

*Your partner
in sustainability*

MOSAB MARINE AND ENGINEERING SERVICES LIMITED

WARRI OFFICE: #20 Ebojoh Street DSC Express Way. Eketé Inland Warri. Delta State- Nigeria

PHC OFFICE: No 10 Hon Gideon St, off Peter Odili Road, Trans-Amadi Industrial L/O.

P.Box 18220. Port Harcourt. Tel: +234 803 421 9890, 08034220146, 08054111741

Website: www.mosabgroup.com. Email: info@mosabgroup.com



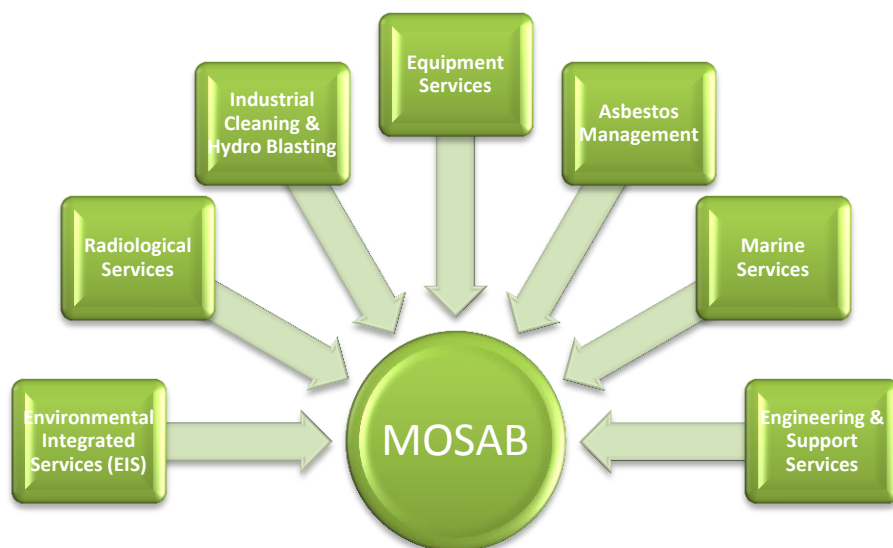
MOSAB Overview

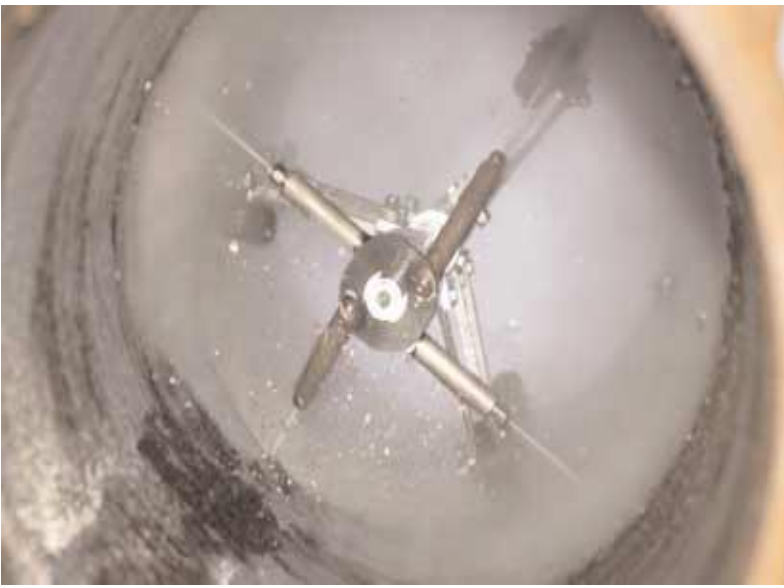
The industry is driven by opportunity, technology and by an increasingly competitive marketplace; these attributes transform over and over again. To succeed in such an environment, you need to evolve faster, become leaner, fitter, smarter, and more sustainable than anyone else. Mosab is your partner to sustainability and market leader:

Mosab is incorporated in Nigeria in 2007 as an engineering, marine and environmental service provider. Mosab is positioned to lead in the onshore, offshore and mining industry in providing solutions to fundamental issues of engineering safety, environmental management, waste management, Radiological services, facility surveillance monitoring systems for safety and security protection etc. These are areas for which there is no margin of error and no room for doubt.

