



Procedure

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# Instructions to Master

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## About this document

<b>Purpose</b>	This procedure describes minimum operational requirements for Offshore Service Vessels working for, or on behalf of Aker BP.
<b>Valid for</b>	This procedure applies to all organizational units and geographical locations
<b>Revision Period</b>	2 Years
<b>Non-conformity/ Deviations</b>	If unable to comply with requirements stated in this document, process for deviations and non-conformity applies.


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<b>Rev.no.</b>	<b>Date</b>	<b>Description of Change</b>
5.0	2021-10-13	<i>New chapter 7.4, 7.4 Unmanned aerial vehicle (UAV) operations</i>
4.0	2019-12-13	<i>Changes to section 7.1, New section 13.</i>
3.0	2017-12-04	<i>Changes to section 7.1</i>
2.0	2017-08-14	<i>Changes in Appendix 1.</i>
1.0	2017-06-12	<i>New document</i>

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## 1 Responsibility

**Aker BP** – It is the responsibility of Aker BP to ensure that requirements in this document are included in contracts and in relevant project and operational documentation.

**Contractor** – It is the responsibility of Contractors to ensure that the requirements in this document are adhered to and that any non-conformance to these requirements are reported to Aker BP without delay.

Nothing in this document or any related Aker BP policies shall relieve the Owner, Manager and Master from their responsibility for the safety and seaworthiness of the vessel, or for the safe operation of the vessel.

## 2 Vessel requirements

In addition to this procedure, further minimum technical and operational requirements for vessels are described in the following Aker BP documents:

- 55-000276 Minimum Requirements for Dynamic Positioned (DP) Vessels
- 55-000278 Minimum Technical and Operational Requirements for Offshore Service Vessels

## 3 Guidelines for Offshore Marine Operations (G-OMO)

In general all offshore service vessels working for, or on behalf of Aker BP, shall operate in accordance with “Guidelines for Offshore Marine Operations (G-OMO)”, and “Norwegian Oil & Gas / Norwegian Shipowners’ Association – Operations Manual for Offshore Service Vessels on NCS”.

This procedure gives Aker BP’s additional instructions for the safe and efficient operation of offshore service vessels.

## 4 Rules and Regulations


Acts and Regulations that are legally binding for Aker BP’s Petroleum Activities on the Norwegian Continental Shelf shall also be followed, where relevant, by Aker BP’s Contractors involved in petroleum activities on the NCS, including, but not limited to, following Acts and Regulations:

- Petroleum Activities Act
- Working Environment Act
- Health Legislation
- Pollution Control Act
- Product Control Act
- Petroleum Safety Authority’s (PSA) regulations

For operations and activities under maritime legislation, relevant maritime rules and regulations shall apply.

## 5 HSE

All Marine operations carried out for, or on behalf of, Aker BP shall be executed with a high level of focus on safety and the environment. It is expected that all incidents, near misses related to health, safety, environment and non-conformities related to quality is reported to Aker BP in accordance with contracts and Aker BP’s instructions.

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Vessels and vessel Managers are responsible for the planning and execution of vessel operations, and shall have procedures and routines implemented to ensure safe and efficient operations in accordance with legislations and established industry standards.

All personnel involved in operations for or on behalf of Aker BP have an obligation to 'Stop the Job' at any time they have a safety concern and/or for any reason, the agreed plan is not being followed.

## 5.1 Emergency response duties

During the transit from shore to offshore location and from leaving the offshore location back to shore, the responsibility for handling all emergency response situations lays with the vessel Owners/Managers.

For activity within Aker BP's owned or operated facilities safety zone, Aker BP is overall responsible. The OIM is Aker BP's representative.

For Manned Underwater Operations, Aker BP is overall responsible. Intersections between Aker BP and Contractor Emergency Response duties will be described in a Bridging Document.

Emergency Response duties for other work in connection with facilities or sites without a safety zone (i.e. some subsea facilities, survey locations, etc.) will be described in a bridging document.

## 5.2 Emergency notification

The emergency response during an incident shall be according to the established bridging document and/or Emergency Notification Flowchart (ENF).

## 5.3 Notifications of incidents

All incidents that occur inside the safety zone shall be reported to the OIM at respective installation.

OIM at the respective installation can be contacted by contact details as per Installation Data Card / ENF / Bridging document.

Outside the safety zone, incidents on board the vessel shall be reported as described in bridging document and/or Emergency Notification Flowchart (ENF).

## 5.4 Personal Protection Equipment


Vessels and vessel Managers are responsible for making sure that proper PPE is available for personnel working on board vessels, and that correct PPE is used as required for the different work tasks.

## 5.5 NORSOK R-003

NORSOK R-003 shall be used for offshore supply operation, and for other operations where this may be relevant. For operations under marginal weather conditions the Appendix K checklist shall be completed before any operations can commence.

## 5.6 Hot work within the safety zone

Hot work is in general prohibited within the safety zone. For special projects a dispensation may be given based on a formal risk assessment. In such cases this shall be approved by Aker BP, and shall be handled through the permit to work (PTW) system on the installation. Hot work and use of incinerator should in general be avoided.

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## 5.7 Risk Assessment

In order to achieve safe operations of offshore service vessels, close to or within the Safety Zone, all identified risk areas shall be assessed as appropriate. For such assessments section 4 in G-OMO shall be followed, Ref. □

## 5.8 Safe Job Analysis and Toolbox Talks

Before commencing work with potential risks or hazards, a Safe Job Analysis shall be carried out with the involved parties. "Toolbox Talks" with involved crew shall also be organized before commencing critical or complex operations. This should include:

- Individual roles
- Tools, methods and procedures to be used
- Review of RA or SJA and PTW

## 5.9 Permit to Work/SIMOPS

Non routine work within an offshore installations safety zone, or on/near subsea facilities, is subject to the relevant installations SIMOPS procedure and may be subject to the offshore installations permit to work system. In such cases no work is allowed to commence before SIMOPS approval is given and a PTW is received from the offshore installation.

Responsible department in Aker BP shall inform all involved parties and ensure the PTW system and relevant SIMOPS procedure is followed.

# 6 Vessel management


## 6.1 Masters Responsibility

It is the responsibility of the Master on offshore service vessels working for, or on behalf of Aker BP, to ensure the vessel complies with, but not limited to, the below:

- G-OMO
- Operations Manual for Offshore Service Vessels – NCS
- NORSOK R-003 – Safe use of lifting equipment
- Contract and instructions from Aker BP
- Statutory requirements, industry guidelines and contractual requirements for crew qualifications
- Relevant procedures provided by Aker BP

## 6.2 Crew Qualification

The Contractor's management system shall describe the requirements for qualifications, competence and experience for officers and crew. Procedures shall be in accordance with STCW, and shall include requirements for personnel involved in DP operations at all levels. These requirements shall be based on recognized industry standards as described in e.g. NI, DNV, IMCA, and G-OMO etc. Such procedures must at all times be updated to cover the latest standard in the industry.

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### 6.3 Manning

The manning of the vessel shall always be in accordance with G-OMO section 5 for the different types of operations to be carried out.

