

**Delivery of the National Training on Strengthening national capacities for sound chemicals and hazardous waste management through the implementation of the Basel and Rotterdam Conventions in the oil and gas sector**

**for the Government of Iraq**

Jouhayna Hotel Erbil, Iraq with Online UNEP Delivery through the Interactio platform

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**Training Summary and Documentation**

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## **Background**

The United Nations Environment Programme (UNEP) and the Government of Norway’s Oil for Development (OfD) Programme have a 5-year collaboration, which aims at strengthening national environmental management capacities in the oil and gas sector in 14 OfD-supported countries.

In this regard, UNEP, in collaboration with the Iraqi Ministry of Environment and Ministry of Oil, organized a National Training Course on Strengthening national capacities for sound chemicals and hazardous waste management through the implementation of the Basel and Rotterdam Conventions in the oil and gas sector. This training followed a previous training in Lebanon on Chemicals and Waste Management in the oil and Gas Exploration and Production, which was delivered in June 2019. This issue was identified by the Government of Iraq as a priority under its OfD Country Programme.

Due to the current global COVID-19 pandemic which have led to travel restrictions, and with the safety and well-being of participants as the highest priority,, the training was delivered online to participants convened in a training venue who met the pre-training preparation requirements. Presentations in the training were recorded and a link has been shared with participants who attended to enable other participants who could not join to access the training when feasible.

This training report summarizes key points from the discussions and participants’ feedback from the training evaluations.

## **Training Course**

The 3-day training course aimed to achieve the following objectives:

- Review and learn about the hazardous waste streams, including use of chemicals, generated in the upstream oil and gas value chain;

- Further expand and deepen knowledge of the key environmental & health concerns associated with hazardous chemicals and waste management;
- Expand knowledge and discuss management of chemicals and hazardous waste management (end-to-end), treatment and disposal options in relation to the oil and gas sector
- Learn about international frameworks, related obligations and guidelines on the sound management of hazardous chemicals and waste associated with oil and gas exploration and production, particularly through improved implementation of the Basel and Rotterdam Conventions;
- Learn about best practices in relation to hazardous chemicals and waste management in the oil and gas sector, drawing from industry best practices and EU frameworks and guidelines ;
- Learn how to improve data classification and management and reporting requirements concerning hazardous waste in the oil and gas sector

*Pre-Training Preparations:* As a prerequisite to participate in the training, participants were required to complete a baseline knowledge assessment , the training needs assessment and to watch a lecture video that provided an initial overview of environmental issues related to chemicals and hazardous waste management in upstream oil and gas. This was to ensure all attendees had acquired at least a minimum level of understanding of the topic before the training.

A total of 39 participants (12 women, 27 men) attended the training, consisting mainly of national and regional government representatives from the Ministry of Health and Environment – including Technical Directorate, International Relations Department, Hazardous waste management section, chemicals management section; and the Ministry of Oil – including Technical Directorate, and Planning and Monitoring Directorate. Also represented were participants from the following regional authorities and entities: North, South, Central and Middle Euphrates, as well as National and private oil companies including Middle Refineries Company, South Refineries Company, South Gas Company, Basra Oil Company, Dhi Qar Oil Company, North Refineries, North Oil, North Gas Company, Iraqi Drilling Company, Oil Exploration Company, Oil Projects Company, and the Oil Research and Development Center.

The online training also included Q & A sessions with contributions from several participants (see Annex 1). Presentations and other training materials were shared with participants prior to, during, and after the training. The training also included group work activities that required participants to identify and review wastes generated from the upstream oil and gas sector, clarify those covered in the existing legal framework in Iraq, as well as the strengths and challenges/constraints in existing national procedures and systems for classification of hazardous wastes and/or chemicals (see Annex 5).

### **Discussion Highlights**

Throughout the training, participants raised questions/comments relating to the different modules, which have been captured through an online shared google doc (captured in Annex

1 for questions, comments and answers). Some of the key issues can be summarized as follows:

- a. **Review/Update of legislation and regulatory frameworks on hazardous wastes management to include stricter penalties for compliance monitoring**
  - Participants highlighted the need to amend/update existing laws, acknowledging that some provisions were either too general or too vague to enable effective implementation of the chemicals and waste conventions to which Iraq is a Party, especially as relates to activities in the oil and gas sector. For example, Instruction 4 of 1989 was highlighted as requiring updates to include a mechanism for handling discharge, as it is not currently provided for.
  - They highlighted the lack of sufficient and appropriate fines against behaviour in contravention of the existing legal framework and suggested the introduction of higher fines and sanctions to serve as a deterrent and to compel polluters to treat these wastes properly, with a sense of urgency.
  - Weak enforcement of existing laws, including monitoring operations by regulators, was another challenge identified. Regulators will need to intensify surveys and field visits to these facilities by the relevant agencies and establish better environmental compliance monitoring measures on site.
- b. **Need for a comprehensive National Strategy for management of hazardous wastes/chemicals and classification/inventorying of wastes streams from the oil and gas sector**
  - Presentations highlighted the importance of having plans in place to manage hazardous waste generators and establishing an updated database on existing hazardous wastes from the oil and gas sector in the country. Participants confirmed there was no national strategy/policy for the management of chemicals in place, nor does Iraq have updated data on the current waste streams in the country. Hence, the need to develop a National strategy that includes classification of hazardous wastes, safety measures for their transportation and choice of appropriate treatment and disposal options.
  - Participants from the Ministry of Environment (MoE) indicated that there had been a strategy developed to deal with hazardous wastes which, however, had not been implemented after the Ministry was merged with the Ministry of Health. This strategy included capacity building and instructions for treatment and management of hazardous wastes but did not cover measures dealing with final disposal. It was suggested that this previous strategy be used as basis to further develop an improved strategy to manage hazardous wastes/chemicals from the oil and gas sector.
  - On inventory, participants acknowledged that there is an existing database of chemicals in Iraq, and that inventory reports are being submitted by oil companies. Participants highlighted that there is a chemical waste repository at the Ministry of Health and the database is updated annually. However, these instruments need to be harmonized and used to create a central database to be used by all relevant ministries across all sectors. Furthermore, they highlighted that a committee has been created with a timeline to establish an inventory on hazardous wastes. Nevertheless, they emphasized the need to review the composition of the Committee to ensure that it includes only representatives of relevant ministries, and to develop a more realistic strategy applicable to all sectors.

- Although some dumpsites have been identified using GPS, an evaluation of the types and the amount of wastes present in the country are still lacking e.g. in war affected areas like Mosul. Iraq is currently implementing its national implementation plan under the Stockholm convention that includes measures to manage stockpiles and wastes containing or contaminated with persistent organic pollutants. Further assistance to implement obligations under the Basel and Stockholm Conventions will be sought in the future from the BRS Secretariat for the challenges identified, especially in terms of developing inventories, classification of hazardous wastes, and reporting.
- c. **Poor coordination between relevant government stakeholders, lack of partnership between public and private sectors, and limited involvement of civil society**
  - Participants highlighted the overlapping mandates/roles and the poor coordination that exists between relevant ministries in waste management in Iraq. The need to raise awareness on the environmental impacts of mismanagement of these wastes within various sectors was emphasized.
  - Also highlighted was the limited role of civil society and the lack of partnership between public and private sectors, which would be beneficial if enhanced. For example, in terms of establishing more stringent procedures to curb or prevent the illegal traffic of hazardous wastes, third party certifications may be introduced as is done in some countries. Private sector, NGOs and civil society organizations can provide useful information to support authorities in being aware of and preventing cases of illegal traffic. In some circumstances, specific assistance is available at the international level to support the identification of cases of illegal traffic.<sup>1</sup> The government could also use established communication network(s) or create networks with these stakeholders to share information and that could serve as additional tools to prevent and combat illegal traffic of hazardous wastes.<sup>2</sup> The importance of dialogue and engagement with impacted communities was also emphasized.
- d. **Inadequate capacity to manage wastes from the oil and gas sector**
  - Participants highlighted the inadequacy in capacity of the relevant institutions to deal with wastes, in particular hazardous wastes. This includes lack of technical skills/expertise, human resources, finance, treatment and disposal facilities. For example, in terms of facilities, there are no laboratories in-country to verify the composition of these chemicals and wastes, as well as at the border for cases of transboundary movements.
  - Legacy wastes from wars, terrorist attacks including on pipelines, etc. were identified as a huge challenge in the country. Huge amounts of drums, some of which that contained chemicals and which currently contain expired chemicals, have been left in storage rooms over the years and need to be managed. Appropriate methods for managing (handling, treatment, transportation, disposal) these

<sup>1</sup> The Basel Convention Secretariat has a mandate under Article 16 of the Convention to assist Parties upon request in their identification of cases of illegal traffic.

<sup>2</sup> For cases of illegal traffic of hazardous wastes, there are existing networks at the regional and international levels e.g. ENFORCE (Environmental Network for Optimizing Regulatory Compliance on Illegal Traffic) <http://www.basel.int/Implementation/TechnicalAssistance/Partnerships/ENFORCE/Overview/tabid/4526/Default.aspx>

chemicals and wastes need to be identified as soon as possible to avoid any adverse impact on human health and the environment.

- Participants highlighted that although there are bioremediation sites, it is not sufficient to treat all hazardous wastes in Iraq. Thus, other disposal options should be considered, such as thermal treatment or technology.
- The need for regulators to grant licenses in a timely manner, using fast-track procedures if possible, to those with capacity to manage these hazardous wastes in an environmentally sound manner, especially in cases where previously licensed operators are unable to do so was highlighted.
- **To address inadequate funding and resources, participants emphasized that Iraq would need financial support from international organizations and support, for example, in technology transfer and capacity building to acquire expertise in treatment and management of hazardous wastes in general.**
- It was indicated that hazardous wastes from the oil and gas sectors are usually collected in a temporary storage location with no disposal facilities for such wastes after treatment. Participants felt that more action was needed to ensure that companies to dispose of the waste they generate and follow international best practices, especially in areas where there are lacunae in national legislation. Regulators should have the authority to require, at the authorisation and licensing stage, that oil and gas companies plan and describe precisely how they intend to manage the wastes they will generate. Many voiced the need for this to be a condition for issuance of any requisite authorisations or permits.



## Modules – Main Highlights

### Day 1.

#### Session 1: Review of key environmental considerations of chemicals and hazardous waste management in the upstream oil and gas sector, onshore and offshore

*Scope and Summary*

This module aimed to highlight key environmental considerations for chemicals and hazardous waste management in the upstream oil and gas sector. It emphasized the need for hazardous wastes to be strictly regulated and monitored from “cradle to grave”.

The various types of chemicals and wastes generated by the upstream sector were discussed. Some examples include produced water, water and oil-based drilling fluids, methane and other harmful emissions, etc. Classification methods of these hazardous wastes and the hierarchy, characteristics and classification of the wastes were also highlighted.

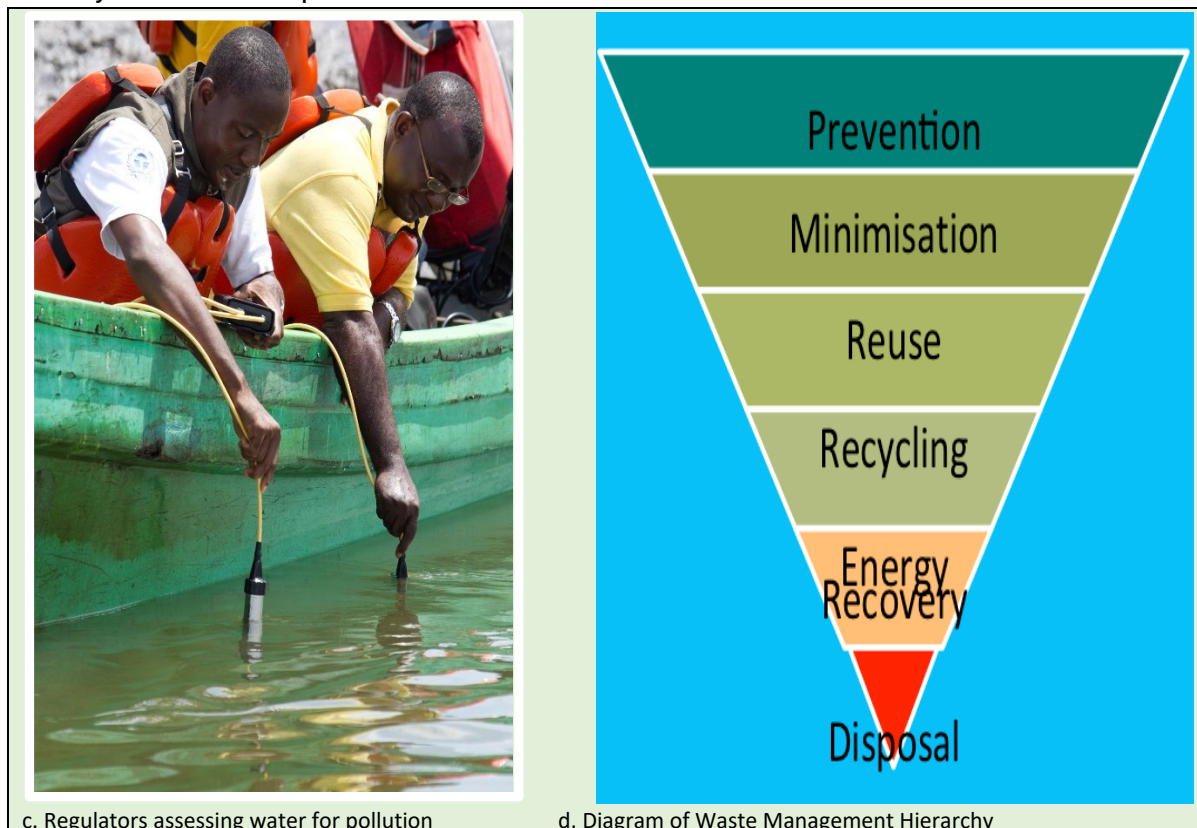
Presenter :  
M.J. Cowing, UNEP



The O&G sector uses a vast amount and diversity of chemicals. Many of these chemicals are hazardous and must be strictly controlled, and failure to do so can pose a serious risk to public health and the environment. The module addressed the following points:

- Oil & gas are here to stay for the foreseeable future, with the associated environmental, health and waste management challenges.
- Upstream activities use a large range of chemicals and are a large producer of hazardous waste – which require careful management;
- All upstream activities use a host of chemicals, including in drilling, cementing, completion, production etc.
- Many of the chemicals and chemical by-products are hazardous in nature and require careful handling and ultimately disposal;

- The largest volumes of waste generated would tend to be waste streams such as spent drilling fluids, cuttings and produced water;
- Hazardous waste from the oil and gas sectors cannot be diluted or mixed and should only be treated in specialized and licensed facilities.



c. Regulators assessing water for pollution

d. Diagram of Waste Management Hierarchy

## Session 2: Iraq's experience on chemicals and hazardous waste issues during exploration and production

### Scope and Summary

This session provided an overview of the current systems/procedures for the management of hazardous waste management (end-to-end), handling, transport, treatment and disposal options in relation to the oil and gas sector in Iraq. Also discussed were key challenges to the management of hazardous chemicals and waste in relation to the oil and gas sector. One of the challenges highlighted during this session was the management of legacy wastes such as expired chemicals, generated by previous operators from decades ago when environmental licenses were not required. Hence, it was difficult for regulators to properly monitor the management (treatment and disposal) of chemicals and hazardous wastes produced in the sector.

### Presenter:

Saad Azeez, Ministry of Oil (MoO)

- Two main types of hazardous wastes from the oil and gas sector in Iraq include solid and liquid waste generated during exploration and production. Some of these wastes

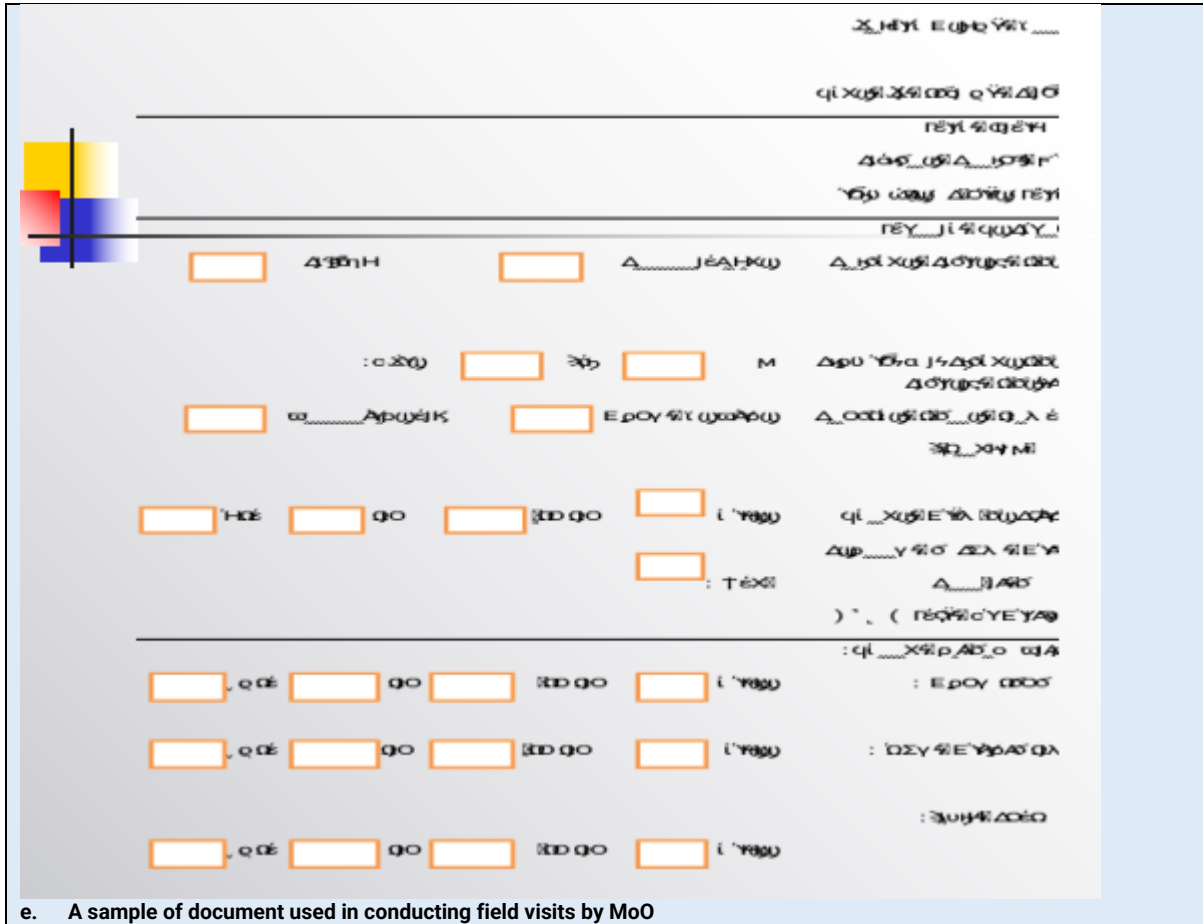


include drilling muds containing heavy metals that cause soil pollution, muds from industrial water treatment, expired chemicals, oil residues from oil spills, empty drums (in tens of thousands), medical wastes, furniture wastes, batteries, electronic wastes (computers, printers), and used tires.