Mosab provide technical expertise and experience encompassing all project phases ranging from investigation, feasibility studies and concept design to final design. We understand the client need and we continually seek innovative ways to address problems and to develop “real world” solutions in a timely manner that achieve compliance, improve operations, minimize liability, maintain schedules and reduce cost. Our goal is to form a working partnership with clients to develop integrated, cost effective solutions that meet and exceed client requirement and expectations

This document introduces our capabilities and services in seven broad service areas. Each area briefly presents information on specific services that are offered by Mosab's professionals. These descriptions have been organized according to end-products that required routine services to address real-live operational situations. More detailed information is available for each of these service areas on request.





Mitigating Environmental Impact

Environmental Integrated Services (EIS)

- 🌐 **Compliance Audit and Training Services**
- 🌐 **Remedial Site Investigations/Feasibility Studies**
- 🌐 **Remediation Systems Engineering and Design**
- 🌐 **Underground Storage Tanks**
- 🌐 **Environmental Contingency and Emergency Planning**
- 🌐 **Construction Services**
- 🌐 **Special Waste solution provider and Transportation**
- 🌐 **Solid Waste and Landfill Studies**

As waste management becomes one of the most heavily regulated areas of business, every organization has clear responsibilities and strict guidelines to follow. To meet your environmental obligations and ensure compliance, Mosab have the professional expertise, the experience and the resources capable of dealing with both routine and emergency environmental challenges.

🌐 **Compliance Audit and Training Services**

Mosab has the experience and resources needed to provide comprehensive environmental audit services. We have completed a large number of projects in this service area that include the following;-

- 🌐 *Comprehensive and specific environmental audits;*
- 🌐 *Regulatory interpretation and analysis;*
- 🌐 *Compliance strategy planning;*
- 🌐 *Environmental management program development and implementation;*
- 🌐 *Environmental audit and training program development;*

Mosab's environmental compliance teams work closely with facility personnel to evaluate environmental control technologies; the potential for off-site contamination resulting from uncontrolled releases; hazardous materials storage, use and disposal practices; and the facility regulatory compliance status. Audit teams are composed of scientists, regulatory specialists, and health and safety professionals from both the client's and Mosab professionals. Through adaptation of a proven approach, Mosab professionals are able to devise cost-effective strategies for assessing and maintaining regulatory compliance at the client facilities.

Mosab cost-effectively meets our client's compliance assessment requirements by integrating environmental resource and energy audit programs; developing environmental audit training materials; performing environmental audits at multiple facilities; preparing environmental program.

Utilizing practical experience with regulators, consultants, and contractors, Mosab custom designs training programs. These customized programs allow our clients to meet the regulatory requirements while focusing on training to



improve their employees job performance. Mosab has extensive experience providing environmental training, hazardous waste characterization, and other environmental issues.

🌐 Remedial Site Investigations/Feasibility Studies

Mosab has performed numerous Remedial Investigations/Feasibility Studies (RI/FS) under Federal Environmental Protection Agency (FEPA), State and Local environmental protection agencies. These projects have contributed to Mosab's diverse expertise in environmental engineering and showcase our ability to develop strategies consistent with our clients' objectives and in accordance with applicable laws and guidance documents.

Whether under FEPA, State and Local Environmental Agencies, Mosab will used the following strategies in developing and conducting a site investigation and feasibility study:-

- 🌐 *Project scoping and planning*
- 🌐 *Data collection*
- 🌐 *Risk assessment*
- 🌐 *Treatability studies pilot tests*
- 🌐 *Alternatives analysis*

The above strategy allows Mosab to consistently select the most cost-effective and technologically sound solution with an unbiased evaluation of the many available technologies in developing and choosing a solution to an environmental concern.