When operating inside a safety zone there shall always be 2 navigators on the bridge. For all DP operations inside a safety zone, a minimum of one Senior and one Junior DPO shall always be present on the bridge.

### 6.4 Mobilization and Demobilization

A mobilization/demobilization form (onhire/offhire statement) shall be issued by Contractor to document consumables to be paid by Aker BP (e.g. bunkers, lube oil, urea etc.).

### 6.5 Variation Orders

The vessel master shall present a variation order for approval by the client rep or responsible department in Aker BP before commencing any additional services not covered by the hire contract or charterers instructions. For projects and scope of work where such additional services may be applicable, a form for variation orders should be included in the hire contract.

## 7 Operations

### 7.1 Entering the Safety Zone

Field and operator specific requirements and procedures shall be followed when entering and working within an Installation's safety zone. In addition, the general requirements given below shall always be followed:

- The OIM is in charge of all activity within the safety zone. No vessels are allowed to enter the safety zone without permission from the Offshore Installation.
- DP operations shall be according to Activity Regulation. DP vessels shall have documented technical redundancy, through a valid "Failure Mode and Effect Analysis" (FMEA). DP operations with vessels holding DP equipment class I is not accepted inside the safety zone.
- Non DP vessels holding a valid Norwegian certificate as Standby Vessel or holding a valid document of compliance towards Norwegian Standby Regulations, are normally accepted inside the safety zone. Cargo operations should however be kept to a minimum, and normally only to accommodate necessary provisions, spare parts and waste handling for the Standby Vessel.
- Smoking is prohibited on decks of vessels within the safety zone of the offshore installation.
- Speed of moves inside 500 m zone (ref: DNVGL-RP-E307):
  - From 500 m to 200m,  $\leq 0.5$  m/sec (approx. 1 knot)
  - From 200 m to work location  $\leq 0.3$  m/sec (approx. 0.6 knot)


### 7.2 Technical pre-checks prior to entering the safety zone

In order to ensure that the vessel is in full technical and operational condition, prior to entering the offshore installation's safety zone, a pre-check of all essential maneuvering functions shall be performed outside of the safety zone.

In addition reference is made to G-OMO Section 8.5. The checklist found in G-OMO Appendix 8-A shall be used prior to entering the safety zone.

Prior to any DP operation, a special pre-check, in accordance with system manufactures recommendations, should be carried out, well outside of the safety zone.



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Any deviations are subject to a risk evaluation and approval has to be obtained from the OIM prior to entering the safety zone. The OIM should seek advice from marine authority and handle any deviation as appropriate.

### 7.3 DP Operations

DP operations shall be in accordance with Aker BP's 55-000276 - Minimum Requirements for Dynamic Positioned (DP) Vessels.

Selected DP equipment class shall always be in accordance with "PSA activity regulation § 90". DP operations within an offshore installations safety zone shall only be carried out by vessels operating to minimum DP equipment class II configuration.

Design and operation of DP systems shall be in accordance with the definitions in IMO MSC/Circ.1580 and IMCA M103.

DP operations inside the safety zone or while conducting well intervention, construction and/or diving operations the power management configuration shall be set up with open bus-tie configuration.

### 7.4 Unmanned aerial vehicle (UAV) operations

Operations with unmanned aerial vehicles (drones) shall not be conducted within an installation's safety zone without prior approval from respective OIM.

UAV operations shall always be conducted according to relevant regulations which can be found CCA Norway's web page: [Civil Aviation Authority -Norway \(luftfartstilsynet.no\)](http://www.luftfartstilsynet.no)

## 8 HSEQ Reporting

### 8.1 General reports

In addition to emergency notification as described in relevant Bridging Documents and/or ENF, the following reports shall be sent:

- HSE reports
- Incidents reports,
- Non-conformity reports
- Other relevant reports

These reports shall be sent to:  
[marinereports@akerbp.com](mailto:marinereports@akerbp.com)


### 8.2 Monthly reports

For vessels on term contracts longer than one month, following monthly reports shall be sent:

- HSEQ Reports including KPIs
- Any suggestions for improvements

Reports shall be sent to: [marinereports@akerbp.com](mailto:marinereports@akerbp.com)

Other email addresses may also be applicable in addition to the one described here. These will be described in project specific documentation.

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## 9 Definitions

### **Client Rep**

Means Aker BP's representative onboard Contractor's vessel

### **Contractor**

Means any company employed by Aker BP to carry out Marine Operations activities according to Hire Contract

### **Hire Contract**

Means the agreement or charter party between Aker BP and the Contractor defining scope of work, terms and conditions, and compensation for the work to be carried out by the Contractor

### **Offshore Installation**

Means Operator's fixed installations and Mobile Offshore Units

### **Offshore Installation Manager (OIM)**

Means the manager onboard the Offshore Installation, ultimately in charge of all operations within the Safety Zone

### **Operation**

Means Marine Operation

### **Operator**

Means the Company responsible for operating the Offshore Installation

### **Safety Zone**

Means an area extending 500m horizontally and vertically from the borders of the Offshore Installation, where the OIM has the full jurisdiction in order to ensure necessary control of activities influencing the Offshore Installation's level of safety

### **Variation Order**

Means a variation to the Hire Contract, agreed between Aker BP and Contractor

### **Vessel**

Means Contractor's vessel hired to perform the work according to the Hire Contract

### **Vessel Master**

Means the officer in charge of the Vessel

## 10 Abbreviations

DP	Dynamic Positioning
ENF	Emergency Notification Flowchart
ETA	Estimated Time of Arrival
FMEA	Failure Mode and Effect Analysis
G-OMO	Guidelines for Offshore Marine Operations
IMCA	International Maritime Contractors Association
NCS	Norwegian Continental Shelf
OIM	Offshore Installation Manager
PPE	Personal Protection Equipment
PSA	Petroleum Safety Authority Norway
PTW	Permit to Work
RA	Risk Assessment
ROV	Remotely Operated Vehicle
SJA	Safe Job Analysis


## 11 References

- Guidelines for Offshore Marine Operations (G-OMO) – [www.g-omo.info](http://www.g-omo.info)
- DNVGL-ST-N001 Marine operations and marine warranty
- Norwegian Oil and Gas/Norwegian Shipowners' Association – Operations Manual for Offshore Service Vessels on NCS
- Water report 129 - Safe, sufficient and good potable water offshore. A guideline to design and operation of offshore potable water systems

### Aker BP Procedures:

#### Marine Operations

- 55-000276 Minimum Requirements for Dynamic Positioned (DP) Vessels
- 55-000278 Minimum Technical and Operational Requirements for Offshore Service Vessels

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## 12 Appendix 1 - Supply Vessels

This appendix describes additional information and requirements for vessels contracted to perform supply duties to offshore installations.

