OPPORTUNITY MV18 B.V.

Registered Address: Van Heuven Goedhartlaan 13D, 1181 LE Amstelveen, the Netherlands
Dutch Chamber of Commerce Registration No.: 34261495

Annex 06: Inventory of Hazardous Materials – Complementary Information to Block 12 of the *Notification Document for Transboundary Movements/Shipments of Waste*

According to the instructions for filling out Block 12 and Block 14 of the Notification Document for Transboundary Movements/Shipments of Waste, OPPORTUNITY MV18 B.V. hereby provides the Inventory of Hazardous Materials of FPSO CIDADE DE NITEROI MV18. The document provides comprehensive information on:

- Inventory of Hazardous Materials
- IHM Statement of Compliance (HKC and EN-1257:2013)
- NORM Survey

OPPORTUNITY MV18 B.V.

_____
Name: Yu Nakaguchi
Title: Director

OPPORTUNITY MV18 B.V.

Registered Address: Van Heuven Goedhartlaan 13D, 1181 LE Amstelveen, the Netherlands
Dutch Chamber of Commerce Registration No.: 34261495

Annex 06

IHM, SoC & NORM

Inventory Hazardous Materials
FPSO Cidade de Niteroi MV18

Sea2Cradle B.V. | Scheepmakershaven 59, 3011 VD Rotterdam, The Netherlands

APPROVED
on behalf of the government of the vessel's registry subject to conditions of ABS letter

ABS

REVIEWED

Details of this review are as indicated in the ABS letter

ABS

WITH ABS FINDINGS - SEE ABS LETTER

Inventory Hazardous Materials
FPSO Cidade de Niteroi MV18
PROJECT 193.23

Principal
MODEC INTERNATIONAL, INC
15011 Katy Fwy., ste.500
Houston, Texas 77094
USA

Prepared by:
Sea2Cradle B.V.
Scheepmakershaven 59
3011 VD Rotterdam
The Netherlands

Date: 19th December 2023
Update: 20th of January 2025 (based on ABS WO0184798)
Update: 4th of February 2025 (included estimated weight/battery)

Note:
Parts II and III (A+B) have not been completed to date and are to be completed based on arrival conditions

Contact information:
Sea2Cradle B.V.
info@Sea2Cradle.com

Contents

Terms of reference

a. Assignment

Aim of the survey

The aim of this survey is to provide an IHM (Inventory Hazardous Materials) on existing ships (Table A, Part I). The survey is based on:

- The IMO Hong Kong International Convention for the safe and environmentally sound recycling of ships, May 19th 2009, further mentioned as the Hongkong Convention;
- MEPC 269(68) Guidelines for the developments of the Inventory of Hazardous Materials, further mentioned as the Guideline;
- US EPA guidelines where applicable
- Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants, amending Directive 79/117/EEC (OJ L 158, 30.4.2004, p. 7) and Regulation 1257/2013 for EU flagged ships.

The IHM Part I-A is restricted to the following substances:

- Asbestos;
- PCBs (Polychlorinated Biphenyls);
- ODS (Ozone Depleting Substances);
- TBT in anti-fouling (Organic tin compounds);
- Perfluorooctane sulfonic acid (PFOS)

IHM Part I-B is not mandatory for existing vessels under the new EU regulation and will be completed as far as practicable.

Assignment

Our assignment is restricted to a non-destructive survey based on a Visual/Sampling Check Plan and information made available by the ship owner and the owner's representative on board, according to the S2C IHM survey procedure.

Liability and accuracy

Although we aim for maximum accuracy, an accuracy of 100% is not feasible. Therefore, our agency cannot be held liable for any damage as a result of hazardous materials that are not mentioned in this inventory. These can be materials that were unreachable and consequently excluded from inspection, materials that are not recognized as hazardous, and materials that were not mentioned as hazardous in the report and are found on board at a later stage.

Safety

Advice will be sought from the senior management of the vessel/structure, prior to commencing any inspection, as to any restricted or unsafe areas. Additionally, it is the decision of the surveyor to omit any other area which he/she assesses as unsafe for whatever reason. Restricted or unsafe areas will be noted in the VSCP.

b. Survey results

Desk Research
For our desk research all available relevant documents were consulted. These are listed in the Visual/Sampling Check Plan (VSCP)
Visual inspection
To meet the IMO standard the inspection is carried out following our in-house developed general standard "Visual/Sampling Check Plan", adjusted to the asset surveyed.
Several materials on board are sampled, a complete overview of the sampled materials and sample locations are shown in the analysis results and on the floor plans.

c. Investigation Methods

➢ ASBESTOS

DEFINITION
Asbestos can be defined as a group of fibrous materials like silicates. According to the Guideline asbestos is material that contains one of the following substances:
- Chrysotile (CAS nr 12001-29-5);
- Amosite (CAS nr 12172-73-5);
- Crocidolite (CAS nr 12001-28-4);
- Tremolite (CAS nr 77536-68-6);
- Anthofilite (CAS nr 77536-67-5);
- Actinolite (CAS nr 77536-66-4).

- Lab testing will be performed at accredited laboratories (ISO 17025), e.g. Fibrecount Environmental Control in Rotterdam, The Netherlands.

From 1 January 2011 the new installation of materials which contain asbestos is prohibited.
In short the Dutch Shipping Inspectorate instructions are:

a.	Vessels in new build but not yet delivered:	Remove before delivery
b.	Vessels delivered on or after 1st January 2011:	Remove immediately
c.	Vessels delivered after 1st July 2002:	Remove within 3 years after discovery
d.	Vessels delivered before 1st of July 2002:	Remove immediately in case of health risk

AIM

The aim of the survey is to prove that, based on the method as described in the Instruction, no asbestos containing materials are installed on board the vessel which is in violation with the SOLAS requirements

SCOPE
The inspection is restricted to a random sampling procedure on the used materials on board the vessel. The list of components as published in the Guideline, including its additions prescribed in the Instruction, is used as a guideline. The complete list includes a brief description of our observations on board and is added as an appendix to this report.

The inspection is restricted to non-destructive inspection. Unless otherwise agreed, no dismantling, cutting or breaking on behalf of the inspection of construction, equipment or components is part of the inspection.

OBSERVATIONS AND RESTRICTIONS
The general restrictions and basic principles that apply to our inspections are discussed below.

Engines, equipment and installations

Regarding the inspection of engines, auxiliaries, installations and other equipment, the following principles apply:

- Engines, auxiliaries, installations and other equipment will not be deconstructed. The inspection is limited to the exterior and parts that are directly accessible. Installation components will not be opened or damaged;
- Composite parts won't be opened or damaged;
- Inspection of pipe insulation will be based on randomly picked samples for each type of suspicious material. Our team leader will decide on the number of samples.
- Installation materials such as gaskets, packings, rope or canvas tape and covers, which are applied on board by the yard or subcontractors, will be sampled randomly. Of each type a representative number of samples will be taken.

The evaluation of the used gaskets is based on a random sampling check and visual check for conformity of the majority of the flange connections on board.

Accommodation

Regarding the inspection of accommodation, the following principles apply:

- All cabins and living or functional areas where accessible for inspection, but the inspection is restricted to a representative number of random picked available cabins;
- The inspection focuses on fire resistant materials, such as wall and ceiling finishes, fire compartments (including transit), heat protection on exposed decks and other insulation materials;
- In addition, the inspection is focused on other visible and accessible places and materials, such as floor finishes, adhesives, sealant and paints.

Equipment such as AC units, bridge equipment, refrigerators and galley equipment is visually checked from the outside only, or through normal opening doors or hatches.

Decks, holds and fixtures

Regarding the inspection of other compartments than the accommodation, the following principles apply:

- All other compartments will be fully inspected, as far as the compartments are accessible;
- Vapour proof insulation on e.g. cooling systems, will not be damaged for further determination. The inspection will be restricted to accessible surfaces and via existing openings;
- Ballast, bunkers and drinking water tanks and other void spaces, inaccessible cofferdams, double bottom tanks, etc. will not be opened for inspection;
- Equipment like winches, windlasses and cranes will only be inspected from the exterior;
- Only bituminous coating and thick mastic coating (applied on accessible surfaces) will be sampled.

TESTING CRITERIA

The threshold level, as specified in the Hong Kong Convention, will function as testing criteria. However the current possibilities for analysis lead to a detection level of approximately 0.1% asbestos in the asbestos containing material. Below this detection level materials can be considered asbestos free.
The analysis of the sampling will be directed to the accredited laboratory of Fibrecount BV.
The results of the analysis are fully documented in the relevant Appendix to the IHM and positive results listed in the IHM table part IA.
Our inspection approach on vessel is based on sampling all materials with a particular reference to the IMO Indicative List, 2.2.3.2 in **RESOLUTION MEPC. 269(68)**

➢ POLY CHLORINATED BIPHENYLS (PCBs)

DEFINITION

PCBs can be defined as man-made synthetic chemicals. The group of PCBs consists of 209 different types (congeners). Fifty of these congeners are found in commercial chemical compounds. PCBs are used as insulating fluid in e.g. transformers, capacitors, oils such as hydraulic cooling and heating oil, and in materials such as plastics and oil based paints.

The convention has determined a threshold value for PCBs at 50 ppm.
The US EPA threshold levels are:

- 50 ppm for hazardous waste
- 10ug/100cm2 for wipes
- 1.0 ppm for oils

TESTING CRITERIA

Testing of all congeners is not feasible in practice. Therefore, several organizations have drafted a list of indicator congeners to be tested. This list of seven congeners, which is used by the International Council for the Exploration of the Sea (ICES) and by several governments, forms the basis of our investigation, except for US Flagged vessels.

The ICES7 list consists of the congeners 28, 52, 101, 118, 138, 153 and 180. The analysis of these samples is restricted to a qualitative analysis ordered to UCL Umwelt Control Labor GmbH Germany.

The proposed threshold levels as specified in the Hong Kong convention will function as testing criterion.

Our inspection approach on vessel is based on sampling all materials with a particular reference to the IMO Indicative List, 2.2.3.3 in **RESOLUTION MEPC. 269(68)**

For US flagged vessels the analysis is based on the US EPA guidelines methodology 8081/8082 (see http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/8082a.pdf). The threshold levels are based U.S. EPA guidelines as well.
The analysis of these samples is restricted to a qualitative analysis ordered to EMSL Analytical, Inc, 200 Route 130 North, Cinnaminson, NJ 08077, U.S.A.

The results of the analysis are fully documented in the relevant Appendix to the IHM and positive results listed in the IHM.

➢ OZONE DEPLETING SUBSTANCES (ODS)

The inventory of ODS focuses on fixed items that are part of the construction or equipment of the ship, incorporating gaseous ODS. Portable items and domestic items such as refrigerators in cabins are not part of this inventory.
Materials likely to have been formed using ODS as blowing agents (e.g insulating materials) are sampled for analysis.
The analysis of these samples is restricted to a qualitative analysis ordered to UCL Umwelt Control Labor GmbH Germany

➢ ORGANOTIN COMPOUNDS (TBT) in anti-fouling

Inspection is based on the ship's certificates as required by the class society. Copies of the certificates are given in the relevant Appendix to the IHM. The original certificates will apply with the ships delivery.

➢ Perfluorooctane sulfonic acid (PFOS)

The inspection is concentrated on foam of fire extinguishers and carpets. Samples will be taken for further analyses ordered to UCL Umwelt Control Labor GmbH Germany.
PFOS was the key ingredient in Scotchgard, a fabric protector made by 3M, and numerous stain repellents. PFOS has been used to make aqueous film forming foam (AFFF), a component of fire-fighting foams, and alcohol-type concentrate foams.
PFOS compounds can also be found in some impregnation agents for textiles, paper, and leather; in wax, polishes, paints, varnishes, and cleaning products for general use; in metal surfaces, and carpets.
The threshold level is zero for new installations.

Particulars of the FPSO Cidade de Niteroi MV18

Distinctive number or letters	**C6WW5**
Port of Registry	**Nassau**
Type of Vessel	**FPSO**
IMO Number	**8500123**
Name of Shipbuilder	**Mitsubishi Heavy Industries, Japan**
Name of Shipowner	**Modec**
Date of Delivery	**28 November 1986**

Attachments:

- Zone and level Definitions
- Location Diagrams of Hazardous Materials on Board
- VSCP
- Asbestos documentation
- PCB, HM & ODS Documentation
- Radiation Report
- Surveyor's 'Approved Hazmat Expert' certificate

Survey carried out offshore at Campos Basin, Marlin Leste Field
26th October – 2nd November 2023

Signature:

Frank Fox
Superintendent
On behalf of Sea2Cradle B.V.

IHM Part I MEPC Table

Part I
Hazardous materials contained in the ship's structure and equipment

I-1 Paints and coating systems containing materials listed in Table A and Table B of Appendix 1 of these guidelines

No.	Application of paint	Name of paint	Sample no	Location	Materials (classification in appendix 1)	Remarks
1	Deck paint	Yellow paint	G CDN 024	01 Nav Deck	Pb 2160 mg/kg	
2	Deck paint	Green paint	G CDN 003	00 Helipad	PCHM	
3	Deck paint	Green Paint	G CDN 010	02 5th Deck	Pb 1350 mg/kg	
4	Deck paint	Green Paint	G CDN 042	06B Forecastle Heas	Pb 1960 mg/kg	

I-2 Equipment and machinery containing materials listed in Table A and Table B of Appendix 1 of these guidelines

No.	Name of equipment and machinery	Location	Materials (classification in appendix 1)	Parts where used	Approximate quantity		Remarks
1	Aft Fire Pump no. 1	07B Above Eng + Elect Workshop	Lead and Lead compounds	Lead Acid Batteries	4	PCS	4 pcs x 25 kg = 100 kgs
2	Aft Fire Pump no. 2	07B Above Eng + Elect Workshop	Lead and Lead compounds	Lead Acid Batteries	4	PCS	4 pcs x 25 kg = 100 kgs
3	Fwd Fire Pump no. 1	06B Forecastle Head	Lead and Lead compounds	Lead Acid Batteries	4	PCS	4 pcs x 25 kg = 100 kgs
4	Fwd Fire Pump no. 2	06B Forecastle Head	Lead and Lead compounds	Lead Acid Batteries	4	PCS	4 pcs x 25 kg = 100 kgs
5	Battery Bank - Rescue Boat	05 2nd Deck	Lead and Lead compounds	Lead Acid Batteries	2	PCS	2 pcs x 25 kg = 50 kgs
6	220V UPS - Battery (topside)	05A Topsides Aft	Lead and Lead compounds	Lead Acid Batteries	32	PCS	32 pcs x 60 kg = 1,920 kgs
7	220V UPS - Battery (Marine)	01 Navigation Deck	Lead and Lead compounds	Lead Acid Batteries	32	PCS	32 pcs x 52 kg = 1,664 kgs
8	220V UPS - Battery (Telecom)	01 Navigation Deck	Lead and Lead compounds	Lead Acid Batteries	32	PCS	32 pcs x 50 kg = 1,600 kgs
9	48V DC UPS Battery	05A Topsides Aft	Lead and Lead compounds	Lead Acid Batteries	4	PCS	4 pcs x 32 kg = 128 kgs
10	48V DC UPS Battery	05A Topsides Aft	Lead and Lead compounds	Lead Acid Batteries	4	PCS	4 pcs x 32 kg = 128 kgs
11	48V DC UPS Battery	05A Topsides Aft	Lead and Lead compounds	Lead Acid Batteries	4	PCS	4 pcs x 32 kg = 128 kgs
12	Turbine Generator A Battery	05A Topsides	Lead and Lead compounds	Lead Acid Batteries	2	PCS	2 pcs x 52 kg = 104 kgs
13	Turbine Generator B Battery	05A Topsides	Lead and Lead compounds	Lead Acid Batteries	2	PCS	2 pcs x 52 kg = 104 kgs
14	Turbine Generator C Battery	05A Topsides	Lead and Lead compounds	Lead Acid Batteries	2	PCS	2 pcs x 52 kg = 104 kgs
15	Battery Bank - Lifeboat No. 1	05 2nd Deck	Lead and Lead compounds	Lead Acid Batteries	2	PCS	2 pcs x 25 kg = 50 kgs
16	Battery Bank - Lifeboat No. 2	05 2nd Deck	Lead and Lead compounds	Lead Acid Batteries	2	PCS	2 pcs x 25 kg = 50 kgs
17	Battery Bank - Emergency Gener	06 Upper Deck Accommodation	Lead and Lead compounds	Lead Acid Batteries	2	PCS	2 pcs x 60 kg = 120 kgs
18	Battery Bank - Emergency Gener	06 Upper Deck Accommodation	Lead and Lead compounds	Lead Acid Batteries	2	PCS	2 pcs x 60 kg = 120 kgs
19	Battery Bank - GMDSS	Radio Room	Lead and Lead compounds	Lead Acid Batteries	24	PCS	24 pcs x 25 kg = 600 kgs
20	Battery Bank - Navigation aids	01 Naviation Deck	Lead and Lead compounds	Lead Acid Batteries	2	PCS	2 pcs x 25 kg = 50 kgs

I-3 Structure and hull containing materials listed in Table A and Table B of Appendix 1 of these guidelines

No.	Name of structural element	Location		Materials (classification in appendix 1)	Parts where used	Approximate quantity		Remarks
1	Roll of Jointing	08 ER Upper Floor Engine Stores	A CDN 040	Asbestos	Card	10	kg	Chrysotile 15-30% friable
2	Auxiliary Diesel Joint	08 ER Upper Floor Engine Room	A CDN 046	Asbestos	Card	2	kg	Chrysotile 30-60% friable
3	Auxiliary Diesel Joint	08 ER Upper Floor Engine Room	A CDN 047	Asbestos	Card	2	kg	Chrysotile 30-60% friable
4	Fire Main Joint	08 ER Upper Floor Engine Room	A CDN 048	Asbestos	Card	2	kg	Chrysotile 30-60% friable
5	T/A Set Pipe Joint	08 ER Upper Floor Engine Room	A CDN 049	Asbestos	Card	2	kg	Chrysotile 30-60% friable
6	Aux Boiler Door Joint	08 ER Upper Floor Engine Room	A CDN 055	Asbestos	Card	2	kg	Chrysotile 30-60% friable
7	Gauge Glass Joint	07 ER 2nd Floor Engine Roon	A CDN 033	Asbestos	Card	2	kg	Chrysotile >60% friable
8	Valve Packing	08 ER Upper Floor Engine Stores	A CDN 036	Asbestos	Cord	2	kg	Chrysotile >60% friable
9	Valve Packing	08 ER Upper Floor Engine Stores	A CDN 037	Asbestos	Cord	2	kg	Chrysotile >60% friable
10	Valve Packing	08 ER Upper Floor Engine Stores	A CDN 038	Asbestos	Cord	4	kg	Chrysotile >60% friable

IHM Part I A

PART I A - Materials Contained in Ship's Structure or Equipment
Materials Listed in Appendix 1 Table A
(Ref MEPC 68/21/Add.1 Annex 17. (RESOLUTION MEPC.269(68))

Code A1	**Asbestos** **(threshold value 0.1%)**		
Type of Asbestos Materials (board, pipe lagging, contained)	Location	Approximate Quantity	Notes
Card Roll of Jointing [A CDN 040] Auxiliary Diesel Joint [A CDN 046] Auxiliary Diesel Joint [A CDN 047] Fire Main Joint [A CDN 048] T/A Set Pipe Joint [A CDN 049] Aux. Boiler Door Joint [A CDN 055]	 08 ER Upper Floor Engine Stores 08 ER Upper Floor Engine Room 08 ER Upper Floor Engine Room 08 ER Upper Floor Engine Room 08 ER Upper Floor Engine Room 08 ER Upper Floor Engine Room	 10 kg 2 kg 2 kg 2 kg 2 kg 2 kg	 02 03 03 03 03 03
Card Gauge Glass Joint (A CDN 033)	 07 ER 2nd Floor Engine Room	 2 kg	 01
Cord Valve Packing [A CDN 036] Valve Packing [A CDN 037] Valve Packing [A CDN 038]	 08 ER Upper Floor Engine Stores 08 ER Upper Floor Engine Stores 08 ER Upper Floor Engine Stores	 2 kg 2 kg 4 kg	 01 01 01
Note 01. Chrysotile >60% friable 02. Chrysotile 15-30% friable 03. Chrysotile 30-60% friable			

Caution: Asbestos Containing Material (ACM) may be found underneath materials that do not contain asbestos.

Code A2	**Polychlorinated Biphenyls (PCBs)** **(threshold value 50 mg/kg)**		
Material	**Location**	**Approximate Quantity**	**Notes**
		Nil	

Code A3	Ozone Depleting Substances (no threshold value)		
Type	**Location**	**Approximate Quantity**	**Notes**
		Nil	

Code A4	Antifouling Organotin Compounds as a Biocide (threshold value 2500 mg/kg)		
Materials	**Location**	**Approximate Quantity**	**Notes**
		Nil	01

01. No record of anti-fouling application. There is 100% marine growth coverage of both hard and soft marine growth on underwater hull up to a thickness of 30mm (refer to report 23.CSS.ENG.023) This suggests no more anti-fouling is present.

* EU Regulation	Perfluorooctane sulfonic acid (PFOS) (Threshold value 10 mg/kg in substances or preparations) (Threshold value 1 µg/m^2 in textiles or coated materials)		
Materials	**Location**	**Approximate Quantity**	**Notes**
		Nil	

* for ships flying the flag of an EU Member country

IHM Part I B

PART I B - Materials Contained in Ship's Structure or Equipment
Materials Listed in Appendix 1 Table B
(Ref MEPC 68/21/Add.1 Annex 17. (RESOLUTION MEPC.269(68))

Code B1	Cadmium and Cadmium Compounds (threshold value 100 mg/kg)		
Type	**Location**	**Approximate Quantity**	**Notes**
		NIL	

Code B2	Hexavalent chromium and hexavalent chromium compounds (threshold value 1000 mg/kg)		
Type	**Location**	**Approximate Quantity**	**Notes**
		NIL	

Code B3	Lead and Lead Compounds (threshold value 1000 mg/kg)		
Type	**Location**	**Approximate Quantity**	**Notes**
Yellow Paint	01 Navigation Deck	2160 mg/kg	G CDN 024
Green Paint	00 Helipad	PCHM	G CDN 003
Green Paint	02 5th Deck	1350 mg/kg	G CDN 010
Green Paint	06B Forecastle Head	1960 mg/kg	G CDN 042
Lead Acid Batteries	Aft Fire Pump No.1	4 pcs	4 pcs x 25 kg = 100 kgs
	Aft Fire Pump No.2	4 pcs	4 pcs x 25 kg = 100 kgs
Type Thin Plate Pure Lead [TPPL]	Fwd Fire Pump No.1	4 pcs	4 pcs x 25 kg = 100 kgs
	Fwd fire Pump No.2	4 pcs	4 pcs x 25 kg = 100 kgs
	Battery Bank – Rescue Boat	2 pcs	2 pcs x 25 kg = 50 kgs
	220V UPS – Battery [Topside]	32 pcs	32 pcs x 60 kg = 1,920 kgs
	220V UPS – Battery [Marine]	32 pcs	32 pcs x 52 kg = 1,664 kgs
	220V UPS – Battery [Telecom]	32 pcs	32 pcs x 50 kg = 1,600 kgs
	48V DC UPS Battery	4 pcs	4 pcs x 32 kg = 128 kgs
	48V DC UPS Battery	4 pcs	4 pcs x 32 kg = 128 kgs
	48V DC UPS Battery	4 pcs	4 pcs x 32 kg = 128 kgs
	Turbine Generator A Battery	2 pcs	2 pcs x 52 kg = 104 kgs
	Turbine Generator B Battery	2 pcs	2 pcs x 52 kg = 104 kgs
	Turbine Generator C Battery	2 pcs	2 pcs x 52 kg = 104 kgs
	Battery Bank, Lifeboat No.1	2 pcs	2 pcs x 25 kg = 50 kgs
	Battery Bank, Lifeboat No.2	2 pcs	2 pcs x 25 kg = 50 kgs
	Battery Bank, Emergency Generator	2 pcs	2 pcs x 60 kg = 120 kgs
	Battery Bank, Emergency Generator	2 pcs	2 pcs x 60 kg = 120 kgs
	Battery Bank, Radio Room, GMDSS	24 pcs	24 pcs x 25 kg = 600 kgs
	Battery Bank Navigation Aids	2 pcs	2 pcs x 25 kg = 50 kgs

Code B4	Mercury and Mercury Compounds (threshold value 1000 mg/kg)		
Type	**Location**	**Approximate Quantity**	**Notes**
		NIL	

Code B5	Polybrominated Biphenyl (PBB) (threshold value 50 mg/kg)		
Type	**Location**	**Approximate Quantity**	**Notes**
	No record or documentation		

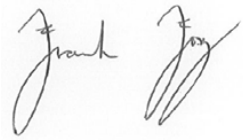
Code B6	Polybrominated Diphenyl Ethers (PBDEs) (Threshold value 1000 mg/kg)		
Type	**Location**	**Approximate Quantity**	**Notes**
	No record or documentation		

Code B7	Polychlorinated Naphthalenes (PCN) (threshold value 50 mg/kg)		
Type	**Location**	**Approximate Quantity**	**Notes**
	No record or documentation		

Code B8	Radioactive Substances (no threshold value)		
Type	**Location**	**Approximate Quantity**	**Notes**
		NIL	

Code B9	Shortchain Chlorinated Paraffins (threshold value 1%)		
Type	**Location**	**Approximate Quantity**	**Notes**
	No record or documentation		

EU Regulation	Hexabromocyclododecane (HBCDD) (Brominated flame retardant) (Threshold value 100 mg/kg)		
Materials	**Location**	**Approximate Quantity**	**Notes**
		NIL	

Part 1 completed by	Frank Fox	**Date**	26/11/2023
Signature		**On behalf of**	Sea2Cradle

WHILST EVERY CARE HAS BEEN TAKEN TO ENSURE THAT THE INFORMATION PROVIDED IN PART 1 OF THIS INVENTORY IS ACCURATE, UP-TO-DATE AND COMPLETE, NEITHER THE SHIPOWNER NOR ANY SHIPOWNER'S REPRESENTATIVE ACCEPTS ANY LIABILITY FOR ANY ERRORS OR OMISSIONS IN THE INVENTORY OR FOR ANY ACTS OR OMISSIONS OF ANY PERSON IN THE HANDLING, REMOVAL OR DISPOSAL OF THESE SUBSTANCES, WHETHER DONE IN RELIANCE ON THE INFORMATION IN THIS INVENTORY OR OTHERWISE.

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IHM Part II

PART II – Operationally Generated Wastes
Materials Listed in Table C
(Ref MEPC 68/21/Add.1 Annex 17. (RESOLUTION MEPC.269(68))

Code C 31	Waste Oil (Sludge)			
Location	**Frame No.**	**Capacity m³**	**Approximate Quantity**	**Notes**

Code C 32	Bilge and/or waste water generated by the after-treatment systems fitted on machineries			
Location	**Frame No.**	**Capacity m³**	**Approximate Quantity**	**Notes**
Bilge Tank Port Sep. Bilge O.T. Port	34 – 44 27 - 34	121.0 28.6		

Code C 33	Oily Liquid Cargo Tank Residues			
Location	**Frame No.**	**Capacity m³**	**Approximate Quantity**	**Notes**

Code C 34	Ballast water			
Location	**Frame No.**	**Capacity (m³)**	**Approximate Quantity**	**Notes**
No.2 WBT Stbd No.4 WBT Port	74 – 82 58 - 66	23924.8 23667.5		

Code C 35	Raw Sewage			
Location	**Frame No**	**Capacity m³**	**Approximate Quantity**	**Notes**

Code C 36	Treated Sewage			
Location	**Frame No.**	**Capacity m^3**	**Approximate Quantity**	**Notes**
Sewage Tank Engine Room				

Code C 37	Non-Oily Liquid Cargo Residue			
Location	**Frame no.**	**Capacity m^3**	**Approximate Quantity**	**Notes**

Code C 39	Dry Cargo Residues		
Location		**Approximate Quantity**	**Notes**

Code C40	Medical Waste/Infectious Waste		
Location		**Approximate Quantity**	**Notes**

Code C41	Incinerator Ash		
Location		**Approximate Quantity**	**Notes**

Code C42	Garbage		
Location		**Approximate Quantity**	**Notes**

Code C43	Fuel Tank Residues		
Location *This refers to unpumpables/ullages.* *See Part 3A C29 for bunker remains*	**Frame No.**	**Approximate Quantity**	**Notes**
HFO HFO Storage Tank Stbd HFO Settling Tank Stbd HFO Service Tank Stbd FO Overflow Tank Stbd	 34 – 48 39 – 44 44 – 48 36 - 44		
MDO No.1 MDO Storage Tank Port No.1 MDO Storage Tank Stbd No.2 MDO Storage Tank Port MDO Service Tank Stbd MDO Day Tank Stbd	 48 – 49 48 – 49 34 – 48 27 – 34 30 - 34		

Code C44	Oily Solid Cargo Tank Residues		
Location	**Frame No.**	**Approximate Quantity**	**Notes**

Code C45	Oily or Chemical Contaminated Rags	
Location	**Approximate Quantity**	**Notes**

Code C53	Dry Tank Residues		
Location	**Frame No.**	**Approximate Quantity**	**Notes**

Code C54	Cargo Residues		
Location	**Frame no.**	**Approximate Quantity**	**Notes**
No.1 Cargo Oil Tank (C)	89 – 91		
No.2 Cargo Oil Tank (C)	74 – 82		
No.3 Cargo Oil Tank (C)	66 – 74		
No.4 Cargo Oil Tank (C)	58 – 66		
No.5 Cargo Oil Tank (C)	49 – 58		
No.1 Cargo Oil Tank (P)	82 – 91		
No.1 Cargo Oil Tank (S)	82 – 91		
No.3 Cargo Oil Tank (P)	66 – 74		
No.3 Cargo Oil Tank (S)	66 – 74		
No.5 Cargo Oil Tank (P)	51 – 58		
No.5 Cargo Oil Tank (S)	51 – 58		
Slop Tank (P)	49 – 51		
Slop Tank (P)	49 - 51		

Part 2 completed by	*NAME*	**Date**	*202X-XX-XX*
Signature		**On behalf of**	*Company*

Note: Part II of the IHM report to be completed by vessel staff, prior to arrival at recycling facility.

WHILST EVERY CARE HAS BEEN TAKEN TO ENSURE THAT THE INFORMATION PROVIDED IN PART 2 OF THIS INVENTORY IS ACCURATE, UP-TO-DATE AND COMPLETE, NEITHER THE SHIPOWNER NOR ANY SHIPOWNER'S REPRESENTATIVE ACCEPTS ANY LIABILITY FOR ANY ERRORS OR OMISSIONS IN THE INVENTORY OR FOR ANY ACTS OR OMISSIONS OF ANY PERSON IN THE HANDLING, REMOVAL OR DISPOSAL OF THESE SUBSTANCES, WHETHER DONE IN RELIANCE ON THE INFORMATION IN THIS INVENTORY OR OTHERWISE.

