

IMPLEMENTATION OF THE BOREHOLE DISPOSAL CONCEPT (BDC): GHANA'S EXPERIENCE

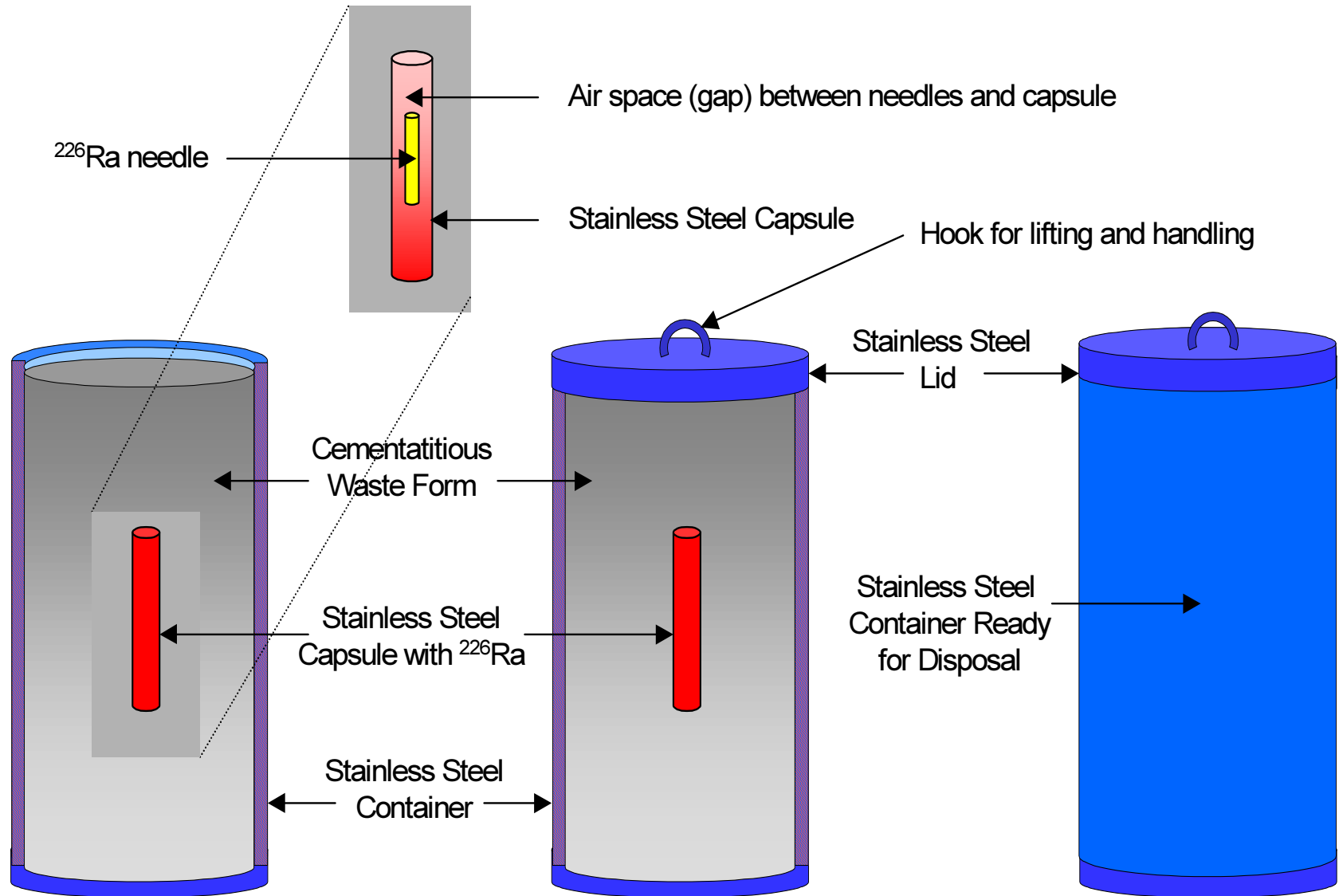
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INTRODUCTION