- A Central Committee was formed consisting of representatives from all oil companies, oil training institutes, oil research and development centers and the MoHE to monitor the storage and circulation of hazardous and polluting chemicals in the oil sector. This Committee is also undertaking field visits to oil sites to conduct a comprehensive survey of oil storage in the fields.
- The Committee is responsible for ensuring companies update their chemical databases in oil facilities, which is required by law, and conducts training/workshops to build capacity. It also ensures that companies adhere to relevant international standards and practices.
- The Ministry of Oil through its Chemical Management Department coordinates with the Ministry of Science and Technology to identify banned materials and who can use these hazardous materials. A Chemical Emergency Plan is in the final stages of completion which contains contingency plans to be used by oil companies.
- Some challenges encountered in Iraq related to management of hazardous wastes/chemicals include high costs of treatment and disposal, lack of specialized transport vehicles to move these wastes between governorates, accumulation of large quantities of electronic wastes in warehouses, lack of environmental approvals for former chemical warehouses, large quantities of spills of chemicals and wastes to be managed from accidents, maintenance work, and attacks.
- Environmental impact assessments at the exploration stage indicated air pollution such as black smoke, water pollution, and soil pollution as a matter of concern. Hazardous wastes generated from exploration include drilling fluid residues, produced water, high concentrations of toxic substances, especially heavy metals such as mercury in solid wastes, empty plastic and iron chemical containers and plastic bags, etc.
- Committees have been established to support the sound management of hazardous chemicals/wastes. For example, there is a research committee on hazardous waste and another responsible for chemicals in the oil sector. They provide monthly reports on the amount of wastes, how they are stored and managed. Data received from these committees are included in the internal national reports and in the Basel Convention annual national reports<sup>3</sup>.
- The Ministry of Oil works with different relevant ministries (such as the Ministry of Science and Technology, the Ministry of Health and Environment, the Ministry of Commerce, and others), in different committees for the effective management of chemicals and wastes from the oil and gas sector.
- Classification of hazardous chemicals and waste in Iraq is done according to international conventions such as the Basel, Stockholm and Rotterdam Conventions. Iraq also uses tests listed under the US Environmental Protection Agency RCRA

including *reliability* (if solid waste is flammable), *reactivity* (solid waste has characteristics such as generating toxic gases, reacting strongly with water, exploding when heated, etc.), *corrosion* (waste has high or low PH that reacts dangerously with other waste to form toxic pollutants), and *toxicity* test.

- Hazardous wastes from the oil and gas sector are collected when they are generated from an established lined ditch, liquid waste collection pit and recovery ditch. These ditches are usually lined to prevent leakage into the environment and the collected wastes are separated into units (separate water from oils).
- Treatment of solid wastes collected are usually done either on-site or at a central treatment site affiliated to the company.
- Some controls to prevent pollution include monitoring concentrations of heavy metals, careful selection of additives to be used, defined environmental guidelines for proper management of liquid waste, and conducting post-discharge chemical analysis
- Liquid waste (produced water) is considered one of the biggest wastes in Iraq oil and gas sector and the management method depends on the quality, quantity and chemical analysis/characteristics of the water/liquid waste. Some methods include injection into waste well, reuse, or reinjection to increase reservoir productivity.
- Solid wastes from oil and gas operations are treated using different methods including thermal processing, biological treatment, steam recovery, soil vapor recovery systems, etc. The choice of the method is dependent on some factors such as the volume of the pollutant, the area of the contaminated site, the quality and density of the hydrocarbons, the available technologies and financial resources, toxicity, weather and environmental sensitivity, etc.
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e. A sample of document used in conducting field visits by MoO



f. Drums which are part of legacy waste issued in Iraq



	g. Evaporation pond - one of the options used in managing produced water in Iraq
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### Session 3: Introduction to the Basel, Rotterdam and Stockholm Conventions' international frameworks on the sound management of hazardous chemicals and wastes

#### *Scope and Summary*

This session provided an overview of the Basel, Rotterdam and Stockholm (BRS) Conventions, their scope and obligations for chemicals and hazardous waste management. Given that one of the identified challenges that Iraq faces is the classification of 'mixed' wastes and reporting under the Basel convention, this session sought to provide adequate information to support strengthened implementation of the related obligations in Iraq.

#### *Presenter :*

Yvonne Ewang-Sanvincenti, BRS Secretariat

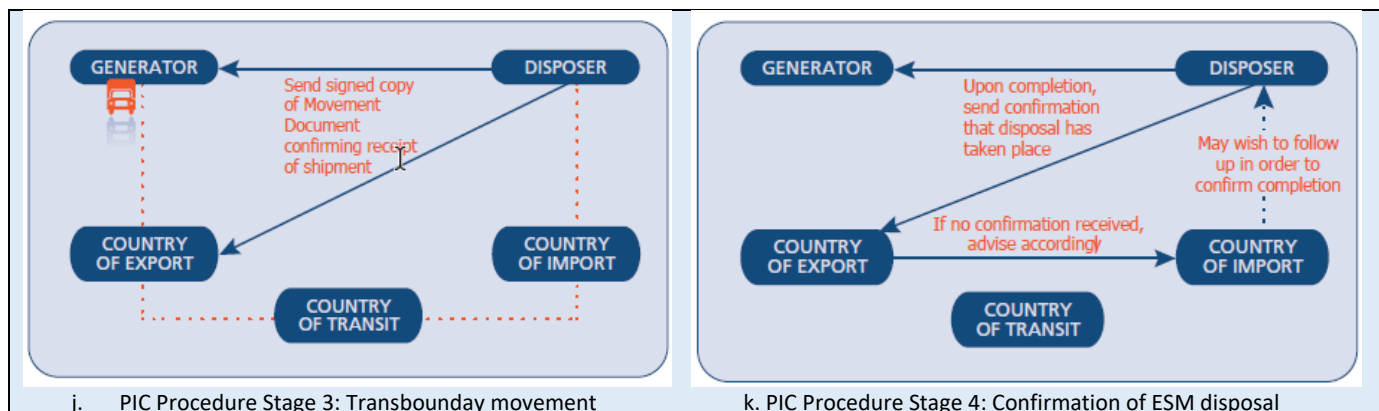
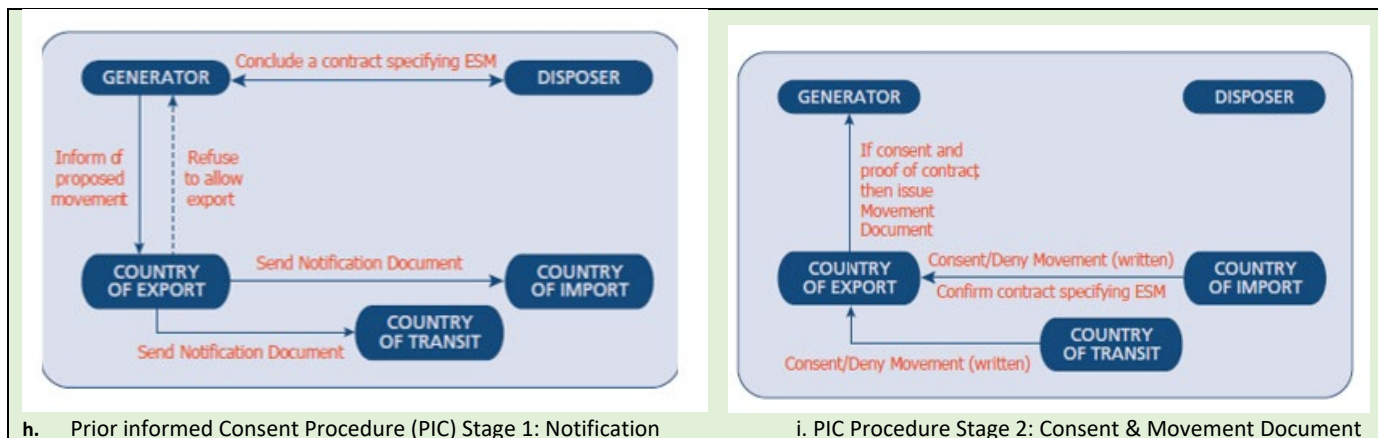
- The Basel convention covers hazardous wastes<sup>4</sup> subject to transboundary movements that belong to Annex I to the Convention unless they do not possess any hazardous characteristics in Annex II (e.g. explosive, flammable, reactive, poisonous, infectious, corrosive, toxic or ecotoxic) as well as hazardous wastes as defined in national or domestic legislation and notified under the Convention. The Convention also covers "other wastes".<sup>5</sup> Transboundary movement of hazardous wastes takes place only among Parties, however, Parties may enter into bilateral, multilateral, or regional agreements or arrangements regarding transboundary movement of hazardous wastes or other wastes with Parties and non-Parties provided that such agreements or arrangements do not derogate from the environmentally sound management as required by the Convention.
- The Convention established a Prior Informed Consent (PIC) procedure for transboundary movements of wastes falling within its scope. This is based on 4 stages: notification; consent and issuance of a movement document; transboundary movement; confirmation of disposal.
- The Convention makes specific provisions about illegal traffic, which is defined as well in the convention. Parties consider illegal traffic criminal and have an obligation to adopt legislation to prevent and punish illegal traffic. It is necessary to have measures at the national level to prevent and punish illegal traffic of hazardous and other wastes
- All States concerned (Transit and import States) must receive the notification from the State of export that a transboundary movement of wastes is planned. The State of import must respond to the notifier in writing, either consenting to the movement with or without conditions, denying permission for the movement, or requesting additional information. The State of export shall not allow a movement to begin unless it has

<sup>4</sup> Article 1(1)

<sup>5</sup> Household waste, ashes from incinerated household waste and certain plastic wastes listed in Annex II

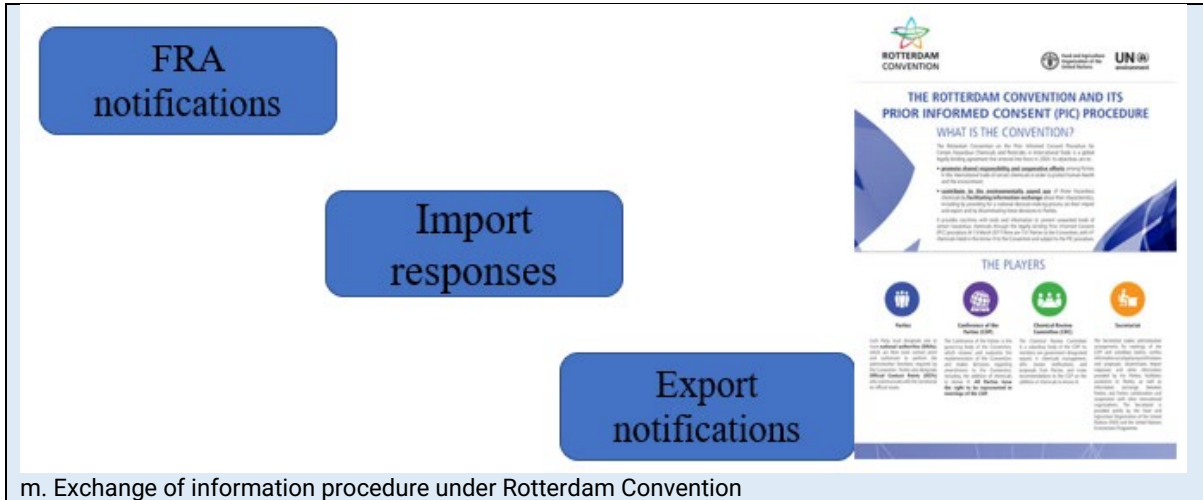
received written confirmation that the notifier has the written consent of the State of import, and that the notifier has received confirmation of the existence of an ESM contract from the State of import. The movement document is only issued on consent to the transboundary movement – it is an important document that needs to accompany the waste consignment at all times. The movement document needs to be signed by each person who takes charge of the transboundary movement, either upon delivery or upon receipt of the wastes in question, and it is also advisable that the notification document equally accompanies the transboundary movement in question.

- The Basel convention provides classification of various wastes in its Annexes. For example, Waste oils can be classified in Category Y8. These codes are to be used in completing the notification and movement documents.
- Minimizing wastes generated at source and ensuring the environmental sound management of wastes are some of the responsibilities Iraq has under the Basel convention. Iraq has a number of resources available that can be consulted, including reports from other Parties in the region. These can provide information to identify facilities available to dispose of wastes if Iraq lacks the capacity to do so in the country.
- The Rotterdam convention covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by Parties and severely hazardous pesticide formulations. The chemicals in the scope of the Rotterdam Convention are listed in its Annex III. Annex III chemicals are also subject to a prior informed consent (PIC) procedure, based on responses Parties provide as to whether or not they consent to future imports of these chemicals. The Convention also provides a procedure based on export notifications in the event that a Party exports from its territory a chemical that it has banned or severely restricted. Export notifications need to be transmitted before the first export and once every calendar year thereafter.
- The Stockholm Convention covers persistent organic pollutants (POPs). The key provisions of the Stockholm Convention have the objective of eliminating and reducing POPs that are produced and used intentionally, POPs that are produced and used unintentionally, and POPs stockpiles and wastes.
- These three conventions work hand in hand due to the overlap in their scope and objectives
- Guidance and tools to assist Parties in the implementation of the Convention are available in the BRS Secretariat website here. These include a toolkit for environmentally sound management of wastes, which contains specific factsheets for waste oils; guidance on hazardous waste inventories; and guidance on national reporting including a Benchmark report. Work is ongoing on guidance on contaminated sites.
- Coordination and communication between government and other stakeholders is essential for effective implementation and enforcement of the Conventions.
- The Secretariat is available to provide technical assistance within the available resources and regularly provides advice and assistance to Parties and other stakeholders e.g. responding to questions. The Secretariat staff can be reached via [email](#)



Examples of waste categories	Y-code, annex I of Basel Convention	H-code, annex III of Basel Convention	A-code annex VIII or B-code annex IX of Basel Convention	United Nations shipping name, number, and hazard class or division
Waste lead-acid batteries	Y31, Y34	H8, H11, H12, H13	A1160	Waste Battery, Wet, Filled with Acid, UN2794, Class 8 -or- Waste Battery, Wet, Non-spillable, UN2800, Class 8
Waste lead-acid batteries, drained	Y31	H11, H12, H13	A1160	Environmentally Hazardous Substances, Solid, N.O.S., UN3077, Class 9
Waste battery electrolyte	Y34	H8	A4090	Waste Battery Fluid, Acid, UN2796, Class 8
Waste lithium batteries	Y19	H13	A1170	Waste Lithium Ion Batteries, UN 3480, Class 9
Waste tyres	-	-	B3140	-
Waste mercury switches	Y29	H11, H12, H13	A1030, A1180	Environmentally Hazardous Substances, Solid, N.O.S., UN3077, Class 9
Waste oils	Y8	H11, H12, H13	A3020	Environmentally Hazardous Substances, Liquid, N.O.S., UN3082, Class 9
Petrol (fuel)	Y9	H3, H11	A4060	Petroleum Products, N.O.S., UN1268, Class 3
Waste antifreeze	Y42	H11	A3140	Environmentally Hazardous Substances, Liquid, N.O.S., UN3082, Class 9
Waste catalytic converters that contain refractory ceramic fibre (RCF)	-	H11	-	Environmentally Hazardous Substances, Solid, N.O.S., UN3077, Class 9

l. Basel Convention prior informed consent procedure: An example of some categories that may relate to the ESM of waste vehicles



Day 2.