🌐 Remediation Systems Engineering and Design

One of Mosab's greatest strengths is our ability to design and construct cost effective remediation or pollution control systems for our clients. We employ engineering personnel capable of providing various levels of design and engineering. These include chemical, civil, water resources, mechanical and process engineers with diverse environmental remediation and industrial process experience. Mosab engineers are dedicated to providing innovative solutions and cost-effectively implementing these solutions in the field. Mosab has provided design and implementation of:

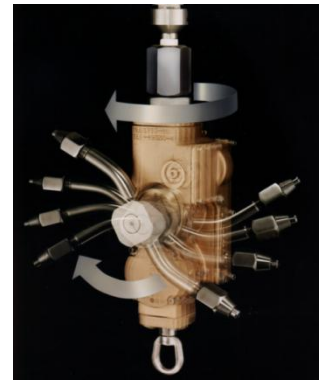
- 🌐 *groundwater extraction systems;*
- 🌐 *water and wastewater treatment systems;*
- 🌐 *bioremediation;*
- 🌐 *Oil recovery from abandoned pits, tank bottom*
- 🌐 *process flow and control schematics;*
- 🌐 *facility layout plans and closure plans;*
- 🌐 *process audits;*
- 🌐 *storm water design; and*
- 🌐 *soil characterization and stability enhancement.*



🌐 Underground Storage Tanks

From initial installation to final closure, underground storage tank (UST) management is governed by complex federal and state regulations. Our extensive knowledge of regulatory policies and practices at all levels can save time and money. Mosab has the full range of services to implement every aspect of UST management programs, from compliance through investigation, remediation, and closure. Our areas of expertise include:

- 🌐 *tank compliance programs;*
- 🌐 *tank removal;*
- 🌐 *pre-pull investigations;*
- 🌐 *engineering design;*
- 🌐 *permitting;*
- 🌐 *contamination assessment;*
- 🌐 *soil and groundwater mitigation; and*
- 🌐 *Construction management.*



Mosab's UST management services are designed to minimize facility downtime and provide affordable solutions for the environmental concerns related to USTs. Following an initial pre-pull investigation, Mosab personnel can determine if compounds of concern are present and streamline the tank removal and remediation process.

🌐 **Environmental Contingency and Emergency Planning**

Since not every event is planned Mosab offers a 24/7, 365-days-a-year rapid response team to deal with oil and chemical spills during emergencies.

Rapid deployment of pumps and tanks together with containment booms, matting and other absorbent materials by our specialist will minimize environmental damage in the event of an oil or chemical spill

In determining the appropriate solution the combination of field and laboratory analysis will be employed to enable the most effective handling and disposal method for each waste consignment.

Our dedicated vacuum transfer fleet transports liquid and sludge waste to our treatment and disposal facilities in line with environmental laws and as best environmental practice.

Construction Services

Construction is an integral part of site remediation. This division allows Mosab to provide clients with turnkey services from investigation to construction remediation, potentially saving clients business disruption as well as money. Mosab employs experienced construction and construction management personnel including construction engineers, field supervisors and technicians trained and experienced in the specific technologies that apply to environmental remediation.

These personnel are knowledgeable in all phases of construction, including bid specification and contract development; field construction of remedial systems; construction contractor selection and management; construction engineering; construction safety planning and supervision; complex soil excavation, capping, and stabilization; treatment system construction; management of waste including hazardous and nonhazardous; and preparation of "as-built" drawings.

Special Waste solution provider and Transportation

Mosab substantial environmental management capabilities can take care of the many waste streams that occur as a natural part of industrial production processes. This includes the careful identification, removal, transportation, treatment and disposal of all residues from pipes, tanks and other vessels. Wastes are analyzed for contaminants prior to disposal thus ensuring compliance with the legislation whilst maintaining the highest standards of Quality Control.



Solid Waste and Landfill Studies

As part of solid waste disposal, land fill engineering studies is conducted by a team of our professionals to determine the best technology and disposal option. Consideration is given to controls both to the top and bottom of disposal facility to minimize air emission, leachate and contaminants to the environment. As part of hazardous waste management in landfill disposal operation the use of record keeping is maintained to effectively track the waste from generation to ultimate disposal site, including mapping units.