### 12.1 Logistics Centre

The Logistics Centre coordinates all logistics for Aker BP and Repsol Norge installations offshore. Vessel instructions will be sent by Vessel Coordinators

#### 12.1.1 Vessel Coordinators

- Office hours weekdays between 08:00 - 16:00
- Duty between 16:00 - 08:00 + weekends and holidays
- Vessel Coordinators (24/7)
  - +47 51 35 80 31 (sleeping duty)
  - E-mail: [vessel@akerbp.com](mailto:vessel@akerbp.com)

Calls between 22:00 - 08:00 should be kept to a minimum and be related to urgent operational matters only (sleeping duty).

E-mail will normally not be read outside office hours except if agreed by phone with the duty holder.

#### 12.1.2 Daily afternoon phone conference:

A conference call takes place every afternoon for all vessels in port to participate, on working days only.

- @15:00hrs for the southern fields, (dial +47 73 87 50 54, pin. 1234)

#### 12.1.3 Marine Logistics Plan

A Marine Logistics Plan is prepared daily. This will be distributed out by the Vessel Coordinators during the morning.

The plan provides all the necessary details for voyages from the base that day and the plans for the near future. Deviations from the plan must be agreed with the Vessel Coordinators.

#### 12.1.4 Sailing order


Before all departures from the base a sailing order shall be distributed. The vessel shall set best economic speed in order to meet the relevant sailing order and route plan. Deviations to the plan shall be agreed with the Vessel Coordinator.

#### 12.1.5 Deviations from the vessel scheduling:

Deviations from the planned sailing must not take place without permission from Vessel Coordinators. If major delays to the vessel scheduling occur the vessel should inform Vessel Coordinator. In cooperation with the installations, the Vessel Coordinators will consider which actions should be taken to avoid undesirable delays and unacceptable costs.

The following are the criteria for major delays:

- > 60 minutes for offshore activities
- > 30 minutes for quay side activities

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## 12.2 Supply base information

ASCO is the main logistics provider for the Logistics Centre

### 12.2.1 Before arrival in Port

In due time before arriving the supply base the vessel should call ASCO for berth allocation and berth facilities (water hoses, linesmen, etc).

If a vessel is departing from installation after 22:00, ASCO should be notified the next day at 08:00. If ETA is before 08:00 please notify before 22:00.

It is emphasized that no vessel shall commence mooring operations unless there is someone on the jetty to take the mooring lines.

### 12.2.2 Entering ISPS area

To get access to the ISPS area, the vessel has to call the Port Authority for instructions.

### 12.2.3 ASCO Tananger supply base

#### ASCO Marine

- Weekdays between 08:00 - 16:00
- +47 481 63 363 / 64

Duty between 16:00 - 08:00 (sleeping duty)

- +47 911 54 389

Duty between 22:00 - 08:00 Securitas Linesmen)

- +47 918 87 407
- [tananger.kai@ascoworld.com](mailto:tananger.kai@ascoworld.com)

#### Stavangerregionen Havnedrift (Port Authority at Sola Havn)

- All hours (office hours from 06:30 - 22:00)
- +47 51 50 12 01
- VHF channel during office hours, Ch 12


### 12.2.4 ASCO Sandnessjøen supply base

#### ASCO Marine

- Weekdays between 08:00 - 16:00
- +47 75 07 04 12
- Duty between 16:00 - 08:00 + weekend/holidays:
- +47 95 33 66 99
- E-mail: logistics: [logistics.sandnessjoen@ascoworld.com](mailto:logistics.sandnessjoen@ascoworld.com)

#### Sandnessjøen vaktelskap (only linesmen)

- Duty between 16:00 - 08:00 + weekend/holidays
- +47 99 29 11 00

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## **Alstahaug Havnevesen (Port Authority at Horvnes)**

- All hours (office hours from 08:00 - 16:00)
- +47 75 07 57 00
- VHF channel 12

## **12.3 General Information**

### **12.3.1 Tank cleaning**

The Vessel Coordinator is responsible for booking tank cleaning. Before a contractor can start any cleaning operations on board a vessel, a toolbox meeting shall be held between the vessel master and the supervisor of the cleaning operation. At the meeting a safe job analysis and risk assessment shall be conducted and a work permit prepared. In this connection, GOMO guidelines "Checklist for Tank Cleaning" should be used in accordance with the work permit.

### **12.3.2 Bulk**

Bulk is available at Quay 23 or 24 (Asco Base) and Quay 5 (Norsea) in Tananger and at Quay 1 and 2 at Horvnes in Sandnessjøen. ASCO Supply base is responsible for booking a quay and coordinating with the bulk supplier through bulk orders which is sent to the supplier and the vessel. According to GOMO guidelines a loading meeting must always be held with supplier personnel before bulk is loaded/unloaded to ensure that the operations take place in an entirely safe and controlled manner. It is important to take care of declarations and datasheets for all bulk loaded on the vessels tanks. Depending on the type of cargo, Logistics Centre uses the companies Baker (mud chemicals, return waste/return bulk and tank cleaning), Halliburton (mud chemicals and cement), MI Swaco (mud chemicals) and Statoil Norge (fuel/MGO).

When operating from other supply bases, vessels will get procedures from the Vessel Coordinator.


### **12.3.3 Loading meeting and loading plan**

A loading meeting shall be conducted between the vessel, supply base and dockers before loading commence. At the meeting the planned loading operation is reviewed, taking into account hazardous goods, position of cargo, urgent lifts, communication, risk identification and other important matters. According to GOMO guidelines the vessels shall prepare a deck area map. This map shall be submitted through the WELS client at the earliest convenient time after loading. When the vessel saves the deck map to web (submitted), this image is made available to all affected personnel both onshore and offshore through the WELS system.

### **12.3.4 Shipping manifest and hazardous goods**

The vessels receive a shipping manifest from the ASCO supply base for all outgoing cargo. The vessels shall receive a preliminary manifest or loading list before the installation starts backloading to the vessel. The final manifest is received before the vessel leaves the field. The manifest shall state whether the cargo contains hazardous goods. Documentation (HSE data sheet and IMDG transport documents) for hazardous goods shall be forwarded to the vessel before such cargo is put down on the vessel, also in those cases where the vessel is used for temporary storage or in-field-transfer.

We expect the captain to say NO to cargo with missing documentation, and to contact the Vessel Coordinator.

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Reporting of hazardous goods to the Norwegian Coastal Administration (Kystverket) must take place in accordance with the current regulations (1999-06-16 No 727: Forskrift om krav til melding og utfylling av kontrolliste ved fartøyers transport av farlig eller forurensende last). In practice, this is reported by the vessel in SafeSeaNet. See [www.shipprep.no](http://www.shipprep.no) for more information.

### **12.3.5 Backload**

The installations report their needs for backload the day before sailing. Pursuant to the GOMO guidelines, at least 10% of the deck area should be reserved for backload. During ongoing loading operations for outbound cargo, the vessels are responsible for notifying ASCO when the 10% limit is reached. This area may only be reduced upon approval from the Vessel Coordinator after they have cleared the situation with the affected installations on the sailing route.

### **12.3.6 Fuel bunkering**

Needs for re-fuelling should be communicated to the Vessel Coordinator. Daily ROB qty (m3) should be reported in Wels @23:59hrs each day.