Session 4. Hazardous Waste Management: Experiences from BCRC-Egypt

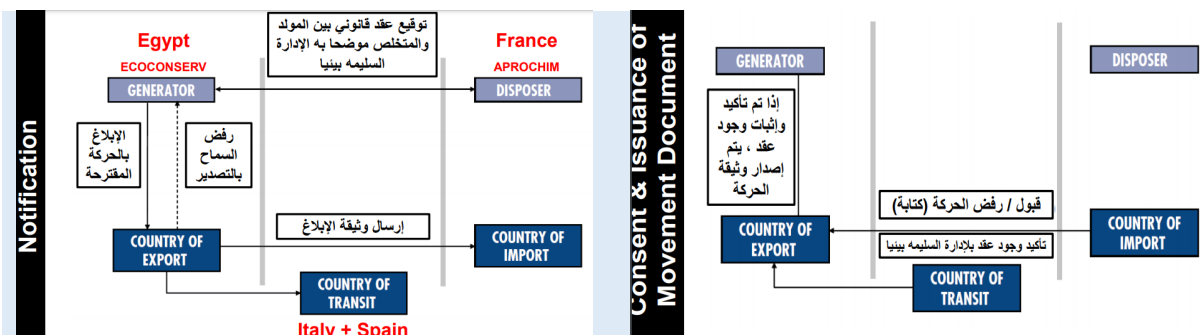
Scope and Summary

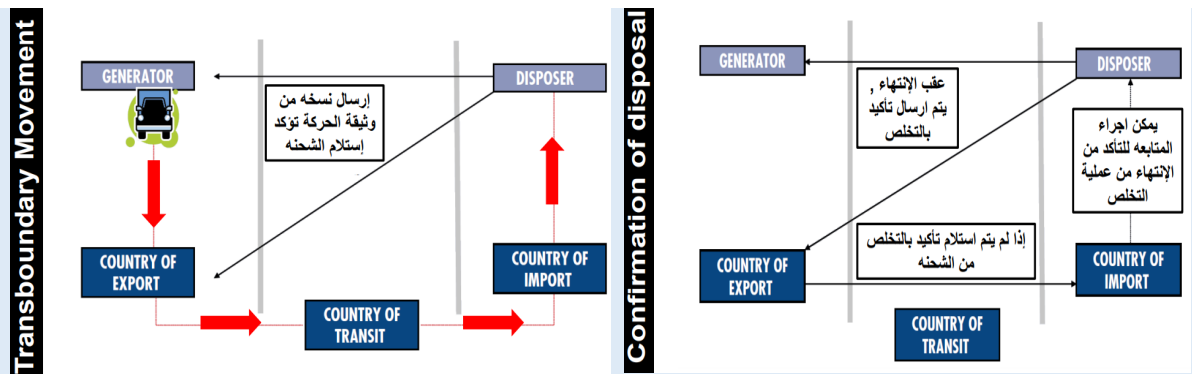
Using the experience of the Basel Convention Regional Centre for the Arab-speaking countries in Egypt (BCRC-Egypt) as a case study, this session aimed to highlight the processes and procedures involved in the management of hazardous waste in Egypt's oil and gas sector. It also provided insights into the practical requirements for transboundary movement (TBM) of waste oil shipment for disposal outside Egypt using the procedures under the Basel Convention. These requirements include steps taken in terms of storage, transport, reporting, tracking, and disposal of the wastes.

Presenters:

Dr. Abdel-Hakim El-Alawy, Egyptian Customs Authority

Chem. Ayman Abd Elbaky Ahmed, Egyptian General Petroleum Corporation (EGPC)





o. Transboundary movement procedure used in the MedPOL Project for PCBs in Egypt

On transboundary movement (TBM) of hazardous waste from Egypt to France, via Italy and Spain, the following were highlighted:

- Incinerators in Egypt were not able to completely destroy the PCBs, hence, Egypt decided to send the waste to specialized facilities that could deal with the waste. The selected facility where the waste was to be sent was in France. Two steps were involved in this MedPOL project for export and disposal of 300 tons of PCB waste and contaminated equipment:
  - Diagnosis and procedure Transfrontier Shipment of waste (TFS) notification in accordance with international regulations, including the Basel Convention and EU and OECD regulations
  - Collection, shipment and disposal of equipment and wastes contaminated by PCBs
- The Basel convention defines TBM as movement involving at least 2 States<sup>6</sup> and subjects this to the PIC procedure. Movement within the country is subject to the national legislation. It is not unusual for a shipment of waste to be rejected or refused by the states of transit and/or import.
- EcoConserv presented the agreement to the Ministry of Environment in Egypt and after legal review was conducted, a notification was sent to the Ministries of Environment in the States of Transit and Import. Before the Ministry of Environment could issue the movement document, France as the State of import had to respond with its consent to the movement, as well as confirmation of the existence of a contract specifying ESM of the wastes, and that the company handling the disposal was authorized to do so.
- On completion of the transboundary movement, the disposer company sent a confirmation that it had received the shipment and that disposal had taken place in accordance with the terms of the contract. This was notified to the Ministry of Environment in Egypt informing of the environmentally sound disposal of the hazardous waste when completed. The competent authority of the exporting country can contact the competent authority of the import country in cases where it has not received this document to confirm the disposal of the wastes

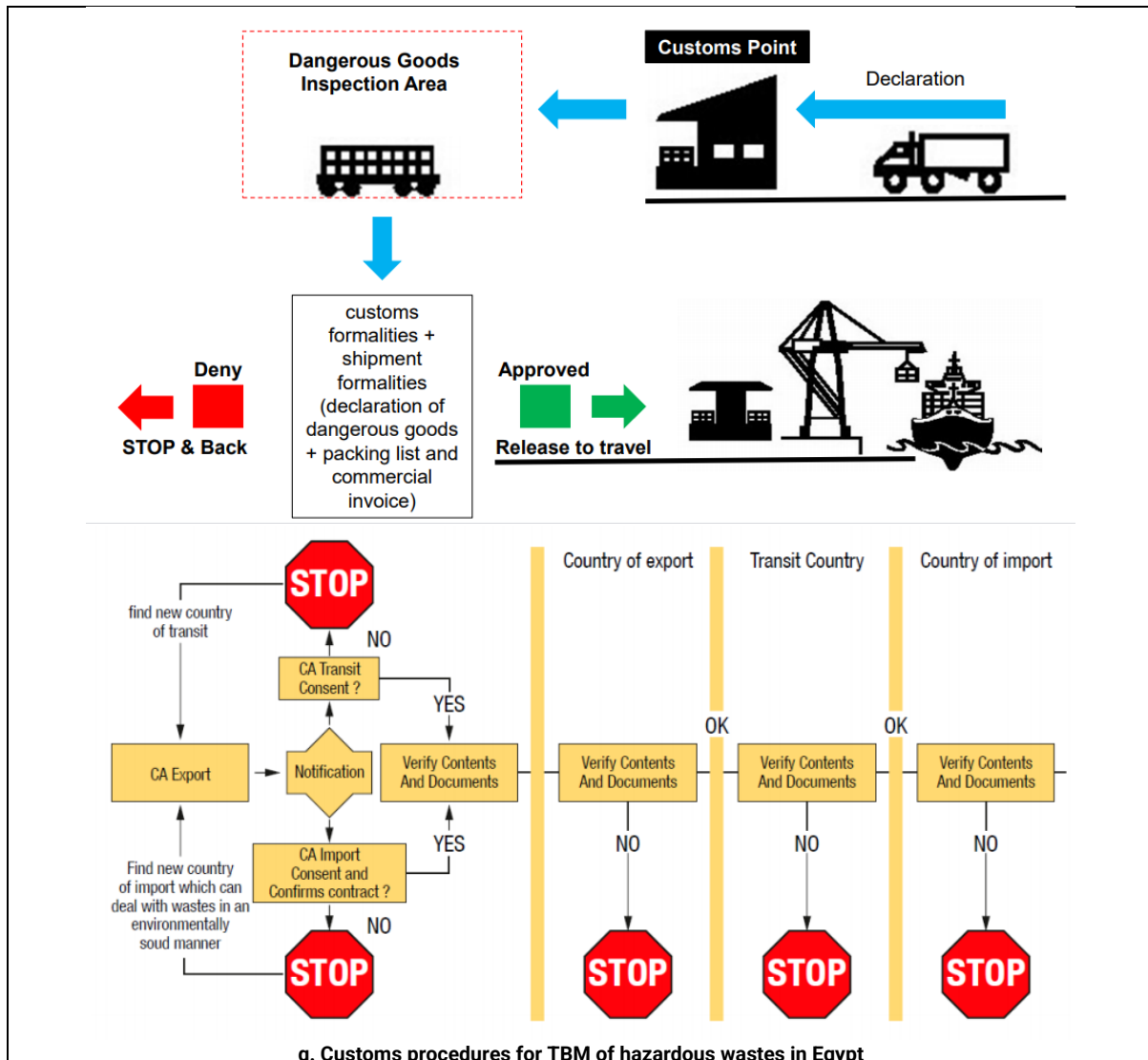
<sup>6</sup> Article 2 “any movement of hazardous wastes or other wastes from an area under the national jurisdiction of one State to or through an area under the national jurisdiction of another State or to or through an area not under the national jurisdiction of any State, provided at least two States are involved in the movement”



- Specialized equipment from France, pumps and drums for shipping and transport to ports were imported in preparation for the TBM, with covers and linings to prevent spillage. The containers were specifically loaded onto wooden crates. The containers were properly labelled to show the hazardous characteristics of the waste.
- The Ministry of Environment and Customs in Egypt need to coordinate and communicate properly to facilitate TBM of hazardous wastes. A committee from the Customs authority was required to come to the site to inspect and ensure the chemicals and wastes were properly labelled and reported, to avoid spillage if they had to reopen them in ports after sealing.




p. Preparation of the hazardous waste for transboundary movement, including proper storage, handling and labeling



On hazardous waste management in Egypt's oil and gas sector, the following were discussed:

- Two chemical lists have been developed by the Ministry of Petroleum for use in the oil sector in Egypt - the first list was created relying on guidelines from the Ministry of Environment (MoE) and the second on guidelines from the Waste Management Regulatory Agency (under the MoE), based on EU classification of hazardous materials. These lists of chemicals are divided into those that need licenses for handling (mainly hazardous) and those that don't need any license to handle (harmful). Egypt has developed a Hazardous Waste Inventory, indicating liquid, semi liquid, non-hydrocarbon and solid wastes.
- Hazardous waste classification in Egypt is based on the EU principles of toxicity, corrosive, reactivity and flammability, similar to the hazard characteristics used in Iraq.
- For temporary storage, hazardous wastes must be separated in licensed restricted areas, properly labeled, and secured for a defined period depending on the property of the waste.

- For transportation, companies transporting hazardous wastes need to be licensed and have adequate vehicles. The wastes are tracked to ensure their safe arrival and disposal. The companies will have to send a signed and sealed form to ensure that they have received and disposed of the wastes.
- Recycling of used oil, reinjection of produced water into depleted wells, reuse of empty containers (refill with chemicals), biological and chemical treatments are some of the options used in management of hazardous wastes from the sector.
- For disposal, some methods used include landfills, burning, cement kilns and specialized incinerators.
- The Egyptian General Petroleum Corporation has the responsibility of compliance monitoring through regular audits, quarterly reports that include data on the amount of waste generated, mechanism of transport, treatment and disposal methods and the company responsible, licensing and authorization for the collection and transportation of waste in the country.
- Some challenges faced include limited number of waste landfills and entities that can undertake recycling operations, limited financial support and need to facilitate lending for the waste management project, capacity building and technical support, among others

	<p style="text-align: center;"><b>License Requirement</b></p> <ol style="list-style-type: none"> <li>1. <b>Filling the form</b> <ol style="list-style-type: none"> <li>A. Data of the company.</li> <li>B. Data of waste or chemicals (Description, Amount &amp; Handling)</li> <li>C. Pledge.</li> <li>D. Certificate of experience.</li> <li>E. Data of transporter.</li> </ol> </li> <li>2. <b>Attachment of contracts &amp; manifest form of licensed Co. for waste transport &amp; disposal.</b></li> <li>3. <b>Application of the form to the competent administrative authority for approval.</b></li> </ol>
<p>r. A picture of a hazardous waste storage room</p>	<p>s. Requirements needed for hazardous waste management license</p>

## Session 5. Current National situation and regulations related to Hazardous Chemicals and Waste Management in the oil and gas sector

### *Scope and Summary*

This session aimed to highlight the key aspects of the regulatory framework and current situation of the management of chemicals and hazardous waste from the oil and gas sector in Iraq. It highlighted the existing policies and regulations as well as the roles and responsibilities of the institutional bodies, including the Chemical Department in the Ministry of Health and Environment which oversee chemicals and hazardous wastes in the oil and gas sector.

Also discussed were the types of waste generated and handled in the country as well as environmental impacts of upstream oil operations

Presenter :

Walid Ali Hussein, Ministry of Health and Environment (MoHE)

- At national level, different sectors have legislation and strategies regulating this. For example, the Chemical Security Strategy, which deals with hazardous chemicals that pose national threat
- Law No.27 of 2009 is the main law regulating handling, storing and transportation of hazardous wastes in the country. The Department of Chemical Control and Evaluation of Contaminated sites collects information and implements plans for chemicals management as well as other compliance monitoring responsibilities
- The Ministry of Environment coordinates with relevant authorities in the management of hazardous chemicals and wastes such as the Department of Studies, Planning and Follow-up, within the Ministry of Oil
- International Conventions related to chemicals and waste management ratified by Iraq include the Basel, Stockholm, and Rotterdam Conventions, the Minamata Convention on Mercury, and the Montreal Protocol (Ozone Convention)
- Some highlighted challenges related to hazardous chemicals and wastes encountered in Iraq include
  - lack of national strategy for chemicals in Iraq;
  - lack of laboratories and equipment to classify the wastes and lack of equipment at the borders to examine TBM shipment;
  - overlaps in roles of some of the institutions and legislation as well as lack of qualified personnel;
  - lack of finances to build capacities in these area and for the implementation of environmental programmes;
  - lack of ESIA's in contaminated sites which are sources of these hazardous wastes;
  - the limited roles of trade unions and civil societies for awareness raising on chemical risks
- Some controls are available in the country to identify if wastes are hazardous or not, and to classify them based for instance on their toxicity, but updated and comprehensive data on current hazardous wastes in the country are currently not available. However, a committee from the MoHE has been set up with the responsibility to develop an inventory for hazardous waste and chemicals in Iraq. The National Strategy for Environmental Protection in Iraq has been developed by the Ministry of Environment in cooperation with the UN Development Programme, the UN Environment Programme, and all government sectors and civil society organizations
- There is growing need to engage with international environmental organizations like UNEP, to help build and facilitate transparency and cooperation e.g. in sharing data within various government institutions for better environmental controls
- Dialogue and partnerships are important between the regulator (government entities) and generator/operator, as well as civil society. All stakeholders need to be seen as partners building good relationships, not as adversaries, to jointly identify challenges and map out solutions

- Prioritization is an important step in addressing these challenges, to avoid being overwhelmed and to easily put in place an action plan to tackle these challenges. The BRS Secretariat is available to support Iraq through technical assistance, but will need to understand what the needs are in the country. For example, the lack of chemical inventory in the country is a need that the Secretariat can provide support to in the future

- اولاً: اتفاقية بازل " التحكم في نقل النفايات الخطرة والتخلص منها عبر الحدود" حيث انضم العراق الى اتفاقية بازل عام 2011 وقد سبق ذلك اصدار قانون الانضمام رقم (3) لسنة 2009.
- ثانياً: قانون انضمام العراق الى اتفاقية ستوكهولم المعنية بالملوثات العضوية الثابتة حيث انضم العراق الى هذه الاتفاقية في 6/حزيران 2016
- ثالثاً: قانون انضمام العراق الى اتفاقية روتردام
- رابعاً: اتفاقية ميناماتا بشأن الزئبق حيث صدر مؤخراً قانون انضمام العراق لهذه الاتفاقية بداية 2021 ويجري العمل لاستكمال العضوية
- خامساً: قانون الانضمام لاتفاقية روتردام المتعلقة بتطبيق اجراء الموافقة المسبقة عن علم على مواد كيميائية ومبيدات آفات معينة خطيرة متداولة في التجارة الدولية. انضم العراق بشهر تموز لسنة 2017
- سادساً: بروتوكول مونتريال بعد انضمام العراق الى اتفاقية فيينا وبروتوكول مونتريال (( اتفاقية الأوزون )) في (25 حزيران 2008) وكان تسلسله (193) بين دول العالم, باشر العراق بتنفيذ بنود اتفاقية فيينا وبروتوكول مونتريال اهمها منع استيراد مواد الكلوروفلوروكاربونات (CFC) التي تستخدم في اجهزة التكييف والتبريد عام 2010.
- اللوائح الصحية الدولية عام 2005 منظمة الصحة العالمية WHO

t. Some international conventions which Iraq is party to in relation to sound environmental management of hazardous chemicals and wastes

## Session 6 (Pt.I). International frameworks and guidelines on the management of chemicals and hazardous wastes associated with oil and gas exploration and production, including through implementation of the BRS Conventions

### Scope and Summary

This session focused on national reporting procedures for the Basel Convention and existing guidelines, guides and other tools available to support Iraq in the environmental sound management of waste oils, especially in terms of transboundary movements of hazardous wastes.

The discussions covered possible classifications of waste oils under the Basel Convention; methods of collection, storage and transportation, including the control procedure for transboundary movement of hazardous and other wastes; as well as guidance and assistance available to Parties on national reporting.

Presenter :

Yvonne Ewang-Sanvincenti, BRS Secretariat

- Each Party is responsible for classifying the wastes subject to transboundary movements but guidance is available to support the relevant authorities. This suggests Waste oils, also known as used/spent oils, can be classified as A3020 in Annex VIII to the Basel Convention
- Participants were made aware of the risk of possible contamination with PCDD, PCDF and PCB

The Guidance covers:

- **Storage:** If the State sets threshold quantities, it should also issue Licenses, permits or authorizations for storage above threshold quantities, and mixing of waste oils should be prohibited
- **Transport:** Licensing, permits and authorizations are also a relevant consideration for transport. When transporting waste oils, they should be packaged and labelled properly, with appropriate emergency response information and hazardous waste tracking documents, such as MSDS
- Transboundary movement should be minimized and conducted in a way consistent with the environmentally sound management of the wastes, and in such a way to protect human health and environment
- When identifying reuse and recycling options, a number of criteria are to be considered including: the extent to which used oil can be treated, potential harm to human health and the environment, economic balance and market opportunities, transport requirements /costs, location of treatment facilities, Processing of hazardous waste contaminants and by-products of the process, and workers safety
- Consideration needs to be given to the waste management hierarchy, considering emissions to air and avoiding open burning, which is an inadvertent source of persistent organic pollutants covered by the Stockholm Convention (Iraq is also a Party)
- Parties to the Stockholm Convention have the responsibility to take measures to reduce the unintentional production and releases derived from anthropogenic sources of chemicals listed in Annex C, with the goal of minimizing and elimination where feasible
- According to the BAT BEP Guidance, the two main options for the treatment of waste oils include recovery of waste oils to be used as fuel or reductant with treatments such as thermal cracking and gasification; and treatment to reconvert it into a material that can be reused or used as a base oil to produce lubricants. The guidance also indicates wastes to be preferred for regeneration and potential treatments of waste oils other than re-refining
- The presentation also gave information on the resources and guidance available to support Parties, including Technical Guidelines, factsheet and BAT/BEP guidance
- National reporting under the Basel convention is required annually and is submitted through the electronic reporting system, to which the Focal Point has access. Previously submitted reports can be viewed in the Basel Convention website [here](#)

- The Secretariat conducts quality control of the data and information and requests clarifications from Parties when necessary. It also has resources on the website to support national reporting, provide assistance on format, procedures and manuals to support national reporting (see more on reporting [here](#))



### Session 6 (Pt.2): Selected international practices, standards and guidelines in the management (handling/treatment/storage/transport/disposal etc.) of hazardous wastes

#### *Scope and Summary*

This session aimed to enhance participants' understanding of the various methods of managing wastes in the oil and gas sector; the tools used such as Waste Management Plans and MSDS; the technical options available for treatment and disposal, and their advantages and disadvantages.