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IHM Part III A

PART III (A) Stores and Spares
Materials Listed in Table C
(Ref MEPC 68/21/Add.1 Annex 17. (RESOLUTION MEPC.269(68))

Code C 1	Kerosene	
Location	**Approximate Quantity**	**Notes**

Code C 2	White Spirit	
Location	**Approximate Quantity**	**Notes**

Code C 3	Lubricating Oils (In machinery and storage tanks)		
Machinery Description	**Location**	**Approximate Quantity including reservoirs**	**Notes**
No2 Hose Reel 3 x 15 ltrs	06B Upper Deck Forward	45 ltrs	
Aux. Winch Fwd	06B Upper Deck Forward	5 ltrs	
Fwd Fire Pump	06B Upper Deck Forward	115 lts	
MOB Davit/Winch	06B Upper Deck Forward	18 ltrs	
Gas Turbine Generator (GTG) A	05A Module 6S	1158/530 ltrs	
Gas Turbine Generator (GTG) B	05A Module 6S	1158/530 ltrs	
Gas Turbine Generator (GTG) C	05A Module 6S	1158/530 ltrs	
Port Lifeboat Davit Gearbox	05 2nd Deck Aft	120 ltrs	
Stbd Lifeboat Davit Gearbox	05 2nd Deck Aft	120 ltrs	
Port Liferaft Davit Gearbox	05 2nd Deck Aft	18 ltrs	
Stbd Liferaft Davit Gearbox	05 2nd Deck Aft	18 ltrs	
Emergency Generator	06 Upper Deck	120 ltrs	
No.1 A.C. Compressor	06 Upper Deck	10 ltrs	
No.2 A.C. Compressor	06 Upper Deck	10 ltrs	
No.1 Provision Reefer Compressor	06 Upper Deck	5 ltrs	
No.2 Provision Reefer Compressor	06 Upper Deck	5 ltrs	
Main Engine	**Decomissioned**		
Auxiliary Generator	**Decomissioned**		
Turbo Alternator Set	**Decomissioned**		

No.1 Main Air Compressor	Engine Room	50 ltrs	
No.2 Main Air Compressor	Engine Room	50 ltrs	
Aux. Air Compressor	Engine Room	50 ltrs	
Tank Cleaning Pump	Engine Room	200 ltrs	
No.1 Cargo Pump Turbine	Engine Room	200 ltrs	
No.2 Cargo Pump Turbine	Engine Room	200 ltrs	
No.3 Cargo Pump Turbine	Engine Room	200 ltrs	
No.1 MDO Purifier	Engine Room	12 ltrs	
No.2 MDO Purifier	Engine Room	12 ltrs	
Aft Fire Pump	Engine Room	115 ltrs	
Emergency Air Compressor	Engine Room	20 ltrs	
Riser Pull-in Winch			
Planetary Gearbox 6 x 25 ltrs	06 Upper Deck	150 ltrs	
Auxiliary Pull-in Winch			
Planetary Gearbox 2 x 25 ltrs	06 Upper Deck	50 ltrs	
Coiled – Tubing Trolley			
Gearbox 5 x 15 ltrs	06 Upper Deck	75 ltrs	
No.1 Hose Reel 3 x 15 ltrs	06 Upper Deck Aft	45 ltrs	
Auxiliary Winch	06 Upper Deck Aft	4 ltrs	
Air Winch	06 Upper Deck Aft	5 ltrs	
Meteorological Winch	06 Upper Deck Aft	5 ltrs	

Lub. Oil Tank Designation	Frame No.	Capacity m^3	Approximate Quantity	Notes
L.O. Sump Tank	22 – 37	58.0		
L.O. Settling Tank	39 – 44	55.1		
L.O. Storage Tank	34 – 39	58.4		
Cylinder Oil Storage Tank	30 – 34	46.7		
Cylinder Oil Storage Tank	26 - 30	46.7		

Lub. Oil Stores (Drums)	Location	Approximate Quantity	Notes

Code C 4	Hydraulic Oils (In machinery and storage tanks)		
Machinery Description	**Location**	**Approximate Quantity including reservoirs**	**Notes**
Fwd Fire Pump	06B Upper Deck Forward	1200 ltrs	
HPU Offloading & Mooring Fwd	06B Upper Deck Forward	3000 ltrs	
Gas Turbine Generator (GTG) A	05A Module 6S	151 ltrs	
Gas Turbine Generator (GTG) B	05A Module 6S	151 ltrs	
Gas Turbine Generator (GTG) C	05A Module 6S	151 ltrs	
Forward Crane	06B Upper Deck Forward	2000 ltrs	
Mid Crane	06A Upper Deck Aft	1742 Ltrs	

Stern Crane Rescue Boat Davit Emergency Generator Hydraulic Power Unit Aft Fire Pump Coiled-Tubing Trolley HPU Offloading & Mooring Aft	06 Upper Deck 05 2nd Deck 06 Upper Deck 06 HPU Room Engine Room 06 Upper Deck 06 Upper Deck Aft	1803 Ltrs 120 ltrs 50 ltrs 520 ltrs 1200 ltrs 600 ltrs 3000 ltrs	

Hyd. Oil Tank Designation	Tank frame	Capacity m^3	Approximate Quantity	Notes

Hyd. Oil Stores (Drums)	Location	Approximate Quantity	Notes

Code C 5	Anti-seize Compounds		
Location		Approximate Quantity)	Notes

Code C 6	Fuel Additives		
Location		Approximate Quantity)	Notes

Code C 7	Engine Coolant Additives & Water Treatments		
Machinery Description *Give tonnage of treated engine coolant*	Location	Approximate Quantity including reservoirs	Notes
Main Engine	**DECOMMISSIONED**		
Generators			
Emergency Generator			
Central Cooling System			

Engine Additives/Treatment Chemical Stores	Location	Approximate Quantity including reservoirs	Notes
N/A			

Code C 8	Antifreeze Fluids		
Machinery Location *Give tonnage of treated water in use (eg Em.Gen. Coolant)*		Approximate Quantity	Notes

Antifreeze Stores	Location	Approximate Quantity	Notes

Code C 9	Boiler and Feedwater Treatment and Test Reagents		
Machinery Description *Give tonnage of treated water in use*	Location	Approximate Quantity including reservoirs	Notes
Main Boiler(s)			
Economiser			
Auxiliary Boiler			

Boiler & Feed Water Chemicals & Test Reagents	Location	Approximate Quantity	Notes
N/A			

Code C10	De-ioniser Regeneration Chemicals		
Location		Approximate Quantity	Notes

Code C11	Evaporator Dosing Descaling Acids		
Location		Approximate Quantity	Notes

Code C12	Paint Stabilisers/Rust Stabilisers	
Location	**Approximate Quantity**	**Notes**

Code C 13	Solvents/Thinners	
Location	**Approximate Quantity**	**Notes**
Paint Locker – 05B Upper Deck Forward		

Code C 14	Paints	
Location	**Approximate Quantity**	**Notes**
Paint Locker – 06 Upper Deck Accommodation		

Code C 15	Chemical Refrigerants	
Location	**Approximate Quantity**	**Notes**

Code C 16	Battery Electrolyte	
Location *Only if in bulk (stores), not in batteries (see B3 and C46)*	**Approximate Quantity**	**Notes**

Code C 17	Alcohol, Methylated Spirit	
Location	**Approximate Quantity**	**Notes**

Code C 18	Acetylene	
Location	**Approximate Quantity**	**Notes**
Acetylene Locker		

Code C 19	Propane	
Location	**Approximate Quantity**	**Notes**

Code C20	Butane	
Location	**Approximate Quantity**	**Notes**

Code C 21	Oxygen	
Location *Include ER use and medical*	**Approximate Quantity**	**Notes**
Oxygen Locker Medical Oxygen - Hospital – 04 3rd Deck Starboard	2	

Code C 22	CO_2	
Location	**Approximate Quantity**	**Notes**
Bulk CO_2 System 06. Upper Deck Accommodation	156 Cylinders	
E- House Module 6 Port Gas Turbine Generator (GTG) A Gas Turbine Generator (GTG) B Gas Turbine Generator (GTG) C Emergency Generator Room	56 Cylinders 3 Cylinders 3 Cylinders 3 Cylinders 2 Cylinders	

Code C 23	Perfluorocarbons (PFCs)	
Location	**Approximate Quantity**	**Notes**

Code C 24	Methane		
Location		Approximate Quantity	Notes

Code C 25	Hydrofluorocarbon (HFCs) (R134a/401a/404a etc)		
Type	Location	Approximate Quantity (kg)	Notes
All Systems on vessel use R404A/R407C/R410A			
R404A	Galley Cold Chamber. 2 x Domestic Reefer Comps		
R407C	Navigation Deck. 2 x HVACs Module 6P E-House. 2 x HVACs UPS Room. 1 x HVAC Upper Deck Reefer Flat. 2 x A.C. Compressors New Accommodation. 2 x HVACs		
R410A	Module 5P Workshops. 4 x Split Systems		

Code C 27	Nitrous Oxide (N_20)		
Location		Approximate Quantity	Notes

Code C 28	Sulphur Hexafluoride (SF_6)		
Location		Approximate Quantity	Notes

Code C 29	Bunkers : HFO/IFO/MDO			
Tank Description	**Frame No.**	**Capacity m³**	**Approximate Quantity**	**Notes**
HFO				
HFO Storage Tank Stbd	34 – 48	1286.2		
HFO Settling Tank Stbd	39 – 44	52.2		
HFO Service Tank Stbd	44 – 48	41.8		
FO Overflow Tank Stbd	36 - 44	72.9		
MDO				
No.1 MDO Storage Tank Port	48 – 49	958.5		
No.1 MDO Storage Tank Stbd	48 – 49	958.5		
No.2 MDO Storage Tank Port	34 – 48	1380.2		
MDO Service Tank Stbd	27 – 34	387.9		
MDO Day Tank Stbd	30 - 34	32.6		
GAS/DIESEL				
Emergency Diesel Generator				
Fwd Emergency Fire Pump				
Aft Emergency Fire Pump				

Code C 30	Grease		
Location *Only grease in stores - not in use*		**Approximate Quantity**	**Notes**

Code C 38	Fuel Gas		
Location *This refers to gas used as fuel (LNG) not gasoline/petrol*		**Approximate Quantity**	**Notes**

Code C46	Batteries (All types incl. Lead acid batteries)		
Type and Use *Only batteries in store (spares or waste) otherwise in B1 and B3. Not consumer batteries (AA AAA etc) see Part 3B*	**Location**	**Approximate Quantity**	**Notes**

Code C47	Pesticides/insecticide sprays	
Location	**Approximate Quantity**	**Notes**

Code C48	Extinguishers, including portable CO_2 units		
Location	**Type**	**Approximate Quantity**	**Notes**
Details as per Fire Plan	5kg CO2 22kg Wheeled CO2 45kg Wheeled CO2	53 2 2	
	45 ltr Wheeled Foam 135 ltr Semi-portable alcohol resistant Foam 45 ltr Semi-portable alcohol resistant Foam	19 2 2	
	3kg Dry Powder 6kg Dry Powder 25kg Wheeled Dry Powder 50 kg Wheeled Dry Powder	23 57 2 3	

Code C49	Chemical Cleaner (incl electrical equipment cleaner, carbon remover)		
Type *(product brand)*	**Location**	**Approximate Quantity**	**Notes**

Code C50	Detergent/bleacher	
Location	**Approximate Quantity**	**Notes**

Code C51	Miscellaneous Medicines	
Location *(product brand) (Attach separate list of medical stores)*	**Approximate Quantity**	**Notes**

Code C52	Firefighting Clothing and Personal Protective Equipment		
Item *Include BA sets & spares, EEBD*	**Location**	**Approximate Quantity**	**Notes**
As per Fire & Safety Plan			

Code C55	Spare Parts which contain materials listed in Table A or Table B		
Location		**Approximate Quantity**	**Notes**

Part 3A completed by	*NAME*	**Date**	*2000-00-00*
Signature		**On behalf of**	*Company*

Note: Part IIIA of the IHM report to be completed by vessel staff, prior to arrival at recycling facility.

IHM Part III B

PART III (B) - Materials Listed in Table D

Regular Consumable (Domestic) Goods Potentially Containing Hazardous Materials

(Ref MEPC 68/21/Add.1 Annex 17. (RESOLUTION MEPC.269(68))

Equipment	Description/Location	Quantity	Notes
D1 : Refrigeration Units	Conventional refrigerators (*can be grouped by location and refrigerant type)*		
	Water fountains		
	Deep freezer		
	Ice machine		
	Drinks chillers		
	Food chillers		
D1 : Radar & Nav Equipment Displays	CRT Display		
	Flat screen		
D1 : Computers (PCs)			
D1 : Printers			
D1 : Scanners			
D1 : UPS Units			
D1 : Television Sets	CRT Displays		
	Flat screen		
D1 : Radio Sets			
D1 : Video Cameras			
D1 : Video Recorders			
D1 : Telephones			

D1 : Consumer batteries			
D2 : Filament Bulbs *(estimated)*			
D2 : Lamps			
D2 : Fluorescent Lamps *(estimated)*			
D3 :			

Part 3B completed by	*NAME*	**Date**	*2000-00-00*
Signature		**On behalf of**	*Company*

Note: Part IIIB of the IHM report to be completed by vessel staff, prior to arrival at recycling facility.

Other hazardous materials

Other hazardous materials (potential, non-IMO/MEPC/EU guidelines)

Equipment containing Lithium Batteries		
Location	Quantity	Notes
EPIRB 00. Compass Deck 01. Navigation Deck SART LIFEJACKET LIGHTS As per fire and safety plan	 1 1 6 486	

AFFF Foam		
Location and Item Description	Quantity	Notes
00. Helicopter Deck 3 x 200 ltrs 06. Upper Deck Accommodation Foam Tank Room SINTEX AFFF 3%	600 ltrs 6000 ltrs	

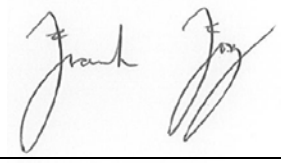
Pyrotechnics		
	Quantity	Notes
Rocket Parachute Flares Line Throwing Appliance Pyrotechnic Distress Signals	12 1 6	

Lifeboats complete with fuel and statutory equipment		
Location and Item Description	Quantity	Notes
05 2nd Deck 104 person 110 person 36 person	 1 1 2	

Liferafts complete with self inflation devices and statutory equipment		
Location and Item Description	Quantity	Notes
05 2nd Deck 25 person 20 person	 12 1	

Transformer Oil		
Location	Quantity	Notes
05A Topsides Aft 06 Upper Deck	2 1	01.
01. Oil Type Mineral Oil IEC 60296 Class 1		

Glygol & Chemical Bulk Tanks (if applicable)		
Location	Capacity – Bulk Tanks	Notes
Glycol Tanks Ethanol Tank Other Chemical Tanks	**ALL TOPSIDE CHEMICAL TANKS TO BE EMPTY AND GAS FREE.**	

Completed by	Frank Fox	**Date**	02/11/2023
Signature		**On behalf of**	Sea2Cradle

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Appendices

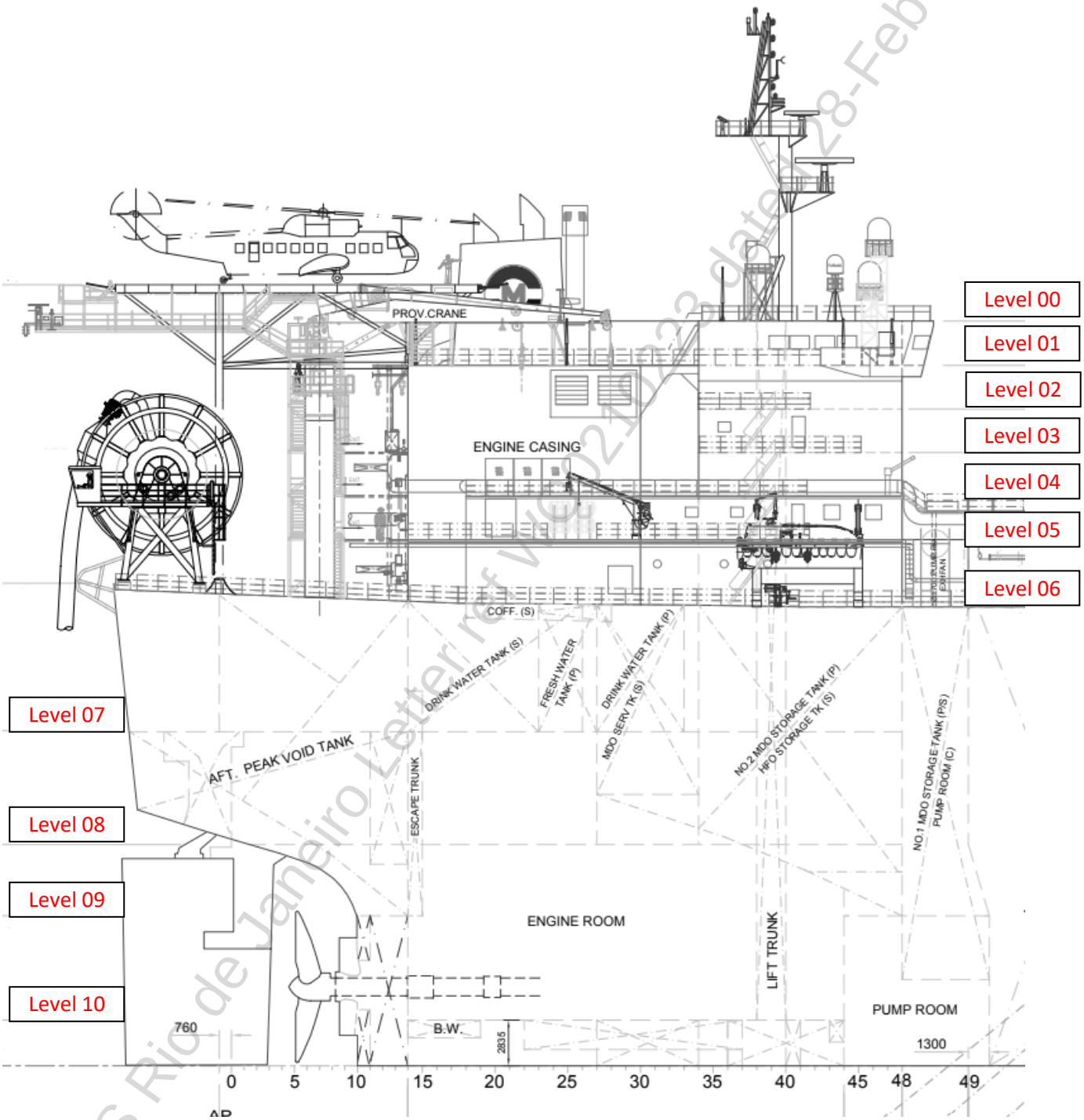
- Zone and level Definitions
- Location Diagrams of Hazardous Materials on Board
- Visual Sampling Check Plan
- Asbestos documentation
- Hazmat documentation
- Radiation documentation
- Medicines documentation
- Surveyor's 'Approved Hazmat Expert' certificate

Zone and Level Definitions

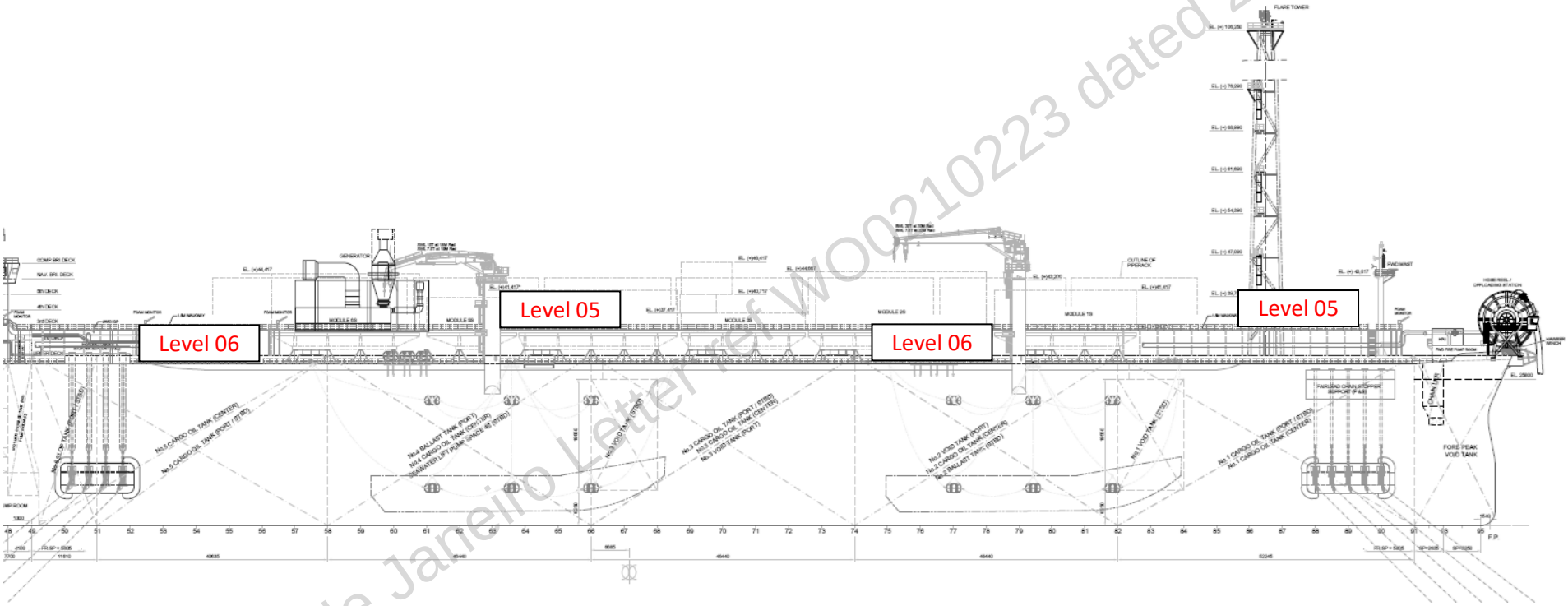
Vessel Zone and Level Definitions

Refer to the profile plan for the location of the listed zones and levels

LEVEL	DECK
00	COMPASS BRIDGE DECK and HELIDECK
01	NAVIGATION BRIDGE DECK
02	5TH DECK
03	4TH DECK
04 04B	3RD DECK ER ENGINE CASING + UPPER CENTRAL STORE
05 05A 05B 05C 05D 05E 05F 05G 05H 05J	2nd DECK ACCOMMODATION TOPSIDES AFT [frame 49 – 73] TOPSIDES FORWARD [frame 72 – fwd] CHEMICAL INJECTION and LAYDOWN MODULE 1S MODULE 2P HP COMPRESSION MODULE 2S PRODUCTION SEPARATION MODULE 3P ELEVATION PLANS frame 70-71 E-HOUSE MODULE 6P POWER GENERATION MODULE 6S
06 06A 06B	UPPER DECK ACCOMMODATION UPPER DECK AFT [frame 49 – 70] UPPER DECK FORWARD [frame 70 – fwd]
07 07B	2ND FLOOR ENGINE ROOM ABOVE ENG + ELECT WORKSHOP
08	UPPER ENGINE FLOOR
09	LOWER FLOOR
10	MAIN FLOOR

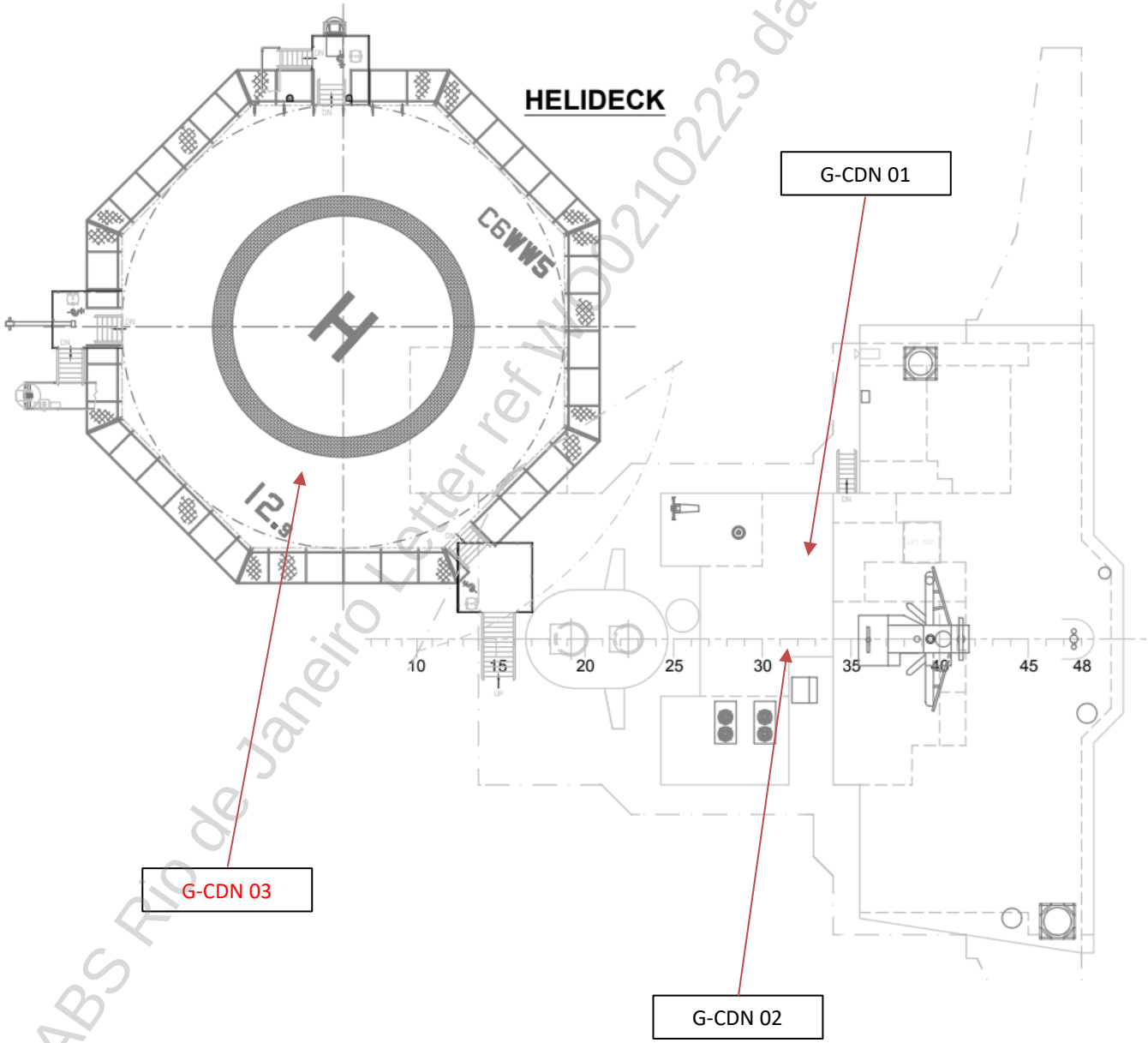


Project 193.23 Cidade de Niteroi MV18
Elevation Main Deck



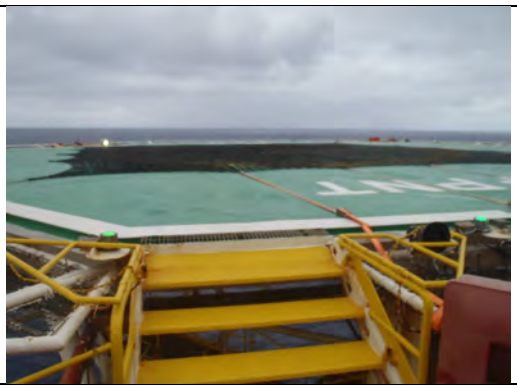
Location Diagrams of Hazardous Materials on Board

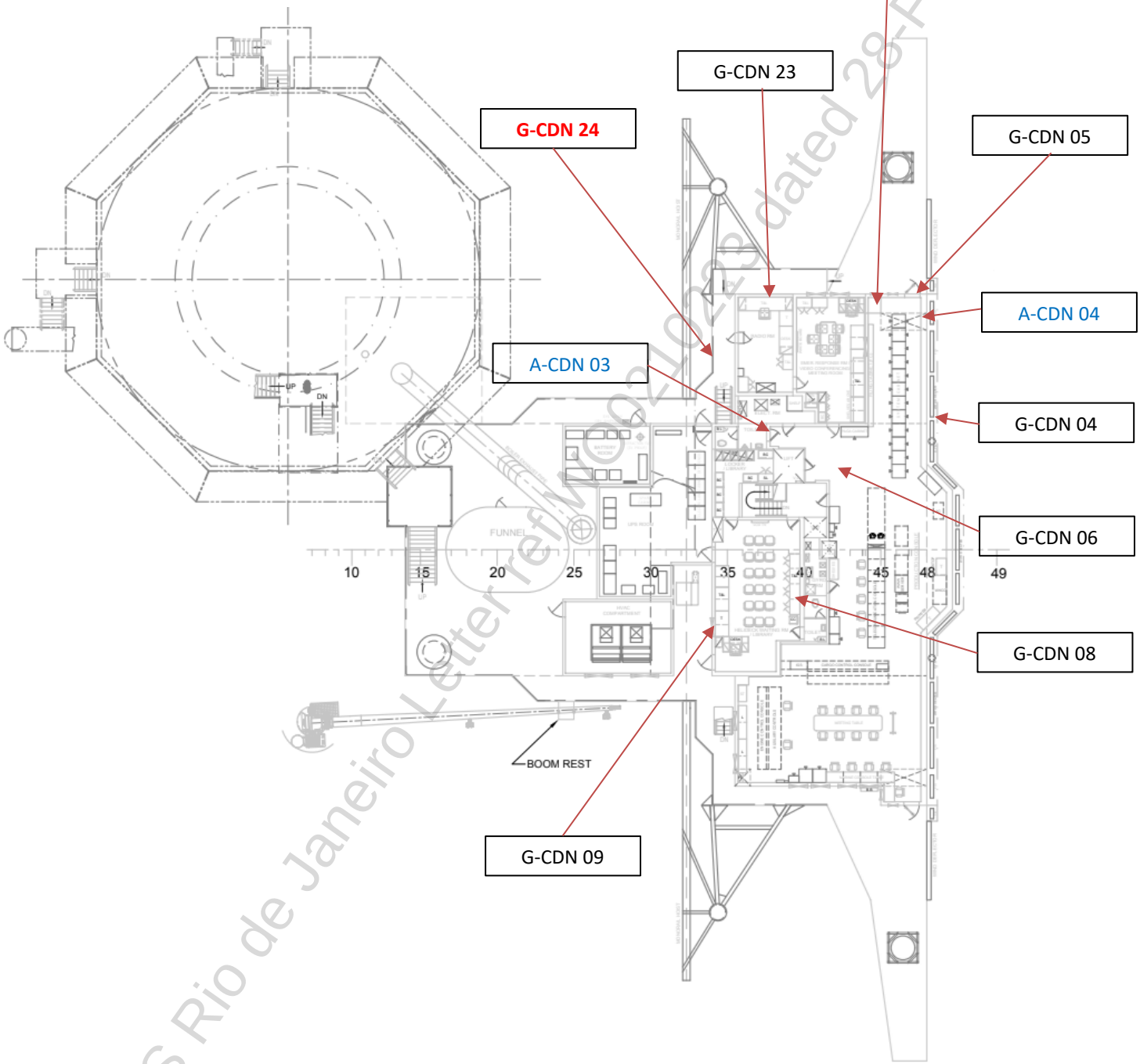
Showing the locations of samples taken, as detailed in the 'Sample List', and the results as detailed in the laboratory report. See attachment 'Hazmat Documentation'



	
Sample : G CDN 001 Location : 00 Compass Deck + Helipad Description : Deck Paint - Green	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 3.7 mg/kg Cd : 0.21 mg/kg Cr : 70 mg/kg

	
Sample : G CDN 002 Location : 00 Compass Deck + Helipad Description : Cable Run Wipe	Tested for : PCB Result : 0.00 µg abs : :

	
Sample : G CDN 003 Location : 00 Compass Deck + Helipad Description : Helipad Special Coating	Tested for : PCB, Pb, Cd, Cr Test results were inconclusive due to limited sample quantity. Paint to be regarded as potentially containging hazardous materials (PCHM) until another sample has been tested.



	
Sample : G CDN 004 Location : 01 Navigation Deck Description : Window Seal	Tested for : PCB Result : 0.00 mg/kg : :
	
Sample : G CDN 005 Location : 01 Navigation Deck Description : Bridge Wing Door Seal	Tested for : PCB Result : 0.00 mg/kg : :
	
Sample : G CDN 006 Location : 01 Navigation Deck Description : Vinyl Flooring	Tested for : PCB Result : 0.00 mg/kg : :

	
Sample : G CDN 008 Location : 01 Navigation Deck Description : Skirting	Tested for : PCB Result : 0.00 mg/kg : :

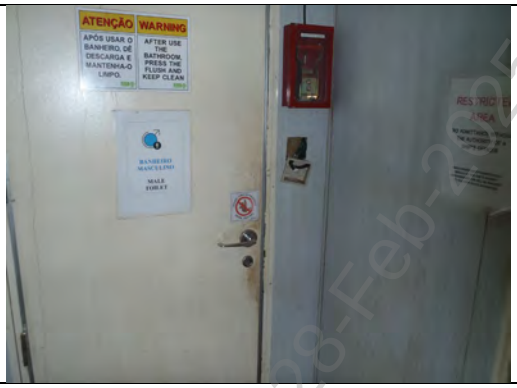
	
Sample : G CDN 009 Location : 01 Navigation Deck Description : Window Seal	Tested for : PCB Result : 10.40 mg/kg : :

	
Sample : G CDN 023 Location : 01 Navigation Deck Description : W/T Door Seal	Tested for : PCB Result : 0.00 mg/kg : :

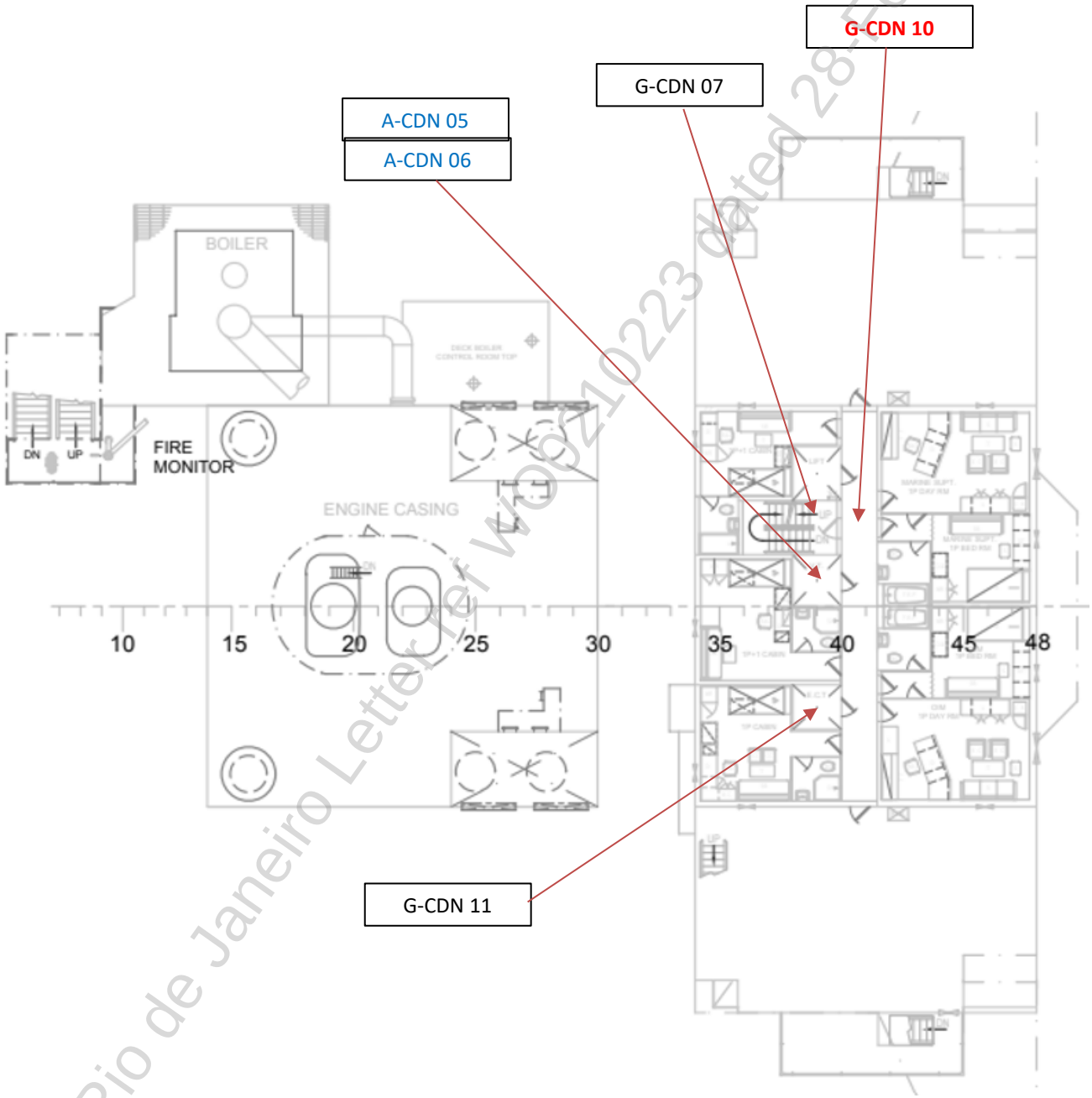
	
Sample : G CDN 024 Location : 01 Navigation Deck Description : Yellow Paint	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 2160 mg/kg Cd : 0.11 mg/kg Cr : 560 mg/kg

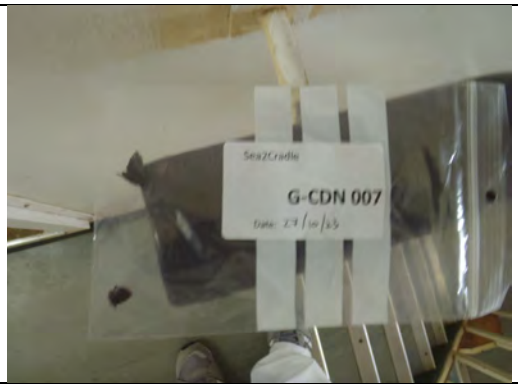
	
Sample : A CDN 001 Location : 01 Navigation Deck Description : Deckhead Upper Insulation	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 002 Location : 01 Navigation Deck Description : Deckhead Panel Insulation	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 003 Location : 01 Navigation Deck Description : Bulkhead Insulation	Tested for : Asbestos Result : <0.1% : :

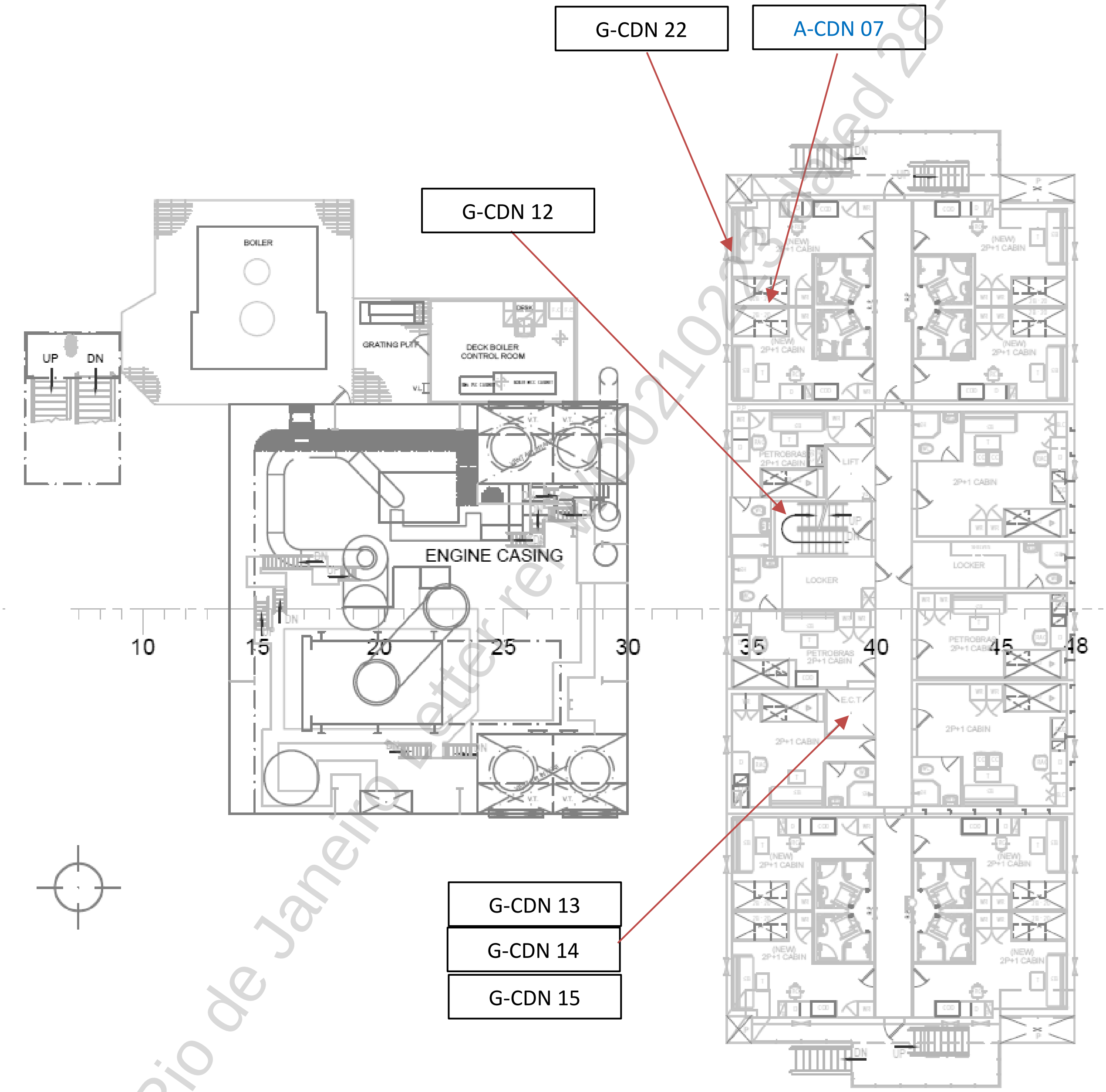
	
Sample : A CDN 004 Location : 01 Navigation Deck Description : Fwd Bridge Bulkhead Insulation	Tested for : Asbestos Result : <0.1% : :