In general vessels are not allowed to deliver fuel to any installations without a written approval from the vessel Coordinator. Before any fuel delivery to installations, the fuel tanks must be tested and approved. Spot vessels are normally not use for bunker supply.

Due to the risk of fuel contamination at the installations, Logistics Centre has stringent fuel quality requirements. No vessels on a short-term contract are allowed to supply fuel offshore before fuel samples have been taken and the results show a satisfactory quality. Logistics Centre uses the company Intertek Westlab for sampling and analysis.

For the vessels set up with fuel sample Pelicase delivered by Logistics, samples will be taken by vessel crew and sent to:

Intertek West Lab AS  
Oljeveien 2  
4056 Tananger

The suitcase will immediately be returned to the vessel with new set of bottles for next periodic sample.

ASCO checks fuel quality on the quayside plant prior to fuelling of the vessel. If the fuel is of satisfactory quality, fuel is allowed transferred to the vessel tanks.

The vessels maintains monthly fuels samples issued to lab for analysis. Quick tests may be used for spot checks or if suspecting low quality fuel.


Fuel older than a month, shall not be delivered to the installations or mixed with new fuel

Before offloading to an installation, the installation shall sample the fuel. If the fuel is of satisfactory quality, fuel is allowed to be transferred to the installation.

### **12.3.7 Fuel efficiency**

Vessel shall sail with economy speed. The ETA on the siling order and rout plan will determine the speed to be used. Any deviations from this shall be approved by the Vessel Coordinator.

The vessel should consider lower speeds where there is opportunity for it. Examples:

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- If the vessel is sailing to a installation with opening hours from 07:00 - 19:00, and estimated arrival is outside working hours. This shall be agreed with the Vessel Coordinator and affected installation.
- If the vessel is finished with last installation on a voyage, and ETA to base is at night time, speed should be adjusted so the arrival to base is in opening hours.

### 12.3.8 Weather reports

Logistics Centre has access to weather services from MET (Meteorologisk institutt). Everyone can access spot forecasts for Gyda/Ula and Tambar area, Skarv, Valhall, Alvheim, Ivar Aasen and Yme (and temporarily locations when a contracted drilling rig is present) by logging on to:

<http://butikk.met.no>

Username: AkerBp-Repsol

Password: Ak=BP

If other contracted drilling rigs is not listed at webpage above, please contact the vessel Coordinator for login info.

The vessel coordinator gives permission to supply potable water once the results have been confirmed to be satisfactory. Potable water on board vessels coming from abroad shall never be supplied to Logistics Centres installations. The tanks must be emptied, flushed and filled with fresh water from supply base and water samples must be taken to make sure the quality is satisfactory.

Please note that due to the risk of contamination of the water tanks, Logistics Centre does not allow potable water to be supplied as drill water offshore. Deviation from this only after approval from the Vessel Coordinator.

## 13 Potable water bunkering

Bunkering of potable water primarily takes place at ASCO supply base (Quay 20-24 in Tananger and Quay 1-3 at Horvnes) or other bases. Capacities for each quay are listed at page 10-11. To avoid late departures from the quay, the vessels are requested to use two hoses if necessary.

Please note that the water hoses use Brass couplings and have to be treated with special care. Do NOT throw them from cargo rail down to the jetty.


In general, vessels are not allowed to deliver potwater to any installation without a written approval from the Vessel Coordinator. Before any potable water delivery, the vessels potable water tanks must be tested and approved.

Due to the risk of potable water contamination at our installations, Logistics Centre has strict water quality requirements. No vessels on a short-term contract are allowed to supply potable water offshore before water samples have been taken and the results show a satisfactory quality. Logistics Centre uses the company Intertek West Lab for all water analysis.

For the vessels set up with water sample Pelicase delivered by Logistics Centre, samples will be taken by vessel crew and sent to:

Intertek West Lab AS  
Oljeveien 2  
4056 Tananger



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The suitcase will immediately be returned to the vessel with new set of bottles for next periodic sample. The vessels shall implement a routine for monthly water sampling.

### **13.1 Executive control**

The drinking water that is delivered to Aker BP`s installations must follow the quality requirements in this document. The water that is delivered to service/drill water also needs to be of the same quality as the drinking water and subject to the same testing protocols.

#### **13.1.1 Risk**

In addition to the requirements in the regulations (listed in chap. 1.4), this procedure shall be followed to minimize the risk for contamination of drinking water that is delivered from supply vessels.

#### **13.1.2 Responsibilities**

All the supply vessels that work for Aker BP have the responsibility for the total operation of the system that delivers the drinking water.

Every supply vessel has the responsibility to ensure that the necessary procedures are on board, and that these are followed by the personnel who are responsible for the operation of the drinking water system. The supply vessels own procedures must be in accordance with the procedures mentioned in this document. If this is not the case, the procedures in this document are to be followed. The vessels working procedures must be updated. The supply vessel needs to have a quality system that ensures safe operation and maintenance.


Drinking water for internal (own) use on the supply vessel is not regulated by this procedure, unless the operation of the internal drinking water system has an impact on the quality of the delivered drinking water (Eg. Mixing of tanks, use of common pipework etc.).

The personnel on board that have the responsibility for the drinking water must be aware of the following:

- Safe,Sufficient and Good Drinking Water (Water Report 128 / 129)
- The use of analytical equipment on board
- This document:
  - o Drinking Water Sampling Methods
  - o Receiving- and delivery procedure
  - o Cleaning and disinfection procedures for tanks and piping systems
  - o Chlorine dosing/calculation
  - o Monthly and daily reporting
  - o Deviation handling / reporting

#### **13.1.3 Competence**

Only personnel with drinking water competence shall perform work on the drinking water system and monitor that the handling and treatment of the drinking water system is performed correctly, to ensure safe water is supplied to Aker BP`s offshore installations. The training should focus on the delivery of drinking water. For supply vessels that produce their own drinking water for delivery to Aker BP`s offshore installations, personnel that operate the drinking water system must have the competence for drinking water as per guidance 128 / 129. Safe Sufficient and Good Potable Water Offshore.

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### **13.1.4 Regulations, standards and claim of compliance**

Aker BP has the following regulations, standards and quality requirements for this procedure:

#### **Ministry of Health and Care Services**

Regulations for water supply and drinking water ([FOR 2001-12-04 nr. 1372 Drikkevannsforskriften](#))

[NORSOK P-100 system 53](#). Process Systems

[NS-EN 1717 Beskyttelse mot forurensning av drikkevann i drikkevannsinstallasjoner og generelle krav til utstyr for å hindre forurensning ved tilbakestrømning](#)

#### **The Norwegian Food Safety Authority (Mattilsynet)**

[LOV 2003-12-19 nr 124 Lov om matproduksjon og mattrygghet \(matloven\)](#)

Guidance: Improved safety and alertness for the water supply.