Also discussed was importance of documentary controls – Trip Tickets and Permits management systems for chemicals and wastes, and some available international guidelines relating to the management of hazardous chemicals and wastes in the oil and gas sector.

*Presenter :*

*M. J. Cowing, UNEP*

Evaluation Criteria	Sub-Criteria	La <sup>1</sup>	IA.1 <sup>2, 13</sup>	IA.2.i.a / I.2.i.a <sup>3</sup>	IA.2.ii.a / I.2.ii.a <sup>4</sup>	IA.2.i.f (a) / IA.2.ii.f (a) <sup>5</sup>	IA.3.c / I.3.c <sup>6</sup>	IA.g / I.g <sup>7</sup>	II.B.1 <sup>8</sup>	II.B.2.iii.f (b) <sup>9</sup>	II.3.c / II.B.3.c <sup>10</sup>	III.3 <sup>11, 12</sup>
Suitability	Environmental Impacts	Yellow	Green	Green	Green	Green	Red	Yellow	Green	Yellow	Green	Red
	Compliance with international conventions / standards	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	In-country Value Addition	Green	Yellow	Green	Green	Green	Yellow	Yellow	Red	Yellow	Red	Red
	Effort to Regulator (Controllability)	Green	Yellow	Green	Green	Green	Red	Yellow	Yellow	Red	Yellow	Red
	Alignment with Industry Trends	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Yellow
Feasibility	Technical Practicability / Availability	Yellow	Green	Green	Green	Green	Red	Yellow	Green	Yellow	Red	Green
	Transportation/transfer requirements	Yellow	Green	Green	Green	Green	Yellow	Yellow	Green	Green	Green	Green
	Infrastructure/ Land Requirements	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green	Green	Green
	Performance / Reliability	Yellow	Green	Green	Green	Green	Green	Green	Green	Yellow	Yellow	Green
	Cost	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Yellow	Green
Acceptability	Public acceptance (expected)	Red	Green	Green	Green	Green	Red	Red	Green	Yellow	Green	Red

v. Waste disposal options Evaluation

- Waste Management Plan is the most important tool in the management of waste from the oil and gas sector and should adopt all international principles and best practices. Some components of the WMP include the Senior Management approval, area identification, regulatory analysis, evaluation of options, selection practices, etc.
- Control mechanisms include legislation - Control mechanisms tend to be weak in developing countries. For example, some gaps were highlighted from the Iraq institution's presentations); institutional arrangements and capacity (human, equipment, technical resources), monitoring data, education, etc.
- There are numerous pieces of international legislation and guidelines which should be encompassed into the national system – for example the IOGP guidelines, International Finance Corporation EHS Guidelines for the oil and gas sector
- A system is only as good as the level of monitoring and supervision applied to it.
- Waste Management Plans should be designed and approved before any site activity begins. It aims to improve efficiency, reduce illegal disposal of waste, increase environmental awareness and maximize environmental protection
- A company's WMP is the key to managing and overseeing their operations.
- There are many treatment and disposal options – the ones selected will be a function of waste characteristics, availability, and cost

Due to the variety of wastes generated by the oil and gas sector in Iraq, a variety of disposal options would be needed. The choice will also depend on feasibility, availability, and affordability. The following waste management disposal and treatment options were discussed:

- **Landfilling** - should be divided into internal cells for the disposal of different types of waste.
- **Landfarming/Bioremediation** - a low-cost technology involving controlled & repeated application of wastes to the soil surface and which promotes the microbial breakdown of hydrocarbons; a technique for reducing the concentration of oily,



hydrocarbon-rich wastes and which is often used for treatment of WBDMs, oil wastes and cuttings. Factors to consider when choosing biological treatment options include regulations in place, soil conditions on site, type of wastes (should be biodegradable), availability and cost, and whether cleanup target levels can be met

- **Incineration and thermal desorption** - two main types of thermal technologies and high-cost solutions which apply high temperatures. Incineration is an appropriate option for materials such as medical waste, solid waste refuse and some types of waste from O&G exploration/production activities.
- **Chemical treatment** options include neutralization, solidification/stabilization.
- **Slurry re-injection** involves the disposing of drilling-waste in hydraulically generated fractures deep beneath the Earth's surface.

### Use of Declaration System / Trip-Ticket

#### Waste Description / Declaration Form

<b>1. Client Details</b>		<b>2. Waste Details</b> (please provide analysis if available)	
Name:		Description:	
Address:		Physical form: Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Sludge <input type="checkbox"/> Multiphase <input type="checkbox"/>	
Tel:		Quantity & Frequency: Bulk or drummed <input type="checkbox"/> Container type & size	
Contact:		Process which produced waste & Waste producer	
<b>3. Material or classes of material likely to be present</b>			
Compounds		Compounds	
Flammable Liquid with Flash Point <21°C		Oxidizing Agents	
Flammable Liquid with Flash Point >21°C		Reducing Agents	
Subphates		Sulphide	
Ammonia		Chloride	
Formaldehyde		Fluoride	
Organic Liquid with Water Immiscible Layer		Wax / Greases	
Phenol or derivatives of Phenol		Metal powder / Finely divided metal	
Acids	Type	Amines / Amides	Type
Alkalis	Type	Organic Halogen Compounds	Type
Detergents		Glycols	
Antibiotics or Medicines		Fluorulating or Coagulating Agents	
Heavy Solids (Capable of rapid settlement)		Cyanide	
Asenics		Hypochlorite	
Sulphur Compounds	Type	Bioocides or Herbicides	Type
<b>Detail if any of the following metals are present in the waste: Supply Concentrations if known (ppm)</b>			
Aluminium	Copper	Molybdenum	Tungsten
Antimony	Iron	Nickel	Vanadium
Beryllium	Lead	Selenium	Zinc
Chromium	Manganese	Silver	Cadmium
Cobalt	Mercury	Tin	Other
Any other class of compound or substance that you would wish to draw our attention to:			
<b>4. Waste Composition</b> (Please insert waste composition as it will appear on any consignment or waste transfer note)			
H codes (Please include any H (hazard) codes associated with the waste or its components)			
Risk Phrases (Please include any R (risk) phrase associated with the waste or its components.)			

w. Use of Trip ticket/declaration system and sample of Waste Declaration form

### Day 3.

#### Group Exercises<sup>7</sup>

##### Scope and Summary

The objectives of the group work (GW) exercises were for participants to gain awareness of the types of hazardous wastes (including hazardous chemicals) that are generated in the upstream oil and gas sector, to reflect on current challenges/gaps regarding hazardous waste from the upstream oil and gas sector, and to discuss priority actions which can be taken to address the challenges identified.

<sup>7</sup> This training included two group work exercises - GW1 was held on Day 1 of the training while the GW2 took place on Day 3 of the training.

GW1: Using the sample table below<sup>8</sup>, participants were required to

- identify the main types of hazardous wastes that are generated in Iraq's upstream oil and gas sector – Listing what they consider to be the top 5 most hazardous wastes
- discuss whether these hazardous wastes are addressed or covered under the current national framework and under the BRS conventions
- Discuss existing national procedures and systems for classifying hazardous wastes/chemicals and identify strengths and challenges/constraints in the current procedures/systems in Iraq

GW2: Using the sample table below, participants were required to

- Identify the top 3 challenges in terms of hazardous wastes (including hazardous chemicals) in the upstream oil and gas sector in Iraq - being as specific as possible.
- For each challenge, discuss current efforts and additional priority actions which could be taken to address these specific challenges.

At the end, these exercises<sup>9</sup> aim to help participants to better understand the types of wastes generated from the upstream oil and gas sector and to identify priority challenges that need to be addressed to improve the environmental management of hazardous waste and chemicals in Iraq's oil and gas sector.

*Presenter :*

*Marisol Estrella, UNEP*



<sup>8</sup> The reference document used for this exercise was [Environmental management in the upstream oil and gas industry IOGP Report 254](#)

<sup>9</sup> Participants were divided into 4 groups consisting of representatives from each institution represented. See Annex 5 for each team's output of the group work exercise. For the second group work exercise, participants were divided into 3 groups based on each institution represented (Ministry of Oil, Ministry of Health and Environment and National Oil Companies)

Type of hazardous waste (including hazardous chemicals) generated in the upstream oil and gas sector	Covered under national laws/regulations?  • Yes or x No If yes, specify if possible If unsure, mark unsure	Covered under the BRS Convention?  • Yes or x No If yes, specify if possible If unsure, mark unsure
1.		
2.		
3.		
4.		
5.		
Current national procedures/systems for classification of hazardous waste	Strengths	Challenges/constraints

**Sample table Template used for Group work exercise I**

Top challenges/gaps with regards to hazardous wastes/chemicals in the upstream oil and gas sector in Iraq  Please be specific!	Current efforts to address this challenge	Additional priority actions needed Please be specific !
1. e.g. lack of comprehensive data inventory on hazardous wastes in the oil and gas sector in the country		
2. e.g. lack of national chemical strategy		
3. e.g. overlapping institutional mandates regarding XX , XX.....		

**Sample table Template used for Group work exercise II**



### **Results of Participant Assessments**

Prior to and after the training, UNEP carried out a baseline and final knowledge assessment<sup>10</sup> using a set of “exam” questions (24 questions in total), which was one way of evaluating the improvements in knowledge attained as a result of the online training. The set of questions (multiple choice or open responses) was primarily based on the technical presentations delivered during the online training session. Responses were in multiple choice or true/false responses..

It should be noted that this type of written assessment only provides a partial assessment of the knowledge of individual participants to help in the evaluation of additional knowledge gained during the training, through group work discussions and direct interactions with their peers and training experts. Hence, it is important to view these assessments together with participants’ own evaluation of the training, and whether it met their learning needs (discussed further below).

Of the total number of participants (39), 27 were able to complete both the baseline and final assessments, while others were unable due to previous engagements. Participants who took both the baseline and final assessments registered a 9% average improvement in their knowledge of chemicals and hazardous waste management in the oil and gas sector. This may be due mainly to language constraints, as the assessment was only in English. Of the 27 people who completed the baseline assessment, the average score was 61%. Of the 32 people who completed the final assessment, the average score was 70%.

<sup>10</sup> Due to the time constraints, as the training was delivered online, participants were required to take the baseline knowledge assessment before the training as a prerequisite to attending the training. The final knowledge assessment was performed online on the final day of the training.

## **Results of the Training Evaluations**

UNEP provided the opportunity for participants to evaluate the training based on their own expectations and learning needs. 35 participants in total completed the evaluation.

The majority of participants gave scores of 3/5 or 4/5 for meeting the set of learning objectives outlined by the training. Participants were also asked to rate the extent to which individual sessions (1-6) met their individual learning needs (score range of 1= not met to 5=fully met). Most participants scored each Session 3/5 or 4/5.

When asked to rate their experience of having the training delivered online in an in-classroom setting, 14% of participants rated the training as 'excellent', 34% rated the training 'highly satisfactory', while 46% rated the training as 'satisfactory' and 6% rated 'needs improvement'. When asked to rate their knowledge after this training 50% indicated they had gained significant new knowledge about the topic while 44% indicated they gained some new knowledge about the topic and 6% indicated they were unsure. When asked to rate their overall satisfaction with the training, 6% of participants rated the training as 'excellent', 48% rated the training as 'highly satisfactory' while 42% as 'satisfactory' and 3% indicated 'needs improvement'.

Participants appreciated the participatory/interactive training approach. Some participants wished to have a more extended training to have more time for discussions, team activities as well as preferred in-person training with field visits.

Participants also gave feedback to be considered for future improvement of online trainings. Some of the feedback comments included continued training or in-person training to apply knowledge acquired, inclusion of field visits and more case studies, as well as need for translation of training materials and better internet connectivity (see Table 3).

Future considerations for improvement include:

- greater time allocation for Question and Answer/comment session or possibility of extending duration of training with an additional day in cases where training is half-day each day, to provide more time for discussions and clarification from presentations
- translation of presentations and training documents to participating country's language, Arabic in this case

For further details of evaluation results, consult Annex 2.

## Annex I. Participants' Questions/Contributions and Experts' Responses

Participant Name/Institution	Questions/Comments	Responses from Experts
<p>Mohamed A.Najemalden</p>	<p>For the drilling of water-based muds, there is about 93% of it released into the environment. What are the tests that are made for the muds, whether oil-based or water-based, and what are the mechanisms for the reuse of the muds? Are they costly, and even possible?</p> <p>Follow-up by Marisol: Is it up to the operator to be testing their waste streams before deciding what to do with the used muds?</p> <p>Why use oil-based muds if they're worse for the environment compared to water-based muds?</p>	<p>Mike Cowing: This is still a very young industry and tends to be a very regulated sector on national and international levels. When there is a proposal to do oil exploration activities, licensed companies need to produce environmental and social assessments and table a waste management plan. Things will need to be prepared already at the planning stage. There is going to be a combination of muds, including synthetic-based, used as pressure increases with depth. Everything is documented and known, so regulators are working from a position of information. Then, it is the regulator's responsibility to ensure compliance for corporations and to evaluate what they are doing with the waste muds, how they are being transported, and how they are being treated. Typically, water-based muds could go to different types of landfills for disposal, and in the end they should be left as a non-toxic material that could be reused in different ways or deposited into a landfill. Evaluation can be done based on the toxic matrix which is based on the chemical's composition, and then they can be disposed of accordingly. Because the fluids are expensive, the muds will be repeatedly reused. As they come up from the well, they will be separated over shaker plates to remove the cuttings for disposal. The muds themselves can be held in holding tanks and reused as long as they are still chemically available.</p>

		<p>Follow-up answer: The chemical matrix is what allows operators/chemical constituents/mud-makers to understand the composition of muds being used and made. Moreso testing is used on the operator side than the regulator side, on the cost of the operator.</p> <p>Oil companies would prefer to use water-based muds because they are cheaper, but they are not as efficient in deep wells due to the pressure. The well can potentially collapse inwards, so at a given temperature and pressure companies would have to change to oil-based muds. It retains its structural integrity and viscosity better, so it better transports cuttings up to the surface. If oil-based muds are not used in these situations, synthetic-based would be.</p>
	<p>As for the mechanism for drilling-waste muds, could you elaborate on how to properly manage the waste before it is disposed of? What are the on-site treatment procedures before the waste is sent to a final disposal location?</p>	<p>Mike Cowing: There are onshore vs. offshore considerations. Offshore there is very little treatment being done due to the lack of space, compared to on land. Whatever the waste products are, they need to be separated. Some of the pre-treatment on site could be going over shaker screens to separate solids and liquids. The cuttings themselves, depending on whether they are water or oil-based, could go for reuse (ie water is nontoxic so reused, whereas if the mud is oil-based it would need to be disposed of in a hazardous waste facility). Oil-based muds need to be safely set aside until they can be safely transported and stored. So apart from the pre-treatment segregation of solids and liquids, most is completed when transported on land.</p>
<p>Head Technician and monitor of chemical materials</p>	<p>There is much monitoring for the import of materials with regard to their physical and chemical characteristics and effects. What happens when these characteristics change during import?</p>	<p>Mike: The operator must train the workers, including through translations, on how to properly monitor these characteristics through the process.</p>

	<p>Is there an approval document other than the MSDS that is electronically written that could mention if the products are toxic, etc? What is the international document for this? Sometimes there are changes in the nature of the specific chemicals that the MSDS refers to, but this is not always captured. Also, is the MSDS recognized internationally?</p> <p>Follow-up by Marisol: Who produces the MSDS sheet?</p>	<p>Yes, MSDS fundamentally are used and displayed at work sites, staff need to be trained with regard to them by the employer and it is the employer's ("operator's") legal responsibility to do this and to regularly update the MSDS.</p> <p>Follow-up response: MSDS' are being produced by the manufacturers of the chemicals. It is a requirement that every shipment of chemicals are sent with MSDS, through transportation, to the site, and all the way to the user. Thus, it moves and changes responsibility depending on which part of the chain it is in, from cradle to grave.</p>
<p>Head of the Ministry of Petroleum</p>	<p>Regarding waste management and when signing with a partner in an international field, what are the procedures taken in European countries to know if waste management plans can be presented before development plans? The plan would be presented by the operator before the drilling begins, and I wanted to make sure when to present this, and if that is standard in all of the contracts, or is each contract different? (When is the waste management plan produced and given to the operator at the development stage?)</p>	<p>The waste management plan has to be produced up-front. No activities can take place until the plan has been produced, reviewed, and approved. It is made at the same time as ESIA (environment and social impact analysis). They need to operate from a position of knowledge and will know in advance how many spent fluids are per meter, how many cuttings are produced, which chemicals will be used, what the chemical waste products will be, etc. A very detailed document by the operator is approved by the regulator. Often, international companies have lots of resources and support. Usually there is an imbalance with environmental ministries that are not as developed, and companies exploit government branches by being too ambiguous. Companies should be as specific as possible in naming exact locations for waste disposal, etc. There are different processes for transportation, if the disposal mechanisms are being imported for usage, etc.</p>



