

## ***ANEXO IV - APRESENTAÇÃO INGLÊS***



Environmental Education for Workers - Drilling Activities BM-PAMA-8 Block



# Environmental Education Project for Workers

Maritime Drilling Activities  
In BM-PAMA-8 Block,  
Pará - Maranhão Basin

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## Module I



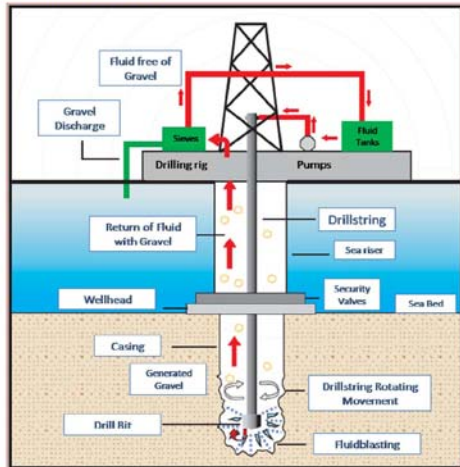
Environment and the Activity



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Drilling Activities – BM-PAMA-8

Drilling activities will take place in the Pará-Maranhão Basin in the BM-PAMA-8 block.



This block is located 186 kilometers from the Brazilian coast, where two wells (1-PAS-28 and 1-PAS-29) will be drilled.

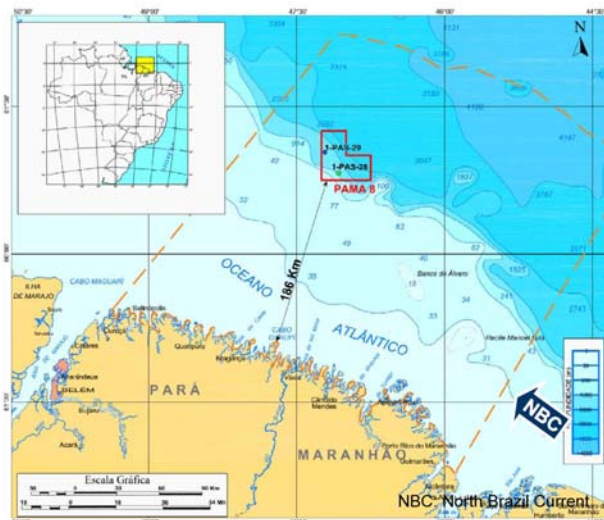
The rig that will perform these drilling activities is the NS-21, shown above.



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Environmental Diagnosis – Physical Surroundings

- ▶ Predominance of the North Brazil Current (NBC) – flowing SE – NW to a depth of 700m (1.4 – 0.5m/s);
- ▶ Mean surface temperature 27°C;
- ▶ Minor temperature variations to a depth of 100m;
- ▶ Twice daily tides (2 low tides and 2 high tides) – 2m variation;



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### Environmental Diagnosis – Local Biota

Examples of wildlife species found in the Pará - Maranhão Basin:



Humpback Whale



Common Dolphinfish



Green Turtle



Albatross



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## Module II



### Legislation – Aspects, Impacts and Mitigatory Measures





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## 1988 Brazilian Constitution

In its Article 225 states that the environment is everybody's right, as your preservation is everyone responsibilities.

Right of All:



Is everyone responsibility to prevent this from happening:

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## Environmental Crimes Act

(Law N° 9,605/1998)

Establishes punishments (fees from R\$ 50,00 to R\$ 50 millions and prison from 06 months to 05 years) for those who cause pollution that results in environmental damage, develop mineral research without license, etc.



## National Environment Policy

(Law N° 6,938/1981)

Presents the concept of sustainable development and creates important environmental management instruments such as the Environmental Licensing, Environmental Education, etc.



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Environmental Licensing – Environmental Projects

**Environmental Monitoring Project - PMA**

Designed to monitor and record marine life in the project implementation area (around the drill rig), and acquire data on rare and important species, such as whales, dolphins and turtles.