[https://www.mattilsynet.no/mat\\_og\\_vann/vann/skipogoffshore/potable\\_water\\_on\\_board\\_ships.4809/binary/Potable%20water%20on%20board%20ships](https://www.mattilsynet.no/mat_og_vann/vann/skipogoffshore/potable_water_on_board_ships.4809/binary/Potable%20water%20on%20board%20ships)

Potable Water on board Ships

#### **Ministry of Trade, Industry and Fisheries**

[FOR-1987-09-04-860 Forskrift om drikkevannsanlegg og drikkevannsforsyning på flyttbare innretninger.](#)

#### **Norwegian Institute of Public Health (NIPH). Department of Water Hygiene:**

Guidance: [Vannrapport 128. Nok, godt og sikkert drikkevann offshore, 5. utgave.](#)

(English version: [Water report 129](#)).

Guidance 123 Legionella:

<https://www.fhi.no/globalassets/dokumenterfiler/rapporter/2015/forebygging-legionellasmitte-veiledning.pdf>


### **13.1.5 Reporting**

Analysis reports for bunkered or produced drinking water stored on supply vessels for delivery to Aker BP's installations shall be received by Aker BP prior to delivery and verified by the on board medic. In addition, reports associated to the water that is bunkered from onshore (Shoreside) should also be received by Aker BP. These reports should include analysis from the supply base (or authority responsible for the bunkering point / hydrant) as well as up to date analysis from the local waterworks supplying the municipality / area.

### **13.1.6 Deviations and exceptions**

Aker BP should be informed of any deviations from the quality requirements detailed in this document and in accordance to the regulations of drinking water.

The responsible offshore nurse with support of the onshore responsible doctor at have to consider and verify if the quality of the drinking water is satisfactory for delivery.

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### **13.1.7 System revision**

The supply chain of drinking water to all of Aker BP's installations must be audited at least every second year by qualified Aker BP personnel. This includes an audit of the drinking water system on the supply vessel and the supply base as a minimum.

## **13.2 System documentation**

### **13.2.1 Supply base**


Only supply bases approved by the appropriate authorities can deliver drinking water. The supply base must be able to document that the water is of the appropriate standard.

### **13.2.2 Drinking water supply vessel**

It should be documented that the drinking water system (hoses, tanks and bunkering systems) should secure the drinking water against contamination:

- The bunkering system must be completely drained after bunkering (both to and from the supply vessel) to avoid stagnant water.
- Permanent connections for other technical equipment to the pipe system for drinking water must be secured with the appropriate protection valve (BA Type protection valve) or similar solutions. In several situations, it has been proven that non-return valves do not provide sufficient protection and water has been passing through.
- All temporary hose connections to the drinking water system must be removed after use.
- All equipment connected to the bunkering system for the purpose of filling to the boat, must be disinfected before connection and after completion prior to storage.
- All pipes, hoses and tanks connected to the drinking water system must be correctly marked (for example by the Flo-Code system). <https://www.flo-code.no/>
- All use of chemicals for cleaning and disinfection of tanks and pipe systems must be approved by The Norwegian Food Safety Authority for use in drinking water systems. [https://www.mattilsynet.no/language/english/food\\_and\\_water/drinkingwater/chemical\\_products\\_for\\_drinking\\_water\\_treatment.24699](https://www.mattilsynet.no/language/english/food_and_water/drinkingwater/chemical_products_for_drinking_water_treatment.24699)
- Painting of tanks used for drinking water storage and transport– complete or patch repair paint work. Documentation must be provided for approval of the painting systems for internal use in drinking water tanks. Paint work of protective coating in drinking water tanks must be also be approved by an inspector certified as FROSIO-Inspector. Level III or NACE-Inspector level II.
- All tools, equipment and PPE used for work in drinking water tanks / systems must be solely dedicated for this purpose to avoid any chance of contamination of the drinking water.
- The drinking water that is loaded from shore to the vessel for delivery to offshore installations must be chlorinated and monthly analysis must be executed to ensure the quality of the drinking water. If negative consequences of the chlorine are discovered, the responsible drinking water consultant and medical doctor must evaluate if actions must be taken.

Supply vessels that produces drinking water for delivery must have an updated drinking water manual and risk and vulnerability analysis for the drinking water system. The drinking water manual must be revised yearly.

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A journal must be recorded according to attachment 10 and 11 for receiving and delivering drinking water. The journal is to be stored on the vessel.

Drinking water is not to be stored longer than 10 days before delivery to the offshore installation. If the need for drinking water demands for the delivery of water that has been stored longer than 10 days, Aker BP's responsible medical doctor must approve this prior to delivery.

### 13.2.3 Chemicals

Safety data sheets (MSDS) for all chemicals must be provided by the supplier and available on board.

Necessary personal protective equipment (PPE) must be available on board for use in regard to handling chemicals. This equipment must be strategically placed by chemical storage and areas where chemicals are being used.

When handling drinking water, chlorine is used for bacterial control and disinfection.

The following chlorine products may be used:

1. Sodium hypochlorite 15% (fluid phase. Limited storage time in concentrated form).
2. Sodium hypochlorite 5% (fluid phase. Storage time up to 6 months in concentrated form).

Lists of approved products/chemicals for use in drinking water or drinking water systems can be found on the website of The Norwegian Food Safety Authority. All chemicals to be used must be represented on this list.

[https://www.mattilsynet.no/language/english/food\\_and\\_water/drinkingwater/chemical\\_products\\_for\\_drinking\\_water\\_treatment.24699](https://www.mattilsynet.no/language/english/food_and_water/drinkingwater/chemical_products_for_drinking_water_treatment.24699)

### 13.3 Procedure for sampling, quality control

All vessels operating on behalf of Aker BP must adhere to routine sample analysis to ensure that they satisfy the quality requirements of drinking water on board. This applies to water that is to be delivered to Aker BP's offshore installations. If the supply vessel delivers water not satisfying the demands, delivery will be declined by the offshore installation. Stored water will be dumped, and the vessel must refill with new water before delivery.

The analysis must be based on attached analysis program for monthly scheduled sample taking and must be executed at least **once a month**. The samples must be collected from every tank that is used to deliver water to Aker BP's installations. Samples must be collected for analysis of THM (trihalometanes) to control the chlorine levels.

The upper limit for THM is set to **30 µg/l**. If the level is between 30 and 50 µg/l Aker BP must be contacted and the responsible medical personnel must evaluate if the water is approved for delivery. If the water is above the limit of 50 µg/l the water is not approved and must be dumped.

Newly contracted vessels must take water samples of all tanks for the purpose of analysis for chemicals / hydrocarbons (BTEX/THC). This is done to discover paint or other elements from the tanks could contaminate the drinking water. The same applies to vessels that operate on behalf of Aker BP when the vessel have modified their paint (patchwork or recoating) in the storage tanks for drinking water, or when using new tanks not previously designated for delivery of drinking water. Vessels or shipowners must report to Aker BP when modifications are implemented. Thereafter, yearly analysis must be done to ensure quality of drinking water and that any modifications have not negatively impacted the quality.

Water samples must be taken 30 minutes after completion of bunkering. All tanks used for drinking water must be tested. Analysis logs from supply vessels must be completed and delivered by the time of bunkering for Aker BP's offshore installations and logs from the previous 6 months must be presented if possible. Procedures for collecting samples are explained in attachments 4 and 5.