	
Sample : G CDN 007 Location : 02 5th Deck Description : Stairwell Handrail	Tested for : PCB Result : 4.75 mg/kg : :
	
Sample : G CDN 010 Location : 02 5th Deck Description : Deck Paint - Green	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 1350 mg/kg Cd : 0.95 mg/kg Cr : 150 mg/kg
	
Sample : G CDN 011 Location : 02 5th Deck Description : Bulkhead Paint - White	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 630 mg/kg Cd : <0.1 mg/kg Cr : 130 mg/kg

	
Sample : A CDN 005 Location : 02 5th Deck Description : Vent Trunk Insulation - Canvas	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 006 Location : 02 5th Deck Description : Vent Trunk Insulation - Fibre	Tested for : Asbestos Result : <0.1% : :

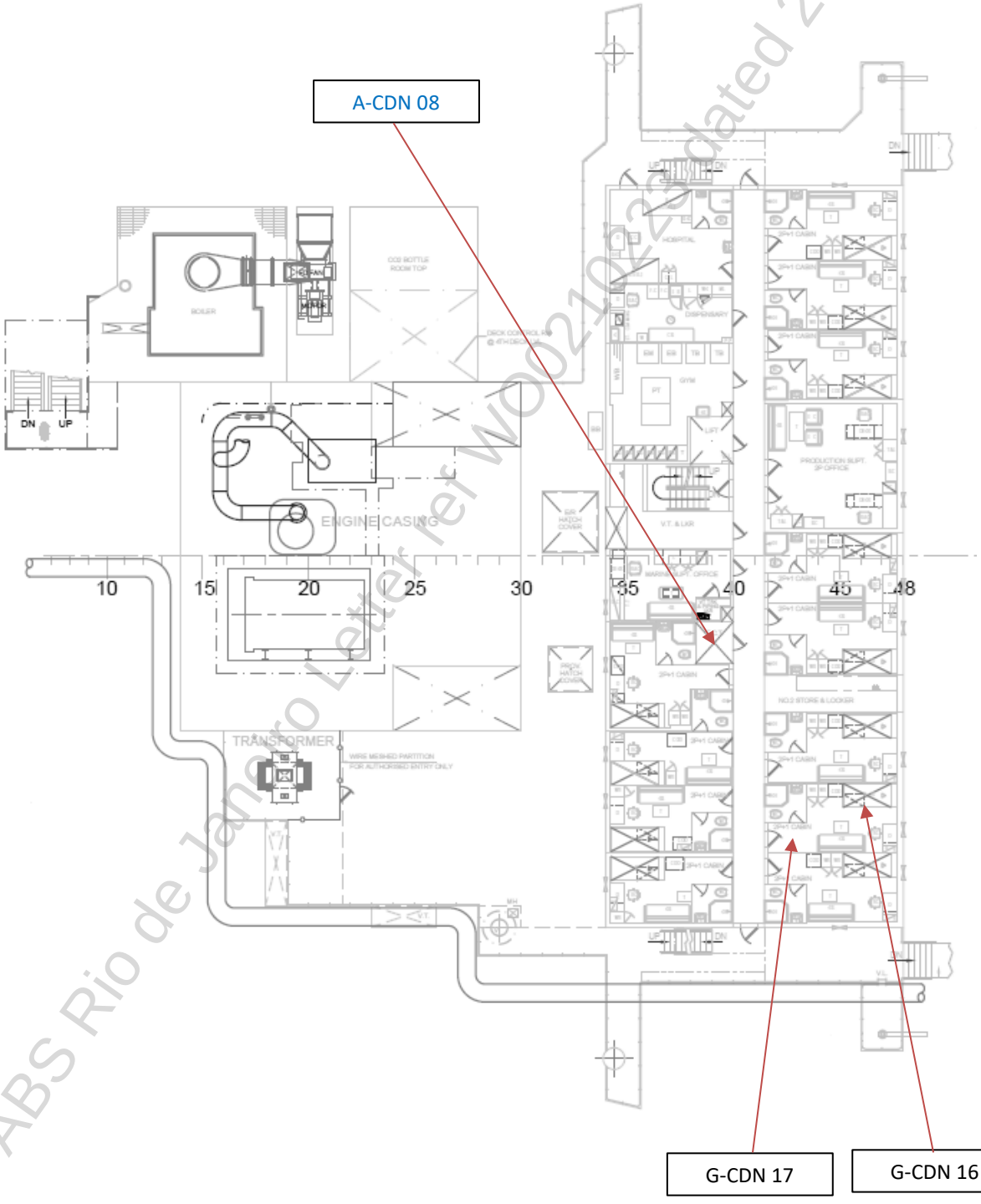


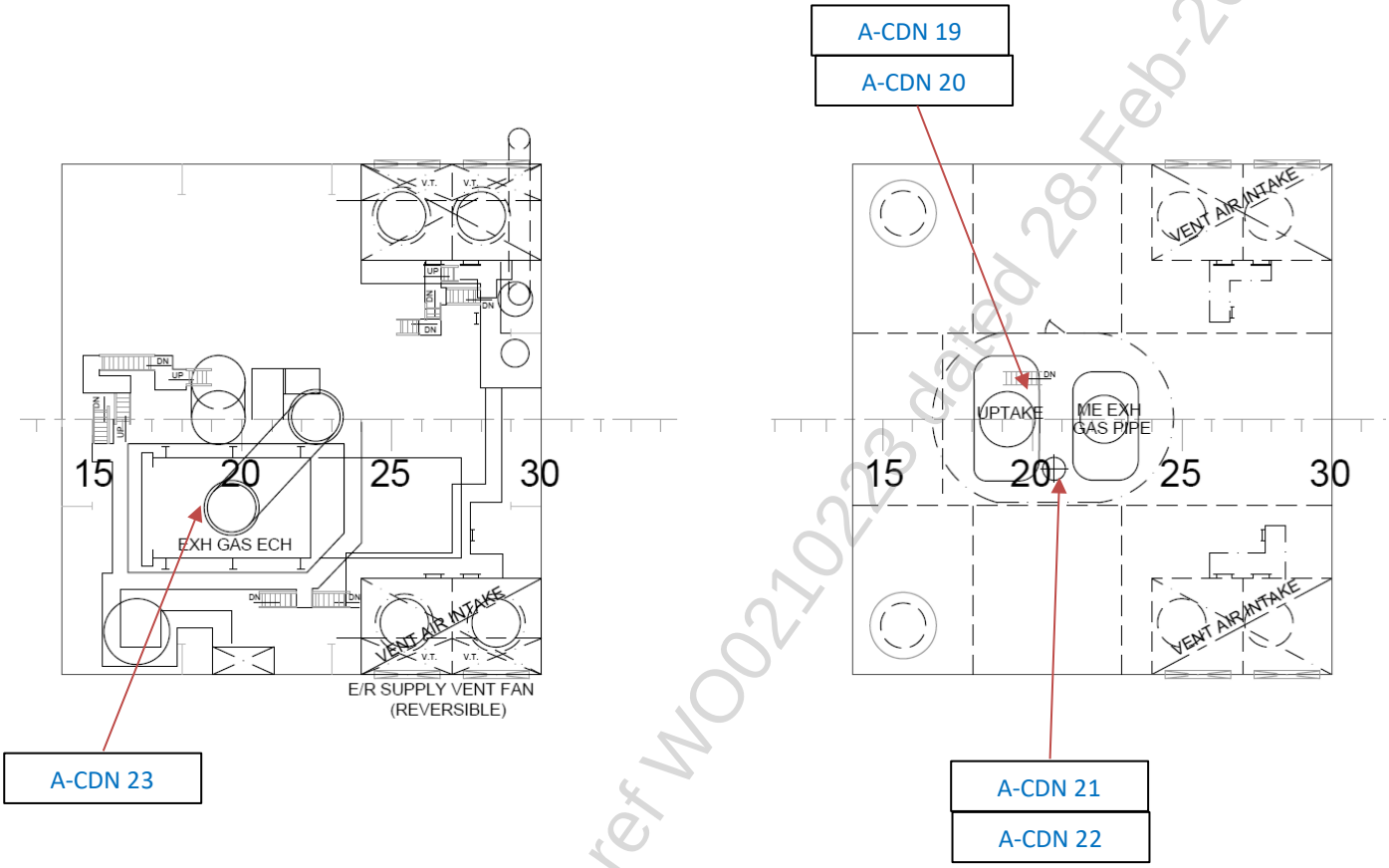
Sample : G CDN 012	Tested for : PCB
Location : 03 4th Deck	Result : 0.00 mg/kg
Description : Stairway Vinyl Flooring	:
	:

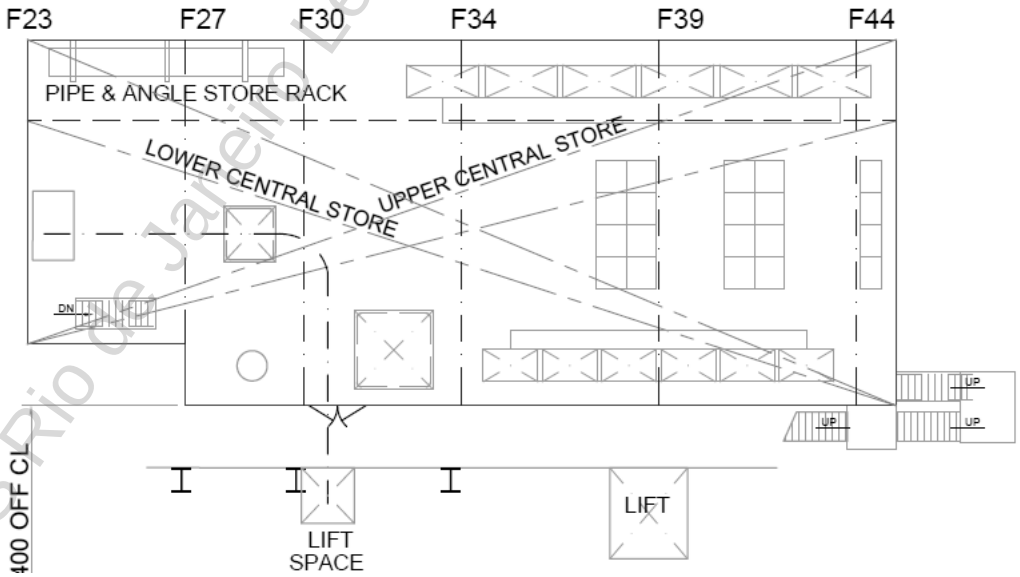
Sample : G CDN 013	Tested for : PCB
Location : 03 4th Deck	Result : 0.00 mg/kg
Description : Electrical Mat	:
	:

Sample : G CDN 014	Tested for : PCB
Location : 03 4th Deck	Result : 0.00 mg/kg
Description : Cable Conduit Caulking	:
	:

	
Sample : G CDN 015 Location : 03 4th Deck Description : Cable Run Wipe	Tested for : PCB Result : 0.00 µg abs : :
	
Sample : G CDN 022 Location : 03 4th Deck Description : Curtain Fabric	Tested for : PFOS Result : <0.01 mg/kg : :
	
Sample : A CDN 007 Location : 03 4th Deck Description : Bulkhead Insulation	Tested for : Asbestos Result : <0.1% : :







	
Sample : G CDN 016 Location : 04 3rd Deck Description : Curtain Fabric	Tested for : PFOS Result : <0.01 mg/kg : :

	
Sample : G CDN 017 Location : 04 3rd Deck Description : Vinyl Flooring	Tested for : PCB Result : 0.00 mg/kg : :

	
Sample : A CDN 008 Location : 04 3rd Deck Description : Deckhead Panel Insulation	Tested for : Asbestos Result : <0.1% : :

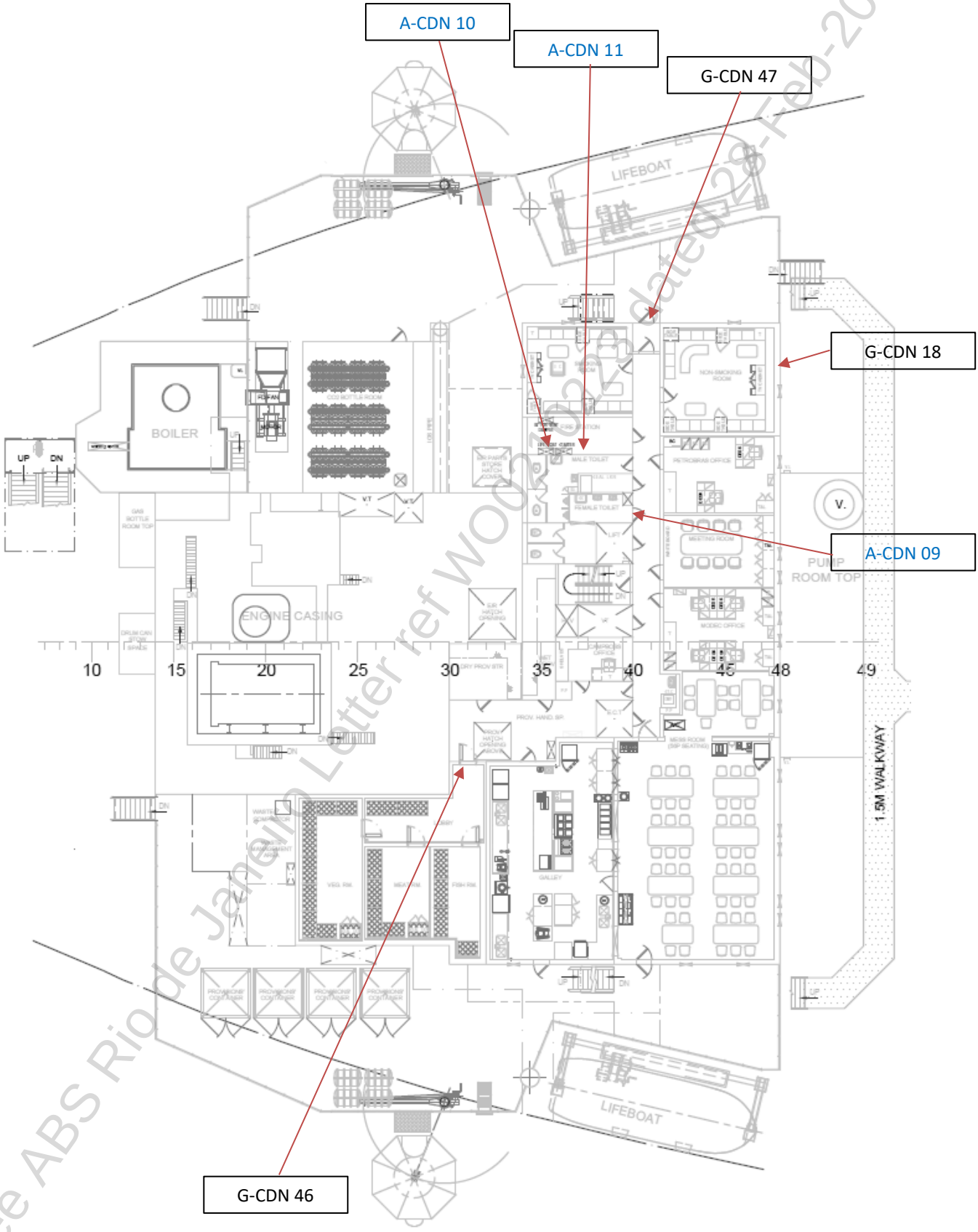
Sample	: A CDN 19	Tested for	: Asbestos
Location	: 04B Engine Casing	Result	: <0.1%
Description	: Boiler Uptake - Canvas		:
			:

Sample	: A CDN 020	Tested for	: Asbestos
Location	: 04B Engine Casing	Result	: <0.1%
Description	: Boiler Uptake - Insulation		:
			:

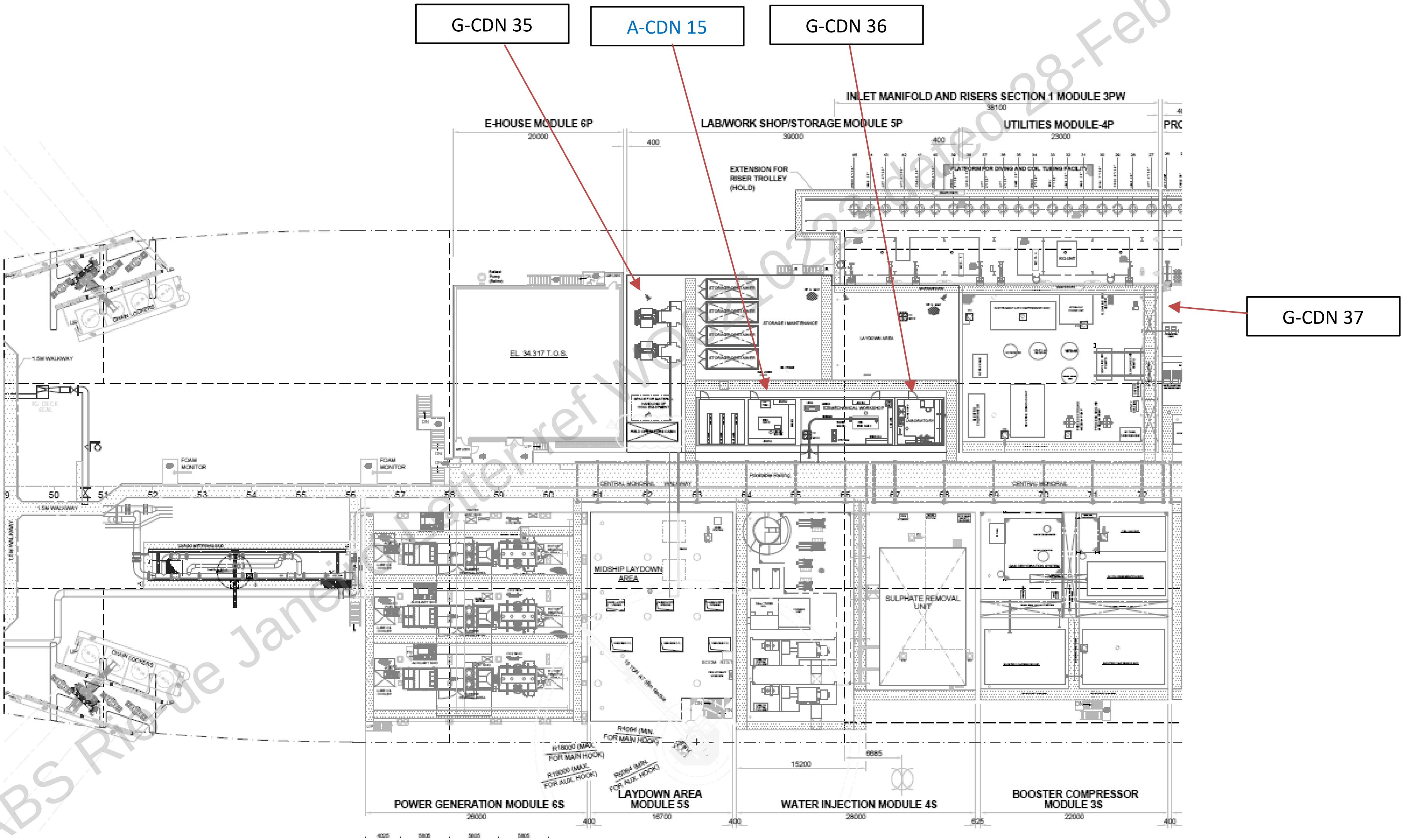
Sample	: A CDN 021	Tested for	: Asbestos
Location	: 04B Engine Casing	Result	: <0.1%
Description	: Header Tank - Canvas		:
			:

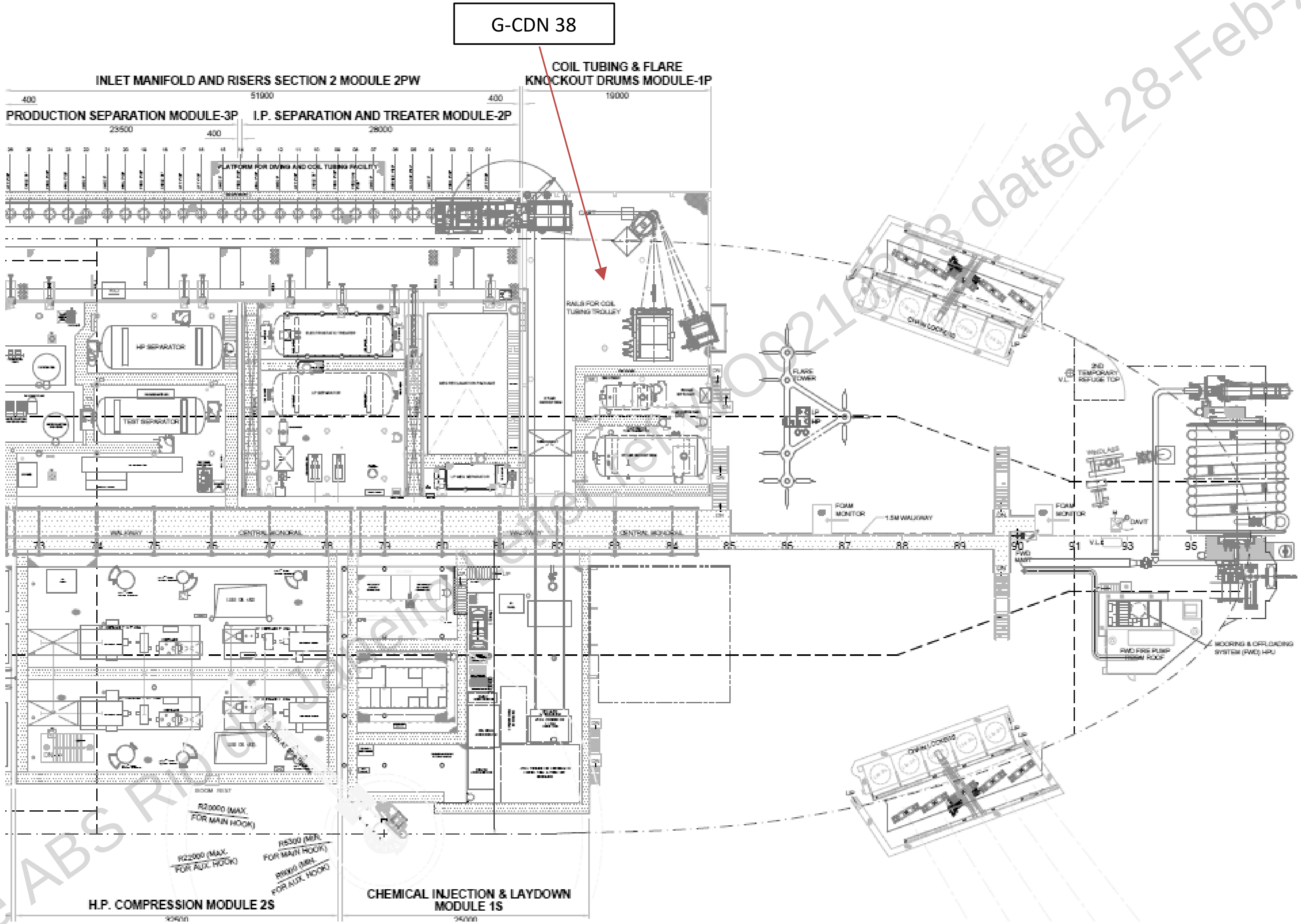
	
Sample : A CDN 022 Location : 04B Engine Casing Description : Header Tank - Insulation	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 023 Location : 04B Engine Casing Description : E.G. Economiser Insulation	Tested for : Asbestos Result : <0.1% : :

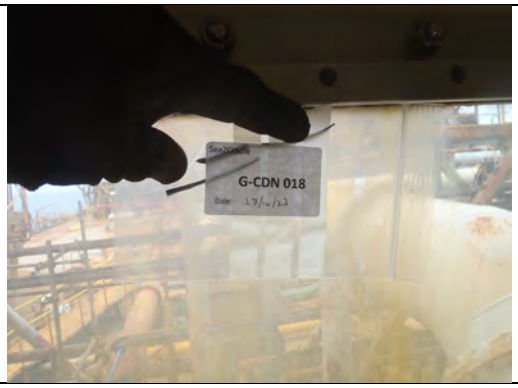


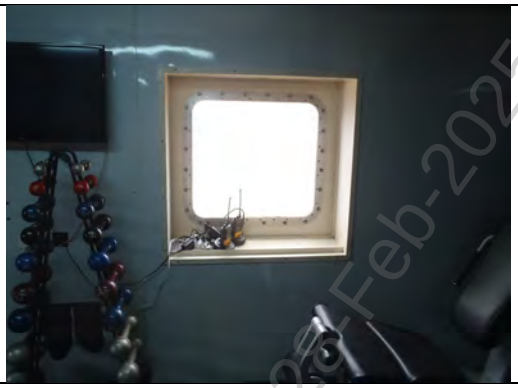
Project 193.23 Cidade de Niteroi MV18
Level 05A Topsides Aft [frame 49 – 73]



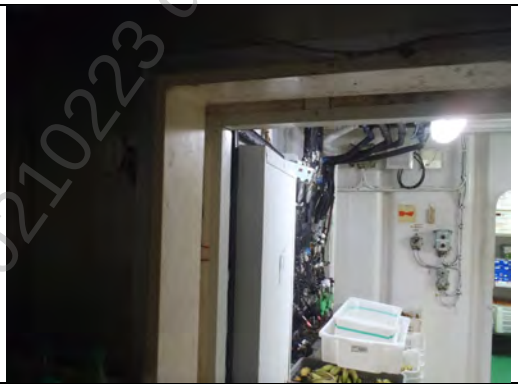


SEA 2 CRADLE





Sample : G CDN 018	Tested for : PCB
Location : 05 2nd Deck	Result : 0.00 mg/kg
Description : Window Seal	:
	:



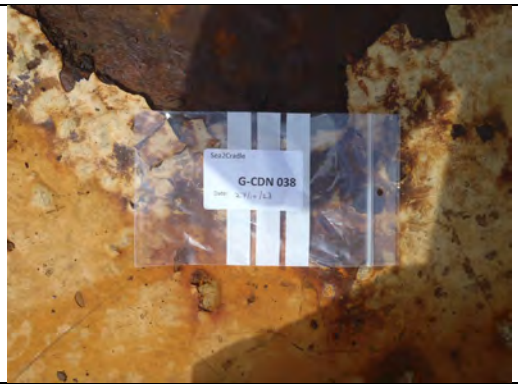
Sample : G CDN 046	Tested for : ODS
Location : 05 2nd Deck Cold Stores	Result : <10 mg/kg
Description : Insulation	:
	:

Sample : G CDN 047	Tested for : PCB
Location : 05 2nd Deck	Result : 0.00 mg/kg
Description : W/T Door Seal	:
	:

Sample : G CDN 035 Location : 05A Topsides Aft Description : Deck Paint - Green	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 6.9 mg/kg Cd : <0.5 mg/kg Cr : 290 mg/kg

Sample : G CDN 036 Location : 05A Topsides Aft Description : W/T Door Seal	Tested for : PCB Result : 0.00 mg/kg : :

Sample : G CDN 037 Location : 05A Topsides Aft Description : Deck Paint - Yellow	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 14 mg/kg Cd : 2.9 mg/kg Cr : 77 mg/kg

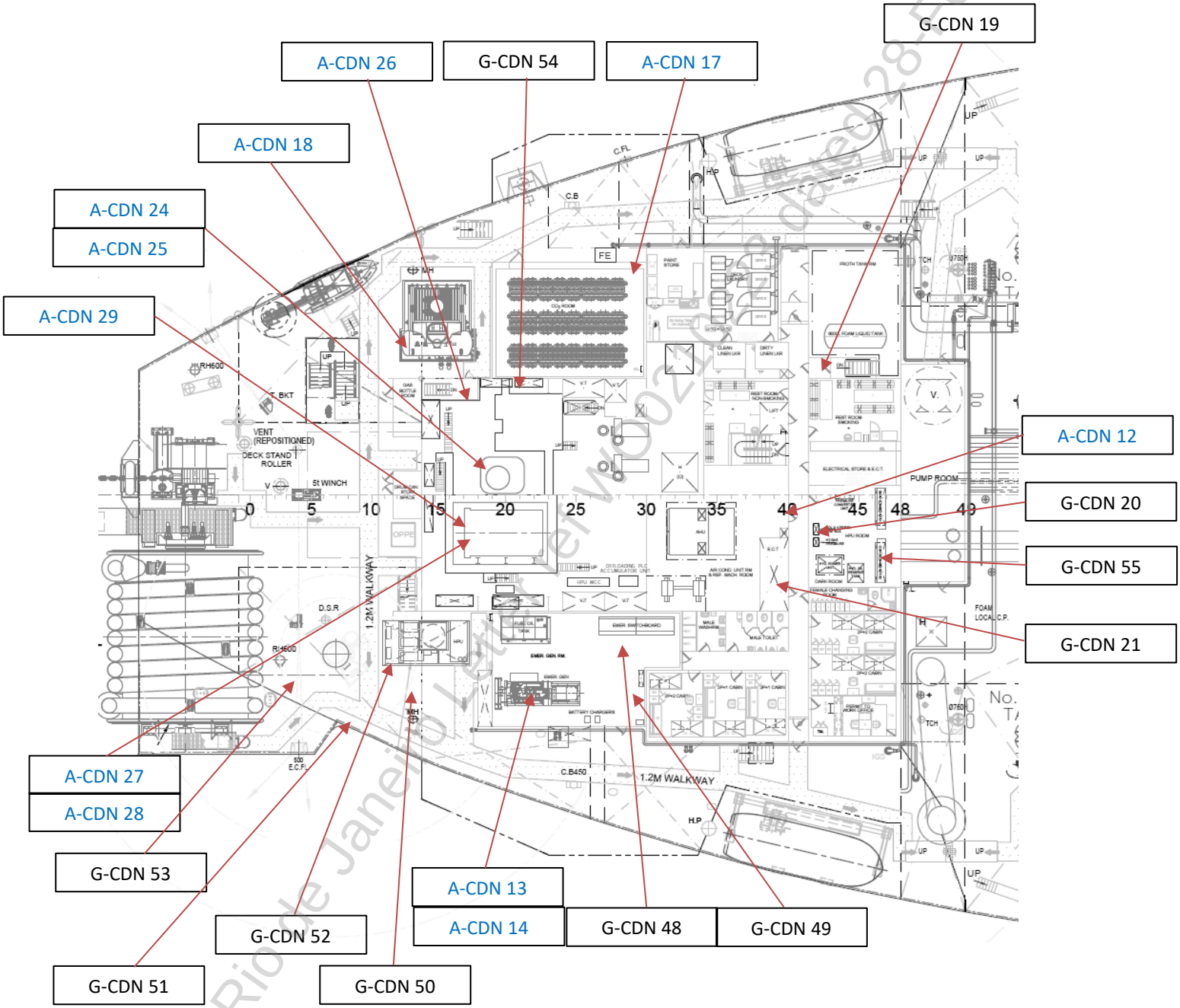
	
Sample : G CDN 038 Location : 05B Topsides Forward Description : Deck paint - White	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 3.8 mg/kg Cd : <0.1 mg/kg Cr : 210 mg/kg

	
Sample : A CDN 009 Location : 05 2nd Deck Description : Cordage Door Seal	Tested for : Asbestos Result : <0.1% : :

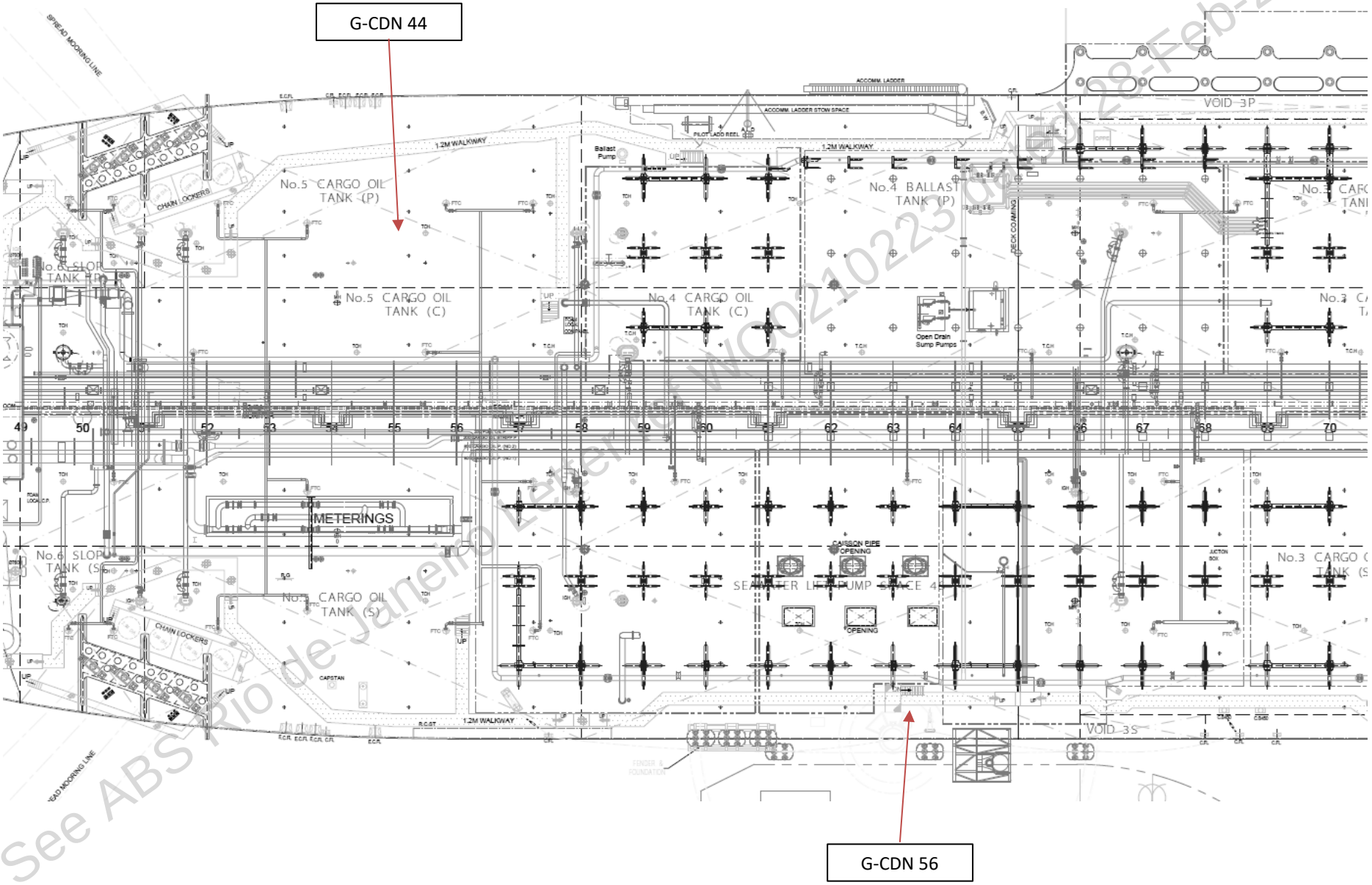
	
Sample : A CDN 010 Location : 05 2nd Deck Fire Station Description : Bulkhead Insulation	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 011 Location : 05 2nd Deck Fire Station Description : Gland Caulking	Tested for : Asbestos Result : <0.1% : :