Another goal of the project is monitoring, registering and communicating with fishing vessels sailing close to the rig.



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Environmental Licensing – Environmental Projects

**Community Communications Project - PCS**

Designed to keep the population informed in the Area of Influence of the enterprise and other groups of interest on the progress of the project, its focus, duration etc.



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Environmental Licensing – Environmental Projects

**Environmental Education for Workers – PEAT**

Designed to provide basic information on Brazilian environmental law for workers engaged in drilling activities, together with concepts related to energy conservation, wastes management and local characteristics, enhancing awareness among them and strengthening links between people and the environment.



**Pollution Control Project – PCP**

This Project is presented in detail in the next module.



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Impacts of Drilling Activities

Some examples of the impacts caused by drilling activities are presented below, together with the projects intended to avoid and or minimize them.

Aspect	Impact	Local	Mitigatory Measure
Outflow of gravel and drilling fluid	Affects water quality	Sea bed	Pollution Control and Environmental Monitoring Project
Use Restriction Area (security zone)	Interferes with fishing craft activities	500 meters around the drilling rig	Social Communication Project
Accidental Oil leak in the sea	Alters the water quality and affects animal communities, etc.	Places that can be reached by the oil spill	Individual Emergency Plan

**Practical Activities – Photo Dynamics**

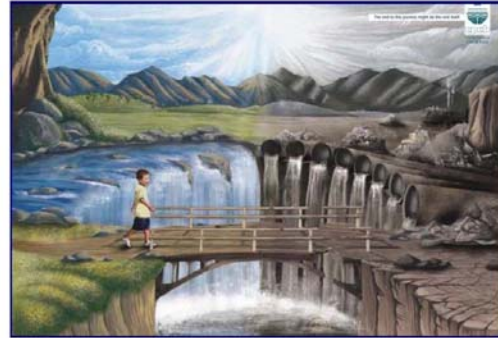




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# Module III



## Waste Management



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## Wastes Management

**Definition:** Sustainable process for reducing impacts on the environment caused by all types of materials discarded by industries and trade. This management is designed to avoid excessive use of environmental resources, in addition to causing less damage, achieved through processes such as recycling.



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**MARPOL & the Pollution Control Project - PCP**

The disposal and management of solid wastes resulting from Oil and Natural Gas E&P activities must comply with MARPOL 73 / 78, as well as Technical Note N° 08/2008 issued by IBAMA, which establishes the Pollution Control Project.

**Pollution Control Project (PCP) – Goals of the PCP :**

- To generate the smallest possible amount of solid and liquid wastes and atmospheric emissions;
- To recycle as much solid wastes as possible;
- To forward the solid wastes for final disposal correctly and in compliance with the law;
- To use processes minimizing pollution caused by atmospheric emissions as well as liquid and solid wastes that can be disposed of at sea.



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**Solid Wastes – Selective Collection**

(CONAMA Resolution N° 275/2001)



**Purpose:** To separate garbage for shipping to specialized enterprises that will recycle it or forward it for reuse. Anything that cannot be recycled or reused will be shipped for final disposal (sanitary landfills, incineration, etc.).



In order to ensure that this scheme runs smoothly, the entire crew must dispose of garbage correctly, as once it is placed in the wrong bin, the garbage is contaminated and can no longer be forwarded for recycling.



**Colour Coding – Solid Wastes**



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**Solid Wastes – Selective Collection**



Contaminated materials with sharp points or cutting edges must be placed in specific packs (e.g.: descarpak boxes, such as that shown on the left).

Fluorescent light bulbs must be disposed of in boxes (such as those in which they are shipped) which must ensure safety for anyone handling them, with no risk of contaminating the environment.



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**Solid Wastes**

- When offloading or on arrival at a temporary warehousing facility, the solid wastes must be weighed;
- Companies that collect garbage for final disposal must hold environmental licenses.



▪ Provided that they are ground to a size of no more than 25 mm, food scraps may be discarded from 12 nautical miles off the coast for offshore E&P rigs.