The results of the analysis from the supply base must be presented prior to bunkering. The supply vessel must record / store the results and present them as requested.

**In summary:**

1. Sample smell, taste, colour, pH, conductivity and chlorine content (Free & Total) prior to bunkering to boat This must be logged as well as results of the same tests 30 minutes after completion of bunkering.
2. Monthly analysis (physical, chemical and bacteriological) with THM. (Every month).
3. BTEX/THC. When entering a new contract and follow up testing once a year.

See attachment 4, 5 and 6 for guidance and closer information on demands.

**Attachment**

The attached procedures and forms are made to describe the reception and delivery of drinking water, the treatment of tanks and piping systems, sampling and analysis of the drinking water.

4. Procedure for receiving drinking water from onshore.
5. Procedure for delivery of drinking water to offshore installations
6. Cleaning and disinfection of drinking water tanks and bunkering / cargo system for delivery of water offshore.
7. Sampling – bacteriological water samples.
8. Sampling – physical and chemical
9. Recommended analysis programs and quality requirements (water reports 128 / 129).
10. Journal for receiving water.
11. Journal for delivery of water.
12. Good practice for bunkering of drinking water.

### 13.4 Procedure for receiving drinking water from onshore

1. Physically inspect the filling point / station on shore and request the person in charge / owner of the point disinfects the delivering shore point before filling commences. The supplier also needs to document that the drinking water is up to the quality standards.
2. Always empty the tanks before bunkering of new water. If the tanks construction does not allow for complete draining, bunker 10-15 m<sup>3</sup> of water and drain again.
3. During chlorination: control that enough chlorine solution is stored in proper concentration. The amount of chlorine is adjusted according to the measure of water to be bunkered. The rest of the free chlorine should be analyzed 30 minutes after bunkering, the values should be according to regulations in attachment 9 (0.1 – 0.5 mg/l free chlorine and 10 mg/l total chlorine).
4. The bunkering hose is connected and flushed for 3 minutes with a 100% rate of flushing. Compromised bunkering hose is not to be used.
5. Disinfect connection point on board by flushing with a chlorine solution, for example 5%.
6. Collect a sample after flushing has concluded. Smell, taste and visuals must be controlled, pH and conductivity are measured. Water found not to be satisfying to this test must not be allowed on board as drinking water. Conductivity must not stray far from previous values from the same water work/base.
7. If the water is accepted, bunkering commences. Bunkering must be executed with a lower rate than the flushing, for example 80%.
8. Only one tank at a time may be bunkered to so as to avoid chances of overreaching contamination.
9. After bunkering has been completed the bunkering lines must be drained / emptied of water to eliminate any stagnant water that may lead to bacteriological growth. This may be achieved by correctly operating the system or by blowing the system dry with instrument air. Endcap is replaced on the bunkering line before being stored away.

#### NB!


- The bunkering hose is not to be stored in direct sunlight, and in a dedicated storage space for potable water equipment.
- Store the bunkering hose and end cap(s) in a clean place to avoid contamination. End cap(s) must not be stored on deck or railing during bunkering. It should be stored in a clean plastic container or bag.
- When a tank is opened the tank hatch must be stored in a clean place and manner to avoid contamination. For example, on a clean piece of cloth or suitable material or in a clean plastic bag etc.

### 13.5 Procedure for delivery of drinking water

1. Clarify required quantity of water to be delivered and prepare the tanks that will supply the water. Prepare the latest analysis from these tanks in question and the analysis from the bunkering area onshore and the name of the bunkering area. Water which is older than 10 days from the bunkering date must not be delivered.
2. Prepare for connection, start the pump and flush the network of pipes from the tank to the discharge point(s). When receiving the bunkering hose from the platform and connecting it, special caution must be taken to prevent old water from the hose entering the vessels pipe system. The connection points on board the vessel and bunkering hose must be disinfected appropriately prior to connection.
3. Start the flushing of the bunkering hose after getting the signal from the installation.
4. Receiver will sample the water after completed flushing. Colour is measured, as well as smell, taste and appearance are registered. Conductivity, pH and chlorine levels are also measured. Water that is found to not satisfy the testing parameters will not be approved as drinking water.

NB: High levels of conductivity from reception to delivery may be an indication of contamination from sea water in the tanks.

5. For security reasons water found to contain chlorine levels of above 0.5 mg/l on the platform will not be accepted (as platform must add chlorine itself to satisfy regulations).
6. If the water is accepted, the bunkering may commence.
7. Water must only be delivered from one tank at a time. Advise offshore installations when the bunkering from a new tank commences and repeat steps 3 – 5.
8. After completion of bunkering, the bunkering lines must be emptied as best as is practicable to avoid bacteriological growth due to stagnant water. This may be accomplished by using the correct operational procedures or by blowing the system dry with instrument air. End cap(s) must be fitted to the bunkering lines following completion of unloading.

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### 13.6 Cleaning and disinfection of drinking water tanks and bunkering / cargo system for delivery of water offshore

**To be conducted every third month or more regularly if needed and must be logged internally. The log is to be stored and available for system audits for at least one year.**

#### Stripping / drainage

The tank must be completely drained for water. If necessary mobile stripping pump must be used. If a pump is used, it must be reserved for drinking water use only.

#### Inspection / verification

When a tank is inspected it must be evaluated if the cleaning and disinfection is regular enough. If the level of deposition / staining is low and the colony count is stable, the tank is deemed to be cleaned regularly enough. The result of the inspection must be recorded.

#### Cleaning

The surface of the tank is washed / cleaned with high pressure. Use only approved cleaning utensils and chemicals.

Inspect the surfaces for slimy coating (biofilm) and remove if found. If necessary, scrub the surface with brushes. After scrubbing and flushing the tanks must be completely stripped / drained again.

NB: Other cleaning or disinfection methods may be used if approved by Aker BP representative.

#### Inspection / Verification

After drainage the tank is inspected for the purpose of quality control of the cleaning. The coating of the tank must be evaluated and repaired as needed. Coating(s) must be certified and approved by an inspector with FROSIO Level III of NACE Level II certification after being applied. If the coating is repaired at a later time, samples must be analysed for BTEX and THC. This is to document that chemicals do not leak into the drinking water from the coating. The wire mesh / filter material on the breather pipes must be inspected and repaired if necessary. The result of the inspection must be logged.

#### Disinfection

If the water is to be used for disinfecting the piping network a chlorine level of 10 mg/l is recommended. The bunkering / cargo pipework is pressurized with water containing chlorine and confirmed at all connection points. The water in the pipework should stand for at least 12 hours. The tank should be circulated if possible.

Chlorine levels should be checked periodically and if a drop of 1mg/l (ppm) is observed, chlorine levels should be topped up to the appropriate level and standing time commenced again. Following 12 hours with appropriate chlorine content the water is then dumped, system flushed with freshwater until normal background levels are achieved then fully drained / blow dry with instrument air.