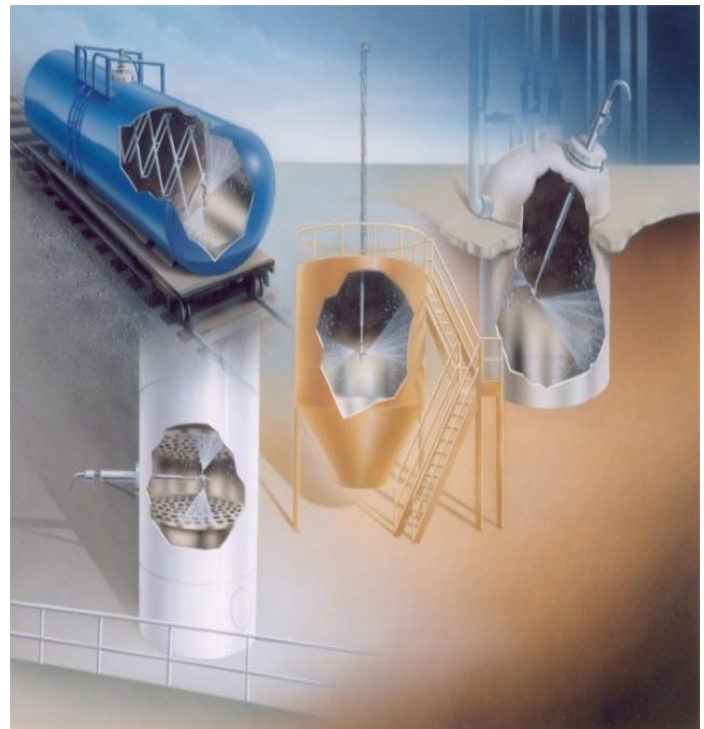
🌐 Sludge Management (Pits/Tank farm etc)

Sludge originating from the treatment process of waste water is the residue generated during industrial processes. Same with our special waste management procedure, sludge is given preliminary treatment by identification, careful removal and transportation to treatment and disposal facilities.

Legacy Operations From Drilling Operations

Most drilling operations lead to discharge of toxic substances into the environment that causes pollution to the ground water, soil, rivers, the atmosphere etc **Mosab** has extensive experience in providing services that covers the removal of waste water, sludge etc of drilling operations and backfilling to restore the environment to original profile or state.





Industrial Cleaning and Waste Management

Industrial Cleaning & Hydro Blasting

- 🌐 Pipe work, Tube bundle and Heat Exchanger Cleaning
- 🌐 Vessel and Confine Space Cleaning
- 🌐 Vacuum Transfer
- 🌐 Drain and Sewer Cleaning
- 🌐 Hydro Blasting Services
- 🌐 Ultra-High Pressure (UHP) Water Jetting
- 🌐 Surface Preparation



🌐 Pipe work, Tube bundle and Heat Exchanger Cleaning

With the fact of life that all physical assets deteriorate in condition with age due to 'wear and tear'. This is especially the case with industrial process systems whereby extremes in operating conditions cause accelerated corrosion or NORM and scale formulation. The issue extends beyond reduced production and up to the safety integrity of the asset may quickly be jeopardized. Be it a complex de-scaling operation or a more routine clean up task, Mosab can restore your systems to optimum performance.



🌐 Vessel and Confine Space Cleaning - Reduction of Manual Intervention

Remote techniques which significantly reduce physical exertion and the need to enter confined spaces are used where at all possible. We use vacuum transfer system which is a safe and ergonomic method to remove a wide range of materials from tanks and vessels.



Tanks are emptied using vacuum transfer or pumps before cleaning. A selection of tank cleaning heads methodology is employed to decontaminate the internal surface of vessels by following a pre-determined three dimensional wash cycle.



However, irrespective of the advanced technology and our 'Brain over Brawn' approach, there are still occasions where human intervention is unavoidable. In these circumstances Mosab teams, trained and experienced in confined space entry techniques will follow proven procedures to manage the associated risks. Where a tank/pipe configuration did not allow mechanical cleaning/descaling, a chemical circulation method may be a viable alternative. Regardless Mosab will provide the optimum solution.