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## Liquid Wastes – Oily Waters

- May be discharged into the sea provided that the oil / grease percentage in the water does not exceed 15 ppm. The discharged volumes must be measured.



Sewage Treatment Unit

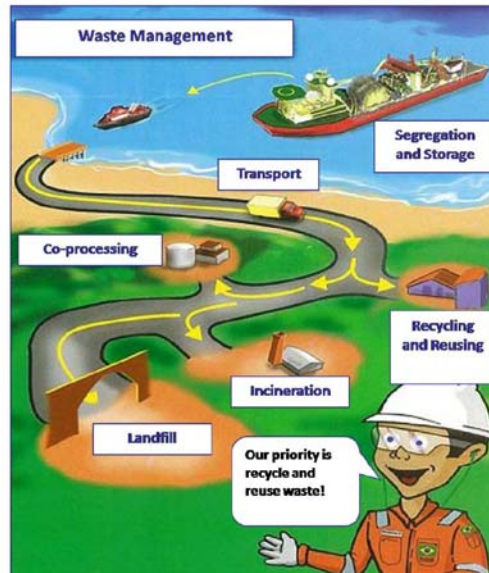
- May not be discharged less than 4 nautical miles off the coast;
- Offshore facilities such as rigs may discharge treated sewage more than 4 nautical miles offshore;
- Sludges must be forwarded for final disposal onshore.



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## Final Disposal

Solid wastes shipped to the mainland are offloaded and sent to specialized enterprises that will handle their final disposal properly.





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VIDEO - DISCUSSIONS

THE STORY OF  
**STUFF**  
WITH ANNIE LEONARD  
PLAY



An Ocean of Plastic



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Module IV



Leak Containment and Oil Spill  
Control Procedures



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### Emergency Plan

Document (demanded by CONAMA nº 398/08) which defines responsibilities, as well as the organization to comply with the oil emergencies.

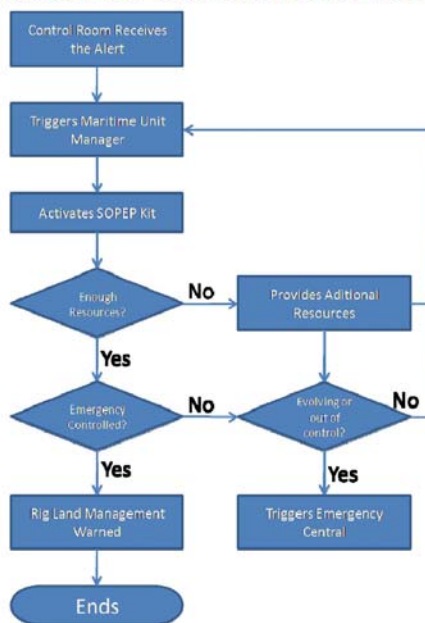


The A.H. Portofino will remain in stand-by to attend any oil spill emergency from NS-21 drilling rig.



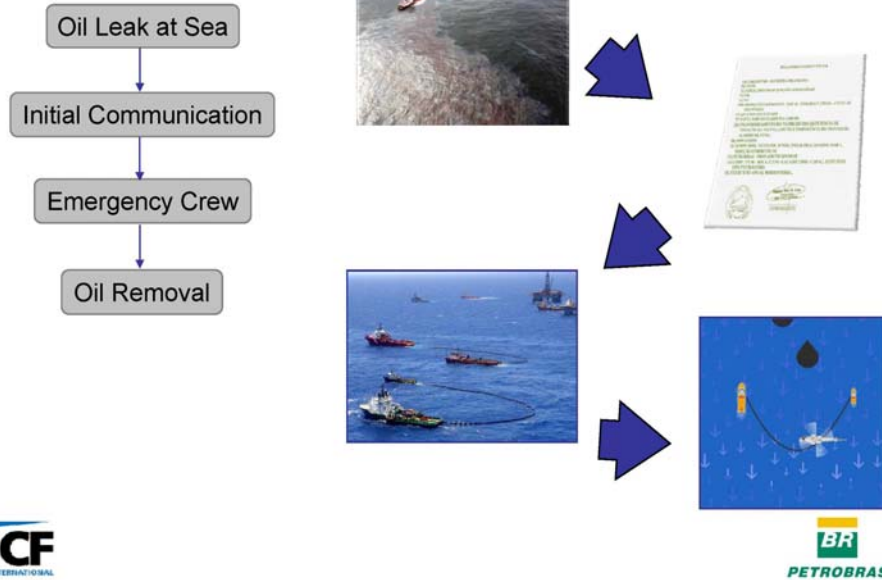
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### Onboard Oil Containment Procedures