	<p>What are the permitting conditions and how are they undertaken/carried out?</p>	<p>The responsibility to produce these documents comes from the oil company that seeks permits to work. They need approval and have other responsibilities to fulfill, such as conducting ESIA. Waste management is part of an ESIA. Companies will employ national environmental and social experts from academia to review the ramifications, details, etc, tailored to each environment and location. Environmental regulators, usually under the Ministry of the Environment, then review the documents and issue the permits and standards. The Ministry of Petroleum would allow the permits, but would also work with the Ministry of the Environment for making sure there is compliance, and that other environmental issues are taken into consideration. Normally this is conducted at the cost of the operator. Health and safety conditions are also set within permitting guidelines.</p>
	<p>In regard to the inter-ministerial database that was designed, what type of system did you use, what is the database, and what does it contain?</p>	<p>It is a committee that supervises the transportation of waste. The delegate reports to the Ministry.</p> <p>Chemicals, excess chemicals - and any information generally related to chemicals starting from the ordering phase to storage - are noted in monthly reports that are created regarding storage locations and updates. If anything isn't functioning it's all under the Petroleum sector.</p> <p>Yvonne: There is a lot of information about wastes included in the Basel Convention guidance and national reports. For the amount of wastes generated, the Basel Convention provides some aspects but not all the classifications are there. There are amounts of wastes generated reported using the codes Y1-Y45, but the national reports do not necessarily include all the information. They are still waiting on a response from the</p>

		<p>ministry to not use materials that are waste. There is a need for governments' support to apply these strategies on the ground. Storage places for the waste are included in the Basel Convention but the delay in Iraq is due to the lack of resources.</p>
	<p>Mike Cowing to Saad Azeez's presentation (Ministry of the Environment): Much waste that is being discussed is historical/legacy waste. How did they end up in this situation, is it because oil companies have left their waste behind, or are they still operating and managing this stockpile?</p>	<p>Azeez: Wastes are divided into two parts, the legacy waste and the newly generated waste. For wastes generated before the 2003 incident/blockade, it was very difficult to have any kind of management of these wastes. The new registration after 2009 changed it a bit. There needs to be a plan for the control of it in a preliminary plan that would be monitored by the Ministry /environmental ministry.</p> <p>Also, IOCs are in charge of dealing with the wastes. Historical wastes are there because operations were done without licenses previously. It is the responsibility of the operator to deal with the waste from cradle to grave and not the government's responsibility.</p>
	<p>Mike inquired about the model Russian group: What are they viewing specifically? What are the processes they're using? Follow-up by Mike: What technology specifically are they using?</p>	<p>The standard contract and agreement between the IOC and the operator is that the operator handles the waste. The historical waste needs to have some funds because the waste is legacy waste and needs to be managed in a sound manner. In regard to the Russian company, they work in an oil field that they visited to review the treatment and separation of wastes. They have storage tanks and treatments (using lined tanks, separation of waste).</p> <p>Follow-up: Mostly biological treatment.</p>
<p>Ahmed Abbas, Oil projects company</p>	<p>What happens when naturally-occurring radioactive waste streams arise from drilling activities? Is this covered under</p>	<p>Yvonne: The Basel Convention excludes radioactive wastes, which does not fall under the scope of the Convention. The BRS</p>

	<p>the Basel Convention or allowed under the Convention to be returned to the producer?</p>	<p>Secretariat cooperates with the IAEA in Vienna which handles radioactive material at the international level to ensure smooth implementation of all relevant international agreements. Check with national legislation as well for provisions on how radioactive wastes are dealt with.</p> <p>Based on industry best practices, participants indicated that there is a high degree of reuse of materials because of high costs, and usually there is a 'take-back' clause in contracts. It should be known in advance if a type of rock that is being drilled into would have NORM occurring, and the company would then make a provision for its disposal (and safe long-term storage). This would be completed before the drilling process begins. Then, the company needs to ensure that this waste will not be mixed with other types of wastes. The National Authority for NORMs is a separate entity and operators would comply with this as well as national guidelines.</p> <p>Having a Waste Management Plan is therefore key. There is the issue of waste that is not readily identified as radioactive and there are difficulties in identifying them. There should be a form of strategy for situations where there is radioactivity and to conduct possible random tests. There have been situations where wastes were identified as radioactive at the receiving country that had not yet been identified as radioactive. WMP should be shared with the appropriate Nuclear entity to identify proper measures to be taken.</p>
	<p>Difficulties with the export of hazardous wastes with Bloc oil company in Basra (via Basra port), since many countries did not respond to the notification letter and received no</p>	<p>Yvonne: There are various channels for communication in the case of such difficulties:</p>

	<p>response. Response within 60 days is required by the Basel Convention. What measures can be taken to dispose of these wastes and help in case no response is received? Countries have national legislation covering restrictions for irresponsible disposal of wastes - does regulation prevent the import of hazardous wastes, or solely regarding trading of hazardous wastes?</p>	<ol style="list-style-type: none"> <li>1. Inform that you are having difficulties in communicating with Parties; email the BRS secretariat to support with verifying contacts.</li> <li>2. In case of transit, there is Guidance from the Basel Convention implementation and compliance committee that may be of assistance to challenges. There is information on the Basel Convention website about Parties that report that they do not require consent for transit, in which case the transboundary movement can proceed 60 days after notification.</li> </ol> <p>There is also the Basel Convention Ban amendment and Parties can decide to put in place import prohibitions or restrictions. This enables Parties to decide on which wastes they wish to receive, intended to prevent wastes being exported to countries without the capacity to manage them in an environmentally sound manner. A notification of a decision of import prohibition triggers an obligation on the state of export not to export those wastes.</p>
	<p><b>Any forms of contracts for countries interested in having an agreement with those countries not signatories to the Basel convention.</b></p>	<p>There is no set format for the agreements or arrangements between Parties and with non-Parties under Article 11 of the Convention. This would be for the contracting states to agree on although there is guidance within some of the documents on the Basel Convention website<sup>11</sup>.</p> <p>The issue of insurance bonds and guarantees should be put in place in case things do not go according to plan. Practical manual is in existence and can be referenced but no formal contract example can be provided.</p>

<sup>11</sup> <http://www.basel.int/Implementation/Publications/GuidanceManuals/tabid/2364/Default.aspx>

	<p>Do countries not signatories to the Basel convention have to abide by the convention for transit countries?</p>	<p>Non-Parties are not bound by the Basel Convention. However Parties have an obligation to not allow exports to or imports from a non-Party unless there is an agreement or arrangement in place that provides no less environmentally sound provisions that those of the Convention (Article 11) In the case of transit through non-Parties, there still needs to be a notification although consent is not required prior to the transboundary movement.</p>
	<p>What is the meaning of refinery waste oil? Part of the recycling options is to use it in cement factories, does it mean conversion to fuel? There is no air pollution control unit in Iraq, will this not cause more air contamination due to the high metal content? Part of the Iraq decree 2015 mechanism was set for handling empty drums to dispose of lubricating oil (washed 3x with surfactants, the liquid collected and discharged to industrial water treatment plant), what are your thoughts on this mechanism?</p>	<p>Yvonne: The technical guidelines were adopted in 1995. The classification in the guidelines refers to “any semi-solid or liquid used product consisting totally or partially of mineral oil or synthesised hydrocarbons (synthetic oils), oily residues from tanks, oil-water mixtures and emulsions.”. The Stockholm Convention is based on a similar definition. It is important to look at the national implementing measures and the facilities available, in particular what capacity there is. It is important to ensure that the generation and release of further emissions are avoided. Look at other options within the guidance to identify suitable disposal options. Mike added that in relation to Cement Kilns - this is a scientific topic under debate. Ensure all due processes are in place for control of emissions. The design and operation of the kiln, the high temperature which is higher than normal incinerators, and longer residence time are some of the attractions of using cement kilns. The guidance does not go into specific details and it is great to see that Iraq has taken steps to ensure that the discharge is managed properly.</p>

<p>Hasan Hashim, Ministry of Health and Environment</p>	<p>Regarding storage, it was mentioned that there should not be any mixing of oil waste. What does this mean, and what is the reasoning for this?</p>	<p>Yvonne: Avoid mixing because of risks associated with mixing of different chemicals or wastes. This could lead to adverse effects on human health and on the environment, and the guidelines stress the risks of these subsequent reactions in the storage containment.</p> <p>It would be for those experts managing the wastes to determine if mixing would be a viable solution and to assess the risks with such an approach based on the chemical properties involved and their reactions to one another.</p> <p>Mike: If you have a holding basin, the reality is that everything goes into these basins (sludges, wastes). In terms of legacy waste, there is a high degree of mixing going on (at least historically). Quite often with these waste lagoons you can get contractors to skim off the top layer of hydrocarbons for reuse, but having dealt with the liquids they would have also dealt with the sludges, which can be processed through bioremediation. If there is a high pH and salinity, then the bioremediation process becomes more difficult.</p>
	<p>Question regarding cross-border transportation. The Basel Convention is mostly guidelines for international transport, and domestic laws could be different. Do they need to apply Basel domestically/can they apply Basel as international regulations domestically? Will they need to update their forms nationally?</p>	<p>The Basel Convention depends on national implementing measures for its effective implementation. The Basel Convention covers transboundary movements but often Parties adopt measures covering both internal and transboundary movements of wastes. There are forms adopted in the context of the Basel Convention but the details within the country would be determined by the national legislation and other measures.</p>
	<p>Questions regarding the Egypt presentation:</p> <ol style="list-style-type: none"> <li>1. The sources of PCBs come from steel, copper, and textile factories. What about electric power plants and</li> </ol>	<p>Abdul-Hakim (BCRC-Egypt experience):</p> <ol style="list-style-type: none"> <li>1. Regarding transformers in electric power plants - this part has been applied in phase 2 of their project. Phase</li> </ol>

	<p>distribution plants that are the main ones for PCBs? Why are they not mentioned as a polluter source if they are a primary source?</p> <ol style="list-style-type: none"> <li>2. Is it possible, in the case that the transformer is not harmful, to be emptied from the PCBs and filled with cooling oils (types produced after 1984 that are eco-friendly). Can they be refilled with other oils?</li> <li>3. Can these PCBs be incinerated in hazardous wastes at temperatures of 1200C on the condition that they include air pollution treatment solutions (or in cement kilns, could be mixed with wastes, need air pollution controls and electrostatic controls monitored)?</li> </ol>	<p>1 included a number of power plants and factories, Phase 2 was the rest of factories and plants that include such transformers. The same disposal methods were followed.</p> <ol style="list-style-type: none"> <li>2. Regarding transformers that are not harmed and still in operable fashion, there was an objection to this. Whether effective or not they are indeed contaminated with the PCBs and should have been disposed of. Ground tarps provided as protection from barrel spillage and PPE usage are all important in the disposal process. You cannot take the PCB oil contamination and use them otherwise, and the transformer is indeed still contaminated.</li> <li>3. In Egypt, they can send oils to cement-kiln incinerators, but there are risks because the existing cement kilns are in residential areas and not in suburban/desert areas. The urban sprawl has expanded to these and could be potentially dangerous for residents, so the recommendation has been to export the waste. If they had the technology, they would not need to send the waste abroad unless it does not have these methods for sound disposal of such wastes. (Said Egypt could export it since their processes are not sound anymore).</li> </ol>
	<ol style="list-style-type: none"> <li>1. Regarding the license for the TBM of hazardous waste: did you have any difficulty regarding the licensing from the transit countries? Iraq has experienced issues in transit countries. How did Egypt overcome this issue?</li> <li>2. What were the internal safety procedures until the shipment arrived in France (for disposal)? What are some of the measures to follow to help the hazardous</li> </ol>	<ol style="list-style-type: none"> <li>1. Abdul-Hakim: Regarding the licensing and responses to notifications of documents from transit countries, the project that they implemented actually had all of the information laid out and they had connections with the Ministry of the Environment in each of the transit countries. The authorizations then were ensured and very organized. When originally notified with the PCB content percentage, it was refused (or the shipping</li> </ol>

	<p>waste transportation process? What should be done for safety, what types of equipment are to be used for transportation? Could you elaborate on issues of customs and the environment, particularly at borders? Are there classifications at borders on wastes and what are the roles of the environmental ministries?</p> <p>Mike follow-up: Who were the generators of the waste, was it invariably small-sector industrial units or the government sector? Depending on this, who paid for it, the government? What was the total cost (maybe say cost per ton)? Was the Nasreya site in Egypt deemed appropriate for this waste? Why could it not be incinerated at the Nasreya site?</p> <p>(Regarding the Nasreya treatment and disposal facility in Alexandria, Egypt.)</p>	<p>process was refused on the way to) in France. The shipment was sent to Spain instead. It is very common that transit for a shipment to be refused, this is a sovereign issue of transit and destination countries, so the Basel measures are applicable between two jurisdictions but not for the shipment internally within the same country.</p> <p>Regarding shipments, there were many organizational measures regarding the national security team, etc that assigned times for transportation (to ensure that there were no heavy winds to overturn the vehicles, nor high temperatures for reactions within the drums, that the roads have low traffic, etc). All of it is extremely detailed. Would be done through a roundtable with all stakeholders involved.</p> <p>There is a mechanism for customs and the Ministry of the Environment through electronic channels. Secured communication channels and with the environmental police are used.</p> <p>Abdul-Hakim follow-up: Project was under the public sector and it did not include any private sector companies. Regarding payments, Egypt did not pay any costs because the project was funded by the international environmental fund, so the government did not pay anything for the disposal. Not sure of the cost per ton. Regarding Nasreya, the type of waste from this project could not be buried safely, and it cannot be buried right away. After processing, some of the waste from the project could be buried, but the management in Nasreya would have</p>
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		<p>refused as burying this type of waste would not be environmentally safe. Therefore, burial was not a good method in this case. Cells for the burial were full. A different burial center may be developed in Nasreya for other types of waste in the future. Regarding the components of the PCBs in the oils - the incinerator could not get rid of these completely nor avoid contamination, therefore they could not use it. The temperature could not get rid of all the waste.</p>
	<p>Chi: Referenced the case in Lebanon where they try to import and export the same amounts of wastes and always have a running list of them. The list is very efficient in seeing what is entering and exiting the country. Does Egypt have something similar?</p>	<p>Abdul-Hakim: The procedures are the same themselves, though a bit different. There are maps etc on customs, how to organize wastes, prepare them according to the international code, etc.</p>
<p>Environment Department</p>	<ol style="list-style-type: none"> <li>1. Activated carbon and ionic exchanges as hazardous waste - is it considered a hazardous waste in general, or in certain situations when activated? When absorbed, it should not be hazardous. Also, what if something has expired ionic exchanges, does it depend on the processing?</li> <li>2. In some of the oil institutions, there are accompanying gases. Could it be said that some of it is not hazardous, but it is hazardous in certain situations? Can you produce a gas that absorbs humidity? Not sure for what composition.</li> <li>3. In some cases they have plastic drums that have solid materials, whether in granules or otherwise. These solid waste materials can be put in plastic bags, and the plastic bags to prevent the drums from becoming contaminated. How do you classify the drums when highly hazardous products are sequestered into individual bags?</li> </ol>	<p>Ayman (BCRC-Egypt presentation):</p> <ol style="list-style-type: none"> <li>1. Activated carbon is used in production and processing that is followed by distillation and for other hazardous chemicals. Activated carbon is hazardous after being absorbed. When talking about the resin that comes out of the ionic change, it is right that it is not “hazardous”, unless mixed with other hazardous chemicals in the ionic exchange process.</li> <li>2. These materials can become hazardous. Through the agreement with the concerned authorities, try to diagnose what material is causing it through the safety data sheet they have (identification of the hazardous material). Look at how to store it temporarily and then how to dispose of it permanently.</li> <li>3. The drums component is a very good consideration. The plastic bag inside of the drum could become torn etc, compromising it. There can be other forms of leakage.</li> </ol>

	<p>4. Can expired pesticides be reused for their chemicals?</p>	<p>Therefore with the drum, the plastic bag could become hazardous. The drum is then considered contaminated and there is no guarantee that cleaning it would remove all the hazardous material.</p> <p>Egypt has experience with the Petrochemical Alliance (under the government/under higher education and the Ministry of Petroleum). They brought specialized machines to evaluate the used drums and looked at how they could be reused in other methods than food.</p> <p>4. Disposing of pesticides is not easy and the chemicals are hard to handle. They sent directions to all the companies from those specialized in dealing with pesticides waste. Companies spray the site without leaving traces of chemicals, and there is no problem in having any pesticides in their companies.</p>
	<p>Follow-up by Mike on treatment and disposal of waste in Egypt: What emission measures are being taken? Is the atmospheric discharge from the kilns being calculated and monitored? What monitoring regime has been applied?</p>	<p>Ayman: They look to companies to help give them outputs, for transformers etc and in alignment with environmental authorities. The amounts do not exceed 1-2 tons in one of the companies, calculated by the environmental authorities. Three companies are specialized in collection and controlling of wastes and work with the environmental authority. They have the equipment to review solid waste and POPs, and oil in transformers. Some things can be reused. They try to monitor the emissions through environmental impact studies, to know all the inputs into the factories, and to control contaminants in the air (notably for chimneys and incinerators).</p>
<p>Marisol:</p>	<p>Does Iraq not have a national chemical strategy/policy?</p>	<p>There is not one, though there is an overlap with a different terms of reference.</p>