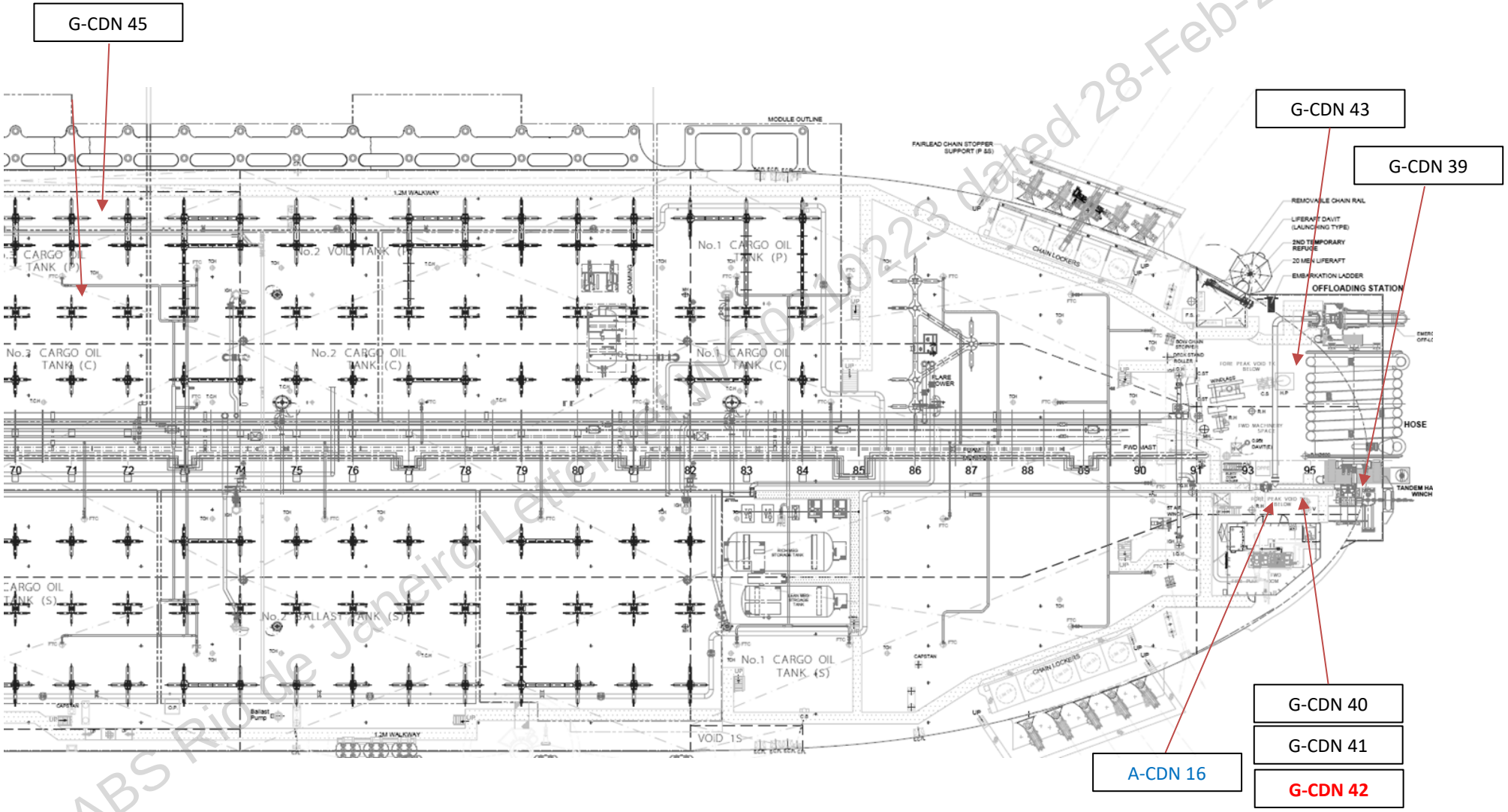
	
Sample : A CDN 015 Location : 05A Topsides Aft Description : Joint Gasket	Tested for : Asbestos Result : <0.1% : :



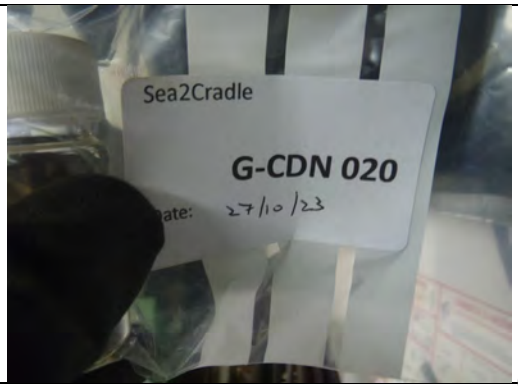
Project 193.23 Cidade de Niteroi MV18
Level 06A Upper Deck Aft [frame 49 - 70]



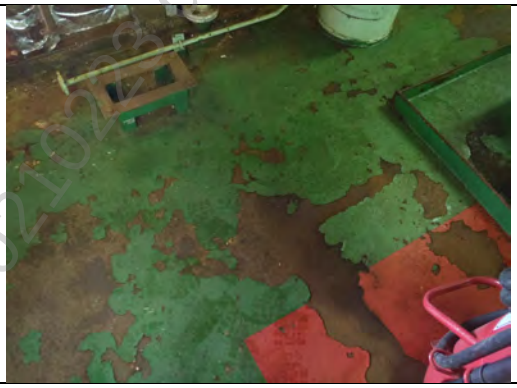
Project 193.23 Cidade de Niteroi MV18
Level 06B Upper Deck Forward [frame 70 – fwd]



	
Sample : G CDN 019 Location : 06 Upper Deck Accommodation Description : Anti-Slip Mat	Tested for : PCB Result : 9.15 mg/kg : :

	
Sample : G CDN 020 Location : 06 Upper Deck Accommodation Description : Cable Run Wipe	Tested for : PCB Result : 0.235 µg abs : :

	
Sample : G CDN 021 Location : 06 Upper Deck Accommodation Description : Electrical Mat	Tested for : PCB Result : 0.00 mg/kg : :

	
Sample : G CDN 048 Location : 06 Emergency Generator Flat Description : Electrical Mat	Tested for : PCB Result : 0.00 mg/kg : :
	
Sample : G CDN 049 Location : 06 Emergency Generator Flat Description : Deck Paint - Green	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 540 mg/kg Cd : 0.81 mg/kg Cr : 47 mg/kg
	
Sample : G CDN 050 Location : 06 Upper Deck Description : Manhole Joint	Tested for : PCB Result : 0.00 mg/kg : :

Sample : G CDN 051
Location : 06 Upper Deck
Description : Fairlead Paint - Black

Tested for : PCB, Pb, Cd, Cr
Result PCB: 0.00 mg/kg
Pb: 290 mg/kg
Cd: 0.18 mg/kg
Cr: 130 mg/kg

Sample : G CDN 052
Location : 06 Upper Deck
Description : Cable Run - Wipe

Tested for : PCB
Result : 0.00 µg abs
:
:

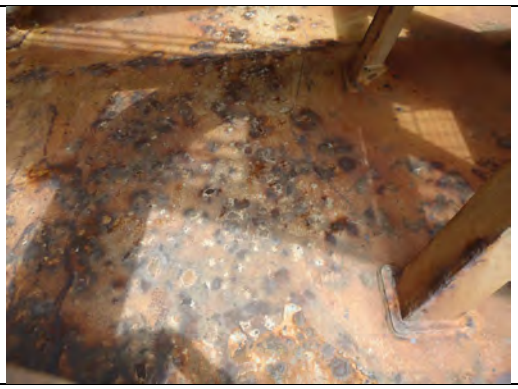
Sample : G CDN 053
Location : 06 Upper Deck
Description : Deck Paint - White

Tested for : PCB, Pb, Cd, Cr
Result PCB: 0.00 mg/kg
Pb: 14 mg/kg
Cd: <0.5 mg/kg
Cr: 34 mg/kg

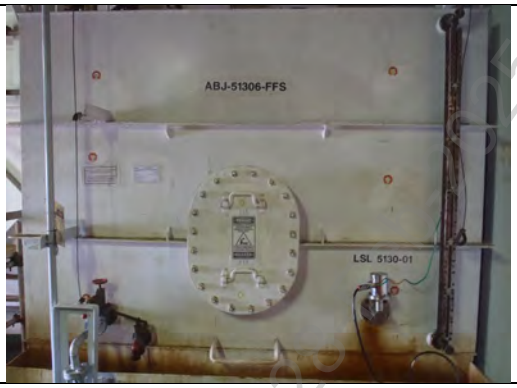
SEA 2 CRADLE

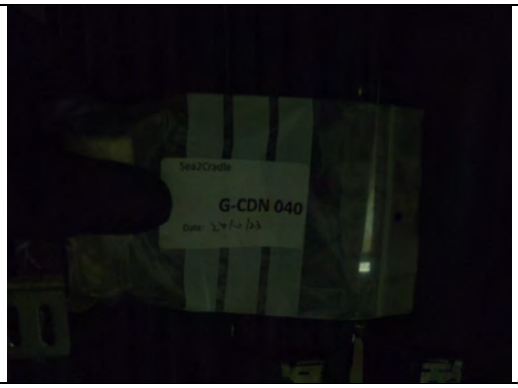
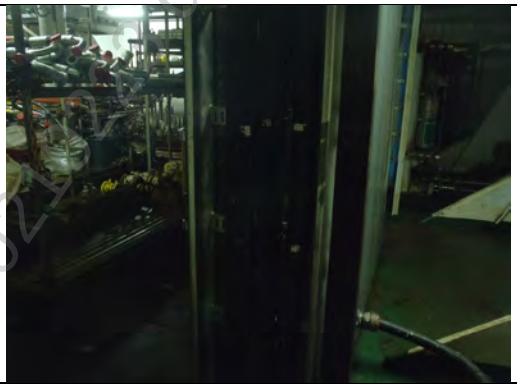
Sample : G CDN 054 Location : 06 Upper Deck ER Description : Manhole Joint	Tested for : PCB Result : 0.00 mg/kg : :

Sample : G CDN 055 Location : 06 HPU Room Description : Hydraulic Oil	Tested for : PCB Result : 0 mg/kg : :



Sample : G CDN 044 Location : 06A Upper Deck Aft Description : Main Deck Paint	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 31 mg/kg Cd : 25 mg/kg Cr : 27 mg/kg

	
Sample : G CDN 039 Location : 06B Forward Fire Pump Room Description : Manhole Joint	Tested for : PCB Result : 0.00 mg/kg : :

	
Sample : G CDN 040 Location : 06B Forecastle Head Description : Cable Run Wipe	Tested for : PCB Result : 0.00 µg abs : :

	
Sample : G CDN 041 Location : 06B Forecastle Head Description : Electrical Mat	Tested for : PCB Result : 0.00 mg/kg : :

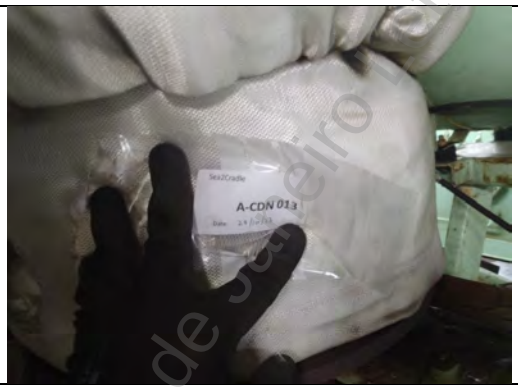
	
Sample : G CDN 42 Location : 06B Forecastle Head Description : Deck Paint - Green	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 1960 mg/kg Cd : 18 mg/kg Cr : 190 mg/kg

	
Sample : G CDN 043 Location : 06B Upper Deck Forward Description : Fire Main Paint - Red	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 30 mg/kg Cd : <0.5 mg/kg Cr : 73 mg/kg

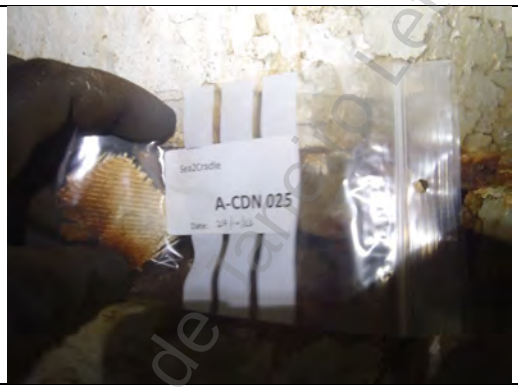
	
Sample : G CDN 045 Location : 06B Upper Deck Forward Description : 3P Void Space Coating	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : <1 mg/kg Cd : 0.47 mg/kg Cr : 110 mg/kg

	
Sample : G CDN 056 Location : 06A Deck Crane Mid Description : Hydraulic Oil	Tested for : PCB Result : 0 mg/kg : :

	
Sample : A CDN 012 Location : 06 Upper Deck Reefer Flat Description : Bulkhead Insulation	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 013 Location : 06 Emergency Generator Room Description : Exhaust Lagging - Canvas	Tested for : Asbestos Result : <0.1% : :

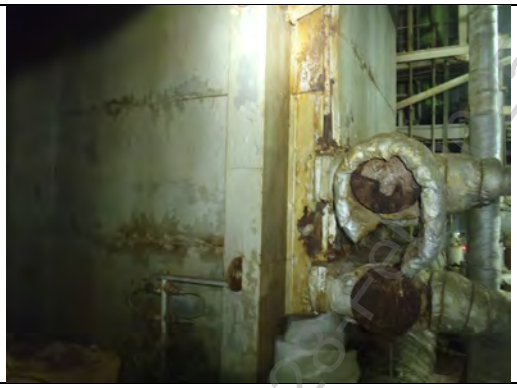
	
Sample : A CDN 014 Location : 06 Emergency Generator Room Description : Exhaust Lagging - Insulation	Tested for : Asbestos Result : <0.1% : :
	
Sample : A CDN 017 Location : 06 CO2 Room Description : Bulkhead Insulation	Tested for : Asbestos Result : <0.1% : :
	
Sample : A CDN 018 Location : 06 Inert Gas Generator Description : Boiler Insulation	Tested for : Asbestos Result : <0.1% : :

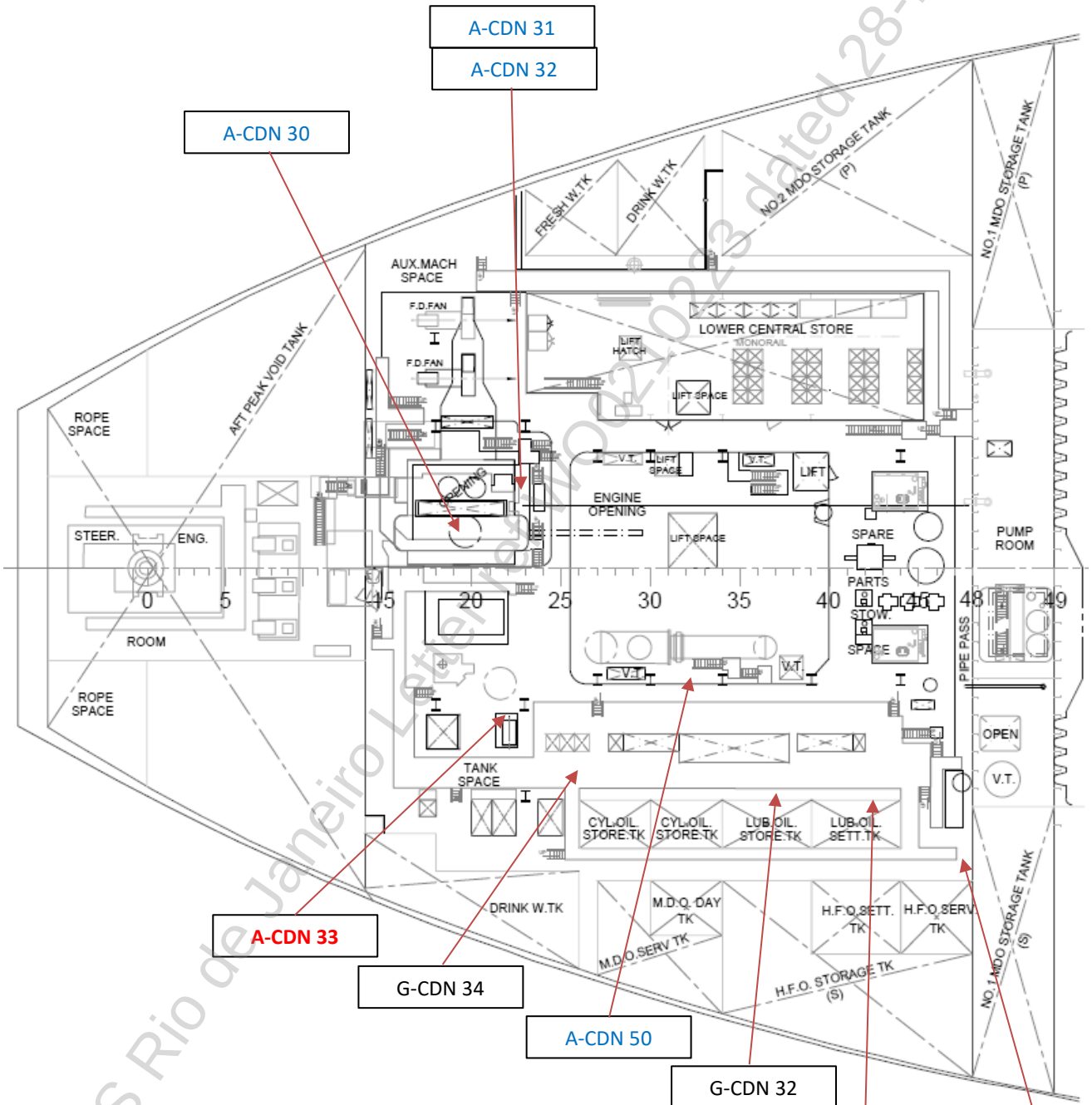
	
Sample : A CDN 016 Location : 06B Forecastle Head Description : Jointing Roll	Tested for : Asbestos Result : <0.1% : :
	
Sample : A CDN 024 Location : 06 ER Upper Deck Description : Aux. Boiler Uptake Insulation	Tested for : Asbestos Result : <0.1% : :
	
Sample : A CDN 025 Location : 06 ER Upper Deck Description : Aux. Boiler Uptake Canvas	Tested for : Asbestos Result : <0.1% : :

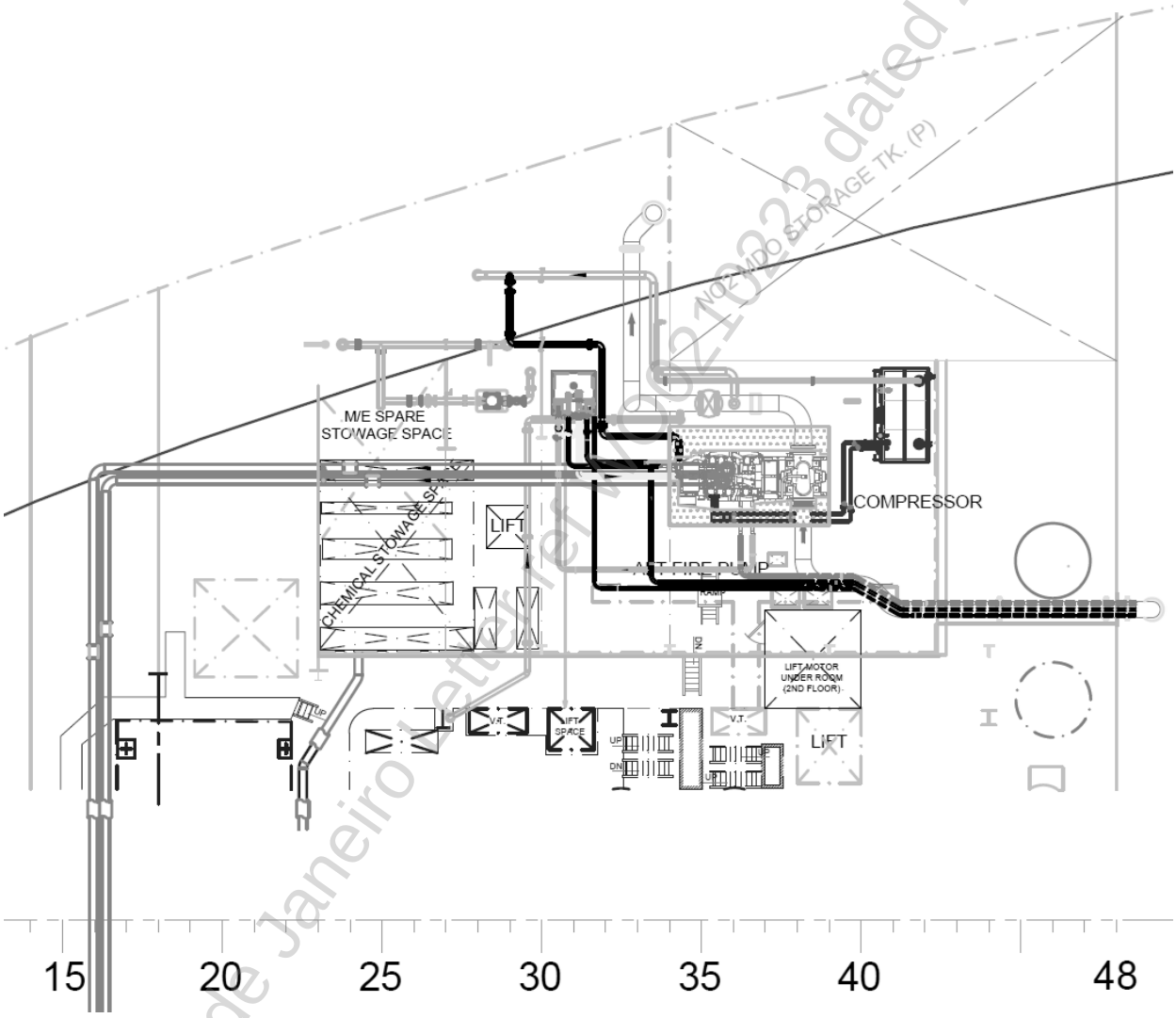
	
Sample : A CDN 026 Location : 06 ER Upper Deck Description : ER Casing Insulation	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 027 Location : 06 ER Upper Deck Description : Economizer Bottom Header	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 028 Location : 06 ER Upper Deck Description : Economizer Bottom Header	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 029 Location : 06 ER Upper Deck Description : Economizer Insulation	Tested for : Asbestos Result : <0.1% : :





Sample	: G CDN 032	Tested for	: PCB
Location	: 07 Engine Room 2nd Floor	Result	: 0.270 µg abs
Description	: Cable Run - Wipe		:
			:

Sample	: G CDN 033	Tested for	: PCB
Location	: 07 Engine Room 2nd Floor	Result	: 0.00 mg/kg
Description	: Manhole Door Joint		:
			:

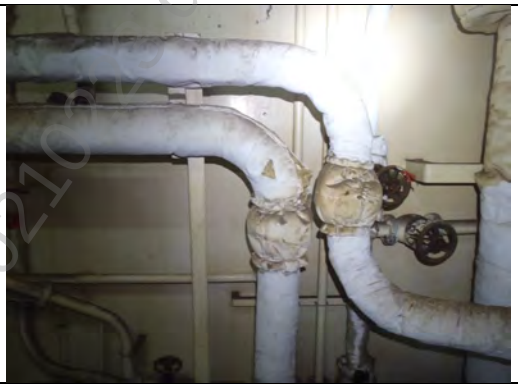
Sample	: G CDN 034	Tested for	: PCB
Location	: 07 Engine Room 2nd Floor	Result	: 0.00 mg/kg
Description	: Electrical Mat		:
			:

Sample	: A CDN 030	Tested for	: Asbestos
Location	: 07 Engine Room 2nd Floor	Result	: <0.1%
Description	: Aux. Boiler Main Stop Valve		:
			:

Sample	: A CDN 031	Tested for	: Asbestos
Location	: 07 Engine Room 2nd Floor	Result	: <0.1%
Description	: Boiler Blow Down - Canvas		:
			:

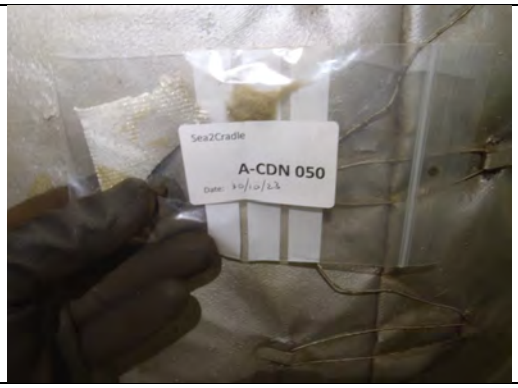
Sample	: A CDN 032	Tested for	: Asbestos
Location	: 07 Engine Room 2nd Floor	Result	: <0.1%
Description	: Boiler Blowdown - Insulation		:
			:

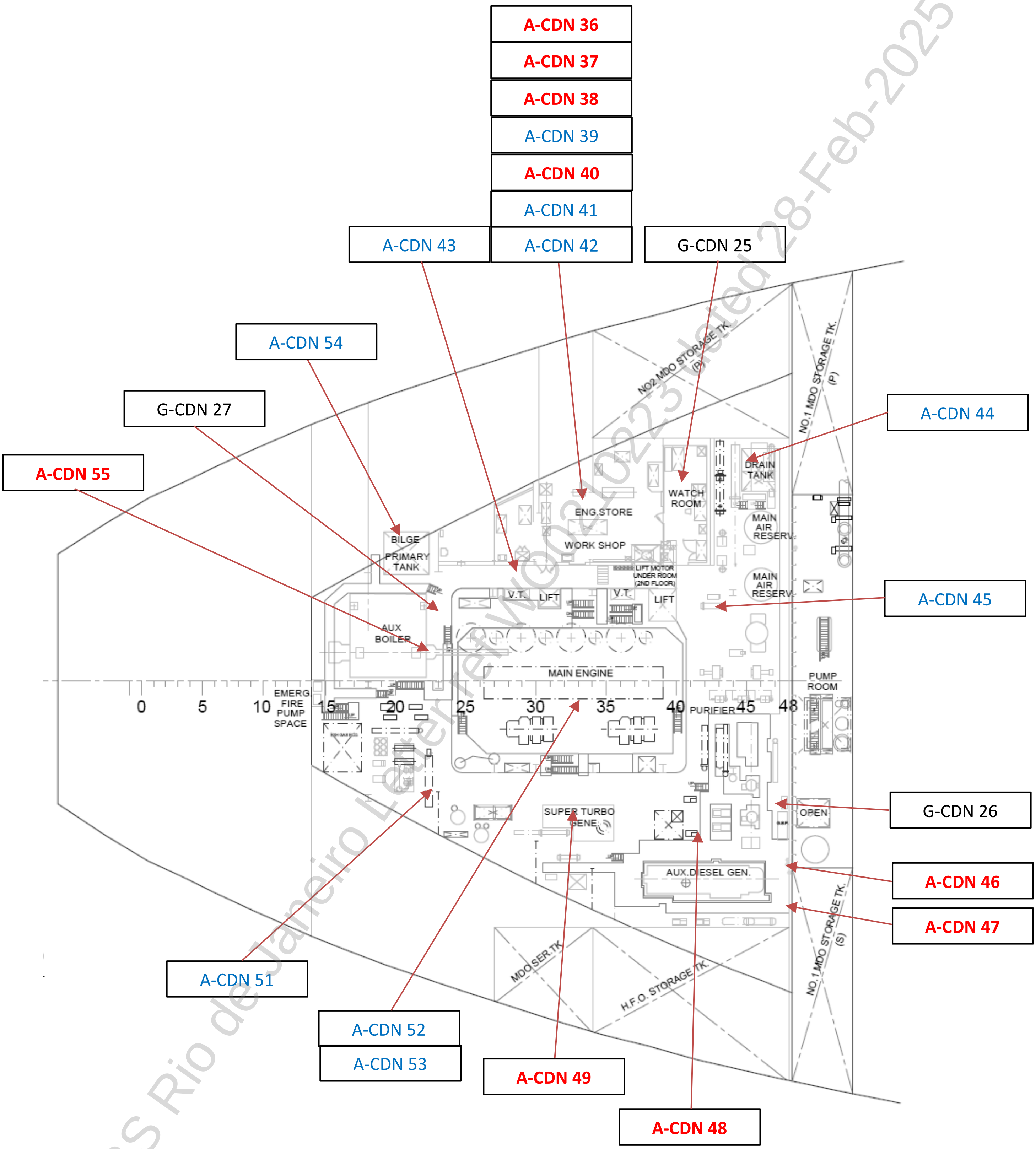
Sample	: A CDN 033	Tested for	: Asbestos
Location	: 07 Engine Room 2nd Floor	Result	: Chrysotile >60%
Description	: Gauge Glass Joint		:
			:



Sample	: A CDN 034	Tested for	: Asbestos
Location	: 07 Engine Room 2nd Floor	Result	: <0.1%
Description	: HFO Service Line - Canvas		:
			:

Sample	: A CDN 035	Tested for	: Asbestos
Location	: 07 Engine Room 2nd Floor	Result	: <0.1%
Description	: HFO Service Line - Insulation		:
			:

	
Sample : A CDN 050 Location : 07 Engine Room 2nd Floor Description : Aux. Diesel Exhaust Insulation	Tested for : Asbestos Result : <0.1% : :



SEA 2 CRADLE

Sample : G CDN 025
Location : 08 Upper Engine Floor
Description : Anti-Slip Mat

Tested for : PCB
Result : 0.00 mg/kg
:
:

Sample : G CDN 026
Location : 08 Upper Engine Floor
Description : Electrical Mat

Tested for : PCB
Result : 0.00 mg/kg
:
:

Sample : G CDN 027
Location : 08 Upper Engine Floor
Description : Deck Paint - Green

Tested for : PCB, Pb, Cd, Cr
Result PCB: 0.00 mg/kg
Pb: 29 mg/kg
Cd: 0.39 mg/kg
Cr: 51 mg/kg

	
Sample : A CDN 036 Location : 08 ER Upper Floor Stores Description : Packing	Tested for : Asbestos Result : Chrysotile >60% : :
	
Sample : A CDN 037 Location : 08 ER Upper Floor Stores Description : Packing	Tested for : Asbestos Result : Chrysotile >60% : :
	
Sample : A CDN 038 Location : 08 ER Upper Floor Stores Description : Packing	Tested for : Asbestos Result : Crysotile >60% : :

Sample	: A CDN 039	Tested for	: Asbestos
Location	: 08 ER Upper Floor Stores	Result	: <0.1%
Description	: Jointing		:
			:

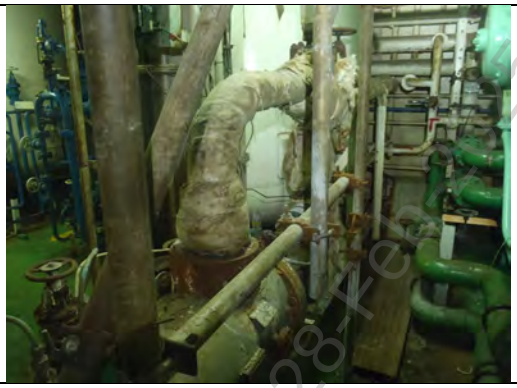
Sample	: A CDN 040	Tested for	: Asbestos
Location	: 08 ER Upper Floor Stores	Result	: Chrysotile 15-30%
Description	: Jointing		:
			:

Sample	: A CDN 041	Tested for	: Asbestos
Location	: 08 ER Upper Floor Stores	Result	: <0.1%
Description	: Cordage		:
			:

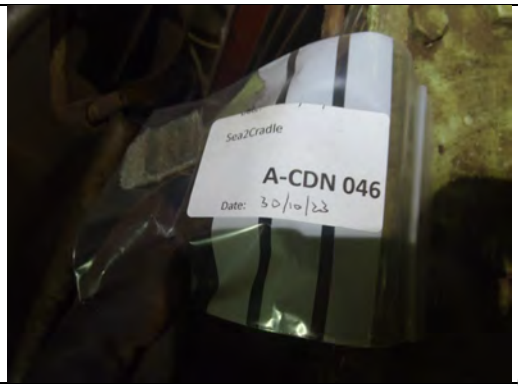
Sample	: A CDN 042	Tested for	: Asbestos
Location	: 08 ER Upper Floor Stores	Result	: <0.1%
Description	: Jointing		:
			:

Sample	: A CDN 043	Tested for	: Asbestos
Location	: 08 ER Upper Floor Stores	Result	: <0.1%
Description	: Jointing		:
			:

Sample	: A CDN 044	Tested for	: Asbestos
Location	: 08 ER Upper Floor	Result	: <0.1%
Description	: Drain Tank Insulation		:
			:

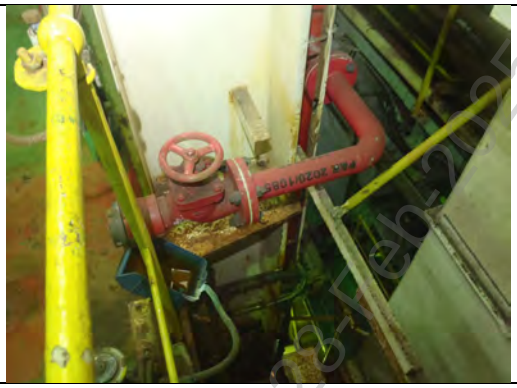


Sample	: A CDN 045	Tested for	: Asbestos
Location	: 08 ER Upper Floor	Result	: <0.1%
Description	: Purifier Heater Lagging		:
			:



Sample	: A CDN 046	Tested for	: Asbestos
Location	: 08 ER Upper Floor	Result	: Chrysotile 30-60%
Description	: Aux. Diesel Joint		:
			:

Sample	: A CDN 047	Tested for	: Asbestos
Location	: 08 ER Upper Floor	Result	: Chrysotile 30-60%
Description	: Aux. Diesel Joint		:
			:

	
Sample : A CDN 048 Location : 08 ER Upper Floor Description : Fire Main Joint	Tested for : Asbestos Result : Chrysotile 30-60% : :

	
Sample : A CDN 049 Location : 08 ER Upper Floor Description : T/A Set Cooling Water Joint	Tested for : Asbestos Result : Chrysotile 30-60% : :

	
Sample : A CDN 051 Location : 08 ER Upper Floor Description : Boiler Burner Line Lagging	Tested for : Asbestos Result : <0.1% : :

Sample : A CDN 052
Location : 08 ER Upper Floor
Description : Aux. Diesel Exhaust Insulation