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**Oil Containment Procedure at Sea**



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**Types of Containment**

Booms are used to contain and clump the oil, for easier collection.



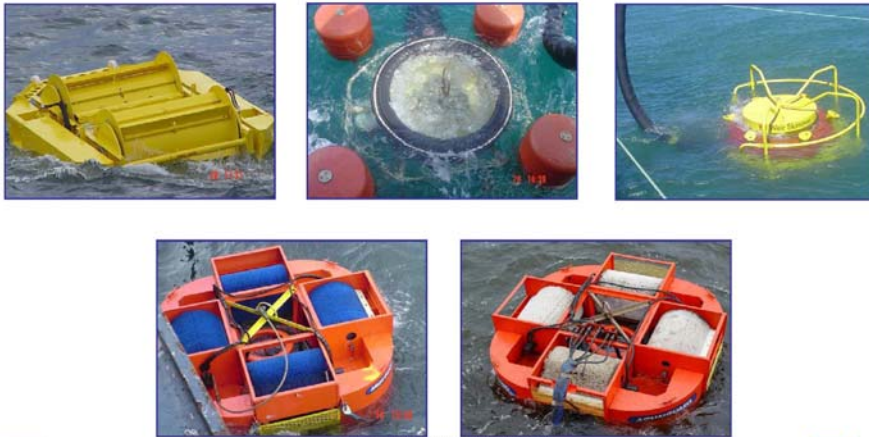
Source: US-AP / Contingencies Control



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### Types of Collection

Skimmers are used to lift the oil off the surface mechanically.



Source : US-AP/ Contingencies Control



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## Module V



### Energy Conservation





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## Conserving Energy and Natural Resources

Conserving energy and natural resources requires more efficient use of energy sources and natural resources such as water. This efficiency may be achieved through reducing the use of energy and other resources while maintaining the same output, or through lessening consumption. Conserving energy and natural resources may result in financial and environmental gains, as well as added comfort.



Examples of water conservation:

- Shorter showers;
- Turning off taps while shaving and brushing teeth;
- Fixing leaks promptly.



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## Energy Conservation



Examples of energy conservation:

- Turning off the lights when leaving the room;
- Replacing incandescent light bulbs by their fluorescent counterparts;
- Switching off equipment when not in use;
- Avoid opening freezer and refrigerator doors unnecessarily;
- Cleaning air-conditioning unit filters;
- Heat insulation in order to maintain room temperatures.



Examples of conservation in fuel use:

- Regular equipment maintenance;
- Avoid using equipment such as cranes with loads above their capacity;
- Avoid overloading generators.



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### Substitution By Less Pollutive Energy Sources

When possible, pollutive energy sources should be replaced by less aggressive options, thus lessening emissions of pollutive gases (such as sulfur which may cause acid rain) and greenhouse gases (such as CO<sub>2</sub>).

**Example:**

Coal-Fired Thermo-Power Plant



Natural Gas-Fired Thermo-Power Plant



Nuclear Power Plants



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### Use of Renewable Energy Sources

The use of this type of energy helps lower CO<sub>2</sub> emissions and thus slows global warming.

Wind Power



Solar Power



Tidal Power



Hydropower



Biomass



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# Thank You!