	<p>We saw how Egypt has classified wastes from waste streams and the criteria to do so. In Iraq, could you elaborate if there is a classification of different types of waste in the oil and gas sector, and does a national repository exist?</p>	<p>There are some controls to classify the hazardous materials depending on flammability, toxicity, and radioactivity. They do not have the data on the current waste streams.</p>
	<p>For the clarification, in the case of a lack of a national strategy for the treatment of waste in the O&amp;G sector in Iraq, and a lack of information submitted to the Ministries, what occurs? What about submission of waste management plans?</p>	<p>The Ministry of Health was requested to run an assessment on this and they are in the process of doing an inventory, in order to build a waste management strategy.</p> <p>There is some repository on chemical waste in the Ministry of Health. The database is being updated every year. Iraq is a Party to the Stockholm Convention and Iraq has transmitted and is implementing its national implementation plan as required under the Convention. They found a lot of gaps from this assessment, so they would like to have assistance from the BRS Secretariat.</p> <p>Marisol encouraged the different ministry departments to work together to help bridge gaps.</p>
<p>Mike inquiry to the group</p>	<p>Mike: Does Iraq have the necessary waste management facilities? Or do they not have the facilities, leading to legacy waste and waste exportation? Is Iraq satisfied with the level being achieved at these sites run by private organizations? Is the best technology being used?</p>	<p>Companies in charge of waste management plans are in charge of the waste sites. They are not necessarily in touch with the Ministries. Temporary approvals by the Ministry of the Environment can be made. Regarding the waste collection, there are no specific sites for the Ministries.</p> <p>There are bioremediation processes. The treatment is not sufficient and Iraq needs thermal treatment or technology that is more updated. Northern oil companies have also invested in oil companies as investment fields rather than service fields, thus treatment is included.</p>

	<p>What have we learned on Day 2: the relationship to the Basel convention and what can be done; more information on the treatment options and how to supervise and monitor these treatments; and equipment to be used to ensure that they are in compliance.</p>	
	<p>Clarification on the process of reinjection: should the water be treated before reinjection, or does that lead to contamination?</p>	<p>Where it is feasible to do it, the reservoir is very deep, deeper than groundwater, with little risk of contamination. The geological conditions have to be right for this to happen - in a rock that will not be easily cracked, and it is done to increase the pressure in the reservoir rock so that the hydrocarbon can come out, but this is challenging. There is no need to pretreat the produced water before reinjection. The bedrock should be appropriate; for muds/cuttings they are usually ground into a slurry so it is good for pumping down the well and should not be done on a trial basis.</p>
	<p>How can the clays be treated in a safe way and what is the context in which they can be used?</p>	<p>Discussed ways to: allow underground injection of water solutions as they can be directly injected. Slurries need to be broken down more since they can have particulate matter and other drilling cuttings need to be disposed of properly.</p>
	<p>Comment was made by the Ministry of the Environment following up that they helped with the bioremediation project in Northern Iraq. Issues came up due to Covid-19 that led to a delay in the project. There were five different components, including different types of fertilizers, that were used.</p>	<p>Mike followed up that community bioremediation in and around the sites themselves is another consideration, therefore bioremediation components would not need to be imported from other countries. Can be reused for agricultural purposes, remediate the in-situ oil. If agricultural fields are the things damaged by hydrocarbons, it takes much longer for a safe bioremediation, though it is possible.</p>

	<p>Mike inquired if bioremediation products were exported? Known sets of wastes (muds, drill cuttings, etc) can be categorized, coded, and later referenced.</p>	<p>Iraqi team followed up that not always; the waste generator incurs the cost.</p>
	<p>Regarding environmental NGOs and audits by non-governmental bodies, can you talk about the unlawful trade in hazardous wastes and what stricter procedures could be followed to prevent this?</p>	<p>Yvonne: Some countries have third party certifications including by NGOs and useful information can come from them, but the national circumstances determine what kind of infrastructure is set up in relation to such certification and the role played by various stakeholders. There are efforts at the international level to create networks such as the Basel Convention ENFORCE and others set up in the context of the World Customs Organisation for custom authorities. You can work in partnership with the private sector and the government as well as to have communications to support this, to ensure the illegal trade of hazardous wastes are stopped or prevented. The Secretariat has the mandate to help on request in identification of these cases, they look for experts to help and link two states together. <a href="http://www.basel.int/Implementation/TechnicalAssistance/Partnerships/ENFORCE/Overview/tabid/4526/Default.aspx">http://www.basel.int/Implementation/TechnicalAssistance/Partnerships/ENFORCE/Overview/tabid/4526/Default.aspx</a>  Dialogue with impacted communities is important; engagement and building relationships is needed and if you marginalize them they will be more agitated as they would not have a role to play.</p>
	<p>Bioremediation and the trend of nature-based solutions when combating climate change. Some treatment methods were adapted to the environment, such as how Japan used bamboo treatments that were successful because they relied on local and cheap remediation methods. Regarding Iraq, the palm tree is abundant. Mike - do you think these branches can be used for bioremediation processes? Could they</p>	<p>Mike: Had briefly discussed leachate treatments. Some were like reed treatments with leachates and heavy metals could be removed out. Using natural, local sources for bioremediation are absolutely helpful (ie such as with mangrove restorations) and encouraged, so yes.</p>

	reduce the amount of soil used? In honor of the “Think global, act local” mantra.	
	<p>Mike had an inquiry regarding shifting oil waste from government oversight to private companies handling it. Or rather, is it the Ministry undertaking the disposal?</p> <p>Sounds like disposal should be done under the operator rather than government.</p>	<p>Azeez (Ministry of the Environment): Issue with licensing. There is a contract between the Ministry of Petroleum and IOC, Article 41 to protect the environment which makes it mandatory for the operator to collect the waste (in a temporary fashion). The Ministry oversees this.</p> <p>Operators put out the plan for waste management and ESIA. The Ministry then gives approval if the plan is comprehensive and has a part about waste management, treatment, and disposal. Operator manages the waste.</p> <p>The operator can also do contracting of another company to properly dispose of the waste.</p>
Marisol:	Which Ministry is currently in charge of hazardous waste/management?	Ministry of Oil. For the mandate on waste, it is part of the Ministry of Health and Environment.
Mike:	Regarding an oil company’s responsibility for disposing waste, is this done themselves or done through a third-party contractor? Do they need to be national contractors, or can they be international ones with more expertise?	In Iraq, it has been given to international contractors before. This has been done, the contractor just needs to be registered in Iraq and abide by the Ministry of Environment and Health rules.
Yvonne:	Any updates for new strategies? In regard to the one referenced.	Yes, the first one included capacity building, legislation, regulations etc. Was once mostly on legislation regarding environmental aspects, not as much on dumping legislation. Every year they conduct workshops on waste and may rely on the previous strategy but need to update it as some of the components from the previous one are outdated.

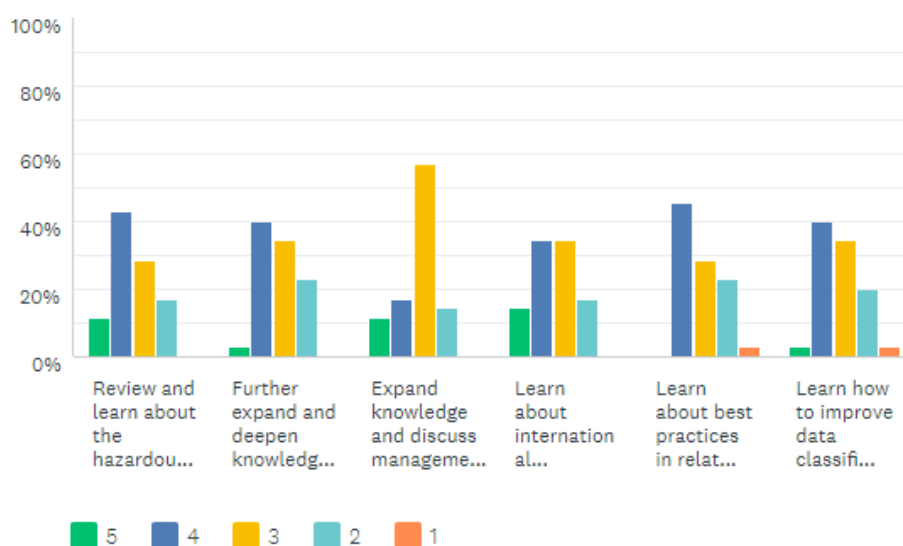
<p>Mike guidance:</p>	<p>Conduct a review of the law and enactment of stricter penalties for polluters and better environmental compliance monitoring on site.</p>	
	<p>Does reduced water from crude oil treatment need processing or is it ready for transportation?</p>	<p>Mike: If the produced water is injected many kilometers below the Earth's surface, then it does not need much processing. For shallow reinjection, then absolutely anything reinjected needs to be treated at a much higher standard. Case by case basis is to be made to evaluate impacts.</p> <p>Crude oil is saline and should be mechanically treated before reinjected into the wells or used for further purposes.</p> <p>Mike asked for clarification regarding crude oil treatment.</p>
<p>Ahmed Abbas, Oil Projects Company</p>	<p>One of the mandates is to establish oil storage and pipelines during construction, and for inspection requirements to use hydro-test techniques. Water in very large quantities is added to a toxic substance which is a corrosion inhibitor to be mixed with the chemical substance. They will try to reach the best treatment method which will not harmfully affect the environment.</p>	
<p>Husam A. Hashim Environmental Engineer Oil Pollution Sub- Department Ministry of Health and Environment</p>	<p>Question about the validity of OBDM. If there is a drilling mud that has been treated, as the operator claims, and they accumulated these muds in an open yard for approximately 8 years for now, and the operator wants to dispose these muds, and we took samples from it to test it and compare the results with the standards to determine whether it was treated properly and it is not considered as a hazardous waste, then my question is: how long is the validity of these samples to make tests on them before they are no longer valid?</p>	

## Annex 2. Detailed results of Participants' Training Evaluations

The majority of participants gave scores of 3/5 or 4/5 for meeting the set of learning objectives outlined by the training.

Table 1. Participant Rating of Learning Objectives Met (score range of 1= not met to 5=fully met)

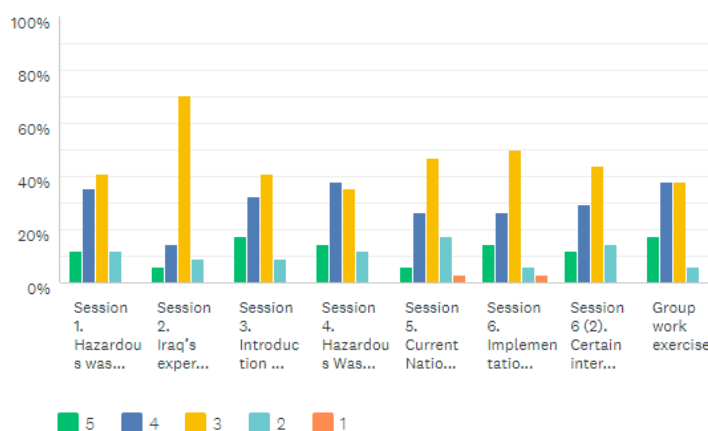
Answered: 35 Skipped: 0



Participants were also asked to rate the extent to which individual Sessions (1-6) including group work exercises, met their individual learning needs (score range of 1= not met to 5 = fully met). Most participants rated each Module 3/5 or 4/5 (Table 2).

Table 2. Participant Rating of each Module against their learning needs

Answered: 34 Skipped: 1

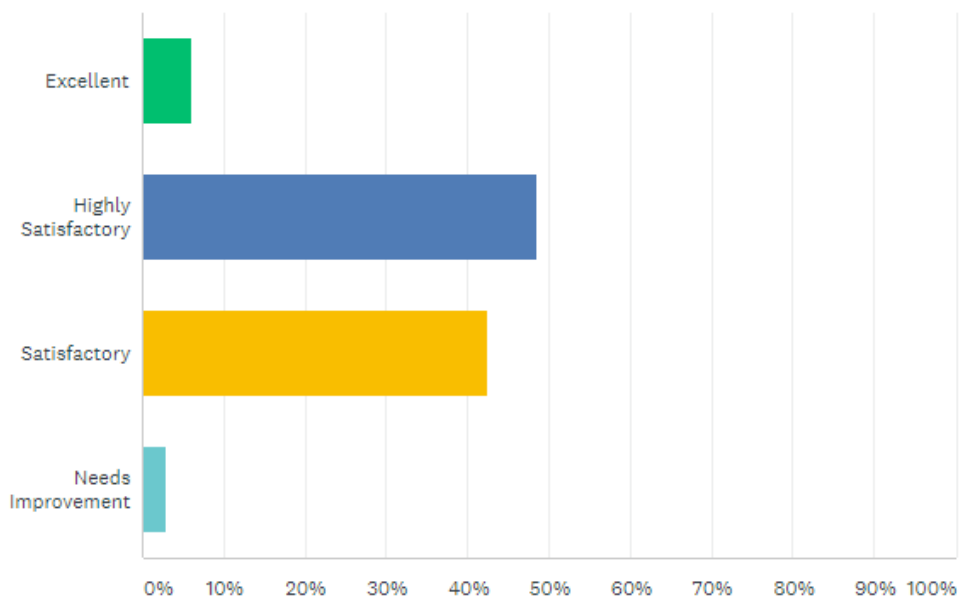


When asked to rate their overall satisfaction with the training, 6% of participants rated the training as 'excellent', 48% rated the training as 'highly satisfactory', 42% rated the training as 'satisfactory', and 3% indicated that it 'needs improvement'.



Figure 3. Participants' overall rating of training

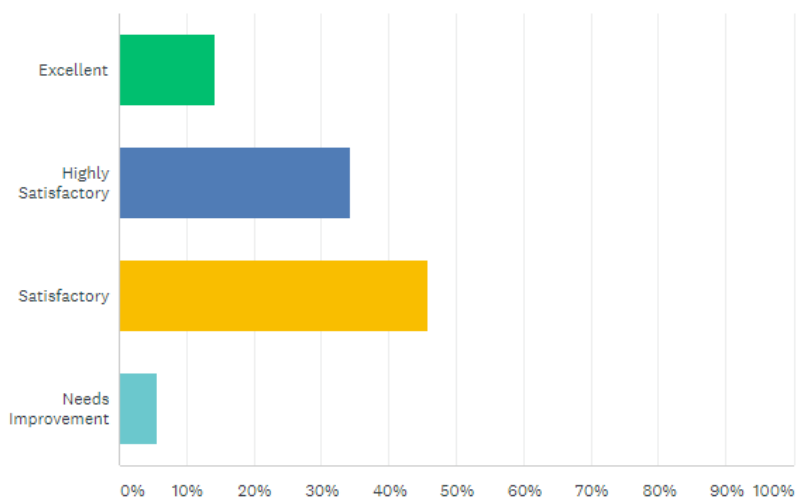
Answered: 33 Skipped: 2



Participants were also asked to rate their experience of having the training delivered online at the training venue in an in-classroom setting, and 14% of participants rated the training as 'excellent', 34% rated the training 'highly satisfactory', 46% rated the training as 'satisfactory' and 6% indicated that it 'needs improvement'.

Figure 4. Participant Rating of online training delivery in in-classroom setting

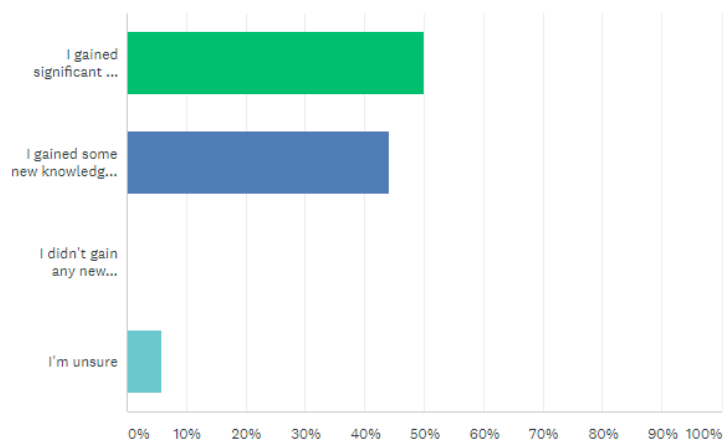
Answered: 35 Skipped: 0



When asked to rate their knowledge after this training (in terms of learning objectives of the course) 50% indicated they had gained significant new knowledge about the topic, 44% indicated they gained some new knowledge about the topic, and 6% indicated they were unsure.

Figure 5. Participants' evaluation of knowledge after training delivery

Answered: 34 Skipped: 1



Participants were also asked how they would apply knowledge gained from the training, and 58% indicated that they would share workshop materials with colleagues, 55% indicated that they would organize a follow up meeting to share knowledge with colleagues who did not attend the training, 61% indicated they would apply knowledge in identifying options for managing chemicals and wastes from the oil and gas sector, including classification of waste, 55% indicated in the review of chemicals and/or waste management plans or monitoring requirements submitted by operators, 27% indicated in the Develop / Review / Updating checklists to support National reporting for Conventions (Basel), and 36% indicated in the Review / Updating / further finalizing existing checklists and/or guidelines and procedures for implementing regulations related to chemicals and waste management for the oil and gas sector.