Tested for : Asbestos
Result : <0.1%

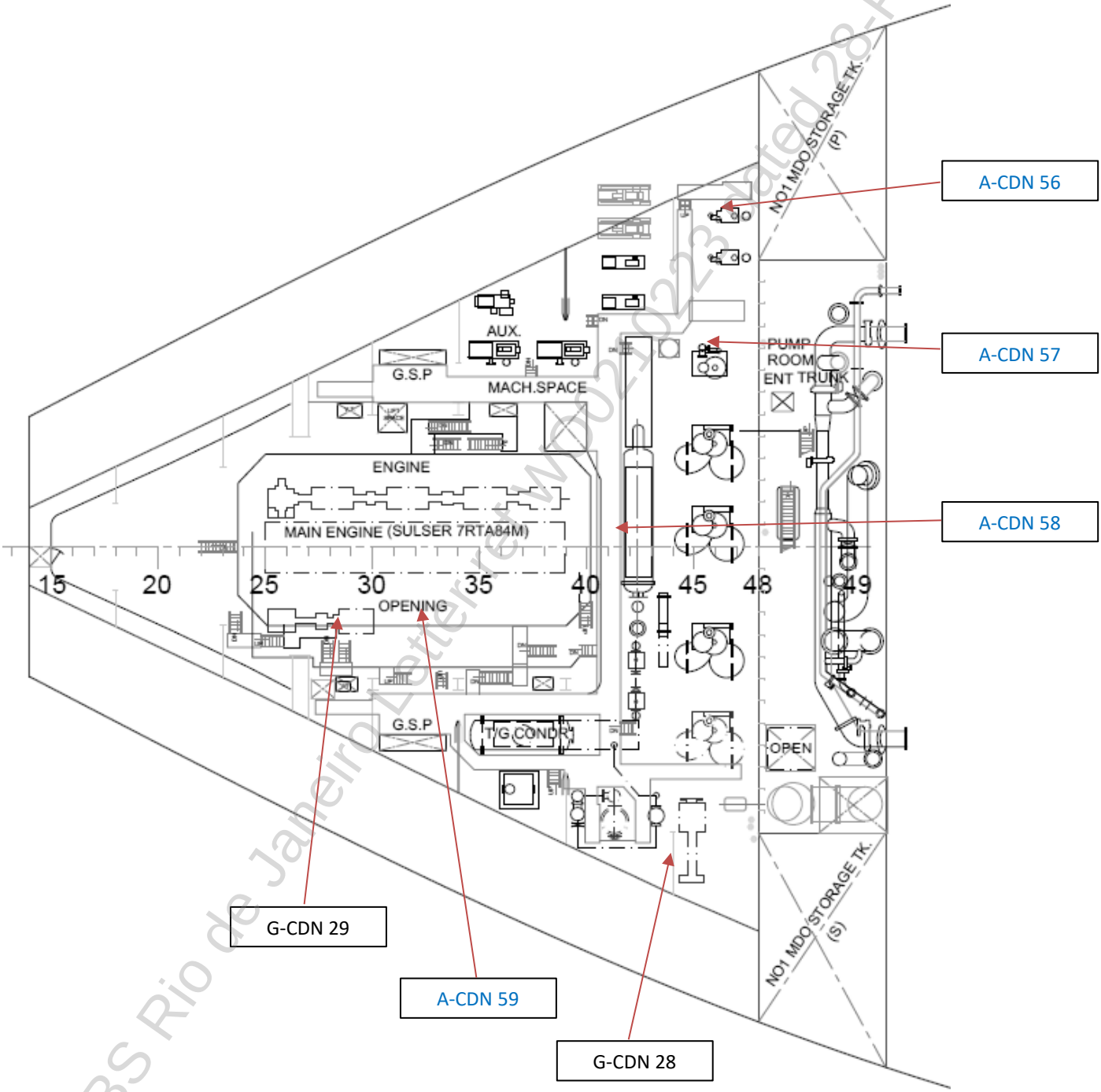
Sample : A CDN 053
Location : 08 ER Upper Floor
Description : Aux. Diesel Exhaust Insulation

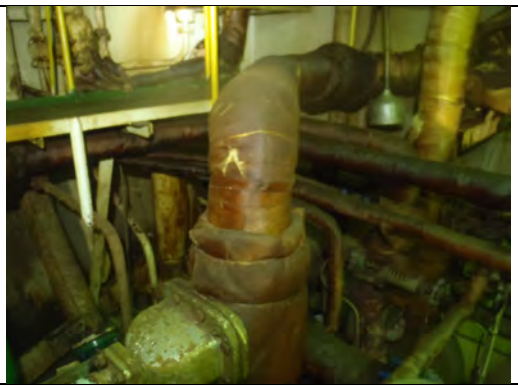
Tested for : Asbestos
Result : <0.1%


Sample : A CDN 054
Location : 08 ER Upper Floor
Description : Tank Insulation

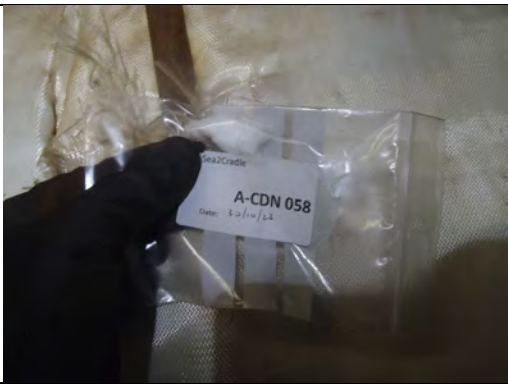
Tested for : Asbestos
Result : <0.1%

	
Sample : A CDN 055 Location : 08 ER Upper Floor Description : Aux. Boiler Water Drum Joint	Tested for : Asbestos Result : Chrysotile 30-60% : :



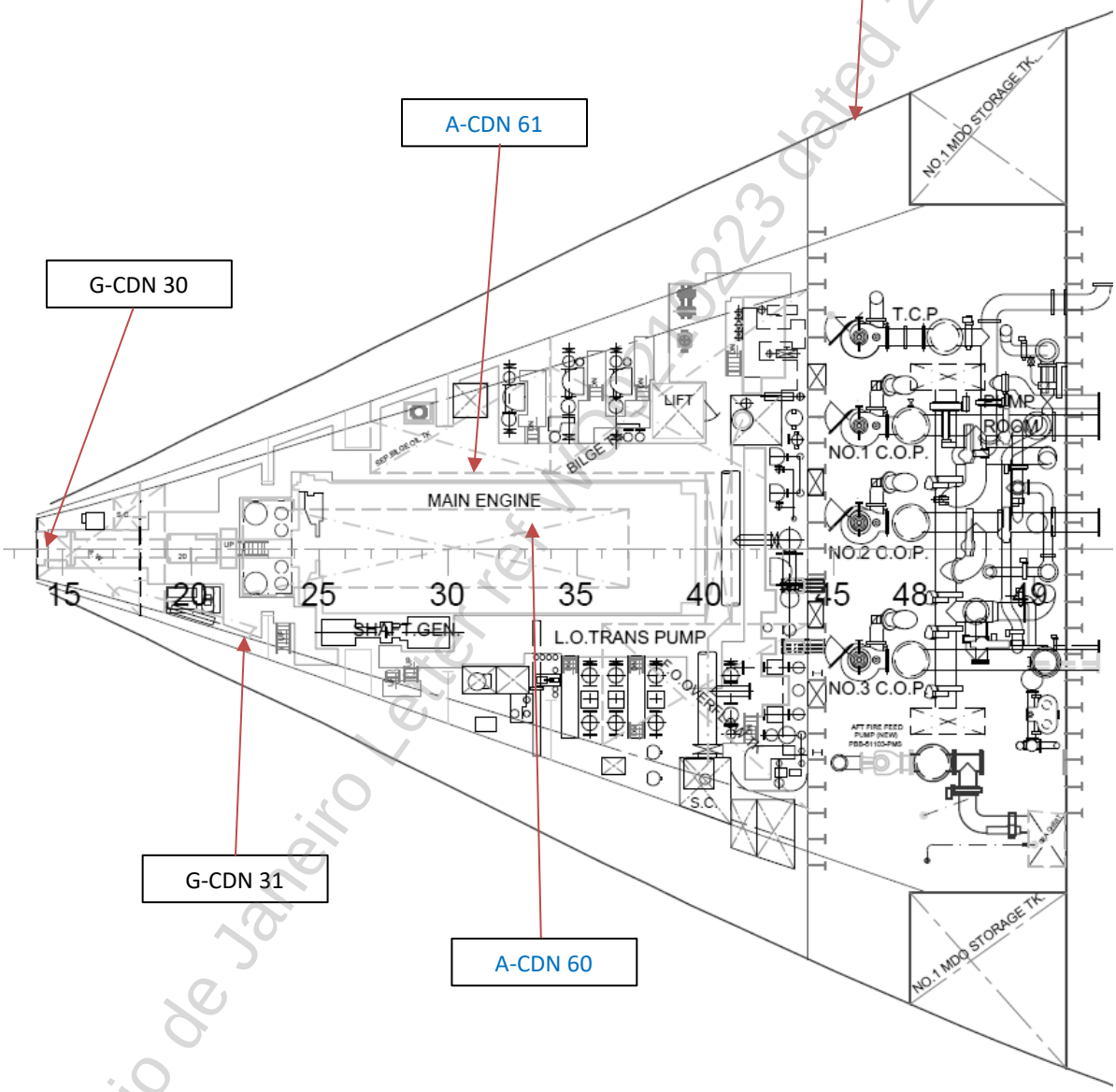
	
Sample : G CDN 028 Location : 09 Engine Room Lower Floor Description : Anti-Slip Mat	Tested for : PCB Result : 0.00 mg/kg : :
	
Sample : G CDN 029 Location : 09 Engine Room Lower Floor Description : Machine Flange Joint	Tested for : PCB Result : 2.45 mg/kg : :
	
Sample : A CDN 056 Location : 09 ER Lower Floor Description : Feed Pipe Lagging	Tested for : Asbestos Result : <0.1% : :

Sample : A CDN 057	Tested for : Asbestos
Location : 09 ER Lower Floor	Result : <0.1%
Description : Tank Cleaning Pipe Lagging	:
	:



Sample : A CDN 058	Tested for : Asbestos
Location : 09 ER Lower Floor	Result : <0.1%
Description : Main Condenser Insulation	:
	:

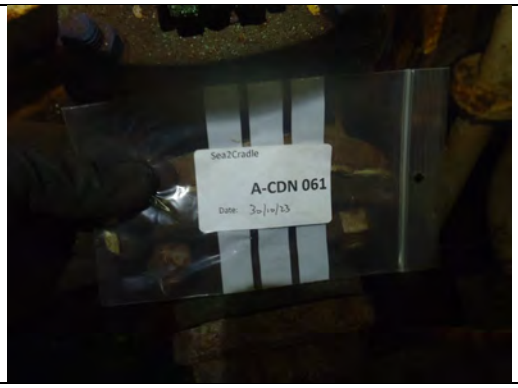
Sample : A CDN 059	Tested for : Asbestos
Location : 09 ER Lower Floor	Result : <0.1%
Description : T/A Condenser Insulation	:
	:



	
Sample : G CDN 030 Location : 10 Engine Room Main Floor Description : Manhole Door Joint	Tested for : PCB Result : 0.00 mg/kg : :

	
Sample : G CDN 031 Location : 10 Engine Room Main Floor Description : Bulkhead Paint - White	Tested for : PCB, Pb, Cd, Cr Result PCB : 0.00 mg/kg Pb : 42 mg/kg Cd : <0.5mg/kg Cr : 130 mg/kg

	
Sample : A CDN 060 Location : 10 Engine Room Main Floor Description : Main Engine Fuel Rail	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 061 Location : 10 Engine Room Main Floor Description : Fire Main Joint	Tested for : Asbestos Result : <0.1% : :

	
Sample : A CDN 062 Location : 10 Engine Room Main Floor Description : Main SW Suction Joint	Tested for : Asbestos Result : <0.1% : :

Visual/Sampling Check Plan (VSCP)

Visual/Sampling Check Plan

Project 193.23 Cidade De Niteroi MV18

This check plan shows the Equipment and Components of which inspection will be made and for which consideration for sampling will be given.
All samples taken are listed on the attached Sample List.
All sampling locations, visually checked and found items, photographs, descriptions and analysis results are shown in the attached IHM Appendices.

The following documents have been consulted:

Vessels particulars sheet; Capacity Plan; General Arrangement Plan; Fire and Safety Plan; IOPP; Freon CFC/HCFC/ODS Schedule; Machinery Oil & Lubricating Schedule; List of Smoke Detectors; Medical Inventory; Trim & Stability program.

Note: The separate Asbestos VSCP appears on pages 8 & 9

Zone	Equipment	Component/Part	Material	Document analysis	Check procedure	Samplenr, Checked (C), Not checked (NC), Not applicable (N/A)
Accommodation	Stairwell	Handrails	PCB		sample	G CDN 007
		Vinyl flooring	PCB		sample	G CDN 012
	Deck	Vinyl Flooring /Skirting	PCB		sample	G CDN 006; G CDN 008; G CDN 017
		matting	PCB		sample	G CDN 013; G CDN 019; G CDN 021
		Carpeting	PFOS		sample	N/A
	Gauges	Gauges	Mercury		visual	C
	windows	Rubber seals	PCB		sample	G CDN 004; G CDN 009; G CDN 018
	electrical	Batteries	Heavy Metals		visual	C
		Cables	PCB		sample	G CDN 002; G CDN 015; G CDN 020
		penetrations	PCB /Lead		Sample /visual	G CDN 014
		Transformer oil	PCB		visual	C
		Fluorescent light ballast	PCB		visual	C
	Bulkhead	Panelling/plastic coating	PCB		sample	N/A
	Internal Doors	Door seals	PCB		sample	G CDN 005
	Fire protection	Smoke Detectors	Radioactive		visual	C

Zone	Equipment	Component/Part	Material	Document analysis	Check procedure	Check Result / Notes (C or NC)
	External doors	W/T seals	PCB		sample	G CDN 023; G CDN 047
	Furniture	Covering materials	PFOS		sample	G CDN 016; G CDN 022
	A/C units	Refrigerant	ODS		visual	C
	Cold Stores	Blown insulation	ODS		Sample	G CDN 046
	Steel bulkheads & deckheads	Coatings (paint)	PCB Lead		Sample sample	G CDN 001; G CDN 004;G CDN 010; G CDN 011; G CDN 024
	Trunking	gaskets	PCB		sample	NC
	Pipe work	Penetrations	Lead/PCB		Sample / visual	NC
		Joints/gaskets	PCB		sample	NC
		Valve gaskets	PCB		sample	NC
		Lagging	ODS		sample	NC
		Pipe hangers	PCB		sample	NC

Zone	Equipment	Component/Part	Material	Document analysis	Check procedure	Samplenr, Checked (C), Not checked (NC), Not applicable (N/A)
Engine Spaces	Steel bulkheads & deckheads	Coatings (paint	PCB		Sample	G CDN 027; G CDN 031
			Heavy Metals		sample	
	Pipe work	Penetrations	Lead/PCB		visual /sample	C
		Joints gaskets	PCB		sample	G CDN 029
		Valve gaskets	PCB		sample	NC
		Lagging	ODS		sample	NC
		Pipe hangers	PCB		sample	NC
	Fire Protection	Smoke detectors	Radioactive		visual	C
	External/internal openings	W/T seals	PCB		sample	G CDN 030; G CDN 033
	stairs	Handrails/treads	PCB		sample	N/A
	Deck	Vinyl flooring /Tiling	PCB		sample	G CDN 034
		matting	PCB		sample	G CDN 025; G CDN 027; G CDN 028
	Gauges	Gauges	Mercury		visual	C
	windows	Rubber seals	PCB		sample	N/A
	Electrical	Cables	PCB		sample	G CDN 032
		penetrations	PCB/Lead		sample/ vis	C
		Transformer oil	PCB		visual	C

Zone	Equipment	Component/Part	Material	Document analysis	Check procedure	Samplenr, Checked (C), Not checked (NC), Not applicable (N/A)
		Lighting ballast	PCB		visual	C
		Phase correction capacitors	PCB		visual	C
		2Ph motor capacitors	PCB		visual	C
		Batteries	Heavy Metals		visual	C
	Bulkhead	Panelling/plastic coating	PCB		sample	NC
		lagging	ODS		visual /sample	C
	Air trunking	jointing	PCB		sample	NC
	Refrigeration & A/C units	Refrigerant	ODS		visual	C
	Hydraulic systems	Hydraulic oil	PCB		sample	G CDN 055
	E.G. Economiser	Lagging	ODS PCB		sample sample	NC
	Incinerator	Lagging	ODS PCB		sample sample	NC
	Auxy Machinery	Casing gaskets	PCB		sample	NC
	Auxy Machinery	Gland packing	PCB		Sample	NC
	Auxy Machinery	Shock mountings	PCB		sample	NC

Zone	Equipment	Component/Part	Material	Document analysis	Check procedure	Samplenr, Checked (C), Not checked (NC), Not applicable (N/A)
Weather Decks and Deck Machinery	Coatings	Deck Paint	Heavy metals		Sample	G CDN 042; G CDN 043; G CDN 044; G CDN 049; G CDN 051; G CDN 053
		Bulkhead paint	Heavy metals		sample	
		Hull Paint	Heavy metals		sample	NC
		Antifouling coatings	TBT		visual	C
	Pipework	Insulation	PCB		sample	NC
		Jointing	PCB		sample	NC
	Cables	insulation	PCB		sample	G CDN 040; G CDN 052
		penetrations	PCB /Lead		sample / visual	NC
	Weatherdeck doors	Manhole Door	PCB		sample	G CDN 039; G CDN 050; G CDN 054
	Pipe work	Penetrations	Lead/PCB		Sample / visual	NC
		Joints gaskets	PCB		sample	NC
		Valve gaskets	PCB		sample	NC
		Lagging	ODS		sample	NC
		Pipe hangers	PCB		sample	NC
	Cranes	Hydraulic oil	PCB		sample	G CDN 056
	Mooring	Hydraulic oil	PCB		sample	NC

Zone	Equipment	Component/Part	Material	Document analysis	Check procedure	Samplenr, Checked (C), Not checked (NC), Not applicable (N/A)
Production Deck and Tanks	Coatings	Deck/Bulkhead Paint	Heavy metals		Sample	G CDN 035; G CDN 037; G CDN 038
		Tank paint	PCB		sample	G CDN 045
			Heavy metals		sample	
	Pipework	Insulation	ODS PCB		sample	NC
		Jointing	PCB		sample	NC
		hangers	PCB		sample	NC
	Cables	insulation	PCB		sample	NC
		penetrations	PCB /Lead		sample / visual	NC
	Deck	Electrical Mat	PCB		sample	G CDN 041; G CDN 048
		Anti-slip Mat	PCB		sample	NC
	Hydraulic systems	Hydraulic oil	PCB		sample	NC
	Hatches and trapdoors	seals	PCB		sample	G CDN 036
	Fire protection	Smoke detectors	Radioactive		visual	C

Zone	Equipment	Component/Part	Material	Test	Check procedure	Samplenr, Checked (C), Not checked (NC), Not applicable (N/A)
Accommodation / Engine Room	Deckhead/ Trunking	Insulation	Matted Fibre	Asbestos	sample	A CDN 001; A CDN 002; A CDN 006; A CDN 008
			Canvas	Asbestos	sample	A CDN 005
			Bitumen	Asbestos	sample	N/A
	Bulkhead	Insulation	Matted Fibre	Asbestos	sample	A CDN 003; A CDN 004; A CDN 007 A CDN 010; A CDN 012; A CDN 017
			Canvas	Asbestos	sample	NC
			Bitumen	Asbestos	sample	N/A
	Fire Doors	Insulation	Matted Fibre	Asbestos	visual	NC
	Doors	Seal	Cordage	Asbestos	sample	A CDN 009
	Cable Gland	Caulking		Asbestos	sample	A CDN 011
	Fire Blankets		Canvas	Asbestos	visual	NC
	Galley	Extractor Hood		Asbestos	sample	N/A
	Exhaust/Boiler Uptakes	Heat Insulation	Matted Fibre	Asbestos	sample	A CDN 014; A CDN 020; A CDN 023; A CDN 024; A CDN 050; A CDN 053
			Canvas/Cord	Asbestos	sample	A CDN 013; A CDN 019; A CDN 025; A CDN 052
			Gypsum	Asbestos	sample	N/A
	Boiler / L.P. Steam Generator	Heat Insulation	Matted Fibre	Asbestos	sample	A CDN 018; A CDN 028; A CDN 029
			Canvas	Asbestos	sample	A CDN 027; A CDN 051
			Gypsum	Asbestos	sample	N/A

Zone	Equipment	Component/Part	Material	Test	Check procedure	Samplenr, Checked (C), Not checked (NC), Not applicable (N/A)
		Access Doors	Cordage	Asbestos	sample	NC
	Tanks	Heat Insulation	Matted Fibre	Asbestos	sample	A CDN 022; A CDN 026; A CDN 044; A CDN 054
			Canvas	Asbestos	sample	A CDN 021
			Gypsum	Asbestos	sample	N/A
	Steam / Feed Pipes	Heat Insulation	Matted Fibre	Asbestos	sample	A CDN 030; A CDN 032; A CDN 035; A CDN 056; A CDN 057; A CDN 060
			Canvas/Cord	Asbestos	sample	A CDN 031; A CDN 034; A CDN 045
			Gypsum	Asbestos	sample	N/A
	Condensers	Heat Insulation	Matted Fibre	Asbestos	sample	A CDN 058; A CDN 059
			Canvas	Asbestos	sample	NC
	Valves	Packing	Cord	Asbestos	sample	A CDN 036; A CDN 037; A CDN 038
	Flanges/ Gauge Glass	Jointing	Card	Asbestos	sample	A CDN 015; A CDN 016; A CDN 033; A CDN 039; A CDN 040; A CDN 041; A CDN 042; A CDN 043; A CDN 046; A CDN 047; A CDN 048; A CDN 049; A CDN 055; A CDN 061; A CDN 062

Asbestos documentation

Asbestos Sample List - CDN

Sample No.	Location	Material Use	Material Type	Analysis required
A CDN 001	01 Navigation Deck	Deckhead Upper Insulation	Matted Fibre	Asbestos
A CDN 002	01 Navigation Deck	Deckhead Panel insulation	Matted Fibre	Asbestos
A CDN 003	01 Navigation Deck	Bulkhead Insulation	Matted Fibre	Asbestos
A CDN 004	01 Navigation Deck	Forward Bridge Bulkhead Insulation	Matted Fibre	Asbestos
A CDN 005	02 5th Deck	Vent Trunking Insulation	Canvas	Asbestos
A CDN 006	02 5th Deck	Vent Trunking Insulation	Matted Fibre	Asbestos
A CDN 007	03 4th Deck	Bulkhead Insulation	Matted Fibre	Asbestos
A CDN 008	04 3rd Deck	Deckhead Panel Insulation	Matted Fibre	Asbestos
A CDN 009	05 2nd Deck	Door Seal	Cordage	Asbestos
A CDN 010	05 2nd Deck Fire Station	Bulkhead Insulation	Matted Fibre	Asbestos
A CDN 011	05 2nd Deck Fire Station	Cable Gland	Caulking	Asbestos
A CDN 012	06 Upper Deck Reefer Room	Bulkhead Insulation	Matted Fibre	Asbestos
A CDN 013	06 Emergency Generator Room	Generator Exhaust Lagging	Canvas	Asbestos
A CDN 014	06 Emergency Generator Room	Generator Exhaust Lagging	Matted Fibre	Asbestos
A CDN 015	05A Topsides Aft	Joint Gasket	Card	Asbestos
A CDN 016	06B Forecastle Head	Spare Jointing	Card	Asbestos
A CDN 017	06 CO2 Room	Bulkhead Insulation	Matted Fibre	Asbestos
A CDN 018	06 Inert Gas Generator	Boiler Insulation	Matted Fibre	Asbestos
A CDN 019	04B ER Engine Casing	Aux. Boiler Uptake Insulation	Canvas	Asbestos
A CDN 020	04B ER Engine Casing	Aux. Boiler Uptake Insulation	Matted Fibre	Asbestos
A CDN 021	04B ER Engine Casing	Header Tank insulation	Canvas	Asbestos
A CDN 022	04B ER Engine Casing	Header Tank insulation	Matted Fibre	Asbestos
A CDN 023	04B ER Engine Casing	Exhaust Gas Economiser Insulation	Matted Fibre	Asbestos
A CDN 024	06 ER Upper Deck	Aux. Boiler Uptake Insulation	Matted Fibre	Asbestos
A CDN 025	06 ER Upper Deck	Aux. Boiler Uptake Insulation	Canvas	Asbestos
A CDN 026	06 ER Upper Deck	ER Casing Insulation	Matted Fibre	Asbestos

Asbestos Sample List - CDN

A CDN 027	06 ER Upper Deck	Exhaust Gas Economiser Bottom Header Lagging	Canvas	Asbestos
A CDN 028	06 ER Upper Deck	Exhaust Gas Economiser Bottom Header Lagging	Matted Fibre	Asbestos
A CDN 029	06 ER Upper Deck	Exhaust Gas Economiser Insulation	Matted Fibre	Asbestos
A CDN 030	07 Engine Room 2nd Floor	Aux. Boiler Main Stop Valve Insulation	Matted Fibre	Asbestos
A CDN 031	07 Engine Room 2nd Floor	Boiler Blow Down Valve	Canvas	Asbestos
A CDN 032	07 Engine Room 2nd Floor	Boiler Blow Down Valve	Matted Fibre	Asbestos
A CDN 033	07 Engine Room 2nd Floor	Gauge Glass Joint	Card	Asbestos
A CDN 034	07 Engine Room 2nd Floor	H.O. Service Line Lagging	Canvas	Asbestos
A CDN 035	07 Engine Room 2nd Floor	H.O. Service Line Lagging	Matted Fibre	Asbestos
A CDN 036	08 ER Upper Floor	Engine Store Packing	Cord	Asbestos
A CDN 037	08 ER Upper Floor	Engine Store Packing	Cord	Asbestos
A CDN 038	08 ER Upper Floor	Engine Store Packing	Cord	Asbestos
A CDN 039	08 ER Upper Floor	Engine Store Jointing	Card	Asbestos
A CDN 040	08 ER Upper Floor	Engine Store Jointing	Card	Asbestos
A CDN 041	08 ER Upper Floor	Engine Store Jointing	Card Cordage	Asbestos
A CDN 042	08 ER Upper Floor	Engine Store Jointing	Card	Asbestos
A CDN 043	08 ER Upper Floor	Engine Store Jointing	Card	Asbestos
A CDN 044	08 ER Upper Floor	Drain Tank Insulation	Matted Fibre	Asbestos
A CDN 045	08 ER Upper Floor	Purifier Heater Lagging	Canvas	Asbestos
A CDN 046	08 ER Upper Floor	Aux. Diesel Joint	Card	Asbestos
A CDN 047	08 ER Upper Floor	Aux. Diesel Joint	Card	Asbestos
A CDN 048	08 ER Upper Floor	Fire Main Joint	Card	Asbestos
A CDN 049	08 ER Upper Floor	T/A Set Cooling Water Joint	Card	Asbestos
A CDN 050	07 Engine Room 2nd Floor	Aux. Diesel Exhaust Line Insulation	Matted Fibre	Asbestos
A CDN 051	08 ER Upper Floor	Boiler Burner Line Lagging	Canvas	Asbestos
A CDN 052	08 ER Upper Floor	Aux. Engine Exhaust Manifold Insulation	Canvas	Asbestos
A CDN 053	08 ER Upper Floor	Aux. Engine Exhaust Manifold Insulation	Matted Fibre	Asbestos
A CDN 054	08 ER Upper Floor	Tank Insulation	Matted Fibre	Asbestos
A CDN 055	08 ER Upper Floor	Aux. Boiler Water Drum Door Joint	Card	Asbestos
A CDN 056	09 ER Lower Floor	Feed Pipe Lagging	Matted Fibre	Asbestos

Asbestos Sample List - CDN

A CDN 057	09 ER Lower floor	Tank Cleaning Pipe Lagging	Matted Fibre	Asbestos
A CDN 058	09 ER Lower floor	Main Condenser Insulation	Matted Fibre	Asbestos
A CDN 059	09 ER Lower floor	T/A Condenser Insulation	Matted Fibre	Asbestos
A CDN 060	10 ER Main Floor	Main Engine Fuel Rail	Matted Fibre	Asbestos
A CDN 061	10 ER Main Floor	Fire Main Joint	Card	Asbestos
A CDN 062	10 ER Main Floor	Main SW Suction Joint	Card	Asbestos

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Certificate of Analysis

Certificate number	A00126185.1
Reporting date	09-11-2023
Version	1
Number of pages including cover	5
Verification code	jTX7fX75
Your reference	1005279
Our projectnumber	A232890
Client description	CDN
Date received samples	07-11-2023
Sampling by	Client
Type of analysis	NEN 5896
Date of analysis	09-11-2023
Analysis location	Hongkongstraat 5 3047 BR Rotterdam

Dear Sir / Madam,

Hereby you will receive the analytical results of the laboratory research for your reference: 1005279. The research was conducted in accordance with your assignment. The results relate solely to the samples examined.

SGI Compliance Environmental Control is not responsible for any interpretations or conclusions that have been made based on the results obtained. Sampling by "Client" can not be ruled out about the data, origin, representativeness and safety obtained during sampling.

The analyzes conducted by SGI Compliance Environmental Control are, unless otherwise stated, accredited under L140 by the Accreditation Board. A list of transactions is included on the website of the Board of Accreditation http://www.rva.nl. If desired, we can send you the operation list.

This analysis report applies to our terms and conditions. The analysis report is a whole and must be used as such. All documents associated with this report have been verified and authorized by the Head Laboratory or its substitute. If there is any doubt about the authenticity of this document, you can verify it at verification@sgicompliance.nl, mentioning the report number.

Yours sincerely, i.o.

Ms. J. Pover, BASc
Head Laboratory

Certificate of Analysis

Certificate number: A00126185.1

Our projectnumber: A232890

Qualitative analysis of asbestos using polarization microscopy in accordance with NEN 5896

Sample number	Client sample description	Material type *1 *3	Asbestos type	Mass (%)	Friability *2
A232890-001	A CDN 001 01 Navigation Deck Deckhead Upper Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-002	A CDN 002 01 Navigation Deck Deckhead Panel insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-003	A CDN 003 01 Navigation Deck Bulkhead Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-004	A CDN 004 01 Navigation Deck Forward Bridge Bulkhead Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-005	A CDN 005 02 5th Deck Vent Trunking Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-006	A CDN 006 02 5th Deck Vent Trunking Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-007	A CDN 007 03 4th Deck Bulkhead Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-008	A CDN 008 04 3rd Deck Deckhead Panel Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-009	A CDN 009 05 2nd Deck Door Seal	Insulation	No asbestos	<0,1% *	N/A
A232890-010	A CDN 010 05 2nd Deck Fire Station Bulkhead Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-011	A CDN 011 05 2nd Deck Fire Station Cable Gland	Insulation	No asbestos	<0,1% *	N/A
A232890-012	A CDN 012 06 Upper Deck Reefer Room Bulkhead Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-013	A CDN 013 06 Emergency Generator Room Generator Exhaust Lagging	Insulation	No asbestos	<0,1% *	N/A
A232890-014	A CDN 014 06 Emergency Generator Room Generator Exhaust Lagging	Insulation	No asbestos	<0,1% *	N/A
A232890-015	A CDN 015 05A Topsides Aft Joint Gasket	Gasket	No asbestos	<0,1% *	N/A
A232890-016	A CDN 016 06B Forecastle Head Spare Jointing	Gasket	No asbestos	<0,1% *	N/A
A232890-017	A CDN 017 06 CO2 Room Bulkhead Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-018	A CDN 018 06 Inert Gas Generator Boiler Insulation	Insulation	No asbestos	<0,1% *	N/A

Certificate of Analysis

Certificate number: A00126185.1

Our projectnumber: A232890

Qualitative analysis of asbestos using polarization microscopy in accordance with NEN 5896

Sample number	Client sample description	Material type *1 *3	Asbestos type	Mass (%)	Friability *2
A232890-019	A CDN 019 04B ER Engine Casing Aux. Boiler Uptake Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-020	A CDN 020 04B ER Engine Casing Aux. Boiler Uptake Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-021	A CDN 021 04B ER Engine Casing Header Tank insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-022	A CDN 022 04B ER Engine Casing Header Tank insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-023	A CDN 023 04B ER Engine Casing Exhaust Gas Economiser Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-024	A CDN 024 06 ER Upper Deck Aux. Boiler Uptake Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-025	A CDN 025 06 ER Upper Deck Aux. Boiler Uptake Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-026	A CDN 026 06 ER Upper Deck ER Casing Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-027	A CDN 027 06 ER Upper Deck Exhaust Gas Economiser Bottom Header Lagging	Insulation	No asbestos	<0,1% *	N/A
A232890-028	A CDN 028 06 ER Upper Deck Exhaust Gas Economiser Bottom Header Lagging	Insulation	No asbestos	<0,1% *	N/A
A232890-029	A CDN 029 06 ER Upper Deck Exhaust Gas Economiser Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-030	A CDN 030 07 Engine Room 2nd Floor Aux. Boiler Main Stop Valve Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-031	A CDN 031 07 Engine Room 2nd Floor Boiler Blow Down Valve	Insulation	No asbestos	<0,1% *	N/A
A232890-032	A CDN 032 07 Engine Room 2nd Floor Boiler Blow Down Valve	Insulation	No asbestos	<0,1% *	N/A
A232890-033	A CDN 033 07 Engine Room 2nd Floor Gauge Glass Joint	Cord	Chrysotile	>60%	friable

Certificate of Analysis

Certificate number: A00126185.1

Our projectnumber: A232890

Qualitative analysis of asbestos using polarization microscopy in accordance with NEN 5896

Sample number	Client sample description		Material type *1 *3	Asbestos type	Mass (%)	Friability *2
A232890-034	A CDN 034 Room 2nd Floor Line Lagging	07 Engine H.O. Service	Insulation	No asbestos	<0,1% *	N/A
A232890-035	A CDN 035 Room 2nd Floor Line Lagging	07 Engine H.O. Service	Insulation	No asbestos	<0,1% *	N/A
A232890-036	A CDN 036 Floor Packing	08 ER Upper Engine Store	Cord	Chrysotile	>60%	friable
A232890-037	A CDN 037 Floor Packing	08 ER Upper Engine Store	Cord	Chrysotile	>60%	friable
A232890-038	A CDN 038 Floor Packing	08 ER Upper Engine Store	Cord	Chrysotile	>60%	friable
A232890-039	A CDN 039 Floor Jointing	08 ER Upper Engine Store	Gasket	No asbestos	<0,1% *	N/A
A232890-040	A CDN 040 Floor Jointing	08 ER Upper Engine Store	Gasket	Chrysotile	15-30%	friable
A232890-041	A CDN 041 Floor Jointing	08 ER Upper Engine Store	Insulation	No asbestos	<0,1% *	N/A
A232890-042	A CDN 042 Floor Jointing	08 ER Upper Engine Store	Gasket	No asbestos	<0,1% *	N/A
A232890-043	A CDN 043 Floor Jointing	08 ER Upper Engine Store	Gasket	No asbestos	<0,1% *	N/A
A232890-044	A CDN 044 Floor Insulation	08 ER Upper Drain Tank	Insulation	No asbestos	<0,1% *	N/A
A232890-045	A CDN 045 Floor Lagging	08 ER Upper Purifier Heater	Insulation	No asbestos	<0,1% *	N/A
A232890-046	A CDN 046 Floor Joint	08 ER Upper Aux. Diesel	Gasket	Chrysotile	30-60%	friable
A232890-047	A CDN 047 Floor Joint	08 ER Upper Aux. Diesel	Gasket	Chrysotile	30-60%	friable
A232890-048	A CDN 048 Floor	08 ER Upper Fire Main Joint	Gasket	Chrysotile	30-60%	friable
A232890-049	A CDN 049 Floor Water Joint	08 ER Upper T/A Set Cooling	Gasket	Chrysotile	30-60%	friable

Certificate of Analysis

Certificate number: A00126185.1

Our projectnumber: A232890

Qualitative analysis of asbestos using polarization microscopy in accordance with NEN 5896

Sample number	Client sample description	Material type *1 *3	Asbestos type	Mass (%)	Friability *2
A232890-050	A CDN 050 07 Engine Room 2nd Floor Aux. Diesel Exhaust Line Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-051	A CDN 051 08 ER Upper Floor Boiler Burner Line Lagging	Cord	No asbestos	<0,1% *	N/A
A232890-052	A CDN 052 08 ER Upper Floor Aux. Engine Exhaust Manifold Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-053	A CDN 053 08 ER Upper Floor Aux. Engine Exhaust Manifold Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-054	A CDN 054 08 ER Upper Floor Tank Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-055	A CDN 055 08 ER Upper Floor Aux. Boiler Water Drum Door Joint	Gasket	Chrysotile	30-60%	friable
A232890-056	A CDN 056 09 ER Lower Floor Feed Pipe Lagging	Insulation	No asbestos	<0,1% *	N/A
A232890-057	A CDN 057 09 ER Lower floor Tank Cleaning Pipe Lagging	Insulation	No asbestos	<0,1% *	N/A
A232890-058	A CDN 058 09 ER Lower floor Main Condenser Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-059	A CDN 059 09 ER Lower floor T/A Condenser Insulation	Insulation	No asbestos	<0,1% *	N/A
A232890-060	A CDN 060 10 ER Main Floor Main Engine Fuel Rail	Insulation	No asbestos	<0,1% *	N/A
A232890-061	A CDN 061 10 ER Main Floor Fire Main Joint	Gasket	No asbestos	<0,1% *	N/A
A232890-062	A CDN 062 10 ER Main Floor Main SW Suction Joint	Gasket	No asbestos	<0,1% *	N/A

**: <0.1% (not demonstrable)*

*1 The material type subscribes the findings from SGI Compliance Environmental Control laboratory. Due to the method of sampling method, it cannot be excluded that the laboratory findings deviate from the type of material established in the field.
*2 The friability subscribes the findings from the SGI Compliance Environmental Control laboratory. Due to the method of sampling as well as the condition of the sample presented, it cannot be excluded that the laboratory findings deviate from the conclusion established in the field.
*3 SGI Compliance Environmental Control recommends scanning electron microscopy (SEM - ISO14966) analysis on organically bound materials (eg. floor tile, mastics, roofing materials, joint compounds) and adhesive tape when PLM analysis shows undetectable quantities of asbestos. These materials often contain milled asbestos with fibre diameters and lengths too small to be resolved by the PLM and the analysis may yield a false negative result.