- **Ionizing radiation sources employed in nuclear technology applications become disused or spent after their useful economic lives; and need to be safely managed.**
- **The National Radioactive Waste Management Centre (NRWMC) is the centre mandated to manage all radioactive wastes in Ghana.**
- **The Borehole Disposal Concept (BDC) has been adopted as the disposal method for Disused Sealed Radioactive Sources (DSRS) in Ghana.**
- **The BDC system of disposal of sealed sources was developed in South Africa under International Atomic Energy Agency (IAEA) Technical Cooperation project.**

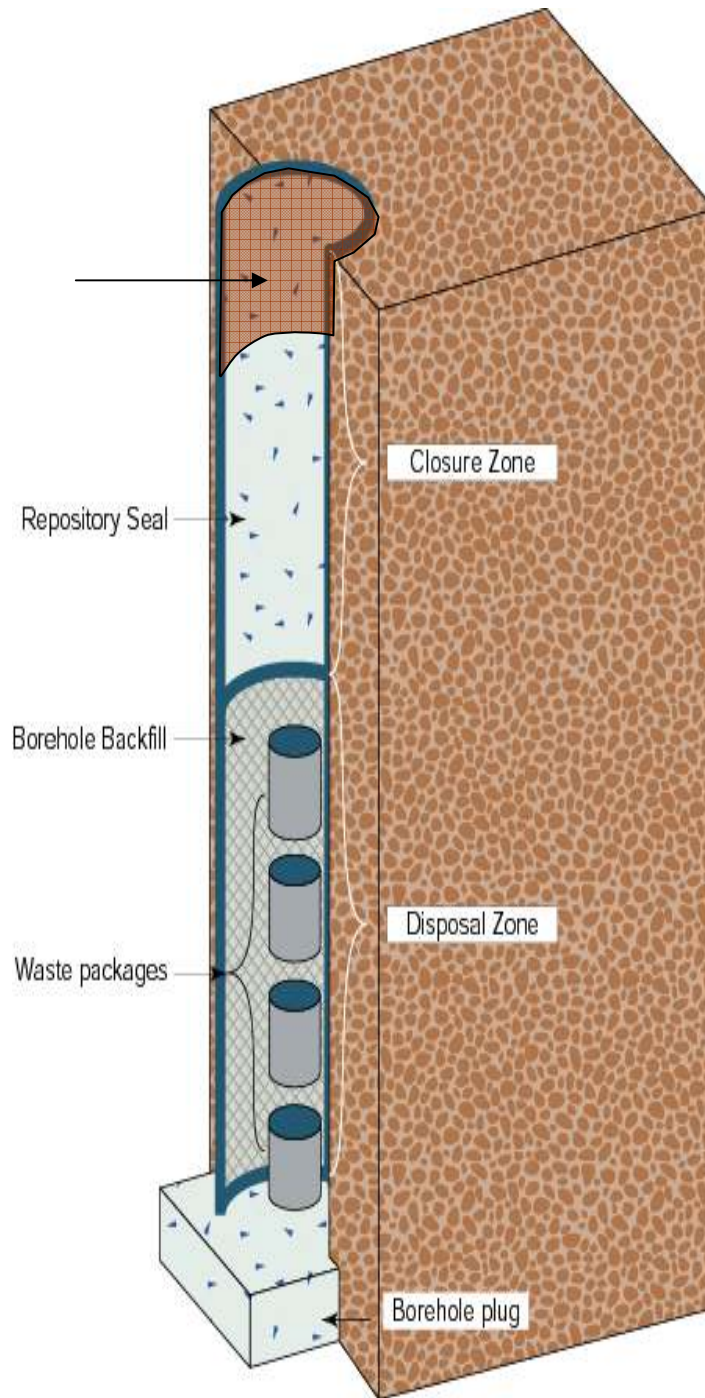
WASTE PACKAGE



BDC container and capsule



Native soil



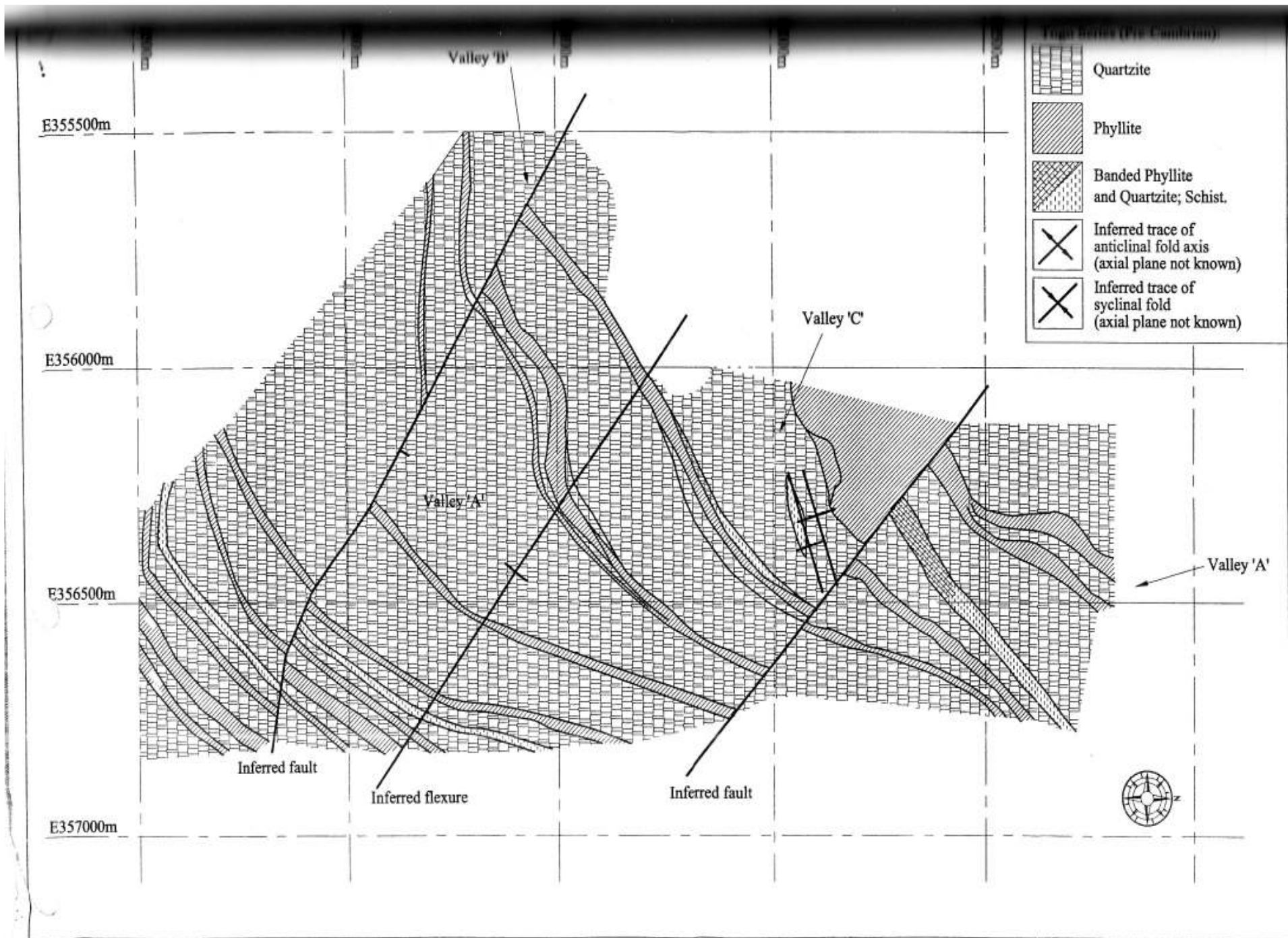
PROJECT IMPLEMENTATION

- **The BDC is being implemented in Ghana under IAEA technical cooperation (TC) project: GH3003**
- **Approved from January 2009, the project is billed to run for 3 years 2009 – 2011 and is so far in its ninth month of implementation.**