Sharing training materials with other colleagues	19
Organizing a follow up meeting to share knowledge and training materials with other colleagues who could not attend this training	18
Identifying options for managing chemicals and wastes from the oil and gas sector, including classification of waste	20
Review of chemicals and/or waste management plans or monitoring requirements submitted by operators	18
Develop / Review / Updating checklists to support National reporting for Conventions (Basel)	9
Review / Updating / further finalizing existing checklists and/or guidelines and procedures for implementing regulations related to chemicals and waste management for the oil and gas sector	12

Table 3. Participants' feedback on the training

<p>What did you like about the training? Which part of the training was most useful to you?</p>	<ul style="list-style-type: none"> <li>• The presentations related to Basel convention</li> <li>• All the training materials was useful, and the experts gave their knowledge to the participants in this field, but if I had to choose one, it would be the presentations of the experts.</li> <li>• Waste management plan and methods</li> <li>• Groupwork</li> <li>• Treatment of hazardous waste from oil extraction</li> <li>• Treatment method for oil and Movement PCB in Egypt</li> <li>• Treatment methods for oil wastes; Cross-border transport of PCBS waste</li> <li>• Learning about the international conventions</li> <li>• Waste management plan</li> <li>• Learn how to improve data classification and management</li> <li>• International conventions and discussions about chemicals transportation and handling.</li> <li>• BRS Conventions Implementation Instructions</li> <li>• Monitoring of treatment plant waste</li> <li>• Bioremediation process</li> <li>• I think it's not training because most people are experienced with this. It's an area for sharing information and Data</li> <li>• طرق المعالجات (Processing methods)</li> <li>• طرق معالجة المياه الصناعية (Industrial water treatment methods)</li> <li>• تعلمت مبادئ الاتفاقيات وكيفية التعامل معها بخصوص المخلفات الخطرة وطرق معالجتها (the principles of conventions and how to deal with them regarding hazardous waste and ways to treat it)</li> </ul> <p>Others responded 'all' or left the response blank.</p>
<p>Which session or part of the workshop did you find least useful, and why?</p>	<ul style="list-style-type: none"> <li>• MSDS</li> <li>• Regarding hazardous radioactive waste</li> <li>• تصنيف النفايات الخطره</li> <li>• knowledge about convention and hazardous waste from oil and gas operations</li> <li>• Hazardous waste management</li> <li>• Failure to mention inspection techniques for hazardous waste</li> <li>• Treatment Procedures- We were hoping that you would provide us with guidelines or references to evaluate the processing procedures to ensure that the processing companies are following the correct procedures</li> <li>• Waste treatment methods in Oil &amp; Gas Sector</li> <li>• Drilling mud treatment as it needs practical application and training on the job site</li> <li>• Evaluation of treatment for waste oil</li> <li>• الاتفاقيات الدولية لعدم وجود معلومات كافية عنها سابقا (International agreements because there was not enough information about them previously)</li> <li>• طرق معالجة النفايات الخطرة (Methods of handling hazardous waste)</li> <li>• Treatment of oil spills</li> </ul> <p>Other participants responded "none", "all was useful" or left the response blank</p>

<p>What challenges, if any, did you encounter with online training?</p>	<ul style="list-style-type: none"> <li>• In general, online events is a great way to share information, but it has this issue of not very good connection between the two parts, which make it somewhat difficult to deliver all what you are thinking, or even to ask questions in the way you want to, rather that it is a great way to connect.</li> <li>• time is short</li> <li>• Translation and sometimes power outages</li> <li>• ضعف الانترنت (weak internet)</li> <li>• عدم التطرق الى تفاصيل اكثر عن بطاقة بيانات السلامه (more discussions or information on MSDS)</li> <li>• Slow internet</li> <li>• Interpretation sometimes is not clear</li> <li>• معالجة التلوث النفطي</li> <li>• كان الانترنت في التدريب جيد (The internet in training was good)</li> </ul> <p>Others responded 'none' or 'good' or 'they were satisfied' with the training</p>
<p>What do you think could be improved?</p>	<ul style="list-style-type: none"> <li>• We need field training</li> <li>• We need face to Face training</li> <li>• We prefer face to face training</li> <li>• Actually, I believe if you let the participants pick their hotels and their meals, that would be better, while you pick the meeting venue.</li> <li>• I think the training was good and nothing needs to be improved</li> <li>• Add a practical aspect to the training</li> <li>• معالجة التلوث النفطي (Oil pollution treatments)</li> <li>• Practical training</li> <li>• More training and field work</li> <li>• Presentations and training materials in Arabic language</li> <li>• By Improving the internet and providing supplies for the success of the workshop</li> <li>• التركيز على العملي في الشرح (Focus on the practical explanation)</li> <li>• More case studies</li> <li>• need more discussion</li> <li>• Treatment of hazard waste</li> <li>• We need more workshops related to these conventions</li> <li>• Wastes management</li> </ul>

### Annex 3. Training Programme

## Training Programme

Time	Activity
<p><b>Pre-training preparations (Individual time requirement: 2 hours maximum)</b></p> <p>Nominated participants are asked to</p> <p>(i) fill in the Training Needs Assessment online survey <a href="#">here</a> before 21 June</p> <p>(ii) undertake an online baseline knowledge assessment <a href="#">here</a> by 28 June</p> <p>(iii) watch 1 lecture video which provides an initial overview of environmental issues related to chemicals and hazardous waste management in upstream oil and gas <a href="#">here</a></p> <p><b>Completion of pre-training assignments is also a requirement for obtaining a UNEP Training Course Completion Certificate</b></p>	
<p><b>29 June, Day 1, 2021</b></p>	
08:00	Participants log-in
<p><b><i>Introduction and Setting the scene: What is currently happening in Iraq?</i></b></p>	
08:30	<p><b>Opening Remarks</b></p> <p><b>Overview, platform orientation and introductions</b></p> <p><i>Marisol Estrella, UNEP</i></p>
09:00	<p><b>Session 1: Review and learn about the hazardous waste streams, including use of chemicals, generated in the upstream oil and gas value chain and key environmental and health concerns</b></p> <p><i>M J Cowing UNEP</i></p> <p>Q&amp;A and Discussion</p>
10:00	<b>Coffee/Tea Break</b>
10:15	<p><b>Session 2: Iraq's experience on chemicals and hazardous waste issues during exploration and production: Current status of chemicals and waste streams and current systems /procedures used for classification and inventory/data management</b></p> <p><b>Presented by MoO (20 minutes)/ MoE (20 minutes)</b></p> <p>Q&amp;A and Discussion</p>
<p><b><i>International frameworks and obligations under the Basel, Rotterdam and Stockholm Conventions: Overview</i></b></p>	

11:30	<p><b>Session 3. Introduction to the Basel, Rotterdam and Stockholm Conventions' international frameworks on the sound management of hazardous chemicals and waste</b></p> <p>Presentation from the BRS Conventions Secretariat</p> <p>Q&amp;A</p>
13:00-14:00	<b>Lunch</b>
14:00	<p><b>Groupwork on reviewing current systems/procedures for the classification of chemicals and hazardous wastes from the oil and gas sector, and identified areas for strengthening/improvement</b></p> <p>Groupwork presentations and plenary discussion</p>
15:30	<p><b>End of Day / Team reflections<sup>12</sup></b></p> <p><b>Participants log off</b></p>
<b>30 June, Day 2, 2021</b>	
8:00	<b>Participants log-in and continue working on their Team Reflections if needed</b>
8:30	<p><b>Participants led Recap of Day 1</b></p> <p><b>Online Quiz</b></p> <p>UNEP</p>
<b>Regional and national perspectives</b>	
8:45	<p><b>Session 4: Hazardous Waste Management: Experiences from BCRC-Egypt</b></p> <p><b>Management of hazardous chemicals and waste in Egypt's oil and gas sector (20mins)</b></p> <p><i>Chem. Ayman Abd Elbaky Ahmed, Environmental General Manager, Egyptian General Petroleum Corporation (EGPC)</i></p> <p><b>Practical case study on trans-boundary movement of oil waste shipment for disposal under the procedures of Basel Convention, with examples from the region (20mins)</b></p>

<sup>12</sup> participants will be asked to reflect on:

1. Key take-away messages from the day (can identify up to 3 top lessons/messages)
2. Based on these key take-aways, what are the emerging challenges with regards to chemicals and waste management treatment and management, regulations, monitoring options?
3. what are the current efforts to address these challenges?

	<p><i>Dr. Abdel-Hakim El-Alawy, Green Customs Director, Egyptian Customs Authority, National Contact Point with WCO and UNEP; Delegate of ECA at WCO-SSC</i></p> <p><b>Q&amp;A</b></p>
10:00	<b>Coffee/Tea Break</b>
10:15	<p><b>Session 5. Presentation on the Iraq experience on:</b></p> <ul style="list-style-type: none"> <li>- <b>Current National situation and regulations related to Hazardous Chemicals and Waste Management in the oil and gas sector</b></li> <li>- <b>Current systems/procedures for the management of hazardous waste management (end-to-end), handling, transport, treatment and disposal options in relation to the oil and gas sector</b></li> <li>- <b>Key challenges to management of hazardous chemicals and waste in relation to the oil and gas sector</b></li> </ul> <p><i>Ministry of Health and Environment (20 minutes)</i> <i>Ministry of Oil (20 minutes)</i></p> <p><b>Q&amp;A</b></p>
<b>Standards, practices, and guidelines</b>	
11:30	<p><b>Session 6. International frameworks and guidelines on the management of chemicals and hazardous waste associated with oil and gas exploration and production, including through implementation of the BRS Conventions</b></p> <p><b>Part 1. Implementation of the Basel and Rotterdam Conventions: Existing guidelines, guides and other tools available to support Iraq. Additional focus will be on Basel Convention reporting and guidelines on management and transboundary movements of hazardous wastes</b></p> <p><i>Presentation from the BRS Conventions' Secretariat (30 minutes)</i></p> <p><b>Q&amp;A</b></p>
12:30	<b>Lunch</b>
13:30	<p><b>Session 6. Continued</b></p> <p><b>Part 2. Presentation on selected international practices, standards and guidelines in the management (handling/treatment/storage/transport/disposal etc) of hazardous wastes, drawing from industry best practices and EU frameworks and guidelines</b></p> <p><i>M J Cowing, UNEP</i></p> <p><b>Q*A</b></p>

15:00	<b>End of Day / Team Reflections</b>
<b>01 July, Day 3, 2021</b>	
8:00	<b>Participants log-in and continue working on their Team Reflections if needed</b>
8:30	<b>Participant-led Recap of Day 2</b> <i>UNEP</i>
<b>Groupwork and wrap up</b>	
8:45	<b>Groupwork on current systems/procedures for managing chemicals and hazardous waste (including handling, storage, treatment, transportation, and disposal), with identified priority areas for strengthening and/or improving existing systems/guidelines/procedures</b>  <b>Group work presentations and plenary discussions</b>
10:30	<b>Coffee/Tea Break</b>
10:45	<b>Wrap Up Session:</b> <ul style="list-style-type: none"> <li>• Final Knowledge Assessments online</li> <li>• Online training evaluation</li> <li>• Recognition of Teams for High Achievement</li> </ul> <b>Closing remarks</b>  <i>Note: Individual certificates of training completion will be sent to participants upon meeting completion of the Pre-Training Requirements, 90% course attendance, completion of the final knowledge assessment and training evaluation.</i>
12:30	<b>Participants log-off</b>

#### Annex 4. List of Participants

No	Name	Institution	Gender
1.	HUSSAM AL-MASHAHEDI	Ministry of Health and Environment/Technical Directorate	male
2.	ISRAA ALBAKER	Ministry of Health and Environment/Technical Directorate	female
3.	ALYAA ALSHAWI	Ministry of Health and Environment/International Relations Department	female
4.	YOUSIF YOUSIF	Ministry of Health and Environment/International Relations Department	male



5.	MOHAMMED ALBARZANCHI	Ministry of Health and Environment/ Department to Protect and Improve the environment in the North Region	male
6.	AMMAR AL KHALAF	Ministry of Health and Environment/Department to Protect and Improve the environment in the North Region	male
7.	MAZIN AL-GBURI	Ministry of Health and Environment/Department to Protect and Improve the environment in the North Region	male
8.	MOHAMMED AL-DAWOODI	Ministry of Health and Environment/ Department to Protect and Improve the environment in the Central Region	male
9.	JASIM AL-AFRAJEE	Ministry of Health and Environment/ Department to Protect and Improve the environment in the Central Region	male
10.	HAZIM BUHASAN	Ministry of Health and Environment/ Department to Protect and Improve the environment in the Middle Euphrates Region	male
11.	YASIR AL MOLAYUSIF	Ministry of Health and Environment/ Department to Protect and Improve the environment in the Middle Euphrates Region	male
12.	AMMAR AL-BAZOOONI	Ministry of Health and Environment/ Department to Protect and Improve the environment in the Middle Euphrates	male
13.	WASAN AL-HASOONI	Ministry of Health and Environment/ Department to Protect and Improve the environment in the South Region	female
14.	MOHAMMED ALDBISAT	Ministry of Health and Environment/ Department to Protect and Improve the environment in the South Region	male
15.	QASIM OLAIKHAN	Ministry of Health and Environment/ Department to Protect and Improve the environment in the South Region	male
16.	ALI AL-ABEDI	Ministry of Health and Environment/ Department to Protect and Improve the environment in the South Region	male
17.	HIBA AL-HUSSEINI	Hazardous waste management section	Female
18.	BASMA AL-DOORI	Ministry of Health and Environment / chemicals management section	Female
19.	KULTHOOM AL-LAMI	Ministry of Health and Environment/Department to Protect And Improve The Environment In The South Region	Female
20.	BAN ABDALHASAN	Ministry of Health and Environment / Assistant national focal point of Stockholm convention	Female
21.	SAAD AL-RUBAYE	Ministry of Oil-Studies, Planning & Follow up Directorate	male

22.	YASSMEEN ALNAOOSI	Ministry of Oil-Studies, Planning & Follow up Directorate	Female
23.	ALI AL-ATTABI	Ministry of Oil- Technical Directorate	male
24.	ABEER AL- KADHIMI	Middle Refineries Company	Female
25.	SAIF AL-WAELI	Middle Refineries Company	male
26.	HANAN ALI	Iraqi Drilling Company	Female
27.	BASIL AL- JUBOORI	Oil Exploration Company	male
28.	AHMED KASHIF	Oil Projects Company	male
29.	WALEED OMARA	Oil Research and Development Center	male
30.	MAYTHAM HAMEED	South Refineries Company	male
31.	WAJDI ALMANSOUR	South Refineries Company	male
32.	SAFAA ALSIEDHASHIM	South Gas Company	male
33.	FATIMAH AL- LUAIBI	Basra oil Company	female
34.	GHOSSAN ABED	Dhi Qar Oil Company	male
35.	AHMED ABED	North Refineries company	male
36.	SINAN HASAN	North oil company	male
37.	MOHANAD OMAR	North Gas Company	male
38.	Sura Basim Kareem		Female
39.	Haider Ahmed Yaweve		

### Resource Persons

Name	Institution
Yvonne Ewang-Sanvincenti	BRS Secretariat
Mostafa Kamel	BCRC-Egypt
Abdel-Hakim El-Alawy	
Ayman Abd Elbaky Ahmed	
Michael Cowing	
Marisol Estrella	UNEP
Chidinma Zik-Ikeorha	
Isabella Corpora	

### Annex 5. Group work I Submissions

The objective of this exercise is to support the participant to

- a. Gain awareness of the types of hazardous waste (including hazardous chemicals) that are generated in the upstream oil and gas sector

b. Reflect on existing national procedures and systems for classifying hazardous wastes/chemicals and identify strengths and challenges/constraints in the existing current procedures

### TEAM 1

Type of hazardous waste (including hazardous chemicals) generated in the upstream oil and gas sector	Covered under national laws/regulations?  • Yes or x No If yes, specify if possible If unsure, mark unsure	Covered under the BRS Convention?  • Yes or x No If yes, specify if possible If unsure, mark unsure
1. Empty drums	<ul style="list-style-type: none"> <li>• Law 84 1985</li> <li>• Law 4 1989 damaged chemicals</li> <li>• Law 27 2009 for sludge outputs law 2001</li> </ul>	
2. Oil spillage		
3.		
Current national procedures/systems for classification of hazardous waste	Strengths	Challenges/constraints
Basel convention, MSDS, National Chemical security Strategy	<ul style="list-style-type: none"> <li>• Existing of database of chemicals</li> <li>• Inventory reports from oil companies</li> <li>• Drainages for discharge which might differ from one company to another</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of legislations and laws</li> <li>• Financial allocations</li> <li>• Human resources in these fields</li> </ul>

### TEAM 2

Type of hazardous waste (including hazardous chemicals) generated in the upstream oil and gas sector	Covered under national laws/regulations?  • Yes or x No If yes, specify if possible If unsure, mark unsure	Covered under the BRS Convention?  • Yes or x No If yes, specify if possible If unsure, mark unsure
1. Empty and metal/plastic drums covered by polluter must pay	<ul style="list-style-type: none"> <li>•</li> </ul>	
2. Oil spillage through theft or terrorist activities		

3. Drilling mud and cuttings	<ul style="list-style-type: none"> <li>• Law no. 3 2015</li> </ul>	
4. Methane and air pollution	<ul style="list-style-type: none"> <li>• Environmental Law 27 2009 (chap on air pollution) National emission déterminants</li> </ul>	
5.		
Current national procedures/systems for classification of hazardous waste	Strengths	Challenges/constraints
Basel convention, MSDS, National Chemical security Strategy	<ul style="list-style-type: none"> <li>• Hazardous waste generators have to have emergency plans to deal with them – including the drums</li> <li>• Approval needed from MoHE before conducting any treatment.</li> <li>• Documentations required by law.</li> <li>• Access to hazardous waste facilities need authorization</li> </ul>	<ul style="list-style-type: none"> <li>• Enforcement of laws are weak;</li> <li>• mechanism for management of the drums required checks and competent authority to ensure compliance have not been identified-general instructions are available and often vague;</li> <li>• lack of practical experience in dealing with these cases;</li> <li>• regulation is needed for handling of dual use chemicals</li> <li>• 7D committee formed includes many ministries, some of which are not relevant</li> <li>• Instruction 4 of 1989 needs to be updated to include sandwich panel for e.g. No mechanism for handling discharge</li> </ul>

### TEAM 3

Type of hazardous waste (including hazardous	Covered under national laws/regulations?	Covered under the BRS Convention?
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chemicals) generated in the upstream oil and gas sector نوع النفايات الخطر	• Yes or x No If yes, specify if possible If unsure, mark unsure القوانين والتشريعات المحلية	• Yes or x No If yes, specify if possible If unsure, mark unsure الاتفاقيات الدولية الحاكمة
1-أطيان الحفر drilling muds	قانون حماية وتحسين البيئة رقم 27 لسنة 2009	اتفاقية روتردام
2-المياه الصناعية Industrial liquids	نظام الحفاظ على الموارد المائية لسنة 2001 المعدل.	اتفاقية روتردام
3- الانسكابات النفطية oil spills	- قانو الحفاظ على الثروة الهيدروكاربونية رقم (84) لسنة 1985 - المادة ( 41 ) من قانون الصحة والسلامة والبيئة	اتفاقية روتردام
4- البراميل الملوثة الحديدية والبيلاستيكية (مخلفات صلبة) solid barrels	تعليمات رقم (3) لسنة 2015 معالجة واتلاف البراميل الفارغة	اتفاقية بازل
5- مخلفات الحفر النفطية واحواض الترسيب cold pits, lagoons	قانون الحفاظ على الثروة الهيدروكاربونية رقم ( 84 ) لسنة 1985	اتفاقية بازل
6- الانبعاثات الغازية	- محددات الانبعاثات الوطنية - تلزم الحكومة العراقية الشركات الاجنبية المستثمرة للحقول المنتجة او التي بطور الانتاج (شركات جولات التراخيص) باضافة بند ملزم للمقاول باتباع أفضل السبل والوسائل والممارسات والنشاطات التي تحمي البيئة المحيطة والانسان من الاضرار الناتجة من عمليات انتاج النفط الخام.	IFC
7- بطاريات الرصاص	التعليمات رقم (4) لسنة 1989 السلامة في خزن وتداول المواد الكيماوية	اتفاقية بازل
8-الزيوت التالفة(زيوت المحولات الكهربائية وزيوت المحركات بشكل عام)	التصنيف العراقي للمواد الكيميائية	اتفاقية بازل
Current national procedures/systems for classification of hazardous waste الإجراءات المتخذة/النظم الوطنية الحالية لتصنيف النفايات الخطرة	Strengths نقاط القوة	Challenges/constraints التحديات
1- (أطيان الحفر)يمكن إعادة تدويرها بعد إجراء المعالجات اللازمة و الضرورية (فصل الاطيان والترسبات الغير مرغوب بها) أغلب اطيان الحفر ذات الاساس المائي والتي تعتبر قليلة	المراقبة الدقيقة على متابعة الية المعالجة من خلال تقارير اسبوعية وشهرية دورية	- قلة التخصيصات المالية بالموازنة لتنفيذ معظم الفعاليات او المشاريع الصديقة للبيئة والتي تقلل من الانبعاثات الغازية وملوثات التربة والمياه.