The tank used to treat the pipework should be drained then refilled / flushed until normal background levels of free chlorine are achieved the reinstated to use. Tanks may not drain to empty and may need to be refilled / flushed several times to achieve appropriate residual levels of free chlorine.

To shorten the time a chlorine solution of 50 mg/l may be added. This should be contained for 4 – 5 hours.

NB: Other cleaning or disinfection methods may be used if approved by Aker BP representative.



## 13.7 Sampling – Bacteriological Water Samples

### Sample flasks:

- Verify that the flasks being used are sterile (flasks especially designed for bacterial samples) and marked that they contain sodium thiosulphate and the date stamp.

### Sampling from faucets:

- Remove any filters from the faucet.
- Disinfect the sample point. (Flame, Chlorine, Alcohol Wipe etc.).
  - E.g.: Check that the faucet is drained of water. Fill a glass with 70% alcohol solution or 5% chlorine solution. (Remember protective equipment specified in safety data sheets).
  - Hold the glass containing the solution to submerge the faucet for at least 30 seconds.
- Turn on the cold water and let it run for at least 3 minutes.
- Mark the flask with the name of the installation, place, date and time of the sample. The marking must be waterproof.
- Open the flask without touching the inside of the lid or the neck of the flask.
- The flask is to be filled almost full of water (to mark on bottle if present). NB: Do not flush or overfill the flask.
- Seal the flask securely without touching the lid or neck of the flask.

### Sampling on vessels from tanks without sample points:

- The samples must be collected from the common bunkering pipe on deck.
- Personnel on the vessel must prepare the sample point and communicate with the bridge.
- The sample point must be disinfected. This can be done with either a 70% alcohol solution or 5% chlorine solution sprayed using a spray bottle. Spray adequately and let it work for 30 seconds. Spray once more and let it work for another 30 seconds. The sampling point / termination can also be sterilised using a blow torch / flame if allowed.
- Personnel on the bridge must advise which tank is being pumped from. The pipe system is then flushed for at least 3 minutes with full delivery pressure.
- Mark the flask with the name of the vessel, place, date and time. The marking must be waterproof.
- Open the flask without touching the inside of the lid or the neck of the flask.
- The flask is to be filled almost full of water (to mark on bottle if present). NB: Do not flush or overfill the flask.
- Seal the flask securely without touching the lid or neck of the flask.
- NB: Special care must be taken due to possible large amounts of water with high pressure.
- Personnel on the vessel must advise when tanks are being changed and the procedure is then repeated until all the required tanks have been handled. During a change of tank, flush for at least 1 minute (3 minutes the first time) with a full delivery pressure from the tank the sample is to be collected from.

### Packing and shipping of the samples:

- The flasks must be securely packed in a clean container, possibly a termobox and shipped to the laboratory as soon as possible.

- If the time from collecting the sample to delivery exceeds 4 hours the samples must be chilled during transport with a temperature between 2 and 10 degrees Celsius. The time between collection and analysis can be extended to a maximum of 24 hours if chilled.

*NB: Samples not packed and sent according to regulations are not usable / acceptable and must be collected again.*

## 13.8 Sampling – physical and chemical

### Sample flasks:

The analysis laboratory can give instructions regarding which sample flasks is to be used and how to handle them. During the yearly analysis program special sample flasks are requested. Necessary special flasks may be attained from the laboratory along with procedures.

### Sampling from faucets:

1. Remove any filters from the faucet.
2. Turn on the cold water and let it stream for at least 3 minutes.
3. Mark the flask with the name of the installation, place, date and time of the sample. The marking must be waterproof.
4. Open the flask without touching the inside of the lid or the neck of the flask.
5. The flask is to be filled full of water. NB: Do not flush the flask before using it.
6. Seal the flask securely without touching the lid or neck of the flask.
7. The flasks must be securely packed in a clean container and shipped to the laboratory as soon as possible.

### Sampling on vessels from tanks without sample points:

1. The samples must be collected from the collective bunkering pipes on deck.
2. Personnel on the vessel must prepare the sample point and communicate with the bridge.
3. Personnel on the bridge must advise which tank is being pumped from. The pipe system is then flushed for at least 3 minutes with a full delivery pressure.
4. Mark the flask with the name of the vessel, place, date and time. The marking must be waterproof.
5. The sample is collected by the same method explained in points 4 to 6 above. Special care must be taken due to possible large amounts of water with high pressure.
6. Personnel on the vessel must advice which tank is being changed and the procedure is then repeated until all the required tanks have been handled. During a change of tank, flush for at least 1 minute (3 minutes the first time) with full delivery pressure from the tank the sample is collected from.

### 13.9 Recommended analysis program and quality requirements (water report 128)

Parameter	Frequency*	Unit	Notes	Limit
Smell	D/B/M	Subjective assessment	Cf. with taste samples.	Not evident
Taste	D/B/M	Subjective assessment	Cf. with smell samples.	Not evident
Clarity	D/B	Subjective assessment		Clear
pH-value	D/B/M	The water must not be corrosive	6,5 – 9,5	
Conductivity	D/B/M	MilliSiemens /m (mS/m) at 25°C (1 mS/m = 10 µS/cm)	Alarm for the production facility is set to: - 6 mS/m from evaporator - 75 mS/m from the opposite osmose system, see 4.3.1.	<i>For bunkered water:</i> Similar conductivity as the delivering waterwork on shore.  <i>For produced water:</i> Must be stable. Possible increases must be explained, see 4.3.1 and 4.3.2.
Free chlorine	D B	Milligram/l	Only analysed if the water is chlorinated. Measured 30 min. after bunkering.	0,1 – 0,5, cf. 4.3.1  See above.
Total chlorine	D B	Milligram/l	Only analysed if the water is chlorinated. Measured 30 min. after bunkering.	1,0, see 4.3.1  See above.
Colour	B/M	Milligram Pt/l	Produced water has colour. >2	20

Turbidity	M	FNU		1
Clostridium perfringens	M	Count/100 ml		0
E.coli	M	Count/100 ml	Discovered findings must be immediately reported to supervising authorities.	0
Intestinal enterococcus	M	Count/100 ml	Discovered findings must be immediately reported to supervising authorities.	0
Calcium	M	Milligram Ca/l	Only analysed if the water is alkalized.	Recommended values between 15 and 25
Colony count 22 °C / 72T	M	Count/ml		100
Coliform bacteria	M	Count/100 ml		0
Iron	M	Milligram Fe/l		0,2
Copper	M	Milligram Cu/l		0,3 in cold water, see 4.3.3

Parameter	Frequency*	Unit	Notes	Limits	Type of measure**
Benzene	A	Microgram C <sub>6</sub> H <sub>6</sub> /l		1,0	B
Benzo(a)pyrene	A	Microgram/l		0,010	B
Lead	A	Microgram Pb/l		10	B
Bromate	A	Microgram BrO <sub>3</sub> /l		5	B
Hydrocarbons, mineral oil	A	Microgram/l	Should also be analysed after painting of tank. See 9.1.4.	10	B

