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GoM Drilling, Completions and Interventions

Mississippi Canyon 252 Offshore Air Monitoring Plan for Source Control and Skimming Operations

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TABLE OF CONTENTS

1 Introduction 4
2 Air Monitoring Instrumentation 4
3 Site Monitoring Locations 5
4 Site Action Levels 6
4.1 Action Levels for Personal Exposure 6
4.2 Action Levels for Safe Operations 8
5 Monitoring of Personnel 9
6 Data Quality and Documentation Management 9
7 Qualified Personnel 10
8 Roles & Responsibilities of Air Monitoring Technicians 10
9 Equipment Decontamination 10
10 Calibration and Maintenance of Field Instruments 11
11 Questions or Concerns: 11

1 Introduction

This plan is intended to protect the health and safety of workers who are performing source control and skimming operations for the MC 252 incident. The origin of the oil released from the incident is located approximately 50 miles southeast of Venice, Louisiana and has the potential to impact the shore line, offshore assets, drilling rigs and other operations with oil.

This plan addresses air monitoring and sampling during the mitigation operations of the impacted areas. Thus, the purpose of this sampling includes the following:

- Monitor the air around the mitigation activities to protect potential downwind receptors.
- Monitor air in the vicinity of mitigation activities to protect workers.
- Monitor specific activities to support safe operations.

Air monitoring will continue until the mitigation process is complete. Air monitoring and sampling data will be summarized and reported to Unified Command through the Houston IMT Safety Officer.

2 Air Monitoring Instrumentation

Real-time air monitoring for VOC's will be performed during oil cleanup and source control activities. Air monitoring will be performed using photo-ionization detectors (PIDs) and the UltraRAE benzene monitor. The PIDs will be used to detect volatile components of the crude oil. The UltraRAE will be used for benzene specific analysis in the event that elevated VOCs are detected using a PID. The UltraRAE is equipped with a 9.8 eV lamp. Real-time monitoring will be conducted using the Rae Systems AreaRAE with photo ionization detectors (PID) which are equipped with 10.6 eV lamps. Additional electrochemical sensors on the AreaRAE measure the Lower Explosive Limit (LEL), Hydrogen Sulfide and Carbon Monoxide (CO).

The term "real–time" refers to direct reading instruments that allow nearly instantaneous determinations of a chemical concentration in air. Real-time measurements provide immediate information for worker and community exposure scenarios and, with the use of appropriate site safety measures, help prevent overexposures. Real-time measurements are not directly comparable to OSHA or ACGIH 8-hour TWA values or to community exposure standards or guidelines. Instantaneous real-time samples do not necessarily represent conditions experienced throughout the workday and can substantially underestimate or overestimate exposures potentially experienced by workers. Direct reading instruments perform sampling and analyses within the instrument and concentration readings can usually be obtained immediately. These instruments have fast response times and can follow rapid changes in concentration.

3 Site Monitoring Locations

Vessel operators will work with the Air Monitoring Technicians to select real-time monitoring locations in common work areas and inside crew quarters. Additional monitors may be placed near the edge of the vessel or in other areas of interest, such as moon pools, to gain early indications of rising LEL levels. Handheld monitors are also available to sample in real-time for LEL, VOCs, H2S, and benzene. Manually logged real-time data for benzene will be collected and reported on approved field forms at prescribed intervals. This data will be shared with response stakeholders.

After initial characterization of the immediate work site has been completed, air monitoring will be continued at regular intervals in the vicinity of operations being conducted. The air monitoring results shall be sent to the Industrial Hygiene Unit Leader in Houston for review at intervals not to exceed 12 hours. At no time, though, shall air monitoring activities impede operations or endanger personnel.

The Air Monitoring Technician will determine location(s), time and duration of air monitoring. Where continuous monitoring instrumentation is not installed, the Air Monitoring Technician will default to monitoring every hour or as conditions change until personnel suspend operations or depart the work site. In addition to general area monitoring aboard vessels, a specific request has been made to conduct air monitoring by exhaust vents or ballast vents which discharge into the work area. If conditions change (such as the amount of oil in the work area, an increase in a reading of VOCs, or a shift in the winds towards the workers, for example), air monitoring should be done immediately following the change, and the need to monitor more frequently should be considered.

Spill recovery and source control site personnel and supervisors shall be updated regularly of the air monitoring results. At minimum, the Air Monitoring Technician shall update the OIM of levels over the preceding 12 hours once per shift.

4 Site Action Levels

Site action levels have been established for airborne hazards. Vessels should execute their own safety evacuation/emergency response plan when action levels are exceeded.