Hazmat Samples Documentation

General Sample List - CDN

Sample No.	Location	Material Use	Material Type	Analysis required
G CDN 001	00 Compass Deck & Helipad	Coating - External	Deck Paint - Green	PCB Pb Cd Cr
G CDN 002	00 Compass Deck & Helipad	Cable Run	Wipe	PCB
G CDN 003	00 Compass Deck & Helipad	Special Coating	Paint - Green	PCB Pb Cd Cr
G CDN 004	01 Navigation Deck	Window Seal	Rubber	PCB
G CDN 005	01 Navigation Deck	Bridge wing Door Seal	Rubber	PCB
G CDN 006	01 Navigation Deck	Flooring	Vinyl	PCB
G CDN 007	02 5th Deck	Stairwell Handrail	Bakelite	PCB
G CDN 008	01 Navigation Deck	Skirting	Rubber	PCB
G CDN 009	01 Navigation Deck	Window Seal	Rubber	PCB
G CDN 010	02 5th Deck	Coating - Internal	Deck Paint - Green	PCB Pb Cd Cr
G CDN 011	02 5th Deck	Coating - Internal	Bulkhead Paint - White	PCB Pb Cd Cr
G CDN 012	03 4th Deck	Stairwell Flooring	Vinyl	PCB
G CDN 013	03 4th Deck	Cable Trunking Mat	Rubber	PCB
G CDN 014	03 4th Deck	Cable Run Caulking	PCB	PCB
G CDN 015	03 4th Deck	Cable Run	Wipe	PCB
G CDN 016	04 3rd Deck	Curtain Material	Fabric	PFOS
G CDN 017	04 3rd Deck	Cabin Flooring	Vinyl	PCB
G CDN 018	05 2nd Deck	Window Seal	Rubber	PCB
G CDN 019	06 Upper Deck Accommodation	Anti-Slip Mat	Rubber	PCB
G CDN 020	06 Upper Deck Accommodation	Cable Run	Wipe	PCB
G CDN 021	06 Upper Deck Accommodation	Electrical Mat	Rubber	PCB
G CDN 022	03 4th Deck	Curtain Material	Fabric	PFOS
G CDN 023	01 Navigation Deck	W/T Door Seal	Rubber	PCB
G CDN 024	01 Navigation Deck	Coating - External	Deck Paint - Yellow	PCB Pb Cd Cr
G CDN 025	08 Upper Engine Floor	Anti-Slip Mat	Rubber	PCB
G CDN 026	08 Upper Engine Floor	Electrical Mat	Rubber	PCB
G CDN 027	08 Upper Engine Floor	Coating - Internal	Deck Paint - Green	PCB Pb Cd Cr
G CDN 028	09 Engine Room Lower Floor	Anti-Slip Mat	Rubber	PCB
G CDN 029	09 Engine Room Lower Floor	Machine Flange Joint	Rubber	PCB

General Sample List - CDN

G CDN 030	10 Engine Room Main Floor	Manhole Door Joint	Rubber	PCB
G CDN 031	10 Engine Room Main Floor	Coating - Internal	Bulkhead Paint - White	PCB Pb Cd Cr
G CDN 032	07 Engine Room 2nd Floor	Cable Run	Wipe	PCB
G CDN 033	07 Engine Room 2nd Floor	Manhole Door Joint	Rubber	PCB
G CDN 034	07 Engine Room 2nd Floor	Electric Mat	Rubber	PCB
G CDN 035	05A Topsides Aft	Coating - External	Deck Paint - Green	PCB Pb Cd Cr
G CDN 036	05A Topsides Aft	W/T Door Seal	Rubber	PCB
G CDN 037	05A Topsides Aft	Coating - External	Deck Paint - Yellow	PCB Pb Cd Cr
G CDN 038	05B Topsides Forward	Coating - External	Deck Paint - White	PCB Pb Cd Cr
G CDN 039	06B Forward Fire Pump Room	Manhole Joint	Rubber	PCB
G CDN 040	06B Forecastle Head	Cable Run	Wipe	PCB
G CDN 041	06B Forecastle Head	Electrical Mat	Rubber	PCB
G CDN 042	06B Forecastle Head	Coating - Internal	Deck Paint - Green	PCB Pb Cd Cr
G CDN 043	06B Upper Deck	Coating - External	Fire-Fighting Red Paint	PCB Pb Cd Cr
G CDN 044	06A Upper Deck Aft	Coating - External	Main Deck Paint	PCB Pb Cd Cr
G CDN 045	06B Upper Deck 3P Void Space	Internal Tank Coating	Paint	PCB Pb Cd Cr
G CDN 046	05 2nd Deck Cold Stores	Insulation	PUR	ODS
G CDN 047	05 2nd Deck	W/T Door Seal	Rubber	PCB
G CDN 048	06 Upper Deck Em. Gen flat	Electrical Mat	Rubber	PCB
G CDN 049	06 Upper Deck Em. Gen flat	Coating - Internal	Deck Paint - Green	PCB Pb Cd Cr
G CDN 050	06 Upper Deck aft	Manhole Joint	Rubber	PCB
G CDN 051	06 Upper Deck aft	Coating - External	Fairlead Paint - Black	PCB Pb Cd Cr
G CDN 052	06 Upper Deck aft	Cable Run	Wipe	PCB
G CDN 053	06 Upper Deck aft	Coating - External	Deck Paint - White	PCB Pb Cd Cr
G CDN 054	06 Upper Deck aft	Manhole Joint	Rubber	PCB
G CDN 055	06 HPU room	HPU System	Oil	PCB
G CDN 056	06A Upper Deck Mid	Hydraulic Crane	Oil	PCB

UCL
IM AUFTRAG DER ZUKUNFT

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NIEDERLANDE

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Report-No.: 23-57264/1

Sample Matrix: 48 x Material Sample, 6 x Swipe Sample, 2 x Oil
Client / Customer ID: Sea2cradle B. V., Scheepmakershaven 59, 3011 VD Rotterdam, Niederlande / 61422
Project: CDN
Sampling on / by: - / Auftraggeber
Delivery on / by: 07.11.2023 / Paketdienst
Testing period: 08.11.2023 - 24.11.2023

Parameter	Sample-ID / Sample-No. / Unit	G CDN 001 / 23-57264-001	G CDN 003 / 23-57264-003	G CDN 004 / 23-57264-004	G CDN 005 / 23-57264-005	Method
Analysis of Original sample						
Lead	mg/kg OS	3,7	n.a.			DIN ISO 22036: 2009-06;L
Cadmium	mg/kg OS	0,21	n.a.			DIN ISO 22036: 2009-06;L
Chromium total	mg/kg OS	170	n.a.			DIN ISO 22036: 2009-06;L
PCB						
PCB-028	mg/kg OS	<0,1	n.a.	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-052	mg/kg OS	<0,1	n.a.	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-101	mg/kg OS	<0,1	n.a.	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-118	mg/kg OS	<0,1	n.a.	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-138	mg/kg OS	<0,1	n.a.	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-153	mg/kg OS	<0,1	n.a.	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-180	mg/kg OS	<0,1	n.a.	<0,1	<0,1	DIN 38414-20: 1996-01;L
sum det. PCB-6	mg/kg OS	0,00	0,00	0,00	0,00	berechnet;L
sum of det. PCB total	mg/kg OS	0,00	n.a.	0,00	0,00	berechnet;L
Sample preparation						
Microwave digestion		+				DIN EN 13657: 2003-01;L

n.b. = not determinable n.a. = not analyzed n.n. = not detectable ° = not accredits FV=Outsourcing UA = Subcontract AG=Customers data + = carried out
site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Comments

DIN ISO 22036:2009-06
003: Probe wurde mit NA frei gegeben, da nicht genügend Material vorhanden ist.

Amount of sample material was not sufficient for analysis.

Parameter / Sample-ID / Sample-No. / Unit	G CDN 006	G CDN 007	G CDN 008	G CDN 009	Method
	23-57264-006	23-57264-007	23-57264-008	23-57264-009	
PCB					
PCB-028 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-052 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-101 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-118 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-138 mg/kg OS	<0,1	0,37	<0,1	0,87	DIN 38414-20: 1996-01;L
PCB-153 mg/kg OS	<0,1	0,32	<0,1	0,66	DIN 38414-20: 1996-01;L
PCB-180 mg/kg OS	<0,1	0,26	<0,1	0,55	DIN 38414-20: 1996-01;L
sum det. PCB-6 mg/kg OS	0,00	0,95	0,00	2,08	berechnet;L
sum of det. PCB total mg/kg OS	0,00	4,75	0,00	10,40	berechnet;L

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Parameter / Sample-ID / Sample-No. / Unit	G CDN 010	G CDN 011	G CDN 012	G CDN 013	Method
	23-57264-010	23-57264-011	23-57264-012	23-57264-013	
Analysis of Original sample					
Lead mg/kg OS	1350	630			DIN ISO 22036: 2009-06;L
Cadmium mg/kg OS	0,95	<0,1			DIN ISO 22036: 2009-06;L
Chromium total mg/kg OS	150	130			DIN ISO 22036: 2009-06;L
PCB					
PCB-028 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-052 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-101 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-118 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-138 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-153 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-180 mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
sum det. PCB-6 mg/kg OS	0,00	0,00	0,00	0,00	berechnet;L
sum of det. PCB total mg/kg OS	0,00	0,00	0,00	0,00	berechnet;L

Parameter / Sample-ID / Sample-No. / Unit	G CDN 010	G CDN 011	G CDN 012	G CDN 013	*Method*
	23-57264-010	23-57264-011	23-57264-012	23-57264-013	
Sample preparation					
Microwave digestion	+	+			*DIN EN 13657: 2003-01;L*

n.b. = not determinable n.a. = not analyzed n.n. = not detectable ° = not accredits FV=Outsourcing UA = Subcontract AG=Customers data + = carried out
site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Parameter / Sample-ID / Sample-No. / Unit	G CDN 014	G CDN 016	G CDN 017	G CDN 018	*Method*
	23-57264-014	23-57264-016	23-57264-017	23-57264-018	
PCB					
PCB-028 mg/kg OS	<0,1		<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-052 mg/kg OS	<0,1		<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-101 mg/kg OS	<0,1		<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-118 mg/kg OS	<0,1		<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-138 mg/kg OS	<0,1		<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-153 mg/kg OS	<0,1		<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-180 mg/kg OS	<0,1		<0,1	<0,1	*DIN 38414-20: 1996-01;L*
sum det. PCB-6 mg/kg OS	0,00		0,00	0,00	*berechnet;L*
sum of det. PCB total mg/kg OS	0,00		0,00	0,00	*berechnet;L*
PFT					
Perfluorooctanesulfonic acid (PFOS) mg/kg OS		<0,01			*i.A.a. DIN 38414-14°: 2011-08;KI*

n.b. = not determinable n.a. = not analyzed n.n. = not detectable ° = not accredits FV=Outsourcing UA = Subcontract AG=Customers data + = carried out
site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Parameter / Sample-ID / Sample-No. / Unit	G CDN 019	G CDN 021	G CDN 022	G CDN 023	*Method*
	23-57264-019	23-57264-021	23-57264-022	23-57264-023	
PCB					
PCB-028 mg/kg OS	<0,1	<0,1		<0,1	*DIN 38414-20: 1996-01;L*
PCB-052 mg/kg OS	<0,1	<0,1		<0,1	*DIN 38414-20: 1996-01;L*
PCB-101 mg/kg OS	0,25	<0,1		<0,1	*DIN 38414-20: 1996-01;L*
PCB-118 mg/kg OS	0,12	<0,1		<0,1	*DIN 38414-20: 1996-01;L*
PCB-138 mg/kg OS	0,67	<0,1		<0,1	*DIN 38414-20: 1996-01;L*
PCB-153 mg/kg OS	0,54	<0,1		<0,1	*DIN 38414-20: 1996-01;L*
PCB-180 mg/kg OS	0,37	<0,1		<0,1	*DIN 38414-20: 1996-01;L*
sum det. PCB-6 mg/kg OS	1,83	0,00		0,00	*berechnet;L*

Parameter	Sample-ID	G CDN 019	G CDN 021	G CDN 022	G CDN 023	Method
	Sample-No.	23-57264-019	23-57264-021	23-57264-022	23-57264-023	
	Unit					
sum of det. PCB total	mg/kg OS	9,15	0,00		0,00	*berechnet;L*
PFT						
Perfluorooctanesulfonic acid (PFOS)	mg/kg OS			<0,01		*i.A.a. DIN 38414-14°: 2011-08;KI*

n.b. = not determinable n.a. = not analyzed n.n. = not detectable ° = not accredits FV=Outsourcing UA = Subcontract AG=Customers data + = carried out
site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Parameter	Sample-ID	G CDN 024	G CDN 025	G CDN 026	G CDN 027	Method
	Sample-No.	23-57264-024	23-57264-025	23-57264-026	23-57264-027	
	Unit					
Analysis of Original sample						
Lead	mg/kg OS	2160			29	*DIN ISO 22036: 2009-06;L*
Cadmium	mg/kg OS	0,11			0,39	*DIN ISO 22036: 2009-06;L*
Chromium total	mg/kg OS	560			51	*DIN ISO 22036: 2009-06;L*
PCB						
PCB-028	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-052	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-101	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-118	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-138	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-153	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-180	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
sum det. PCB-6	mg/kg OS	0,00	0,00	0,00	0,00	*berechnet;L*
sum of det. PCB total	mg/kg OS	0,00	0,00	0,00	0,00	*berechnet;L*
Sample preparation						
Microwave digestion		+			+	*DIN EN 13657: 2003-01;L*

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site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Parameter	Sample-ID	G CDN 028	G CDN 029	G CDN 030	G CDN 031	Method
	Sample-No.	23-57264-028	23-57264-029	23-57264-030	23-57264-031	
	Unit					
Analysis of Original sample						
Lead	mg/kg OS				42	*DIN ISO 22036: 2009-06;L*
Cadmium	mg/kg OS				<0,5	*DIN ISO 22036: 2009-06;L*
Chromium total	mg/kg OS				130	*DIN ISO 22036: 2009-06;L*

Parameter / Sample-ID / Sample-No. / Unit	G CDN 028 23-57264-028	G CDN 029 23-57264-029	G CDN 030 23-57264-030	G CDN 031 23-57264-031	*Method*
PCB					
PCB-028 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-052 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-101 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-118 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-138 mg/kg OS	<0,1	0,22	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-153 mg/kg OS	<0,1	0,16	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-180 mg/kg OS	<0,1	0,11	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
sum det. PCB-6 mg/kg OS	0,00	0,49	0,00	0,00	*berechnet;L*
sum of det. PCB total mg/kg OS	0,00	2,45	0,00	0,00	*berechnet;L*
Sample preparation					
Microwave digestion				+	*DIN EN 13657: 2003-01;L*

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site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Comments

DIN ISO 22036:2009-06

031: Aufgrund der Probenmatrix wurden die Bestimmungsgrenzen für die Metalle um den Faktor 5 erhöht.

Due to the sample matrix, the quantification limits for the metals were increased by a factor of 5.

Parameter / Sample-ID / Sample-No. / Unit	G CDN 033 23-57264-033	G CDN 034 23-57264-034	G CDN 035 23-57264-035	G CDN 036 23-57264-036	*Method*
Analysis of Original sample					
Lead mg/kg OS			6,9		*DIN ISO 22036: 2009-06;L*
Cadmium mg/kg OS			<0,5		*DIN ISO 22036: 2009-06;L*
Chromium total mg/kg OS			290		*DIN ISO 22036: 2009-06;L*
PCB					
PCB-028 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-052 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-101 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-118 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-138 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-153 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-180 mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
sum det. PCB-6 mg/kg OS	0,00	0,00	0,00	0,00	*berechnet;L*

Parameter	Sample-ID / Sample-No. / Unit	G CDN 033 23-57264-033	G CDN 034 23-57264-034	G CDN 035 23-57264-035	G CDN 036 23-57264-036	*Method*
sum of det. PCB total	mg/kg OS	0,00	0,00	0,00	0,00	*berechnet;L*
Sample preparation						
Microwave digestion				+		*DIN EN 13657: 2003-01;L*

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site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Comments

DIN ISO 22036:2009-06

035: Aufgrund der Probenmatrix wurden die Bestimmungsgrenzen für die Metalle um den Faktor 5 erhöht.

Due to the sample matrix, the quantification limits for the metals were increased by a factor of 5.

Parameter	Sample-ID / Sample-No. / Unit	G CDN 037 23-57264-037	G CDN 038 23-57264-038	G CDN 039 23-57264-039	G CDN 041 23-57264-041	*Method*
Analysis of Original sample						
Lead	mg/kg OS	14	3,8			*DIN ISO 22036: 2009-06;L*
Cadmium	mg/kg OS	2,9	<0,1			*DIN ISO 22036: 2009-06;L*
Chromium total	mg/kg OS	77	210			*DIN ISO 22036: 2009-06;L*
PCB						
PCB-028	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-052	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-101	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-118	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-138	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-153	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-180	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
sum det. PCB-6	mg/kg OS	0,00	0,00	0,00	0,00	*berechnet;L*
sum of det. PCB total	mg/kg OS	0,00	0,00	0,00	0,00	*berechnet;L*
Sample preparation						
Microwave digestion		+	+			*DIN EN 13657: 2003-01;L*

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site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Parameter	Sample-ID / Sample-No. / Unit	G CDN 042 / 23-57264-042	G CDN 043 / 23-57264-043	G CDN 044 / 23-57264-044	G CDN 045 / 23-57264-045	Method
Analysis of Original sample						
Lead	mg/kg OS	1960	30	31	<1	*DIN ISO 22036: 2009-06;L*
Cadmium	mg/kg OS	18	<0,5	25	0,47	*DIN ISO 22036: 2009-06;L*
Chromium total	mg/kg OS	190	73	27	110	*DIN ISO 22036: 2009-06;L*
PCB						
PCB-028	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-052	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-101	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-118	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-138	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-153	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-180	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
sum det. PCB-6	mg/kg OS	0,00	0,00	0,00	0,00	*berechnet;L*
sum of det. PCB total	mg/kg OS	0,00	0,00	0,00	0,00	*berechnet;L*
Sample preparation						
Microwave digestion		+	+	+	+	*DIN EN 13657: 2003-01;L*

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Comments

DIN ISO 22036:2009-06
043: Aufgrund der Probenmatrix wurden die Bestimmungsgrenzen für die Metalle um den Faktor 5 erhöht.

Due to the sample matrix, the quantification limits for the metals were increased by a factor of 5.

DIN ISO 22036:2009-06
044: Aufgrund der Probenmatrix wurden die Bestimmungsgrenzen für die Metalle um den Faktor 5 erhöht.

Due to the sample matrix, the quantification limits for the metals were increased by a factor of 5.

Parameter	Sample-ID / Sample-No. / Unit	G CDN 046 / 23-57264-046	G CDN 047 / 23-57264-047	G CDN 048 / 23-57264-048	G CDN 049 / 23-57264-049	Method
Analysis of Original sample						
Lead	mg/kg OS				540	*DIN ISO 22036: 2009-06;L*
Cadmium	mg/kg OS				0,81	*DIN ISO 22036: 2009-06;L*
Chromium total	mg/kg OS				47	*DIN ISO 22036: 2009-06;L*
FCKW/Kältemittel						
R 22 (chlorodifluoromethane)	mg/kg OS	<10				*DIN EN ISO 22155°: 2016-07;KI*

Parameter	Sample-ID	G CDN 046	G CDN 047	G CDN 048	G CDN 049	Method
	Sample-No.	23-57264-046	23-57264-047	23-57264-048	23-57264-049	
	Unit					
R 114 (Dichlortetrafluorethan)	mg/kg OS	<10				DIN EN ISO 22155°: 2016-07;KI
R11 (trichlorfluormethane)	mg/kg OS	<10				DIN EN ISO 22155°: 2016-07;KI
R12 (dichlordifluormethane)	mg/kg OS	<10				DIN EN ISO 22155°: 2016-07;KI
R21 (Dichlorofluoromethane)	mg/kg OS	<10				DIN EN ISO 22155°: 2016-07;KI
R113 (1,1,2-Trichlor-1,2,2-trifluorethan)	mg/kg OS	<10				DIN EN ISO 22155°: 2016-07;KI
PCB						
PCB-028	mg/kg OS		<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-052	mg/kg OS		<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-101	mg/kg OS		<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-118	mg/kg OS		<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-138	mg/kg OS		<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-153	mg/kg OS		<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-180	mg/kg OS		<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
sum det. PCB-6	mg/kg OS		0,00	0,00	0,00	berechnet;L
sum of det. PCB total	mg/kg OS		0,00	0,00	0,00	berechnet;L
Sample preparation						
Microwave digestion					+	DIN EN 13657: 2003-01;L

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Parameter	Sample-ID	G CDN 050	G CDN 051	G CDN 053	G CDN 054	Method
	Sample-No.	23-57264-050	23-57264-051	23-57264-053	23-57264-054	
	Unit					
Analysis of Original sample						
Lead	mg/kg OS		290	14		DIN ISO 22036: 2009-06;L
Cadmium	mg/kg OS		0,18	<0,5		DIN ISO 22036: 2009-06;L
Chromium total	mg/kg OS		130	34		DIN ISO 22036: 2009-06;L
PCB						
PCB-028	mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-052	mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-101	mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-118	mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L
PCB-138	mg/kg OS	<0,1	<0,1	<0,1	<0,1	DIN 38414-20: 1996-01;L

Parameter	**Sample-ID** / Sample-No. / Unit	**G CDN 050** 23-57264-050	**G CDN 051** 23-57264-051	**G CDN 053** 23-57264-053	**G CDN 054** 23-57264-054	*Method*
PCB-153	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
PCB-180	mg/kg OS	<0,1	<0,1	<0,1	<0,1	*DIN 38414-20: 1996-01;L*
sum det. PCB-6	mg/kg OS	0,00	0,00	0,00	0,00	*berechnet;L*
sum of det. PCB total	mg/kg OS	0,00	0,00	0,00	0,00	*berechnet;L*
Sample preparation						
Microwave digestion			+	+		*DIN EN 13657: 2003-01;L*

n.b. = not determinable n.a. = not analyzed n.n. = not detectable ° = not accredits FV=Outsourcing UA = Subcontract AG=Customers data + = carried out
site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Comments

DIN ISO 22036:2009-06

053: Aufgrund der Probenmatrix wurden die Bestimmungsgrenzen für die Metalle um den Faktor 5 erhöht.

Due to the sample matrix, the quantification limits for the metals were increased by a factor of 5.

Parameter / Sample-ID / Sample-No. / Unit		G CDN 002 23-57264-002	G CDN 015 23-57264-015	G CDN 020 23-57264-020	G CDN 032 23-57264-032	*Method*
Analysis of Original sample						
PCB						
PCB-028	µg abs	<0,002	<0,002	0,013	<0,002	*DIN 38414-20: 1996-01;L*
PCB-052	µg abs	<0,002	<0,002	0,014	0,004	*DIN 38414-20: 1996-01;L*
PCB-101	µg abs	<0,002	<0,002	0,010	0,008	*DIN 38414-20: 1996-01;L*
PCB-118	µg abs	<0,002	<0,002	0,007	0,009	*DIN 38414-20: 1996-01;L*
PCB-138	µg abs	<0,002	<0,002	0,005	0,020	*DIN 38414-20: 1996-01;L*
PCB-153	µg abs	<0,002	<0,002	0,005	0,015	*DIN 38414-20: 1996-01;L*
PCB-180	µg abs	<0,002	<0,002	<0,002	0,007	*DIN 38414-20: 1996-01;L*
sum det. PCB-6	µg abs	0,000	0,000	0,047	0,054	*berechnet;L*
sum of det. PCB total	µg abs	0,000	0,000	0,235	0,270	*berechnet;L*

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site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Parameter / Sample-ID / Sample-No. / Unit		G CDN 040 23-57264-040	G CDN 052 23-57264-052			*Method*
Analysis of Original sample						
PCB						
PCB-028	µg abs	<0,002	<0,002			*DIN 38414-20: 1996-01;L*
PCB-052	µg abs	<0,002	<0,002			*DIN 38414-20: 1996-01;L*
PCB-101	µg abs	<0,002	<0,002			*DIN 38414-20: 1996-01;L*
PCB-118	µg abs	<0,002	<0,002			*DIN 38414-20: 1996-01;L*
PCB-138	µg abs	<0,002	<0,002			*DIN 38414-20: 1996-01;L*
PCB-153	µg abs	<0,002	<0,002			*DIN 38414-20: 1996-01;L*
PCB-180	µg abs	<0,002	<0,002			*DIN 38414-20: 1996-01;L*
sum det. PCB-6	µg abs	0,000	0,000			*berechnet;L*
sum of det. PCB total	µg abs	0,000	0,000			*berechnet;L*

n.b. = not determinable n.a. = not analyzed n.n. = not detectable ° = not accredits FV=Outsourcing UA = Subcontract AG=Customers data + = carried out
site identifier (letters postpositioned the standard method): H=Hannover, KI=Kiel, L=Lünen, HE=Heide, BS=Braunschweig

Parameter	Sample-ID Sample-No. Unit	G CDN 055 23-57264-055	G CDN 056 23-57264-056			*Method*
Analysis of Original sample						
PCB						
PCB-028	mg/kg OS	<0,1	<0,1			*DIN EN 12766-1: 2000-11;L*
PCB-052	mg/kg OS	<0,1	<0,1			*DIN EN 12766-1: 2000-11;L*
PCB-101	mg/kg OS	<0,1	<0,1			*DIN EN 12766-1: 2000-11;L*
PCB-118	mg/kg OS	<0,1	<0,1			*i.A.a. DIN EN 12766-1°: 2000-11;L*
PCB-138	mg/kg OS	<0,1	<0,1			*DIN EN 12766-1: 2000-11;L*
PCB-153	mg/kg OS	<0,1	<0,1			*DIN EN 12766-1: 2000-11;L*
PCB-180	mg/kg OS	<0,1	<0,1			*DIN EN 12766-1: 2000-11;L*
sum det. PCB-6	mg/kg OS	0	0			*berechnet;L*
sum of det. PCB total	mg/kg OS	0	0			*berechnet nach DIN EN 12766-2 Verfahren B: 2001-12;L*

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The test report was created electronically and is legally valid without a signature.

24.11.2023 i.A. M.Sc. Chemie Tammy Bialas-Rapp (Kundenbetreuer)

Radiation Documentation

Radiation Documentation

Unit surveyed	**FPSO CIDADE DE NITEROI MV18**
Date	**1ST November 2023**
Location of survey	**Campos Basin, Macae, Brazil**
S2C Project No.	**193.23**
Name of surveyor	**Frank Fox**
By order of	**Sea2Cradle B.V.**

Contents

1 Terms of reference

Whilst every care has been taken to ensure that the information provided is accurate, up-to-date and complete, Sea2Cradle does not accept any liability for any errors or omissions in the information or for any acts or omissions of any person in the handling, removal or disposal of these substances, whether done in reliance on the information in this report or otherwise.

It is stressed that the information provided in this survey is not a contractual statement of precise quantities of residues and materials on board. Any quantities given are estimates only and no guarantee of their accuracy is either given or implied.

The aim of this radiation documentation is:

A. To list all sources (provided by the ship-owner) of radioactive equipment which are part of the structure of the vessel

For reference, instantaneous dose limits for members of the public is worldwide 1 mSv/annum (average 0.114 µSv/hr) above background levels (sources 2014: Euratom, ICRP and IAEA, US Nuclear Regulatory Commission).
Importation of ships for recycling, containing radioactive sources is in 2014 restricted at:

- China : 0.25 µSv/hr above background
- Turkey : 0.20 µSv/hr absolute

When levels exceed dose limits for the public or local threshold levels, importation needs to be verified.

2 Equipment

Visual and Documentation Check Only

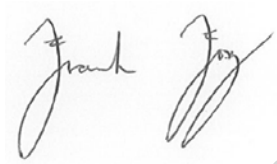
3 SURVEY

A. List of equipment containing radioactive sources (state nil in case no sources):

Name	Marks/type	location (s)	Qty
Ionization chamber smoke detectors			Nil
Instruments/signs containing gaseous tritium light sources			Nil
Instruments/signs containing radioactive painting			Nil
High intensity discharge lamps			Nil
Radioactive lighting rods			Nil
Radioactive level gauges			Nil
Radioactive dredger gauges			Nil
Radioactive conveyor gauges			Nil
Radioactive spinning pipe gauges			Nil

Attached is extract from Fire Detecection System review from ABS October 2007 showing all smoke detectors are optical type.

Signed :



Name : Frank Fox
Date : 01/11/2023
Sea2Cradle BV

Medicines Documentation

MODEC	MODEC 00.000.000/0000-00 MV 18	INVENTÁRIO DE MEDICAMENTO EMITIDO 31/10/2023 08:13:53 POR: ASANTOS

ATC	MEDICAMENTO	APRESENTAÇÃO	VENCIMENTO	LOTE	ESTOQUE	CLASSE
N/A	LISTO 4MG 10CPR BIOLAB SANUS FARM.	UN	30/04/2024	1073275	110	O
D02AE01	ACERATUM GTS 10ML (PEROXIDO DE CARBAMIDA) DELTA	UN	18/08/2025	00036795	10	
0	ACETATO HIDROCORTISONA CR 30G	CREME	30/04/2024	3297180	7	
R05CB01	ACETILCISTEINA 600MG 16ENV	SACHE	16/02/2024	0001744	128	
D07AB09	ACETONIDO TRIANC 10G POM ORABASE	CREME	19/03/2024	2S5939	2	
D07AB09	ACETONIDO TRIANC 10G POM ORABASE	CREME	08/01/2025	3G2561	5	
342243	ACICLOVIR 200MG COMP.	COMPRIMIDO	30/10/2024	MR6952	50	O
342243	ACICLOVIR 200MG COMP.	COMPRIMIDO	31/03/2024	22001458	25	
J05AB01	ACICLOVIR CR 10G	CREME	14/03/2026	2305165	5	
B01AC06	ACIDO ACETILSALICILICO 100MG BLISTER 10CPR	COMPRIMIDO	30/12/2023	2R9608	7	
B01AC06	ACIDO ACETILSALICILICO 100MG BLISTER 10CPR	COMPRIMIDO	30/03/2024	2S5988	20	
N02BA01	ACIDO ACETILSALICILICO 500MG BLISTER 10CPR	COMPRIMIDO	30/12/2023	2A7781	10	O
N02BA01	ACIDO ACETILSALICILICO 500MG BLISTER 10CPR	COMPRIMIDO	30/06/2025	3A6977	400	
N/A	ADENOSINA 3MG/ML INJ AMPOLA 2ML	AMPOLA	30/09/2024	BC-008/22M	5	
RO3AC02	AERODINI 100MCG JATO-DOSE SPY	AMPOLA	30/06/2024	07642201	2	
V07AB	AGUA P/INJECAO 10ML AMPOLA	AMPOLA	30/01/2024	22A10048D	97	
R06AX26	ALLEXOFEDRIN D 60MG 10CPR D1	COMPRIMIDO	15/08/2024	3A3949	76	
R03DA05	AMINOFILINA 240MG SOL INJ AMPOLA 10ML	AMPOLA	12/10/2024	9073133	10	
J01CR02	AMOX+CLAV POTASSICO 875MG 14CPR (LEGR)	COMPRIMIDO	30/08/2024	2Z6967	70	
J01CA04	AMOXICILINA 500MG 21CPR (UQUIM) UNIAO QUIMICA GENER	COMPRIMIDO	31/12/2024	2252908	63	
S01AA09	ANESTESICO SOL OFT 10ML 'C1'	FRASCO	19/04/2024	F70374	5	
6080	ANTUX XPE 120ML	FRASCO	30/09/2024	2211814	10	

C07AB03	ATENOLOL 25MG 30CPR	COMPRIMIDO	11/04/2024	2U1179	60	
0	ATENSINA 0,100MG 30CPR	COMPRIMIDO	30/06/2024	D15988	60	O
0	ATENSINA 0,100MG 30CPR	COMPRIMIDO	15/06/2024	D18616	58	
0	ATENSINA 0,100MG 30CPR	COMPRIMIDO	30/11/2024	D44502	30	
A03BA01	ATROFARMA (SULF. DE ATROPINA) 0,25MG/ML 1ML AMP	AMPOLA	30/04/2024	AT22D007	40	
A03BA01	ATROFARMA (SULF. DE ATROPINA) 0,25MG/ML 1ML AMP	AMPOLA	19/07/2024	AT22G012	16	
A03BA01	ATROFARMA (SULF. DE ATROPINA) 0,25MG/ML 1ML AMP	AMPOLA	31/03/2024	AT22C006	6	
0	AVIDE 100MG	COMPRIMIDO	29/09/2024	2213497	125	
0	AVIDE 100MG	COMPRIMIDO	13/03/2025	2304798	180	
0	AVIDE 100MG	COMPRIMIDO	31/01/2025	2216363	27	
0	AVIDE 100MG	COMPRIMIDO	13/03/2025	2304797	18	
J01EE01	BACTRIM F 10CPR	COMPRIMIDO	22/11/2025	R1843R01	40	
J01EE01	BACTRIM F 10CPR	COMPRIMIDO	09/08/2024	71470	60	
B05XA02	BICARBONATO DE SODIO 8,4% SOL INJ AMPOLA 10ML	AMPOLA	30/04/2024	BLV	20	
B05XA02	BICARBONATO DE SODIO 8,4% SOL INJ AMPOLA 10ML	AMPOLA	31/05/2024	BMN	15	
N/A	BIOVIR 450MG 60CAPS 'C4'	COMPRIMIDO	30/01/2024	ST8D	120	
N/A	BISALAX 5MG 20DRG	COMPRIMIDO	30/11/2024	2253329	60	
R05CB02	BISOLVON XAROPE - CLOR. BROMEXINA	FRASCO	25/08/2024	A340-005/22	98	
N/A	BLOQ SOLAR FPS 60 2,8L	UN	30/04/2025	65/841	5	
N05BA08	BROMAZEPAM 3MG 30CPR 'B1'	COMPRIMIDO	31/03/2024	2210197	30	
R03BB01	BROMETO IPRATROPIO SOL 20ML	FRASCO	21/07/2024	1441244	5	
11111111	BUSCOPAN SIMPLES 20MG INJETAVEL	AMPOLA	31/01/2024	H-004/22M	10	
A03DB04	BUTIL ESCOPOLAMINA+DIP SOD INJ AMPOLA 5ML	AMPOLA	31/08/2024	H-112/22	30	