<p>الخطورة يتم فحصها باخذ نماذج موقعية وتتم المعالجة كيميائيا</p>		<ul style="list-style-type: none"> <li>- قلة الكوادر الفنية</li> <li>- محدودية تدريب الكوادر</li> <li>- التقنية العاملة على مراقبة مراحل ازالة التلوث .</li> </ul>
<p>2- (المياه الصناعية) بالنسبة للمياه الصناعية توجد ثلاث طرق للمعالجة ميكانيكية وكيميائية وبيولوجية يجب ان تكون نتائج المعالجات ضمن المحددات البيئية العراقية السارية المفعول .</p>	<p>المراقبة الدقيقة على متابعة الية المعالجة من خلال تقارير اسبوعية وشهرية دورية</p>	<ul style="list-style-type: none"> <li>- قلة التخصيصات المالية</li> <li>- بالموازنة لتنفيذ معظم الفعاليات او المشاريع</li> <li>- الصديقة للبيئة والتي تقلل من الانبعاثات الغازية وملوثات التربة والمياه.</li> <li>- قلة الكوادر الفنية</li> <li>- محدودية تدريب الكوادر</li> <li>- التقنية العاملة على مراقبة مراحل ازالة التلوث .</li> </ul>
<p>3- (الانسكابات النفطية) سحب المادة المنسكبة واعادتها (تدويرها او استخلاصها) الى وحدات الانتاج او الضخ الرئيسية اذا تطابق مواصفات API والتربة الملوثة يتم قشطها ومعالجتها بطرق بيولوجية وحرارية بعد اخذ نماذج والتأكد من خلوها من الملوثات شرط ان لا تكون ضارة للبيئة.</p>	<p>المراقبة الدقيقة على متابعة الية المعالجة من خلال تقارير اسبوعية وشهرية دورية.</p>	<ul style="list-style-type: none"> <li>- قلة التخصيصات المالية</li> <li>- بالموازنة لتنفيذ معظم الفعاليات او المشاريع</li> <li>- الصديقة للبيئة والتي تقلل من الانبعاثات الغازية وملوثات التربة والمياه.</li> <li>- قلة الكوادر الفنية</li> <li>- محدودية تدريب الكوادر</li> <li>- التقنية العاملة على مراقبة مراحل ازالة التلوث</li> </ul>
<p>4- (البراميل الملوثة) يتم تجميعها بمخازن خاصة بانتظار: -احالتها كعقد حكومي لاحدى الشركات المرخصة بينيا من قبل وزارة الصحة والبيئة او استعمالها او تدويرها بعد أخذ موافقات مسبقة وضمن فعالية البيئة المستدامة بعد تنظيفها ومعالجتها بينيا من قبل الشركات المرخصة بينيا من وزارة الصحة والبيئة واستعمالها مرة اخرى كملانها بمادة الزفت او الفلان كوت .</p>	<p>المراقبة الدقيقة على متابعة الية المعالجة من خلال تقارير اسبوعية وشهرية دورية</p>	<ul style="list-style-type: none"> <li>- قلة التخصيصات المالية</li> <li>- بالموازنة لتنفيذ معظم الفعاليات او المشاريع</li> <li>- الصديقة للبيئة والتي تقلل من الانبعاثات الغازية وملوثات التربة والمياه.</li> <li>- قلة الكوادر الفنية</li> <li>- محدودية تدريب الكوادر</li> <li>- التقنية العاملة على مراقبة مراحل ازالة التلوث .</li> </ul>
<p>5- (مخلفات الحفر النفطية واحواض الترسيب ) هنالك عدة طرق للمعالجة: - قشط الحفرة الطينية ومعالجة التربة الملوثة بوحدات حرق نظامية ذات فلاتر لتنقية الغازات المنبعثة عن الحرق. - اما النفط المتخلف عالي اللزوجة والملوثة بالامكان بيعها بالمزاد العلني بعد أخذ الموافقات الرسمية من الجهات ذات العلاقة</p>	<p>المراقبة الدقيقة على متابعة الية المعالجة من خلال تقارير اسبوعية وشهرية دورية</p>	<ul style="list-style-type: none"> <li>- قلة التخصيصات المالية</li> <li>- بالموازنة لتنفيذ معظم الفعاليات او المشاريع</li> <li>- الصديقة للبيئة والتي تقلل من الانبعاثات الغازية وملوثات التربة والمياه.</li> <li>- قلة الكوادر الفنية</li> <li>- محدودية تدريب الكوادر</li> <li>- التقنية العاملة على مراقبة مراحل ازالة التلوث</li> </ul>

<p>- تعرض المخلفات النفطية الطافية على سطح البركة للبيع بالتنسيق مع الجهات الحكومية ومن ثم معالجة التربة الملوثة بالتنسيق مع احدى الوزارت المتخصصة لقاء ثمن بعد اخذ العينات وتحديد نوع المعالجة وهناك تنسيق مع احدى الوزارات بهذا الصدد.</p>		
<p>6- (الانبعاثات الغازية) تنصب منظومات فلترة على فوهات المداخن Gas off والتوجية باستثمارها عوضا عن حرق الغازات لما له من تاثير سلبي على صحة الانسان والبيئة معا. - تنصب متحسسات للغاز والابخرة الضارة لتحديد مدى تاثر الهواء المحيط بالملوثات الغازية .</p>	<p>المراقبة الدقيقة على متابعة الية المعالجة من خلال تقارير اسبوعية وشهرية دورية</p>	<p>- قلة التخصيصات المالية بالموازنة لتنفيذ معظم الفعاليات او المشاريع الصديقة للبيئة والتي تقلل من الانبعاثات الغازية وملوثات التربة والمياه. - قلة الكوادر الفنية - محدودية تدريب الكوادر التقنية العاملة على مراقبة مراحل ازالة التلوث .</p>
<p>7- (بطاريات الرصاص ) بالامكان تجميعها واعادة تدويرها من قبل وزارة الصناعة</p>	<p>المراقبة الدقيقة على متابعة الية المعالجة من خلال تقارير اسبوعية وشهرية دورية</p>	
<p>8- ( الزيوت التالفة ) زيوت المحركات بالامكان اعادة تدويرها من قبل وزارة الصناعة لقاء ثمن او استبدالها وتحت نشاط البيئة المستدامة .</p>	<p>المراقبة الدقيقة على متابعة الية المعالجة من خلال تقارير اسبوعية وشهرية دورية</p>	<p>- قلة التخصيصات المالية بالموازنة لتنفيذ معظم الفعاليات او المشاريع الصديقة للبيئة والتي تقلل من الانبعاثات الغازية وملوثات التربة والمياه. - قلة الكوادر الفنية - محدودية تدريب الكوادر التقنية العاملة على مراقبة مراحل ازالة التلوث .</p>

#### TEAM 4

Type of hazardous waste (including hazardous chemicals) generated in the upstream oil and gas sector	Covered under national laws/regulations?  • Yes or x No If yes, specify if possible If unsure, mark unsure	Covered under the BRS Convention?  • Yes or x No If yes, specify if possible If unsure, mark unsure
1. الهيدروكربونات سواء كان مصدرها 1. اطيان الحفر، الانسكابات، تنظيف الخزانات	-قانون حماية وتحسين البيئة رقم ٢٧ لسنة ٢٠٠٩ قانون الحفاظ على الثروة - الهيدروكربونية رقم ٨٤ لسنة ١٩٨٥ قانون بازل الوطني -	اتفاقية بازل
العناصر الثقيلة 2.	قانون بازل الوطني	اتفاقية بازل
المواد الكيماوية التالفة 3.	تصنيف المخلفات الخطرة في القطاع النفطي	اتفاقية بازل

	المواد الكيميائية الخطرة التي تهدد الامن الكيميائي	
الغاز المصاحب غير المستمر 4.	قانون حماية وتحسين البيئة رقم ٢٧ لسنة ٢٠٠٩ قانون الحفاظ على الثروة - الهيدروكربونية رقم ٨٤ لسنة ١٩٨٥	اتفاقية بازل اتفاقية ستوكهولم SAICM
المخلفات الصلبة الخطرة كيراميل 5. المواد الكيماوية الفارغة	قانون بازل الوطني قانون حماية وتحسين البيئة رقم ٢٧ لسنة ٢٠٠٩	اتفاقية بازل
Current national procedures/systems for classification of hazardous waste	Strengths	Challenges/constraints
	<ul style="list-style-type: none"> <li>-وجود دائرة معالجة واتلاف حكومية</li> <li>-وجود شركات اهلية مرخصة للمعالجة</li> <li>-تغطية كبيرة للمخلفات الخطرة في القوانين والتعليمات النافذة</li> <li>-لجان تيسيرية بين الوزارات لتسهيل ابداء الرأي لبعض المواضيع ضمن اتفاقية روتردام</li> </ul>	<ul style="list-style-type: none"> <li>-عدم كفاية المعالجات مقارنة مع حجم المخلفات الموجودة</li> <li>-عدم وجود مواقع طمر</li> <li>-عدم وجود وحدات اعادة تدوير</li> <li>-قلة الكوادر المختصة في هذا المجال وضعف القدرات</li> <li>-قلة التخصيصات المالية وكلفة المعالجة</li> </ul>

## Annex 5b. Group work II Submissions

### TEAM 1

Current National regulation	Strengths	Weakness
<p>Current National regulation 2015 regulation</p> <p>Committee 7d (dual use + Terrorist)</p>	<ul style="list-style-type: none"> <li>- Cover all type of waste</li> <li>- وضع خطة لمعالجة النفايات مع الكوادر المتخصصة</li> <li>- تنظيم العمال وتدريبهم</li> <li>- الامدادات الفارغة</li> <li>- اعتماد موازنة وزارة البيئة</li> <li>- فصل المعالجة</li> <li>- توعية البنية المعالجة</li> <li>- من خلال اعداد جلسات ومنتديات للقاءات</li> <li>- تحديث فترة ٣ ايام لتقديم نتائج التقييم الى وزارة البيئة</li> <li>- منع دخول غير المرغوب لبيع مواد سامة</li> <li>- التنازل الاملا</li> </ul>	<ul style="list-style-type: none"> <li>- ضعف التقييم</li> <li>- لم يتم تدوير النفايات الخطرة</li> <li>- الخطورة للتأكد من سلامة المعالجة</li> <li>- لم يتم دمج المعالجة</li> <li>- لا جوار التقييم للتأكد من سلامة المعالجة</li> <li>- لم يتم آلية التعامل مع السوائل في عز عن البرازيل</li> <li>- لم يتم تدوير النفايات الخطرة</li> <li>- الكيماوية المستعملة</li> <li>- عند البرازيل</li> <li>- عدم التقييم</li> <li>- ان ملاحظ</li> <li>- توضع التنازل</li> <li>- الكلفة</li> <li>- التقييمات</li> </ul>



<p>كثرة &gt; 7 النسبة من المخارص المخاطر المترتبة على الاستهلاك والاستخدام الآمن</p>	<p>1- وضع هياكل لتقديم الموارد المطلوبة الاجتهاد 2- المطور التي يحظر التصدير خارجها الى الخارج 3- حدد مهام كل هيئة 4- اشركت اللجنة الاقليمية بالمخبر في الخطى القوية والالتزام</p>	<p>ضعفت بالتهديد لا يوجد عديد لا يوجد مجال لتذكرنا شرك فزاره غير مصيئة ليعمل ال 18 اجتهاد صاحبة اكبر</p>
<p>تقاييم في سنة 1987 هذين وشارك الموارد الكيماوية</p>	<p>1- تقاييم شاملة (الملاحة - راحة - صحة) HSE 2- مهلة التقييم 3- زفت تهيئة الموارد الكيماوية الى 4- زفت مهلة عزل الانسكاب بمطلوبة مخارج صناديق</p>	<p>1- لم تتخذ مواظفة بنار المتوازن الاعمال المتبعة 2- مواظفة قد عجز 1987 تحتاج تحديث 3- لم يتخذ مواظفة عن التعامل مع نواتج الترسب</p>

type / Haz waste	Covered by Law if you explain	Covered by BRS Contract
1- Haz gas الفازان الخطير مخاطر SOx تصريفها	Yes, No. 27 for 2009 مخاطر الترسب Emission Standards	No
2- empty barrels	Yes, haz waste regulation No. 3 for 2013 مادة 3	Yes
3- cutting Mud	Yes No. 27 for 2009	Yes
4- oil spill	Yes No. 27 for 2009 2001 مخاطر الترسب	No

TEAM 2

تاريخ

1- توجد مشكلة فلامية رئيسية في العراق  
وفقاً للمحور، لجنة المختصة  
بمجالته عامة، لوضع الخطط

توجد مخلفات بيئية خطيرة  
في مناطق مختلفة

لا يوجد موانع غير محددة للمخلفات  
بعد معالجة

وزارة البيئة بالتعاون مع الجهات المختصة

3- وضع آلية عمالية لحسم المخلفات  
البيئية من موانع معالجة المخلفات  
للحلول دون تدخل حكومي  
بمخازن

2- تترك هذه المخلفات  
سواء في البيئات

4- وزارة البيئة - لجنة  
بالتعاون مع الجهات المختصة

4- تأخر استكمال معالجة المخلفات  
المخزنة في مخزنه  
لا تزال المخلفات البيئية  
تتراكم في المخازن

الهدف

1- خفض اعداد المخلفات البيئية  
بمجال حماية البيئة  
التي تلحقها بالاصابة بسمات  
تضررنات عالمية تتسبب بها

اولاً

2- لا يوجد مورد كونه وزارة  
مختصة بتعليمات اللجنة

3- وزارة البيئة بالتعاون  
مع الجهات المختصة

المسؤولية

4- الوزارة، لجنة

5- عدم ذمته في هذه المخلفات  
المحددة للجهات المختصة

6- موانع معالجة المخلفات  
البيئية

7- موانع معالجة المخلفات  
البيئية

8- موانع معالجة المخلفات  
البيئية

9- موانع معالجة المخلفات  
البيئية

10- موانع معالجة المخلفات  
البيئية

TEAM 3

Top challenges/gaps with regards to hazardous wastes/chemicals in the upstream oil and gas sector in Iraq	Current efforts to address this challenge	Additional priority actions needed Please be specific!
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<p>Please be specific!</p>		
<p>ضعف بالتشريعات العراقية وعدم وجود غرامات كافية لا تتناسب مع حجن الضرر البيئي او عقوبات رادعة تلزم الشركات الملوثة على معالجة التلوث بأسرع وقت ممكن</p>	<p>- وجود عدد من القوانين العراقية وكذلك انضمام العراق الى العديد من الاتفاقيات الدولية -</p>	<p>- ضرورة تعديل بعض القوانين العراقية وتضمينها غرامات عالية باسرع وقت ملزم لكي تلزم الجهات الملوثة بمعالجة التلوث الناجم عن عملياتها النفطية - تكثيف عمليات المراقبة والزيارات الميدانية من قبل الجهات الرقابية ذات العلاقة</p>
<p>- ضعف في الخبرات الفنية العملية وخصوصا في مسالة المعالجة - منح تراخيص لشركات أهلية للمعالجة تفنقر للإمكانيات الفنية</p>	<p>- وجود بعض من المعالجات التي تقوم بها بعض الشركات النفطية وبالتنسيق مع وزارة الصحة والبيئة - جمع كافة المخلفات الخطرة في مخازن او أماكن مسيطرة عليها ورفع تقارير شهرية لقيادة القطاع النفطي بكميتها وطرق خزنها</p>	<p>استيراد وحدات معالجة محمولة او ثابتة من قبل الشركات الملوثة وتدريب الكوادر بصورة عملية وميدانية على كيفية ادارتها</p>
<p>تعدد دوائر القرار والتداخل في العمل وضعف التنسيق بين هذه الجهات</p>	<p>- مؤخرا تم تشكيل عدد من اللجان المشتركة من الجهات ذات العلاقة في شأن المخلفات الخطرة - وجود اجتماعات دورية</p>	<p>- اختزال الجهات المتعددة وحصرها بجهة او جهتين على اكثر تقدير - وضع استراتيجية وطنية لتصنيف المخلفات الخطرة وإجراءات السلامة المطلوبة في نقلها وكيفية اختيار نوع المعالجة المناسب</p>