PROJECT STATUS AND ACHIEVEMENTS

- **The following have been undertaken:**
 - i). An IAEA expert mission that discussed preliminary geophysical report of the site earmarked for the project.**
 - ii. Acquired and installed the IAEA developed software RMWR version 1.06 for registration of radioactive waste materials collected.**
 - iii. Training of staff of the NRWMC on usage of the RWMR software.**
 - iv. Geophysical investigation of the site earmarked for the borehole disposal facility has been carried out.**

- **Report of the geophysical investigations has provided Ghana Atomic Energy Commission (GAEC) with an initial site characterisation report which has initiated further site characterisation studies to help develop safety and environmental assessment reports.**
- **The geophysical report recommended among others that groundwater accumulation is restricted to the third and fourth layers which are between the depths 20 and 45m.**



Plan of Geology of Kwabenya Valley

Figure 10

COLLABORATING INSTITUTIONS

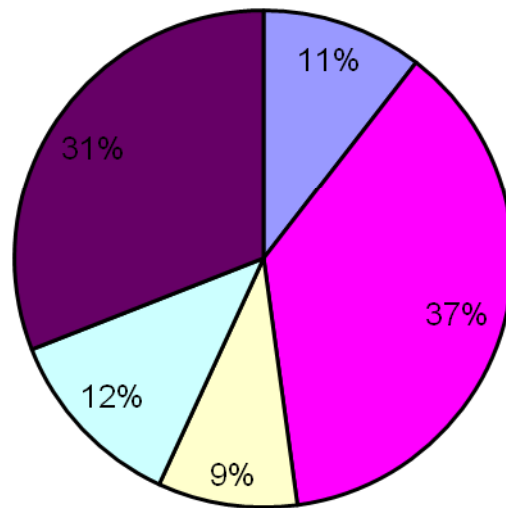
GAEC is collaborating with some other institutions to perform activities involved in the project.

These are:

- Ghana Geological Survey Department- to undertake geological and geophysical studies to identify the structural and geological nature of selected area.**
- Water Research Institute of Ghana - to undertake and document all geochemical investigations the recharge regimes as well as groundwater interactions with the surface water of the selected area**
- Ghana Hydrological Services - to undertake measurement of hydrogeologic parameters e.g., flow rate and flow direction and document the hydrogeologic parameters of the selected area.**

PROJECT COST DISTRIBUTION

Estimated Total Cost of Project: US\$ 750,000



■ Capital equipment

■ Site selection/ confirmation

■ Construction

■ Containerization & emplacement

■ Licensing

PROJECT EXPENDITURE SINCE IMPLEMENTATION

- 1. US \$ 5,100: expert mission to advise on performing and evaluating hydrogeological investigations**
- 2. US \$ 5,100: expert mission to advise on development and implementation of radioactive waste tracking system**
- 3. US \$ 10,000: cost of geophysical survey of area earmarked for siting borehole(s)**
- 4. US \$ 7,000: cost of geochemical and hydrogeologic investigations (on-going)**

PROJECT ACTIVITIES YET TO BE UNDERTAKEN

- **Fellowship programme on management of DSRS including waste characterization, and pre disposal management of the sources**
- **Expert mission to advise on pre-disposal management of sealed sources**
- **Expert missions on the following :**
 - i. **Planning and performing site characterization studies**
 - ii. **Performing SA and EIA modelling, content and scope of SA and EIA studies**
- **Development of generic design of BOSS surface and underground facilities**

CONCLUSION

- **The Borehole Disposal Concept being implemented in Ghana has taken off successfully, most of the activities planned for the first year of implementation have been carried out with exception of a scientific visit (SV) and fellowship programmes which are yet to be awarded.**

THANK YOU