🌐 Vacuum Transfer

Remote techniques which significantly reduce physical exertion and the need to enter confined spaces are used where at all possible. An example of this is our vacuum transfer system which is a safe and ergonomic method of removing a wide range of materials from tanks and vessels.

After the vacuum transfer remote methodology is utilized using a selection of tank cleaning heads which can decontaminate the internal surface of vessels by following a pre-determined three dimensional wash cycle



Vacuum transfer is an effective means of conveying a wide range of materials over significant horizontal and vertical distances.



🌐 Drain and Sewer Cleaning

Mosab is an environmental solution provider and technology enhanced organization that safely and efficiently, tackles wastes, residues and by-products derived from industrial processes. In other words Mosab take the dirty business of industrial cleaning off our client's hands.

🌐 Hydro blasting Services

When it comes to planned maintenance shutdowns, the demand for high levels of efficiency is absolute. And that's exactly what Mosab delivers. The use of HP and UHP are employed for cleaning solutions.

🌐 Ultra-High Pressure (UHP) Water Jetting (Clean and Protect)

High Pressure (HP) and Ultra-High Pressure (UHP) water jetting are two of the most powerful and environmentally safe cleaning solutions employed in today industry.

Both processes are extremely versatile and consequently utilized in a diverse range of industrial applications and as the preferred surface preparation technique in most offshore and marine environments.



🌐 **Surface Preparation (Corrosion Protection and Preservation)**

By removing existing coatings or corrosion with water alone, ultimately there is less waste and debris produced. However, by-products may be created. Vacuum transfer equipment can be used to control and contain these deposits thus minimizing the environmental risk.

Of course, different materials demand different techniques. That's why alongside UHP water jetting, Mosab offers the options of dry abrasive blasting and mechanical preparation.

Having prepared the surface using these applications, we can then apply a conventional or specialist coating to provide an effective barrier to combat corrosion.

🌐 **Cold Cutting**

Water is an incredibly effective tool which can be utilized to cold cut steel and concrete. This specialist application can be deployed in a wide variety of hazardous areas and offers a clean and safe alternative to hot cutting.

Cold cutting using an abrasive entrained UHP water jet is commonly used in sensitive projects; the high quality of cut that can be achieved without deformation of the mechanical properties of the steel lends itself equally to maintenance free applications where further fabrication and welding is to take place.



Pumping Services

We are dedicated to providing pumping service solutions in various areas of our client's interest. All our operations are aimed at ensuring safe and quality services delivery. Our Pumping services include;

- 🌐 **Chemical Cleaning**
- 🌐 **Pigging**
- 🌐 **High Pressure Jetting**
- 🌐 **Decontamination/Change of Services**
- 🌐 **Helium Leak Detection.**
- 🌐 **Hot Oil Flushing**
- 🌐 **Pipeline Debris**
- 🌐 **Nitrogen Purging**
- 🌐 **Water Injection**



Equipment Services

- 🌐 **Sales and Rental**
- 🌐 **Training**
- 🌐 **Repairs**
- 🌐 **Equipment Calibration**
- 🌐 **Certification**
- 🌐 **Jetting Units and Accessories**
- 🌐 **Confine Space entry equipments,**
- 🌐 **Storage Tanks, Containers etc**

Mosab offers instrumentation Services that include cleaning and maintenance equipment, these include portable wash down units, industrial vacuum tanks and a range of proprietary accessories, complete radiological instrumentation package, Marine boats etc. Like all Mosab equipment, they have been designed and configured to the highest performance and specification standards and are certified for use in hazardous environment.

Our equipments address the specific demands for enhanced safety and productivity during planned maintenance turnarounds, outages and shutdowns.

Encapsulation.

Controlled Removal: Where this is the case, we will use the most appropriate stripping technique for the type, location and condition of the asbestos.

A number of fibre suppression techniques including spray injection and shadow vacuuming are used during asbestos removal operations to ensure that the predetermined action levels are not exceeded.