A03DB04	BUTIL ESCOPOLAMINA+DIP SOD INJ AMPOLA 5ML	AMPOLA	31/08/2024	H-112/22	20	
D04AA32	CALAMED LOCAO 100ML	FRASCO	21/11/2025	2224482	1	
D04AA32	CALAMED LOCAO 100ML	FRASCO	22/11/2025	2224569	4	
C09AA01	CAPTOPRIL 25MG 30CPR	COMPRIMIDO	30/03/2024	2207483	55	
C09AA01	CAPTOPRIL 25MG 30CPR	COMPRIMIDO	30/03/2024	2T9370	30	
N/A	CARVEROL 20CPR	COMPRIMIDO	30/06/2024	2222125	60	
N/A	CARVEROL 20CPR	COMPRIMIDO	30/06/2024	2223979	60	
J01DB01	CEFALEXINA 500MG 8CPR UNIAO QUIMICA GENER	COMPRIMIDO	30/04/2024	2215412	48	P
J01DB01	CEFALEXINA 500MG 8CPR UNIAO QUIMICA GENER	COMPRIMIDO	30/09/2024	2239687	56	
J01DB03	CEFALOTINA 1G PÓ SOL.INJ	UN	29/11/2023	21120213	4	
J01DB03	CEFALOTINA 1G PÓ SOL.INJ	UN	10/12/2023	21121404	4	
J01DD04	CEFTRIAXONA SOD 1G IV SOL INJ AMPOLA BIOCHIMICO	UN	30/03/2024	009223	4	
D01AC08	CETOCONAZOL CR 30G	CREME	22/03/2025	2306286	5	
N/A	CETOPROFENO 150MG 10CPR	COMPRIMIDO	18/05/2024	2W7303	21	O
N/A	CETOPROFENO 150MG 10CPR	COMPRIMIDO	30/01/2025	834855	140	
A01AD02	CIFLOGEX 12PAST MEL LIMAO	PASTILHA	15/07/2024	2215871	168	O
A01AD02	CIFLOGEX 12PAST MEL LIMAO	PASTILHA	25/07/2024	2216553	180	
A01AD02	CIFLOGEX 12PAST MENTA LIMAO	PASTILHA	30/05/2024	2212186	24	
A01AD02	CIFLOGEX 12PAST MENTA LIMAO	PASTILHA	30/03/2024	2206763	96	
C01BD01	CLOR AMIODARONA 100MG 30CPR GEOLAB GENERICO	COMPRIMIDO	31/01/2025	2300660	30	
C01BD01	CLOR AMIODARONA 100MG 30CPR GEOLAB GENERICO	COMPRIMIDO	31/10/2024	2214618	30	
J01MA02	CLOR CIPROFLOXACINO 500MG 14CPR	COMPRIMIDO	30/06/2024	22003498	126	
J01MA02	CLOR CIPROFLOXACINO 500MG 14CPR	UN	30/08/2024	B22H0428	14	

NO2AX02	CLOR DE TRAMADOL 50MG SOL INJ AMP 1ML 'A2'	AMPOLA	30/01/2024	9068109	1	
NO2AX02	CLOR DE TRAMADOL 50MG SOL INJ AMP 1ML 'A2'	AMPOLA	31/08/2024	2232571	5	
281817	CLOR DE TRAMADOL 50MG COMP.	COMPRIMIDO	19/11/2024	2114380	50	
C01CA04	CLOR DOPAMINA 5MG/ML INJ AMPOLA 10ML	AMPOLA	07/07/2024	21070698	20	
J01AA02	CLOR DOXICICLINA 100MG 15CPR	COMPRIMIDO	31/03/2025	231160	105	
R06AX26	CLOR FEXOFENADINA 180MG 10CPR	COMPRIMIDO	30/11/2023	DFC5017A	73	
N05BB01	CLOR HIDROXIZINA 25MG 30CPR	COMPRIMIDO	19/07/2024	2Z4802	30	
N/A	CLOR ONDANSETRONA 4MG SOL INJ AMPOLA 2ML	AMPOLA	30/09/2024	AQ-106/22M	20	
R01AA05	CLOR OXIMETAZOLINA 30ML	FRASCO	24/09/2024	3A2117	10	
N/A	CLORETO DE POTASSIO 10% SOL INJ AMPOLA 10ML	AMPOLA	29/02/2024	RNE	10	
338969	CLORETO DE SODIO 0,9% 500ML BOLSA	AMPOLA	17/09/2024	0000167793	18	
338969	CLORETO DE SODIO 0,9% 500ML BOLSA	AMPOLA	26/01/2025	0000172960	10	
BO5XA03	CLORETO DE SODIO 0,9% 10ML AMPOLA	AMPOLA	24/03/2024	P11122A	20	
340872	CLORETO DE SODIO 20% SOL INJ AMPOLA 10ML SAMTEC BIOTECNOLOGIA	AMPOLA	30/03/2024	WKS	19	
340872	CLORETO DE SODIO 20% SOL INJ AMPOLA 10ML SAMTEC BIOTECNOLOGIA	AMPOLA	30/03/2024	WKS	10	
N/A	CLOREXIDINA 2% 100ML ALMOTOLIA	FRASCO	30/08/2024	2202942	10	
C01BB01	CLORIDRATO LIDOCAINA GEL 30G	GEL	30/09/2024	22005067	4	
N/A	COLIRIO TEUTO 20ML	FRASCO	17/12/2023	01651244	6	
0	CUTENOX 40MG 0,4ML SC/IV C/TRAVA 1 SERINGA (ENOXAPARINA)	AMPOLA	28/02/2024	JB223	3	
S01CA01	DEXAM.+NEOMIC.+POLIMIX.B SOL OFT 5ML	OFTAMOLOGICO	28/02/2024	2202495	1	
S01CA01	DEXAM.+NEOMIC.+POLIMIX.B SOL OFT 5ML	OFTAMOLOGICO	31/07/2024	2210777	2	
N05BA01	DIAZEPAM 5MG 30CPR B1	COMPRIMIDO	29/11/2023	B21L2115	30	
M01AB05	DICLOF POTASSICO 50MG 20CPR	COMPRIMIDO	30/12/2023	2200741	194	

M01AB05	DICLOF SODICO 25MG/ML SOL INJ AMPOLA 3ML	AMPOLA	29/02/2024	22020061	10	
M01AB05	DICLOFENACO DE SÓDIO 50 MG COMPR	COMPRIMIDO	31/10/2024	2215042	60	
N02AA01	DIMORF 10MG/ML SOL INJ AMPOLA 1ML A1	AMPOLA	29/02/2024	AZ-002/22	4	
N02AA01	DIMORF 10MG/ML SOL INJ AMPOLA 1ML A1	AMPOLA	23/08/2024	22080891	4	
N02AA01	DIMORF 10MG/ML SOL INJ AMPOLA 1ML A1	AMPOLA	28/02/2024	AZ-002/22	5	
N02BB02	DIPIRONA 500MG COMP.	COMPRIMIDO	30/01/2025	004023	280	O
N02BB02	DIPIRONA 500MG SOL INJ AMPOLA 2ML	AMPOLA	01/10/2024	20724322	6	
R03BA01	DIPROP BETAMET+FOSF.DISS.BETAMET SOL INJ AMPOLA 1ML	AMPOLA	08/09/2024	794570	4	
0	DORDENTE FLACONETE 3ML	FRASCO	30/12/2026	221222DD	4	
R06AA02	DRAMIN CAPSGEL 50MG BLISTER 10CPS	COMPRIMIDO	30/01/2024	525943	20	
R06AA02	DRAMIN CAPSGEL 50MG BLISTER 10CPS	COMPRIMIDO	30/01/2024	525947	280	
R06AA02	DRAMIN CAPSGEL 50MG BLISTER 10CPS	COMPRIMIDO	30/06/2024	535640	120	
R06AA02	DRAMIN CAPSGEL 50MG BLISTER 10CPS	COMPRIMIDO	11/10/2024	540300	720	
R06AA02	DRAMIN CAPSGEL 50MG BLISTER 10CPS	COMPRIMIDO	30/07/2024	535639	10	
R06AA02	DRAMIN CAPSGEL 50MG BLISTER 10CPS	COMPRIMIDO	30/06/2024	535638	2010	
R05DB19	DROPROPIZINA XPE ADU 120ML	FRASCO	30/03/2025	2300206	10	
N/A	DUCODIL 5MG COMP.	COMPRIMIDO	20/07/2024	2216438	60	
J02AC01	FLUCONAZOL 150MG 1CPR	COMPRIMIDO	30/04/2024	O21248	8	
0	FLUMAZENIL 0,1MG/ML SOL INJ AMPOLA 5ML C1	AMPOLA	30/04/2024	22040483	3	
S01JA01	FLUORESCEINA 1% COLIRIO 5ML	FRASCO	30/06/2024	062204	5	
307010	FOSFATO DISSOD DEXAMETASONA 4MG ML AMPOLA 2,5ML	AMPOLA	31/01/2024	22010060	10	
C03CA01	FUROSEMIDA 10MG/ML SOL INJ AMPOLA 2ML	AMPOLA	01/03/2024	20206222	10	
C03CA01	FUROSEMIDA 10MG/ML SOL INJ AMPOLA 2ML	AMPOLA	31/07/2024	F-002/22	20	

M02AC	GELO BIO AER 60ML	SPRAY	31/01/2024	2101701	3	O
M02AC	GELO BIO AER 60ML	SPRAY	30/03/2024	2112795	2	O
M02AC	GELO BIO AER 60ML	SPRAY	30/04/2025	2215537	12	
B05BA03	GLICOSE 25% 10ML AMPOLA PLASTICA	FRASCO	31/07/2024	LCX	20	
B05BA03	GLICOSE 5% 500ML BOLSA BEKER	FRASCO	30/07/2024	B0236JUL22	9	
B05BA03	GLICOSE 5% 500ML BOLSA JP INDUSTRIA	FRASCO	17/10/2024	9303 22	10	
B01AB01	HEPAMAX S 5000UI/ML SOL INJ AMPOLA 5ML (HEPARINA SOD)	AMPOLA	26/11/2024	21121375	3	
348607	HIDRAPLEX 27,9G NATURAL 50 ENV NATULAB LAB	SACHE	07/11/2024	0017780	193	
C03AA03	HIDROCLOROTIAZIDA 25MG 30CPR	COMPRIMIDO	30/11/2024	O23656	30	
C03AA03	HIDROCLOROTIAZIDA 25MG 30CPR	COMPRIMIDO	30/11/2024	O23656	30	
A03DB04	HIOSPAN BUTIL ESCOPOLAMINA+DIP SOD INJ AMPOLA 5ML	AMPOLA	31/08/2024	22080644	10	
R0ABA52	HISTADIN D 12CPR D1	COMPRIMIDO	29/02/2024	2206024	115	
R0ABA52	HISTADIN D 12CPR D1	COMPRIMIDO	31/08/2024	2237054	240	
N/A	HISTOACRYL FLEXIBLE ADESIVO TOPICO PELE 0,5ML	UN	27/09/2024	223921I	5	
C01CA24	HYFREN 1MG ML INJ AMP 1ML IV IM (EPINEFRINA)	AMPOLA	30/06/2024	22060942	60	
C01CA24	HYFREN 1MG ML INJ AMP 1ML IV IM (EPINEFRINA)	AMPOLA	29/02/2024	22020446	15	
C01CA24	HYFREN 1MG ML INJ AMP 1ML IV IM (EPINEFRINA)	AMPOLA	29/02/2024	22020446	40	
M01AE01	IBUPROFENO 400MG 10CPR	COMPRIMIDO	30/07/2024	2209394	80	O
348542	IBUVIX 400MG COMP.	COMPRIMIDO	31/07/2024	2209394	140	
0	INALIDE 32MCG 120DOSES	FRASCO	10/12/2024	3B5432	10	
0	INALIDE 32MCG 120DOSES	FRASCO	30/03/2025	3I7069	5	
C01DA08	ISORDIL 5MG SUBL 30CPR	COMPRIMIDO	30/06/2024	3B2973	30	
P02CFO1	IVERMECTINA 6MG 2CPR	COMPRIMIDO	30/11/2024	73946	8	

B06AA02	KOLLAGENASE 30G POMADA	CREME	30/09/2024	22090092	5	
0	LENAZEN 0,5MG ML SOL INJ UN AMP 5ML C1 (FLUMAZENIL)	AMPOLA	13/06/2024	7361027	5	
N/A	LIDOSPORIN SOL OTO 10ML	FRASCO	24/10/2024	222727	5	
N/A	LORASLIV 10MG 12CPR (LORATADINA) VITAMEDIC GENERICO	COMPRIMIDO	31/10/2024	72711	144	
N/A	LORATADINA 10MG COMP.	COMPRIMIDO	30/05/2024	2210717	36	O
R06AB02	MAL. DEXCLORFERNIRAMINA 2MG 20CPR	COMPRIMIDO	18/03/2024	B22B3069	53	
R06AB02	MAL. DEXCLORFERNIRAMINA 2MG 20CPR	COMPRIMIDO	30/03/2024	B22B3068	60	
N/A	MANTEIGA DE CACAU ZINZIN	UN	30/05/2025	522	50	
N/A	MANTEIGA DE CACAU ZINZIN	UN	30/07/2025	722	100	
J01XD01	METRONIDAZOL 250MG 20CPR	COMPRIMIDO	30/12/2024	B22L3031	60	
J01XD01	METRONIDAZOL 250MG COMP.	COMPRIMIDO	31/01/2024	42510114	20	
347389	METRONIDAZOL 5MG/ML BOLSA PLAST 100ML SIST FECHAD	AMPOLA	22/11/2024	0000170666	1	
347389	METRONIDAZOL 5MG/ML BOLSA PLAST 100ML SIST FECHAD	AMPOLA	03/12/2024	0000171046	3	
N05CD08	MIDAZOLAM 5MG ML SOL INJ AMPOLA 3ML	AMPOLA	29/02/2024	AP-016/22	3	
N05CD08	MIDAZOLAM 5MG ML SOL INJ AMPOLA 3ML	AMPOLA	31/03/2024	AP-026/22	5	
N05CD08	MIDAZOLAM 5MG ML SOL INJ AMPOLA 3ML	AMPOLA	30/03/2024	AP-026/22	5	
M03BC51	MIORRELAX 30CPR	COMPRIMIDO	13/05/2024	B22E0876	104	O
A02AB01	MYLANTA PLUS 240ML	FRASCO	02/03/2025	3G2539	5	
0	NAPROXENO 500MG 10CPR	COMPRIMIDO	30/12/2023	73400054	56	O
0	NAPROXENO 500MG 10CPR	COMPRIMIDO	01/03/2024	73400056	20	
V03AB15	NARCAN 0,4MG/ML SOL INJ AMPOLA 1ML C1 (CLOR NALOXONA)	AMPOLA	13/05/2024	22050236	5	
V03AB15	NARCAN 0,4MG/ML SOL INJ AMPOLA 1ML C1 (CLOR NALOXONA)	AMPOLA	14/05/2024	22050236	4	
A03DB04	NEOCOPAN 20CPR	COMPRIMIDO	30/11/2023	D57508A	179	

A03DB04	NEOCOPAN 20CPR	COMPRIMIDO	31/05/2024	22002561	160	
A03DB04	NEOCOPAN 20CPR	COMPRIMIDO	31/05/2024	22002561	140	
21549	NEOSORO SOL 30ML	FRASCO	30/01/2024	B22A2336	7	
D02AB	NISTATINA+OX ZINCO POM 60G	CREME	06/05/2024	B22D2582	19	O
G01AF04	NITRATO DE MICONAZOL CR DERM 28G	UN	14/04/2024	2208051	8	
G01AF04	NITRATO DE MICONAZOL CR DERM 28G	UN	07/10/2024	2221416	6	
N/A	NITRATO DE MICONAZOL CR VAG 80G	CREME	16/03/2024	8911227	4	
0	NOXX 40MG 0,4ML SC IV S TRAVA 1 SERINGA (ENOXAPARINA)	AMPOLA	30/08/2024	22100166	3	
A06AA01	OLEO MINERAL 100ML (U.QUIM)	FRASCO	30/11/2023	754	8	O
A02BC01	OMEPRAZOL SODICO IV 40MG PO LIOF C/DILUENTE FR/AMP 10ML	AMPOLA	19/11/2023	21111290	8	
A02BC01	OMEPRAZOL SODICO IV 40MG PO LIOF C/DILUENTE FR/AMP 10ML	AMPOLA	18/11/2023	21120274	8	
S02CA03	OTOSPORIN SOL 10ML	FRASCO	30/05/2024	221011	10	
N/A	OTOSYLASE SOL 10ML OTOL	FRASCO	30/06/2024	2208158	3	
N02BE01	PARACETAMOL 750MG COMP.	COMPRIMIDO	30/01/2025	O30285	397	
348010	PERMENATI 5% LOCAO CREMOSA 60ML	FRASCO	01/06/2024	220530	1	
348010	PERMENATI 5% LOCAO CREMOSA 60ML	FRASCO	30/01/2025	230031	4	
D02AB	PILOCARPINA 2% COL 10ML	FRASCO	23/06/2024	F68784	2	
D02AB	PILOCARPINA 2% COL 10ML	FRASCO	28/01/2024	F68392	2	
A03FA01	PLABEL 10MG 20CPR (METOCLOPRAMIDA)	COMPRIMIDO	30/06/2024	062078	38	
D04AA10	PROMERGAN CR 30G	CREME	26/01/2025	013072	2	
S01XA02	REGENCEL POM OFT 3,5G	CREME	26/01/2025	23011005	5	
N02BE51	RESFENOL 20CPS	COMPRIMIDO	30/06/2024	0000210634	260	O
N02BE51	RESFENOL 20CPS	COMPRIMIDO	30/06/2024	0000210634	400	

N02BB52	SEDAMED 20CPR	COMPRIMIDO	30/10/2024	B22K0514	60	
A03AX13	SIMETICONA 40MG COMP.	COMPRIMIDO	24/08/2024	3A6372	70	
347615	SORO FISIOLOGICO 0,9% 500ML - USO EXTERNO	AMPOLA	30/03/2025	7898	18	
BO5BB1	SORO RINGER LACTADO 500ML BOLSA	AMPOLA	30/06/2024	0000164427	5	
0	SORO RINGER SIMPLES 500ML FRASCO	FRASCO	01/06/2025	0000178213	5	
0349151	SUCCINATO METOPROLOL 50MG COMP.	COMPRIMIDO	30/04/2024	57175	90	
D06AX04	SULF NEOMICINA+BACITR 50G	CREME	30/09/2024	3390385	10	
J01EE01	SULF+TRIMETOPRIMA 400MG+80MG 10CPR	COMPRIMIDO	09/08/2024	071470	30	
D06BA01	SULFADIAZINA DE PRATA CR 30G C/VP	CREME	30/04/2025	2318822	5	
0	SUMAX 25MG 4CPR	COMPRIMIDO	06/01/2024	22B0429	12	
0	TIORFAN 100MG 9CPS	COMPRIMIDO	31/08/2024	R004	4	
S01AA12	TOBRAMICINA COL 0,3% 5ML	FRASCO	16/03/2025	3J6584.1	4	
N02AA59	TYLEX 7,5MG 12CPS 'A2'	COMPRIMIDO	30/09/2024	AT6634	60	
A04AD01	UNI HIOSCIN 10MG 20CPR	CX	31/10/2024	B22M1532	60	
0	VACINA HEPATITE A AVAXIM ADULTO	AMPOLA	06/02/2024	1325839	44	O
D07CC01	VALERATO BETA+GENT+TOL+CLIO CR 20G	CREME	01/10/2024	00037705	5	
D07CC01	VALERATO BETAMETASONA CR 30G	CREME	23/06/2024	2W7389	3	
D07CC01	VALERATO BETAMETASONA CR 30G	CREME	30/04/2025	232032	2	
N/A	VONAU FLASH 4MG 10CPR	COMPRIMIDO	30/04/2024	1073275	28	
N/A	VONAU FLASH 4MG 10CPR	COMPRIMIDO	30/08/2024	2Z2259	200	
N/A	VONAU FLASH 4MG 10CPR	COMPRIMIDO	06/08/2024	3A3245	150	

Surveyor's 'Approved Hazmat Expert' Certificate

DNV·GL

Certificate

Fully Approved HazMat Expert

Reg. No.: 3346262E

This is to certify that

Mr. Frank Fox

Has successfully completed the seminar “Approved HazMat Expert” and the witnessing audit for final approval.
The participant has demonstrated the competence to prepare an “Inventory of Hazardous Materials” (IHM) with reference to the following:

- Hong Kong International Convention for the Safe and Sound Recycling of Ships 2009
- EU Ship Recycling Regulation (EC 1257/2013)

Seminar “Approved HazMat Expert”	Place, Date, Signature:	Hamburg 2009-04-27 to 30, Gerhard Aulbert DNV GL Representative
Successful witnessing	Place, Date, Signature:	Hamburg 2009-04-30 Gerhard Aulbert DNV GL Representative

This certificate is valid until 2025-04-14

Issued at Hamburg, 2022-10-06

This certificate is subject to revalidation every three years.

First Revalidation	Place, Date, Signature:	Shanghai 2016-01-11 , Chenping Huang DNV GL Representative
Second Revalidation	Place, Date, Signature:	Hamburg, 2019-04-11 , Khalid Mahmood DNV GL Representative
Third Revalidation	Place, Date, Signature:	Hamburg, 2022-10-06 , Khalid Mahmood DNV GL Representative

Khalid Mahmood

Lloyds Register 'Approved Service Supplier' Certificate

Certificate No: LR22202528AS

Issue Date: 19/06/2022

Expiry Date: 18/06/2025

Lloyd's Register Approved Service Supplier

Supplier	**Sea2Cradle B.V.**
Address	Scheepmakershaven 59, ROTTERDAM, 3011 VD, Netherlands
Contact Details	Moll@sea2cradle.com
Contact Number	+31 628146745

The above company having been assessed hereby receives approval in accordance with the requirements of Lloyd's Register Procedures for Approval of Service Suppliers as Supplier from the address(es) listed above for the provision of

Visual/Sampling Checks And Testing For Hazardous Materials, Such As Asbestos, PCBS, TBTS And CFCS Onboard Ships, Including Advise On Numbers And Locations Of Samples, And Preparation Of Reports On The Quantities,Locations And Estimates Of These Materials

In accordance with:

• IMO Resolution MEPC.269(68) Guidelines for the development of the Inventory of Hazardous Materials for compliance with Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009.

• EMSA's Best Practice Guidance on the Inventory of Hazardous Materials for compliance with Regulation (EU) No 1257/2013 of the European Parliament and of the Council of 20 November 2013 on Ship Recycling and Amending Regulation (EC) No 1013/2006 and Directive 2009/16/EC.

This approval is conditional upon the Supplier maintaining the documented scheme as audited by any member of the Lloyd's Register Group and hereby approved; and notifying Lloyd's Register in writing of any change to that scheme including any change in personnel, equipment or procedures. This certificate is issued to the Supplier and, subject to the Supplier complying with the necessary conditions, is valid to the date referred to above.

Walter Machielsen

Surveyor Existing Ship to Lloyd's Register EMEA
A member of the Lloyd's Register group

71 Fenchurch Street, London, EC3M 4BS, United Kingdom

End of report

Statement of Compliance
For
Inventory of Hazardous Materials

(Note: This statement shall be supplemented by Part I of the Inventory of Hazardous Materials)

Issued under the provisions of Regulation (EU) No 1257/2013

under the authority of the Government of:

The Commonwealth of the Bahamas

(Name of the State)

by **American Bureau of Shipping**

Under Regulation (EU) No 1257/2013 of the European Parliament and the Council on ship recycling

Particulars of Ship:

Name of Ship	Distinctive Number or Letters	Port of Registry	Gross Tonnage	IMO Number
FPSO CIDADE DE NITERÓI MV18	9000260 C6WW5	Nassau	144898	8500123
Name and Address of Shipowner		IMO Registered Owner Identification Number	IMO Company Identification Number	Date of Construction
OPPORTUNITY MV18 B.V.		5768367	8500123	31 January 1986
VAN HEUVEN GOEDHARTLAAN 13D AMSTELVEEN 1181 LE Netherlands				

Particulars of Part I of the Inventory of Hazardous Materials

Part I of the Inventory of Hazardous Materials Identification/Verification Number: 193.23 / WO0210223

Note: In accordance with Article 9(1) of Regulation (EU) No 1257/2013, Part I of the inventory of hazardous materials is annexed to this certificate. Part I of the Inventory of Hazardous Materials should be compiled on the basis of the standard format shown in the guidelines developed by the International Maritime Organization, supplemented, where applicable, by guidelines on aspects specific to Regulation (EU) No 1257/2013, such as substances listed in that Regulation but not in the Hong Kong Convention.

THIS IS TO CERTIFY THAT:

1. the ship has been surveyed in accordance with Article 8 of Regulation (EU) No 1257/2013; and

2. the survey shows that Part I of the Inventory of Hazardous Materials fully complies with the applicable requirements of that Regulation.

Completion date of the survey on which this statement is based: 10 March 2025

This statement is valid until 04 November 2028

Issued at Rio de Janeiro, Brazil *(Place of Issue of Certificate)* on 10 March 2025 *(Date of Issue)*

https://ABSeCert.Eagle.org

Electronically Signed By
Correia, Rafael Machado, Rio de Janeiro Port - Offshore
(Surveyor, American Bureau of Shipping)
(Signature of duly authorized official)
(Seal of stamp of the authority, as appropriate)

ENDORSEMENT TO EXTEND THE CERTIFICATE IF VALID FOR LESS THAN FIVE YEARS WHERE ARTICLE 9(5) APPLIES*

The ship complies with the relevant provisions of regulation (EU) No 1257/2013 on ship recycling, and this certificate shall, in accordance with Article 9(4) of that regulation, be accepted as valid until _____

Signed: _____
(Surveyor, American Bureau of Shipping)
(Signature of duly authorized official)
(*Seal or stamp of the authority, as appropriate*)

Place: _____

Date: _____

ENDORSEMENT WHERE THE RENEWAL SURVEY HAS BEEN COMPLETED AND ARTICLE 9(4) APPLIES*

The ship complies with the relevant provisions of regulation (EU) No 1257/2013 on ship recycling, and this certificate shall, in accordance with Article 9(4) of that regulation, be accepted as valid until: _____

Signed: _____
(Surveyor, American Bureau of Shipping)
(Signature of duly authorized official)
(*Seal or stamp of the authority, as appropriate*)

Place: _____

Date: _____

ENDORSEMENT TO EXTEND THE VALIDITY OF THE CERTIFICATE UNTIL REACHING THE PORT OR ANCHORAGE OF SURVEY FOR A PERIOD OF GRACE WHERE ARTICLE 9(7) OR ARTICLE 9(8) APPLIES*

This certificate shall, in accordance with Article 9(7) or 9(8) * of regulation (EU) No 1257/2013 on ship recycling, be accepted as valid until: _____

Signed: _____
(Surveyor, American Bureau of Shipping)
(Signature of duly authorized official)
(*Seal or stamp of the authority, as appropriate*)

Place: _____

Date: _____

ENDORSEMENT FOR ADDITIONAL SURVEY WHERE ARTICLE 9(2) APPLIES*

At an additional survey in accordance with Article 8(6) regulation (EU) No 1257/2013 on ship recycling, the ship was found to comply with the relevant provisions of that regulation.

Signed: _____
(Surveyor, American Bureau of Shipping)
(Signature of duly authorized official)
(*Seal or stamp of the authority, as appropriate*)

Place: _____

Date: _____

* Delete as appropriate.

Statement No.: 86187847-6872221-579

Statement of Compliance
For
Inventory of Hazardous Materials

(Note: This statement shall be supplemented by Part I of the Inventory of Hazardous Materials)

under the authority of the Government of:

The Commonwealth of the Bahamas

(Name of the State)

by American Bureau of Shipping

Issued under the provisions of the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (hereinafter referred to as "the Convention")

Particulars of Ship

Name of Ship	Distinctive Number or Letters	Port of Registry	Gross Tonnage	IMO Number
FPSO CIDADE DE NITERÓI MV18	9000260 C6WW5	Nassau	144898	8500123

Name and address of shipowner	IMO registered owner identification number	IMO company identification number	Date of Construction
OPPORTUNITY MV18 B.V. VAN HEUVEN GOEDHARTLAAN 13D AMSTELVEEN 1181 LE Netherlands	5768367	8500123	31 January 1986

Particulars of Part I of the Inventory of Hazardous Materials

Identification No. 193.23, location of issue Rotterdam, The Netherlands, date of issue 04 February 2025

Note: Part I of the Inventory of Hazardous Materials, as required by regulation 5 of the Annex to the Convention, is an essential part of the International Certificate on Inventory of Hazardous Materials and must always accompany the International Certificate on Inventory of Hazardous Materials. Part I of the Inventory of Hazardous Materials should be compiled on the basis of the standard format shown in the guidelines developed by the Organization.

THIS IS TO CERTIFY THAT:

1. the ship has been surveyed in accordance with regulation 10 of Annex to the Convention; and
2. the survey shows that Part I of the Inventory of Hazardous Materials fully complies with the applicable requirements of the Convention.

Completion date of the survey on which this statement is based: 10 March 2025

This statement is valid until: 04 November 2028

Issued at Rio de Janeiro, Brazil (*Place of issue of statement*) on 10 March 2025 (*Date of issue*)

https://ABSeCert.Eagle.org

Electronically Signed By
Correia, Rafael Machado, Rio de Janeiro Port - Offshore
(Surveyor, American Bureau of Shipping)
(*Signature of duly authorized official issuing the certificate*)
(*Seal or stamp of the authority, as appropriate*)

ENDORSEMENT TO EXTEND THE CERTIFICATE IF VALID FOR LESS THAN FIVE YEARS WHERE REGULATION 11.6 APPLIES*

The ship complies with the relevant provisions of the Convention, and this certificate shall, in accordance with regulation 11.6 of the Annex to the Convention, be accepted as valid until: _____

Signed: _____
(Surveyor, American Bureau of Shipping)
(Signature of duly authorized official)
(*Seal or stamp of the authority, as appropriate*)

Place: _____

Date: _____

ENDORSEMENT WHERE THE RENEWAL SURVEY HAS BEEN COMPLETED AND REGULATION 11.7 APPLIES*

The ship complies with the relevant provisions of the Convention, and this certificate shall, in accordance with regulation 11.7 of the Annex to the Convention, be accepted as valid until: _____

Signed: _____
(Surveyor, American Bureau of Shipping)
(Signature of duly authorized official)
(*Seal or stamp of the authority, as appropriate*)

Place: _____

Date: _____

ENDORSEMENT TO EXTEND THE VALIDITY OF THE CERTIFICATE UNTIL REACHING THE PORT OF SURVEY OR FOR A PERIOD OF GRACE WHERE REGULATION 11.8 OR 11.9 APPLIES**

This certificate shall, in accordance with regulation 11.8 or 11.9** of the Annex to the Convention, be accepted as valid until: _____

Signed: _____
(Surveyor, American Bureau of Shipping)
(Signature of duly authorized official)
(*Seal or stamp of the authority, as appropriate*)

Place: _____

Date: _____

ENDORSEMENT FOR ADDITIONAL SURVEY*

At an additional survey in accordance with regulation 10 of the Annex to the Convention, the ship was found to comply with the relevant provisions of the Convention.

Signed: _____
(Surveyor, American Bureau of Shipping)
(Signature of duly authorized official)
(*Seal or stamp of the authority, as appropriate*)

Place: _____

Date: _____

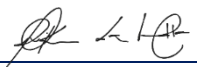
ABS

* This page of the endorsement at survey shall be reproduced and added to the certificate as considered necessary by the Administration.
** Delete as appropriate.

Final Monitoring Report - NORM

FPSO CIDADE DE NITERÓI – MV18

JAB-REL-MOD-CDN-023

Prepared by:	Ériksen Matta	Signature:	
Approved by:	André Duque	Signature:	
Revision:	0	Date:	20/03/2025

Jabarra Serviços de Radioproteção LTDA ME
Avenida Silvio Picanço 463, sala 404 – Charitas, Niterói, Rio de Janeiro
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www.jabarra.com.br

Revision Record

Revision	Date	Description
0	20/03/2025	First Issue

Table of contents

1. Introduction

NORM is the acronym formed by the first letters of the expression "Naturally Occurring Radioactive Material", which translates to Naturally Occurring Radioactive Material, found in certain ores and which can contribute to exposure of individuals to the public. This type of material can be found at certain oil production sites and, in these cases, a specific comprehensive procedure is required to identify, manage, transfer and properly treat these materials.

- Normally, there are no high gamma equivalent dose rates;
- Limited number of nuclides (mainly U and Th disintegration chains);
- Long disintegration chains - long decay times;
- Inhalation and ingestion are the main concerns from a dose point of view.

Radium deposition (^{228}Ra, ^{226}Ra, ^{224}Ra) is special because of the α (alpha) decay of the parent radionuclides (^{228}Th, ^{230}Th, ^{232}Th). By nature, Radium isotopes prefer the aqueous phase, leading to naturally higher concentrations. Therefore, after production, Radium will follow the flow of produced water. As Radium (Ra) is chemically similar to Barium (Ba), Strontium (Sr), Calcium (Ca) and Magnesium (Mg), it becomes incorporated into sulphate or carbonate deposits. Once deposited inside installations or produced on the surface due to their radiation characteristics, all three Radium isotopes behave differently.

However, in a much slower process (about 10 years), ^{228}Th, absent in produced water deposits, grows in (transient equilibrium). With the appearance of ^{228}Th all the NORMs in the chain up to ^{208}Pb can also be found in about two weeks.

- ^{226}Ra initiates a secular equilibrium (within two weeks) of short-lived NORMs (^{222}Rn, ^{218}Po, ^{214}Pb, ^{214}Bi and ^{214}Po) of its own. The growth of ^{210}Pb occurs at a much slower rate (around 100 years).
- ^{224}Ra appears in produced water or its deposits without its immediate parent ^{228}Th, so its concentration does not tend to increase, but instead tends to disappear within two weeks. This means that ^{224}Ra can only be detected in fresh produced water samples. With the reappearance of ^{228}Th, ^{224}Ra will also reappear in older samples.

Radon (Rn) isotopes are special because, being a noble gas element, they prefer the gaseous (natural) phase for transportation from the underground to the surface. As ^{220}Rn only lives for

minutes, by the time this NORM reaches the surface, it will have decayed. ^{222}Rn, with a half-life of around four days, can appear in Liquid Natural Gas (LNG) processing plants, at the top of crude oil storage tanks (associated gas) or in Natural Gas (NG) transmission lines. Ultimately, it will decay to ^{210}Pb, but as ^{222}Rn is short-lived compared to ^{210}Pb, no equilibrium status will be reached.

In gas or oil fields, where stable Pb is present in the produced waters, ^{210}Pb can be incorporated into any deposits formed as well. In this type of deposit, the activity concentrations of ^{210}Pb will be substantially higher than the activity concentrations of ^{226}Ra, indicating that a separate and independent mechanism for Pb transport is present.

The level of NORM accumulation can vary substantially from one installation to another depending on the geological formation and operating conditions and will change over the life of a single well. NORM cannot be readily differentiated from other oilfield materials and residues, except by specialized measurements. The amount of material does not necessarily determine the amount of NORM present or the radiological risk it may pose. To determine whether or not a facility is accumulating NORM, a periodic NORM survey with sampling and subsequent analysis needs to be carried out.

2. Description of the field

The MV18 - CIDADE DE NITERÓI, operated by MODEC, is in operation in the MARLIM LESTE oil field, located in the CAMPOS BAY.

The Marlim Leste field was discovered in January 1987, in water depths of approximately 1,251 meters and approximately 120 km from the coast.

3. Objective

This document presents the results of a comprehensive radiometric survey carried out on board the FPSO CIDADE DE NITERÓI - MV18 operated by MODEC SERVIÇOS DE PETRÓLEO DO BRASIL. The scope of the work included a complete radiometric survey of the oil production and water separation plant, followed by the interpretation of the results.

This radiometric survey was carried out in order to map equipment, drains and lines of interest with NORM indications. In order to achieve this goal, a radiometric survey was carried out at all accessible points by monitoring every meter of the line. The aim of this work is to identify the points where external monitoring is higher than the background radiation value (BG), indicating the presence of NORM inside. In addition, it will help with cleaning activities with a view to decommissioning the unit and classifying areas according to occupational risk.

4. References

NORMA CNEN NN - 3.01

Requisitos Básicos De Radioproteção E Segurança Radiológica De Fontes De Radiação

NORMA CNEN NE - 3.02

Serviços de Radioproteção

NORMA CNEN NN - 8.01

Gerência de Rejeitos Radioativos de Baixos e Médios Níveis de Radiação

Lei Nº 10.308, de 20 de novembro de 2001.

NR-37 *– Segurança e Saúde em Plataformas de Petróleo*

IOGP - Managing Naturally Occurring Radioactive Material (NORM) in the oil and gas industry – **Report 412, de 2016.**

Instituto Brasileiro de Petróleo, Gás e Biocombustíveis: *Diretrizes para gerenciamento de materiais radioativos de ocorrência natural (NORM),* ***Rio de Janeiro, 2019*****.**

Radiological Protection Plan - NORM FPSO CIDADE DE NITERÓI MV18 (Revision 3 of 22/03/2023).