Cadmium	A	Microgram Cd/l		5,0	B
Polycyclic aromatic hydrocarbons (PAH)	A	Microgram/l		0,10	B
Trihalometanes	A	Microgram/l		50	B
Boron	A	Milligram B/l	Analysis is only required if the water is produced by opposite osmose.	1,0	B
Glycols	A	Microgram/l	Analysis is only required if compounds are used in affiliation to drinking water production.	10	B
Chromium	A	Microgram/l	Measurement is only required if the device is new.	50	B
Nickel	A	Microgram/l	Measurement is only required if the device is new.	20	B

**\*The frequency is divided in daily (D), bunkering (B), monthly (M) and annual (A) analysis. Demands to point of sampling are featured in section 4.4.**

### 13.10 Journal for receiving of water

Date and time of bunkering: \_\_\_\_\_

Bunkered from shore: \_\_\_\_\_

Does the supplier have the analysis results from its water taken from the shore where it gets bunkered: YES / NO

If yes, date of analysis: \_\_\_\_\_

*If no, a water sample should be taken from the place of bunkering on shore for a bacteriological analysis.*

Amount of water bunkered: \_\_\_\_\_

Amount of chlorine added: \_\_\_\_\_

#### Results of water samples from bunkered water:

Parameter:	Quality norm:
Smell:	Not evident
Taste:	Not evident
Look:	Clear and without discoloration
Conductivity (mS/m):	10 mS/m, or as the supplied waterwork*
pH-value:	6,5 – 9,5
Is the water accepted (Y/N)?	

\*The conductivity must not deviate significantly in comparison with the common for the supplied waterwork.

**If chlorine is added when bunkering, the following should be done:  
The water sample results from each of the tanks with bunkered water. The sample must be taken at least 30 minutes after the bunkering is ended:**

Tank nr:	1	2	3	4	5	6	7	Quality norm:
Time for measuring of chlorine								
Amount of free chlorine (mg/l)								0,1 – 0,5 mg/l
Is the water accepted (Y/N)?								

**Signature from responsible person for bunkering:**

\_\_\_\_\_

**13.11 Journal for delivery of water**

**Delivered to** : \_\_\_\_\_  
**Date** : \_\_\_\_\_  
**Time, start** : \_\_\_\_\_  
**Time, end** : \_\_\_\_\_  
**From tank nr.** : \_\_\_\_\_  
**From bunkering point on deck** : \_\_\_\_\_  
**Total delivery** : \_\_\_\_\_ m<sup>3</sup>

Parameter:	Quality norm:
Smell:	Not evident
Taste:	Not evident
Look:	Clear and without discoloration
Conductivity (mS/m):	10 mS/m, or as the supplied waterwork*
PH-value:	6,5 – 9,5
Is the water chlorinated? (Y/N)	
Is the water accepted (Y/N)?	

\* The conductivity must not deviate significantly in comparison with the common for the supplied waterwork.

***Analysis are taken from each tank before delivery***

**Is the water approved on the receiving installation: YES / NO**

**If NO,**  
**why:**.....  
 .....  
 .....

**Vessel:** \_\_\_\_\_ **Date** \_\_\_\_\_

**Signature:** \_\_\_\_\_

### 13.12 Recommended practice for bunkering of drinking water

To maintain good quality of drinking water on board demands good procedures and the continued enforcement of them. Due to reasons like time pressure, shift changes or other unforeseen events this may prove challenging. It is still possible if the correct procedures are followed and parameters met. This list of tips may prove useful in helping maintain good quality drinking water on board.

- Always empty the tanks before bunkering new water from shore.
- The water should be changed as often as is operationally possible.
- If there is a lot of residual water after emptying a 10-15 m<sup>3</sup> of water should be added and then drained again.
- Disinfect the filling point on shore before any bunkering hose(s) are connected and flush the hose for three minutes at full pressure before connecting it on board.
- Contaminated or punctured hoses will not to be used / accepted. Advise personnel on base or on board so as actions can be taken to replace the hose(s) with the appropriate quality hose.
- Recommended level of chlorine is 0,5 mg/l free chlorine. This should be controlled with a chlorine measurement tool 30 minutes after bunkering. The quality of water varies from waterworks to waterworks so the amount of chlorine needed is individual to the respective waterworks. If the free chlorine can't be measured, the chlorine must be topped up to achieve the appropriate level (more must be added during the next bunkering to ensure appropriate levels are achieved).
- The objective is to add as little chlorine as possible to achieve the appropriate levels. There should, under no circumstance, be added more than the equivalent of 1mg/l free chlorine. If the measurement fails and free chlorine can't be measured following this addition, this may indicate biofilm in the system and this signals the need for cleaning and disinfection.
  - The recommended method is quantity-controlled (flow controlled) dosage of chlorine via a dosing pump.
  - 15 % sodium hypochlorite older than 3 months should not be used.
  - 5% sodium hypochlorite older than 6 months should not be used.
  - If the colony count exceeds recommended level or if presence of water borne bacteria is discovered, the tanks should be cleaned and disinfected. There are many procedures that can be utilised for this provided they are approved by Aker BP.
  - If other types of contamination are discovered (Chemical / Physical, THM, mould or Hydrocarbon contamination) other procedures must be evaluated for returning the drinking water system to a compliant state.
  - When cleaning and disinfecting potable water tanks, it is important that the cargo / bunkering lines are cleaned and disinfected at the same time to remove all possible sources of contamination.
  - If there are several filling / cargo lines on board, it is important to disinfect these even when they are not considered for use. Bacteriological growth may occur in these areas which may contaminate the rest of the system.
  - If samples are collected directly from the tanks, the sampling points must also be opened and disinfected at the same time as the tanks.
  - It is not recommended to use the same superchlorinated water from one tank to treat another by transferring the superchlorinated water. This creates the chance for residual free chlorine to reduce and it makes it very hard to track and also often leads the process having to be undertaken again. It is best to treat each tank independently.



- It is important to drain the tanks properly after disinfection. In tanks with large doses of residual chlorine, it is recommended to flush thoroughly with several m<sup>3</sup> of freshwater and check appropriate background free chlorine levels are achieved prior to reinstatement. This may require the tank to be flushed more than once.
- Key points to minimise bacteriological issues are:
  - o Minimise storage times as much as possible
  - o Maintain a high flow rate in all areas of the system
  - o Maintain suitable temperatures during transportation (<20°C)
  - o Maintain a residual free chlorine level of between 0.2 – 0.5 mg/L (ppm), ideally towards the upper thresholds.
  - o Do not mix tanks under any circumstances.
  - o Minimise any dead areas in pipework and where possible fully drain lines and blow dry with instrument air.

The vessel coordinator gives permission to supply potable water once the results have been confirmed to be satisfactory. Potable water on board vessels coming from abroad shall never be supplied to Logistics Centres installations. The tanks must be emptied, flushed and filled with fresh water from supply base and water samples must be taken to make sure the quality is satisfactory.

Please note that due to the risk of contamination of the water tanks, Logistics Centre does not allow potable water to be supplied as drill water offshore. Deviation from this only after approval from the Vessel Coordinator.