products (S5) and moderately drift sensitive, wettable products (S4) BAT is to apply an open belt conveyor and additionally use a combi of the following techniques	n.v.t.
139	Lateral wind protection, spraying water and jet spraying at the transfer points, belt cleaning	n.v.t.
140	Highly drift sensitive products (S1 and S2) and non-wettable products (S3) BAT is to apply closed conveyors, or types where the belt itself or a second belt locks the material: pneumatic conveyors, trough chain conveyors, screw conveyors, tube belt conveyors, loop belt conveyors or double belt conveyors or apply enclosed conveyor belts without support pulleys such as aero belt conveyor, low friction conveyor or conveyor with diabolos	n.v.t.

Existing conventional conveyors

141	BAT is to apply housing, for existing conveyors transporting highly drift sensitive products (S1 and S2) and moderately drift sensitive, not wettable products (S3)	n.v.t.	
142	BAT is to apply energy reducing measures such as a good conveyor design, accurate installation tolerance, belt with low rolling resistance	n.v.t.	