5. Equipment

In order to carry out this radiometric survey for NORM presence, on the oil production units, it was used a Scintillator radiation meter, which is capable of distinguish the different radiations and energy that are emitted from the homogeneous material.

6. Radiometric Survey

In order to establish a monitoring plan for the radiometric survey, there was an extensive analysis of FPSO CIDADE DE NITERÓI – MV18 process plant engineering documents (P&IDs) provided by MODEC. Based on the analysis of the process flowcharts, the areas of interest for NORM research were mapped on the equipment, in accordance with the best national and international monitoring practices in the sector.

6.1. Equipment Checklist

Before carrying out the work, it is necessary to make a checklist of all the devices to be used in the following tasks:

- Radiation meter;
- Test source for admeasuring the radiation meter;
- Forms.

6.2. Radiation meter function test

The function test of the radiation meter consists of the following steps:

1) Check if the radiation meter battery is charged and the calibration certificate is updated.
2) Choose the monitoring mode in terms of reading speed (slow / fast) and select the scale to be used (x0.1; x1.0; x10; x100).
3) Using the test source, “read” it in the standard condition to determine the standard value. This standardization procedure should be performed only once, right after the calibration of the radiation meter. The measurement of the standard condition should be made by touching the radiation meter against the open test source, making 3 (three) measurements and averaging them.
4) Standard condition is the measurement made at a given distance and position from the detector in relation to the test source during the reading time.
5) Standard value is the measure of the exposure rate or equivalent dose rate in the standard condition and should be used as a reference value for comparing the next measurements,
6) Using the test source, perform the reading process in the standard condition;
7) Compare the reading performed with the standard value, if the deviation found is equal to or less than 20% of the standard value, the equipment (radiation meter) is suitable for use. Otherwise, the radiation meter must be sent for maintenance and new calibration, as it is outside the acceptance range;
8) Record the reading as well as the data related to the equipment (radiation meter) on the function/operation test form.

6.3. Radiometric Survey on Equipment

The radiometric survey of the equipment demonstrated in item 6 of this Monitoring Report must follow the general steps described below:

1) Check if the radiation meter battery is charged and the calibration certificate is updated.
2) Choose an appropriate scale, taking into account that the values read correspond to the chosen scale.
3) Perform the Radiation Meter test, using the Cs-137 test source.
4) Check if the deviation between the measured value and the standard value is within the range (± 20%).

5) Perform the background radiation measurement, approximately 2 (two) meters from the equipment. At this stage, it is necessary to ensure that, when measuring the bottom, there is no other radiation source that affects the monitoring result.
6) Take the respective readings along the entire length of the equipment / line, filling out the form provided.
7) Archive the measured readings in standard report format.

7. Results

Below are the results of the highest radiation rate values found on the surface and within 1 meter of each piece of equipment, lines and closed drains, as described in item 3 of this plan. These results will serve as a guide for classifying areas from a radiological protection perspective.

7.1.1. External monitoring of equipment and lines

The following table shows the maximum radiation levels found in each of the equipment / lines, to view the complete pipeline monitoring, refer to the monitoring data on the highlighted P&ID, available in item 7.1.2.

Table 1 - Results of the external monitoring carried out at the production plant

TAG	Equipamento (*Equipment*)	External Monitoring			
		Superfície (Surface) [µSv/h]	*1 metro (1 meter)* [µSv/h]	Background [µSv/h]	Date (dd/mm/yyyy)
8"-PF-G-310103	Inlet	No access	No access	0,05	30/03/2024
8"-PF-A2-311501	Inlet	No access	No access	0,05	30/03/2024
8"-PF-G-310203	Inlet	No access	No access	0,05	30/03/2024
8"-PF-A2-311502	Inlet	No access	No access	0,05	30/03/2024
8"-PF-G-310303	Inlet	No access	No access	0,05	30/03/2024
8"-PF-A2-311503	Inlet	No access	No access	0,05	30/03/2024
8"-PF-G-310403	Inlet	No access	No access	0,05	30/03/2024
8"-PF-A2-311504	Inlet	No access	No access	0,05	30/03/2024
8"-PF-G-310503	Inlet	No access	No access	0,05	30/03/2024
8"-PF-A2-311505	Inlet	No access	No access	0,05	30/03/2024
8"-PF-G-310603	Inlet	No access	No access	0,05	30/03/2024
8"-PF-A2-311506	Inlet	No access	No access	0,05	30/03/2024
8"-PF-G-310703	Inlet	No access	No access	0,05	30/03/2024
8"-PF-A2-311507	Inlet	No access	No access	0,05	30/03/2024
8"-PF-G-310803	Inlet	No access	No access	0,05	30/03/2024
8"-PF-A2-311508	Inlet	No access	No access	0,05	30/03/2024
8"-PF-G-310903	Inlet	No access	No access	0,05	30/03/2024
8"-PF-A2-311509	Inlet	No access	No access	0,05	30/03/2024
8"-PF-G-311003	Inlet	No access	No access	0,05	30/03/2024

TAG	Equipamento (*Equipment*)	External Monitoring			
		Superfície (Surface) [µSv/h]	*1 metro (1 meter)* [µSv/h]	Background [µSv/h]	Date (dd/mm/yyyy)
8"-PF-A2-3115010	Inlet	No access	No access	0,05	30/03/2024
24"-PF-A2-311517	Manifold Topsides Piperack - Inlet	No access	No access	0,05	30/03/2024
24"-PF-A2-312401	Manifold Topsides Piperack - Outlet	No access	No access	0,05	30/03/2024
8"-PF-A2-311518	Manifold Topsides Piperack - Inlet	No access	No access	0,05	30/03/2024
8"-PF-A2-312402	Manifold Topsides Piperack - Outlet	No access	No access	0,05	30/03/2024
4"-DC-A2-311903	Manifold Topsides Piperack - Inlet	No access	No access	0,05	30/03/2024
4"-DC-A2-312405	Manifold Topsides Piperack - Outlet	No access	No access	0,05	30/03/2024
12"-WI-G1-317905	Manifold Topsides Piperack - Inlet	No access	No access	0,05	30/03/2024
12"-WI-G1-312408	Manifold Topsides Piperack - Outlet	No access	No access	0,05	30/03/2024
HBG-1055	Crude Inlet Heater	0,52	0,08	0,05	30/03/2024
24"-PF-A2-312401	Inlet	0,05	0,05	0,05	30/03/2024
24"-PF-A2-313401	Outlet	0,05	0,05	0,05	30/03/2024
24"-PF-A2-313431	Bypass	0,05	0,05	0,05	30/03/2024
MBD-1015	HP Separator	0,15	0,05	0,05	06/01/2025
24"-PF-A2-313401	Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313419	PW Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313420	PW Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313421	PW Inlet	0,05	0,05	0,05	06/01/2025
3"-PW-A2-313422	PW Inlet	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313416	Closed Drain	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313417	Closed Drain	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313418	Closed Drain	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313423	Closed Drain	0,05	0,05	0,05	06/01/2025
2"-DC-A2-313437	Closed Drain	0,05	0,05	0,05	06/01/2025
12"-PL-A2-313406	Outlet	0,05	0,05	0,05	06/01/2025
12"-PL-A2-313446	Outlet	0,05	0,05	0,05	06/01/2025
12"-PL-A2-313407	Outlet	0,05	0,05	0,05	06/01/2025

TAG	Equipamento (*Equipment*)	External Monitoring			
		Superfície (Surface) [µSv/h]	*1 metro (1 meter)* [µSv/h]	Background [µSv/h]	Date (dd/mm/yyyy)
8"-PW-A2-313408	PW outlet	0,05	0,05	0,05	06/01/2025
8"-PW-A2-313409	PW outlet	0,05	0,05	0,05	06/01/2025
HBG-1056	Test Crude Inlet Heater	0,10	0,08	0,05	06/01/2025
8"-PF-A2-312402	Inlet	0,05	0,05	0,05	06/01/2025
12"-PF-A2-313501	Outlet	0,05	0,05	0,05	06/01/2025
8"-PF-A2-313504	Bypass	0,05	0,05	0,05	06/01/2025
MBD-1010	Test Separator	0,67	0,06	0,05	06/01/2025
12"-PF-A2-313501	Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313529	PW Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313524	PW Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313525	PW Inlet	0,05	0,05	0,05	06/01/2025
3"-PW-A2-313531	PW Inlet	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313526	Closed Drain	0,53	0,09	0,05	06/01/2025
4"-DC-A2-313527	Closed Drain	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313528	Closed Drain	0,05	0,05	0,05	06/01/2025
2"-DC-A2-313541	Closed Drain	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313509	Closed Drain	0,05	0,05	0,05	06/01/2025
1"-DC-A2-313550	Closed Drain	0,05	0,05	0,05	06/01/2025
8"-PL-A2-313516	Outlet	0,05	0,05	0,05	06/01/2025
8"-PL-A2-313514	Outlet	0,05	0,05	0,05	06/01/2025
4"-PL-A2-313519	Outlet	0,05	0,05	0,05	06/01/2025
8"-PL-A2-313547	Outlet	0,05	0,05	0,05	06/01/2025
8"-PL-A2-313515	Outlet	0,05	0,05	0,05	06/01/2025
8"-PL-A2-313510	Outlet	0,05	0,05	0,05	06/01/2025
8"-PL-A2-313511	Inlet	0,05	0,05	0,05	06/01/2025
6"-PW-A2-313512	PW outlet	0,05	0,05	0,05	06/01/2025
6"-PW-A2-313513	PW outlet	0,05	0,05	0,05	06/01/2025
8"-PW-A2-313532	PW Outlet	0,05	0,05	0,05	06/01/2025
PBA-1050	Test Crude Booster Pump	0,05	0,05	0,05	06/01/2025
8"-PL-A2-313516	Inlet	0,05	0,05	0,05	06/01/2025
8"-PL-A2-313517	Outlet	0,05	0,05	0,05	06/01/2025
1"-DC-A2-313549	Closed Drain	0,05	0,05	0,05	06/01/2025
HZZ-1110A	Crude/Crude Exchanger	0,05	0,05	0,05	30/03/2024

TAG	Equipamento (*Equipment*)	External Monitoring			
		Superfície (Surface) [µSv/h]	*1 metro (1 meter)* [µSv/h]	Background [µSv/h]	Date (dd/mm/yyyy)
12"-PL-A2-313407	Inlet	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313807	Inlet	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313608	Outlet	0,05	0,05	0,05	30/03/2024
14"-PL-A2-313601	Outlet	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313604	Bypass	0,05	0,05	0,05	30/03/2024
HZZ-1110B	Crude/Crude Exchanger	0,05	0,05	0,05	30/03/2024
8"-PL-A2-313630	Inlet	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313807	Inlet	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313608	Outlet	0,05	0,05	0,05	30/03/2024
10"-PL-A2-313629	Outlet	0,05	0,05	0,05	30/03/2024
HZZ-1135	Sales oil cooler	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313637	Inlet	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313608	Inlet	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313609	Outlet	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313631	Outlet	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313610	Outlet	0,05	0,05	0,05	30/03/2024
12"-PL-A2-313619	Bypass	0,05	0,05	0,05	30/03/2024
HZZ-1115	Crude Heater	0,05	0,05	0,05	30/03/2024
14"-PL-A2-313601	Inlet	0,05	0,05	0,05	30/03/2024
16"-PL-A2-313605	Outlet	0,05	0,05	0,05	30/03/2024
14"-PL-A2-313606	Bypass	0,05	0,05	0,05	30/03/2024
2"-DC-A2-313616	Closed Drain	No access	No access	0,05	30/03/2024
MBD-1125	LP Separator	0,07	0,05	0,05	06/01/2025
16"-PL-A2-313728	Inlet	0,05	0,05	0,05	06/01/2025
6"-PL-A2-313731	Inlet	0,05	0,05	0,05	06/01/2025
6"-PL-A2-313709	Inlet	No access	No access	0,05	06/01/2025
2"-PW-A2-313714	PW Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313716	PW Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313717	PW Inlet	0,05	0,05	0,05	06/01/2025
3"-PW-A2-313729	PW Inlet	0,05	0,05	0,05	06/01/2025

TAG	Equipamento (*Equipment*)	External Monitoring			
		Superfície (Surface) [µSv/h]	*1 metro (1 meter)* [µSv/h]	Background [µSv/h]	Date (dd/mm/yyyy)
16"-PL-A2-313703	Outlet	0,05	0,05	0,05	06/01/2025
6"-PW-A2-313720	PW Outlet	0,05	0,05	0,05	06/01/2025
6"-PW-A2-313721	PW Outlet	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313718	Closed Drain	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313715	Closed Drain	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313719	Closed Drain	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313722	Closed Drain	0,05	0,05	0,05	06/01/2025
2"-DC-A2-313736	Closed Drain	0,05	0,05	0,05	06/01/2025
6"-DC-A2-313730	Closed Drain	No access	No access	0,05	06/01/2025
PBA-1145A	Crude Booster Pump	0,05	0,05	0,05	06/01/2025
16"-PL-A2-313703	Inlet	0,05	0,05	0,05	06/01/2025
12"-PL-A2-313705	Outlet	0,05	0,05	0,05	06/01/2025
PBA-1145B	Crude Booster Pump	0,05	0,05	0,05	06/01/2025
16"-PL-A2-313704	Inlet	0,05	0,05	0,05	06/01/2025
12"-PL-A2-313706	Outlet	0,05	0,05	0,05	06/01/2025
12"-PL-A2-313707	Outlet	0,05	0,05	0,05	06/01/2025
12"-PL-A2-313708	Outlet	0,05	0,05	0,05	06/01/2025
MAD-1140	Eletrostatic Treater	0,05	0,05	0,05	06/01/2025
12"-PL-A2-313708	Inlet	0,05	0,05	0,05	06/01/2025
12"-PL-A2-313828	Bypass	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313820	PW Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313821	PW Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313822	PW Inlet	0,05	0,05	0,05	06/01/2025
2"-PW-A2-313819	PW Inlet	0,05	0,05	0,05	06/01/2025
12"-PL-A2-313807	Outlet	0,05	0,05	0,05	06/01/2025
2"-PL-A2-313809	Outlet	0,05	0,05	0,05	06/01/2025
4"-PW-A2-313801	Outlet	0,05	0,05	0,05	06/01/2025
4"-PW-A2-313814	Outlet	0,05	0,05	0,05	06/01/2025

TAG	Equipamento (*Equipment*)	External Monitoring			
		Superfície (Surface) [µSv/h]	*1 metro (1 meter)* [µSv/h]	Background [µSv/h]	Date (dd/mm/yyyy)
6"-PW-A2-313721	Outlet	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313804	Closed Drain	0,07	0,05	0,05	06/01/2025
2"-DC-A2-313826	Closed Drain	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313805	Closed Drain	0,05	0,05	0,05	06/01/2025
4"-DC-A2-313806	Closed Drain	0,05	0,05	0,05	06/01/2025
2"-DC-A2-313825	Closed Drain	0,05	0,05	0,05	06/01/2025
6"-DC-A2-313815	Closed Drain	0,05	0,05	0,05	06/01/2025
MBM-3610	Water Collection / Skim Vessel	0,05	0,05	0,05	18/03/2025
10"-PW-A2-316208	PW Inlet	0,05	0,05	0,05	18/03/2025
8"-PW-A2-313532	PW Inlet	0,05	0,05	0,05	18/03/2025
6"-PW-A2-313721	PW Inlet	0,05	0,05	0,05	18/03/2025
6"-PW-A2-316309	PW Inlet	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316205	Bypass	0,05	0,05	0,05	18/03/2025
10"-PW-A2-316202	PW Outlet	0,05	0,05	0,05	18/03/2025
2"-DC-A2-316215	Closed Drain	0,05	0,05	0,05	18/03/2025
2"-DC-A2-316206	Closed Drain	0,05	0,05	0,05	18/03/2025
2"-DC-A2-316219	Closed Drain	0,05	0,05	0,05	18/03/2025
2"-DC-A2-316220	Closed Drain	0,05	0,05	0,05	18/03/2025
3"-PW-A2-316217	PW Inlet	0,05	0,05	0,05	18/03/2025
PBA-3615A	Skim Vessel Pumps	0,05	0,05	0,05	18/03/2025
10"-PW-A2-316202	PW Inlet	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316204	PW Outlet	0,05	0,05	0,05	18/03/2025
3"-PW-A2-316213	PW Outlet	0,05	0,05	0,05	18/03/2025
PBA-3615B	Skim Vessel Pumps	0,05	0,05	0,05	18/03/2025
10"-PW-A2-316207	PW Inlet	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316203	PW Outlet	0,05	0,05	0,05	18/03/2025
3"-PW-A2-316213	PW Outlet	0,05	0,05	0,05	18/03/2025
ZBM-3620	Hydrocyclone	0,05	0,05	0,05	18/03/2025

TAG	Equipamento (*Equipment*)	External Monitoring			
		Superfície (Surface) [µSv/h]	*1 metro (1 meter)* [µSv/h]	Background [µSv/h]	Date (dd/mm/yyyy)
8"-PW-A2-316204	PW Inlet	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316301	PW Outlet	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316302	PW Outlet	0,05	0,05	0,05	18/03/2025
2"-PL-A2-316303	Outlet	0,05	0,05	0,05	18/03/2025
2"-PL-A2-316312	Outlet	0,05	0,05	0,05	18/03/2025
6"-PW-A2-316309	PW Outlet	0,05	0,05	0,05	18/03/2025
6"-PW-A2-316310	PW Outlet	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316304	Bypass	0,05	0,05	0,05	18/03/2025
2"-PW-A2-316311	Bypass	0,05	0,05	0,05	18/03/2025
2"-DC-A2-316308	Closed Drain	0,05	0,05	0,05	18/03/2025
2"-PW-A2-316306	PW Outlet	0,05	0,05	0,05	18/03/2025
2"-DC-A2-316307	Closed Drain	0,05	0,05	0,05	18/03/2025
2"-DC-A2-316305	Closed Drain	0,05	0,05	0,05	18/03/2025
MBM-3630	Flotation Cell	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316302	PW Inlet	0,05	0,05	0,05	18/03/2025
4"-PW-A2-316408	PW Inlet	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316401	PW Outlet	0,05	0,05	0,05	18/03/2025
4"-PW-A2-316403	PW Outlet	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316414	Bypass	0,05	0,05	0,05	18/03/2025
2"-DC-A2-316418	Closed Drain	No access	No access	0,05	18/03/2025
2"-DC-A2-316406	Closed Drain	No access	No access	0,05	18/03/2025
2"-DC-A2-316417	Closed Drain	0,05	0,05	0,05	18/03/2025
2"-DC-A2-316414	Closed Drain	0,05	0,05	0,05	18/03/2025
HZZ-3640	PW Cooler	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316401	PW Inlet	0,05	0,05	0,05	18/03/2025
10"-PW-A2-316402	PW Outlet	0,05	0,05	0,05	18/03/2025
8"-PW-A2-316420	Bypass	0,05	0,05	0,05	18/03/2025
10"-PW-A2-316416	PW Outlet	0,05	0,05	0,05	18/03/2025
PBE-3635A	Flotation Cell Pump	0,05	0,05	0,05	18/03/2025

TAG	Equipamento (*Equipment*)	External Monitoring			
		Superfície (Surface) [µSv/h]	*1 metro (1 meter)* [µSv/h]	Background [µSv/h]	Date (dd/mm/yyyy)
4"-PW-A2-316405	PW Inlet	0,05	0,05	0,05	18/03/2025
4"-PW-A2-316408	PW Outlet	0,05	0,05	0,05	18/03/2025
PBE-3635B	Flotation Cell Pump	0,05	0,05	0,05	18/03/2025
4"-PW-A2-316404	PW Inlet	0,05	0,05	0,05	18/03/2025
4"-PW-A2-316407	PW Outlet	0,05	0,05	0,05	18/03/2025
ABJ-3410	Closed Drain Sump Tank	0,47	0,05	0,05	30/03/2024
6"-DC-A2-319002	Inlet	0,05	0,05	0,05	30/03/2024
3"-PW-A2-319112	Inlet	0,05	0,05	0,05	30/03/2024
3"-PL-A2-319102	Outlet	0,05	0,05	0,05	30/03/2024
PBA-3415A	Closed Drain Sump Pump	0,05	0,05	0,05	30/03/2024
3"-PL-A2-319115	Inlet	0,05	0,05	0,05	30/03/2024
3"-PL-A2-319104	Outlet	0,05	0,05	0,05	30/03/2024
3"-PL-A2-319110	Outlet	No access	No access	0,05	30/03/2024
3"-PL-A2-319111	Outlet	No access	No access	0,05	30/03/2024
2"-PL-A2-319107	Bypass	0,05	0,05	0,05	30/03/2024
1"-PL-A2-319106	Bypass	0,05	0,05	0,05	30/03/2024
PBA-3415B	Closed Drain Sump Pump	0,05	0,05	0,05	30/03/2024
3"-PL-A2-319103	Inlet	0,05	0,05	0,05	30/03/2024
3"-PL-A2-319105	Outlet	0,05	0,05	0,05	30/03/2024
3"-PL-A2-319110	Outlet	No access	No access	0,05	30/03/2024
3"-PL-A2-319111	Outlet	No access	No access	0,05	30/03/2024
2"-PL-A2-319109	Bypass	0,05	0,05	0,05	30/03/2024
1"-PL-A2-319108	Bypass	0,05	0,05	0,05	30/03/2024
ZAQ-1222	Pig Receiver-Production Lines	0,05	0,05	0,05	30/03/2024
8"-PF-G-311101	Inlet	0,05	0,05	0,05	30/03/2024
6"-PF-G-311102*	Outlet	0,55	0,05	0,05	30/03/2024
2"-DC-A2-311104	Closed Drain	0,05	0,05	0,05	30/03/2024
ZAQ-1223	Pig Receiver-Production Lines	0,05	0,05	0,05	30/03/2024
8"-PF-G-311201	Inlet	0,05	0,05	0,05	30/03/2024
6"-PF-G-311202	Outlet	0,05	0,05	0,05	30/03/2024
2"-DC-A2-311204	Closed Drain	0,05	0,05	0,05	30/03/2024
200-PL-A-1000077	C.O Stripping / Off-Spec Water Reprocessing	0,05	0,05	0,05	30/03/2024
800-PL-A-1000060	NO:1 C.O Offloading	0,05	0,05	0,05	30/03/2024
800-PL-A-1000061	NO:2 C.O Offloading	0,05	0,05	0,05	30/03/2024
200-PL-A-1000090	-	0,05	0,05	0,05	30/03/2024
200-PL-A-1000131	-	No access	No access	0,05	30/03/2024
200-PL-A-1000108	-	0,05	0,05	0,05	30/03/2024

TAG	Equipamento (*Equipment*)	External Monitoring			
		Superfície (Surface) [µSv/h]	*1 metro (1 meter)* [µSv/h]	Background [µSv/h]	Date (dd/mm/yyyy)
500-PL-A-1000 105	-	No access	No access	0,05	30/03/2024
200-PL-A-1000 111	-	No access	No access	0,05	30/03/2024
100-PL-A-1000 139	-	No access	No access	0,05	30/03/2024
750-PL-A-1000 140	-	0,05	0,05	0,05	30/03/2024
500-PL-A-1000 123	-	0,05	0,05	0,05	30/03/2024
500-PL-A-1000 135	-	No access	No access	0,05	30/03/2024
100-PL-A-1000 136	-	No access	No access	0,05	30/03/2024
200-PL-A-1000 109	-	0,05	0,05	0,05	30/03/2024
750-PL-A-1000 093	-	0,05	0,05	0,05	30/03/2024

* **The 6"-PF-G-311102 line, belonging to the Pig Receiver-Production Lines equipment, registered a measurement of 0.55 µSv/h in a specific section located away from the equipment itself. For a better understanding of the specific point, please refer to the highlighted P&ID attached to this document.**

7.1.2 Meter-by-Meter Monitoring - P&IDs

In addition to direct monitoring of the inlets, outlets, and drains of the equipment of interest, a comprehensive inspection was also conducted on the pipelines carrying oil and/or produced water. For this purpose, P&ID drawings were used to identify the pipelines. Each of these pipelines of interest was monitored meter by meter, and the highest radiation levels recorded were highlighted on the respective P&ID drawings, enabling a clear and straightforward reading of the maximum external radiation levels found in each pipeline of interest. Attached below are the marked P&ID drawings:

Highlighted P&ID - MODEC MV18

7.2. Internal Monitoring of equipment

The following table shows the maximum level of radiation found inside these equipment:

Table 2 - Results of internal monitoring

TAG	Equipamento (*Equipment*)	Internal Monitoring		
		Superfície (Surface) [µSv/h]	Background [µSv/h]	Date (dd/mm/yyyy)
COT 2C	2C Tank	0,05	0,05	11/01/2025
SLOP P	SLOP P Tank	0,11	0,05	09/01/2025
COT 5C	5C Tank	0,05	0,05	01/11/2024
COT 1C	1C Tank	0,05	0,05	04/11/2024
COT 3S	3S Tank	0,05	0,05	30/10/2024
COT 3C	3C Tank	0,05	0,05	07/09/2024
COT 5C	5C Tank	0,05	0,05	20/02/2024
COT 4C	4C Tank	0,05	0,05	07/12/2023
COT 3P	3P Tank	0,05	0,05	23/08/2023
COT 1P	1P Tank	0,05	0,05	23/08/2023
COT 1S	1S Tank	0,05	0,05	20/08/2023
MBM-3630	Floatation Cell	0,05	0,05	18/03/2025
MBM-3610	Skim Vessel	0,05	0,05	18/03/2025
MAD - 1140	Electrostatic Treater	0,05	0,05	06/01/2025
MBD - 1015	HP Separator	0,46	0,05	06/01/2025
MBD - 1125	LP Separator	0,18	0,05	06/01/2025
MBD - 1010	Test Separator	0,53	0,05	06/01/2025

7.3. Radionuclide Analysis

Several samples were collected from the equipment of interest for analysis purposes. These samples were sent to a laboratory accredited by the National Nuclear Energy Commission (CNEN), specialized in radionuclide analysis. The results obtained are compiled in the table below, providing a consolidated overview of the data. For additional details and an in-depth analysis, the complete report is attached to this document:

Table 3 - Results of radionuclide analysis

Collection origin	Sample identification	Result
COT 1P	JAB-MOD-MV18-001	**Exempt Waste**
COT 3P	JAB-MOD-MV18-002	**Exempt Waste**
Test Saparator MBD-1010	JAB-MOD-MV18-003	**NORM**
	JAB-MOD-MV18-004	
	JAB-MOD-MV18-005	
	JAB-MOD-MV18-006	
COT 5C	JAB-MOD-MV18-007	**Exempt Waste**
	JAB-MOD-MV18-008	
	JAB-MOD-MV18-009	
	JAB-MOD-MV18-010	
	JAB-MOD-MV18-011	
	JAB-MOD-MV18-012	
COT 4C	JAB-MOD-MV18-013	**Exempt Waste**
	JAB-MOD-MV18-014	
	JAB-MOD-MV18-015	
	JAB-MOD-MV18-016	
COT 3S	JAB-MOD-MV18-017	**Exempt Waste**
	JAB-MOD-MV18-018	
	JAB-MOD-MV18-019	
	JAB-MOD-MV18-020	
	JAB-MOD-MV18-021	
COT 3C	JAB-MOD-MV18-022	**Exempt Waste**
	JAB-MOD-MV18-023	
	JAB-MOD-MV18-024	
	JAB-MOD-MV18-025	
	JAB-MOD-MV18-026	
COT 2C	JAB-MOD-MV18-027	**Exempt Waste**
	JAB-MOD-MV18-028	
	JAB-MOD-MV18-029	
	JAB-MOD-MV18-030	
	JAB-MOD-MV18-031	
	JAB-MOD-MV18-032	
	JAB-MOD-MV18-033	
	JAB-MOD-MV18-034	
SLOP P	JAB-MOD-MV18-035	**Exempt Waste**
	JAB-MOD-MV18-036	
	JAB-MOD-MV18-037	

Collection origin	Sample identification	Result
	JAB-MOD-MV18-038	
	JAB-MOD-MV18-039	
	JAB-MOD-MV18-040	
	JAB-MOD-MV18-041	
	JAB-MOD-MV18-042	
COT 1C	JAB-MOD-MV18-043	**Exempt Waste**
	JAB-MOD-MV18-044	
	JAB-MOD-MV18-045	
	JAB-MOD-MV18-046	
	JAB-MOD-MV18-047	
	JAB-MOD-MV18-048	
	JAB-MOD-MV18-049	
COT 3S	JAB-MOD-MV18-050	**Exempt Waste**
	JAB-MOD-MV18-051	
	JAB-MOD-MV18-052	
	JAB-MOD-MV18-053	
	JAB-MOD-MV18-054	
	JAB-MOD-MV18-055	
	JAB-MOD-MV18-056	
	JAB-MOD-MV18-057	
Electrotastic Treater MAD-1140	JAB-MOD-MV18-058	**Exempt Waste**
	JAB-MOD-MV18-059	
	JAB-MOD-MV18-060	
Test Separator MBD-1010	JAB-MOD-MV18-061	**NORM**
LP Separator	JAB-MOD-MV18-062	**Exempt Waste**
HP Separator	JAB-MOD-MV18-063	**NORM**
Floatation Cell	JAB-MOD-MV18-064	**NORM**
Skim Vessel	JAB-MOD-MV18-065	**Exempt Waste**

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7.4. Classification of areas and indication of NORM

According to the unit's radiological protection plan, the equivalent dose rate parameters for classifying areas are as follows:

- Controlled area: Equivalent Dose Rate at 1 meter from the equipment/vessel is greater than 3.0 µSv/h.
- Supervised area: Equivalent Dose Rate at 1 meter from the equipment/vessel is greater than 0.5 µSv/h and equal to or less than 3.0 µSv/h.
- Free area: Equivalent Dose Rate at 1 meter from the equipment/vessel is equal to or less than 0.5 µSv/h.

In addition, the measurement parameter above the background radiation value (BG) is used to define NORM in the equipment, in other words, if the equipment or one of its lines has equivalent dose rate values above BG, there is evidence of NORM in it.

Based on these parameters and the measurements described in the previous section, the table below shows the area classifications.

Table 2 - Classification of areas

TAG	*Equipamento* (Equipment)	*Classificação de área* (Area classification)	*Indicativo de NORM* (NORM indication)
8"-PF-G-310103	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-311501	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-G-310203	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-311502	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-G-310303	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-311503	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-G-310403	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-311504	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)

TAG	*Equipamento* (Equipment)	*Classificação de área* (Area classification)	*Indicativo de NORM* (NORM indication)
8"-PF-G-310503	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-311505	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-G-310603	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-311506	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-G-310703	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-311507	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-G-310803	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-311508	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-G-310903	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-311509	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-G-311003	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-3115010	Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
24"-PF-A2-311517	Manifold Topsides Piperack - Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
24"-PF-A2-312401	Manifold Topsides Piperack - Outlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-311518	Manifold Topsides Piperack - Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
8"-PF-A2-312402	Manifold Topsides Piperack - Outlet	Sem acesso (*No access*)	Sem acesso (*No access*)
4"-DC-A2-311903	Manifold Topsides Piperack - Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
4"-DC-A2-312405	Manifold Topsides Piperack - Outlet	Sem acesso (*No access*)	Sem acesso (*No access*)
12"-WI-G1-317905	Manifold Topsides Piperack - Inlet	Sem acesso (*No access*)	Sem acesso (*No access*)
12"-WI-G1-312408	Manifold Topsides Piperack - Outlet	Sem acesso (*No access*)	Sem acesso (*No access*)

TAG	*Equipamento* (Equipment)	*Classificação de área* (Area classification)	*Indicativo de NORM* (NORM indication)
HBG-1055	Crude Inlet Heater	Área Livre *(Free Area)*	Indicativo de NORM (NORM indication)
MBD-1015	HP Separator	Área Livre *(Free Area)*	Indicativo de NORM (NORM indication)
HBG-1056	Test Crude Inlet Heater	Área Livre *(Free Area)*	Indicativo de NORM (NORM indication)
MBD-1010	Test Separator	Área Livre *(Free Area)*	Indicativo de NORM (NORM indication)
PBA-1050	Test Crude Booster Pump	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
HZZ-1110A	Crude/Crude Exchanger	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
HZZ-1110B	Crude/Crude Exchanger	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
HZZ-1135	Sales oil cooler	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
HZZ-1115	Crude Heater	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
MBD-1125	LP Separator	Área Livre *(Free Area)*	Indicativo de NORM (NORM indication)
PBA-1145A	Crude Booster Pump	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
PBA-1145B	Crude Booster Pump	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
MAD-1140	Eletrostatic Treater	Área Livre *(Free Area)*	Indicativo de NORM (NORM indication)
MBM-3610	Water Collection / Skim Vessel	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
PBA-3615A	Skim Vessel Pumps	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
PBA-3615B	Skim Vessel Pumps	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
ZBM-3620	Hydrocyclone	Área Livre *(Free Area)*	Indicativo de NORM (NORM indication)

TAG	*Equipamento* (Equipment)	*Classificação de área* (Area classification)	*Indicativo de NORM* (NORM indication)
MBM-3630	Flotation Cell	Área Livre *(Free Area)*	Indicativo de NORM (NORM indication)
HZZ-3640	PW Cooler	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
PBE-3635A	Flotation Cell Pump	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
PBE-3635B	Flotation Cell Pump	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
ABJ-3410	Closed Drain Sump Tank	Área Livre *(Free Area)*	Indicativo de NORM (NORM indication)
PBA-3415A	Closed Drain Sump Pump	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
PBA-3415B	Closed Drain Sump Pump	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
ZAQ-1222	Pig Receiver-Production Lines	Área Livre *(Free Area)*	Indicativo de NORM (NORM indication)
ZAQ-1223	Pig Receiver-Production Lines	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
200-PL-A-1000 077	C.O Stripping / Off-Spec Water Reprocessing	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
800-PL-A-1000 060	NO:1 C.O Offloading	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
800-PL-A-1000 061	NO:2 C.O Offloading	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
200-PL-A-1000 090	-	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
200-PL-A-1000 131	-	Sem acesso (*No access*)	Sem acesso (*No access*)
200-PL-A-1000 108	-	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
500-PL-A-1000 105	-	Sem acesso (*No access*)	Sem acesso (*No access*)

TAG	*Equipamento* (Equipment)	*Classificação de área* (Area classification)	*Indicativo de NORM* (NORM indication)
200-PL-A-1000 111	-	Sem acesso (*No access*)	Sem acesso (*No access*)
100-PL-A-1000 139	-	Sem acesso (*No access*)	Sem acesso (*No access*)
750-PL-A-1000 140	-	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
500-PL-A-1000 123	-	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
500-PL-A-1000 135	-	Sem acesso (*No access*)	Sem acesso (*No access*)
100-PL-A-1000 136	-	Sem acesso (*No access*)	Sem acesso (*No access*)
200-PL-A-1000 109	-	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)
750-PL-A-1000 093	-	Área Livre *(Free Area)*	Sem indicativo de NORM (*No NORM indication*)

8. Conclusion

In 2007, the International Commission on Radiological Protection (ICRP) recommended a public dose (risk) limit of 1 mSv/y additional to the natural background dose (~2.4 mSv/year). Ordinary gas and oil industry workers are treated as a member of the public with a limited exposure time (2,000 h/year). These recommendations have been implemented in the International Atomic Energy Agency (IAEA) Basic Safety Standards (BSS).

Considering that the Radiometric Survey is the first step in confirming the presence of NORM for this specific scope of work, any results greater than the background radiation should indicate that the respective equipment is a focus point for future investigations into the presence of NORM.

Based on the analysis of the results presented in item 7 of this report, it was found that the equipment listed in the table below recorded radiation levels higher than background radiation values, indicating the presence of naturally occurring radioactive materials (NORM) within these pieces of equipment:

TAG	Equipamento (*Equipment*)
HBG-1055	Crude Inlet Heater
MBD-1015	HP Separator
HBG-1056	Test Crude Inlet Heater
MBD-1010	Test Separator
MBD-1125	LP Separator
ZAQ-1222	Pig Receiver-Production Lines
ABJ-3410	Closed Drain Sump Tank
SLOP P TANK	Slop P Tank

The FPSO Cidade de Niterói - MV-18 recorded no measurements exceeding the limit of 0.50µSv/h at a distance of 1 (one) meter from the specified points (excluding background radiation). Consequently, all operational areas were classified as **Free Area.**