Our teams are experienced in the successful removal of Asbestos Containing Materials from a number of different environments including offshore installations, marine vessels and industrial, commercial and private premises.

During and following asbestos removal operations, strict decontamination procedures are carried out utilizing our modular and mobile decontamination units.

Marine Services

- 🌐 Ship brokering and marketing agent,
- 🌐 Ship management including manning and inspections report,
- 🌐 Marine fleet establishment consultancy and DOC acquisition,
- 🌐 Logistics Support
- 🌐 Supply and sales of marine equipment, boats, spare parts etc

Mosab provide substantial marine cost effective solutions with experienced team of a wide range of skills and experience to work within the client requirement. Our services include:

- 🌐 ship brokering and marketing agent,
- 🌐 Ship management including manning and inspections report,
- 🌐 Marine fleet establishment consultancy and DOC acquisition,
- 🌐 Logistics Support
- 🌐 Supply and sales of marine equipment, boats, spare parts etc

Our skill marine professionals are flexible in providing services tailored to meet the client need.

Engineering Services

- 🌐 Surface Preparation, Pipes and tubing cleaning,
- 🌐 Heat exchanger cleaning , Corrosion control,
- 🌐 Mechanical interventions,
- 🌐 Services of petroleum storage equipment (offshore/onshore)
- 🌐 Equipment Decontamination etc

Mosab offers a range of engineering products and services that include the following:-

Surface Preparation, Pipes and tubing cleaning, Heat exchanger cleaning , Corrosion control, Gas tubing, Transshipment services, Mechanical interventions, services of petroleum storage equipment (offshore/onshore), Equipment Decontamination, Pipeline and production facilities maintenance.

We represent the manufacturers of some of these products and in conjunction with our technical partners we provide services backed with the experienced for innovative but realistic solutions.

Support Services

- 🌐 Development and implementation of management systems such as 18001, 14001, ISO 9000:2000, ISM, ISPS, QSMS.
- 🌐 Personnel training and development,
- 🌐 Risk Management,
- 🌐 Supply of Personnel Protective Equipment (PPE) and Maintenance,
- 🌐 Research and Development (R&D)

Support Services

Our support services include

- 🌐 Development and implementation of management systems such as 18001, 14001, ISO 9000-2000, ISM, ISPS, QSMS.
- 🌐 Personnel training and development,
- 🌐 Risk Management,
- 🌐 Supply of Personnel Protective Equipment (PPE) and Maintenance,

Research and Development (R&D)

Research and Development is essential to the continuous improvement of our products and services, Mosab have a team of engineers dedicated to R&D product efficiency and optimization.

As part of our continuous improvement strategies the quality of services and products are develop and implemented and backed up by our philosophy of incremental improvement and optimization.

Solution Provider In:-

Environmental

- Special Waste Transport
- Facility and Site Remediation
- Treatment and Disposal
- Sewage Transport
- Oil and Chemical Spill Response

Industrial

- Ultra-High Pressure (UHP) Water Jetting
- Surface Preparation
- Corrosion Protection and Preservation
- Personal Protective Equipment (UHP)
- Cold Cutting
- High Pressure (HP) Water Jetting
- Personal Protective Equipment (HP)
- Industrial Cleaning
- Pipework Descaling
- Tube Bundle and Heat Exchanger Cleaning
- Vacuum Transfer
- Tank Cleaning
- Vessel and Confined Space Entry
- Chemical Cleaning

Pumping Services

- Chemical Cleaning
- Pigging
- High Pressure Jetting
- Decontamination/Change of Services
- Helium Leak Detection.
- Hot Oil Flushing
- Pipeline Debris
- Nitrogen Purging
- Water Injection

Equipment rental

- Jetting Units and Accessories
- Storage Tanks, Containers etc
- Pumping Equipment
- Personal Protective Equipment (PPE)
- Confined Space Entry Equipment
- Environmental Monitoring

Support services

- Base Infrastructure
- Logistics
- Accreditations
- Personnel, Training & Development

- Safety Management Systems