
MWEA Lagoon Seminar

General Safety in Lagoon Environments

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Lagoon Safety Hazards

- **Confined Spaces**
- **Oxygen Deficiency, Gases & Vapors**
- **Pathogens**
- **Slips and Falls**
- **Drowning**
- **Lone Worker Hazards**
- **Zika Virus?**

Lagoon Safety Hazards

➤ Confined Spaces



Lagoon Safety Hazards

➤ Confined Space Definition



1. Able to enter to do work.
2. Not designed for normal human occupancy.
3. Limited access / egress.
4. Permit-required: Includes a Recognized Hazard
 - ✓ Atmospheric Hazard
 - ✓ Entrapment -- Sloping walls
 - ✓ Engulfment -- Liquid or solid that can flow like a liquid.

Lagoon Safety Hazards

➤ Confined Space Atmospheric Hazards

❖ Oxygen Deficiency

- Displacement
- Chemical Reaction
- Aerobic Consumption

❖ Combustibles

- Methane
- Influent Combustibles

❖ Toxics – *beware pockets under ice, algae, sludge*

- Hydrogen Sulfide
- Chlorine
- Created Toxics (e.g.: Chloroform)
- Influent Toxics



Lagoon Safety Hazards

➤ Confined Space Other Hazards

❖ Retrieval

- Worker Down
- Stuck in Sludge



Lagoon Safety Hazards

➤ **Pathogens** *Almost all disease-causing bugs are enteric, or from the human intestinal tract.*

- ❖ Gastroenteritis (e-coli)“24-hr flu”)
- ❖ Samonella
- ❖ Shigellosis
- ❖ Hepatitis
- ❖ Fecal Streptococcus
- ❖ E-coli
- ❖ TB
- ❖ Amoebic Dysentery



Lagoon Safety Hazards

➤ Pathogens *PPE*



Lagoon Safety Hazards

➤ Slips & Falls

- ❖ Extremely slippery lagoon synthetic liners.
- ❖ Slippery, grassy lagoon banks.



Lagoon Safety Hazards

➤ Drowning

- ❖ Aeration makes swimming very difficult due to decreased surface tension of water. Like swimming in air.
- ❖ Slippery, grassy lagoon banks.



Lagoon Safety Hazards

➤ Drowning



- Life Vests
- Rescue Boat



Lagoon Safety Hazards

- **Lone Worker Down**
 - **Fall with Injury**
 - **Overcome by Toxic Exposure or O2 Deficiency**
 - **Heat Stress**
 - **Stroke / TIA**
 - **Heart Attack**
 - **Diabetic Coma**



Lagoon Safety Hazards

➤ Wireless Lone Worker Down Systems

- With Integrated Gas Detection (1 – 4 Gases) *on left*
- Stand Alone Systems *on right*




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Lagoon Safety Hazards

➤ Zika Virus

➤ Africa → Brazil → Heading North

➤ Spread via: Mosquitos, STD

➤ *1 in 5 infected experience symptoms*

➤ *Rash, Fever, Pink Eye, Joint Pain*

➤ *Microencephaly, other brain abnormalities*



Lagoon Safety Hazards

Thank you!

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