4.1 Action Levels for Personal Exposure

Chemical	Action Level	Monitoring Condition	Recommended Action
VOC, ppm	100	Continuous levels for > 15 minutes	Evacuate immediate work area to area of lower concentration or wear a respirator to continue work in this area
H2S, ppm	5	Continuous levels for > 15 minutes	Evacuate immediate work area to area of lower concentration
Benzene, ppm	0.5	At least 3 samples over 15 minutes	Evacuate immediate work area to area of lower concentration or wear a respirator to continue work in this area
Carbon monoxide, ppm	25	Continuous levels for > 15 minutes	Evacuate immediate work area to area of lower concentration

Above the Action Level, a beeping alarm with a red flashing light will sound on the monitor where the result was detected. Once the action level has been consistently above the limit for 15 minutes, the Air Monitoring Technician will notify the crew to evacuate the immediate area to an area of lower concentration. Additionally, the Air Monitoring Technician will immediately inform the OIM that a consistent reading has been confirmed and that the area of the vessel in which the monitor is located is considered a restricted area. The area will remain a restricted area until levels are consistently below the action limit. Air monitors indicate levels in the immediate environment surrounding the monitor. If results are at or below the action limit for 15 minutes.

At minimum, benzene readings are collected manually in each work area on an hourly basis and when VOC action limits are exceeded. If a benzene result exceeds the action limit, the Air Monitoring Technician will verify that the action level is sustained by collecting at least three

samples over a 15 minute period. If the action level is confirmed, the area will be considered a restricted area until levels are consistently below the action limit for 15 minutes. The Air Monitoring Technician will notify the crew to evacuate the immediate area to an area of lower concentration. Additionally, the Air Monitoring Technician will immediately inform the OIM that a consistent reading has been confirmed and that the area of the vessel in which the monitor is located is considered a restricted area.

When levels of VOC or benzene exceed action limits, work may continue in the restricted area by wearing a respirator with organic vapor cartridges. Prior to allowing the use of respiratory protection, the vessel must put in place a respiratory protection program which includes training, medical certification, and fit-testing of personnel that are performing work in restricted areas. If there is potential to come in contact with hydrocarbon contaminated material, additional personal protective equipment should be considered based on the task including nitrile or neoprene gloves, PVC boots, and slicker suits.

At the OIM's discretion, the vessel may implement other possible controls to reduce airborne hazards below action limits such as moving portable industrial fans to increase air flow, repositioning the vessel, notifying standby boats with water cannons to break up sheen in the immediate area or requesting application of dispersants or foams from standby boats, if approved. It is recommended that each vessel install activated charcoal filters on the ventilation system intakes to provide a clean air environment within the crew quarters.

4.2 Action Levels for Safe Operations

Hazard	Action Level	Monitoring Condition	Recommended Action
Flammable, %LEL	10%	Continuous levels confirmed by 2 or more monitors for 15 minutes	Take action to lower levels such as: • Reposition vessel, if possible • Utilize fans/ blowers • Notify standby boats with water cannons to break up sheen in immediate area • Apply surface dispersant or vapor suppressing foam from standby vessels* (if approved)
Flammable, %LEL	40%	Instantaneous reading confirmed by 2 or more monitors	Move off

Lower Explosive Limit (LEL) action levels are designed to create a safe operating environment. The 10% LEL action level is designed to indicate that action is needed to reduce airborne hazard levels. This level is confirmed by detection of 10% or more LEL consistently on 2 or more monitors for 15 minutes. At this level, the Air Monitoring Technician should notify the OIM to that control measures are required. The OIM will evaluate and implement controls to reduce LEL levels below the 10% action limit such as moving repositioning the vessel, notifying standby boats with water cannons to break up sheen in the immediate area or requesting application of dispersants from standby boats.

The 40% LEL action level indicates when immediate action for safe operation is required. This level is confirmed by detection of 40% or greater LEL instantaneously on 2 or more monitors at the same time. At this level, the Air Monitoring Technician will immediately notify the OIM this level was confirmed. The OIM will suspend vessel operations and the vessel will drive-off location to the safe zone and await further instructions. A ship announcement will be made upon notification by the Air Monitoring Technician (or any crew member) to the OIM. The OIM will communicate moves through the appropriate SIMOPS Coordinator. Prior to re-entry, other support vessels will verify the LEL is below the action limit and communicate results to the affected vessel.

Utilize other support vessels or small crew boats in the vicinity that are equipped with AIR MONITORING Techs and monitoring equipment to provide clearance monitoring. The clearance monitoring will provide information to the main vessel of when it is safe for the vessel to re-enter the area. All contaminants must be below BP internal limit/permissible exposure limit/threshold limit value before the vessel can re-enter the area.

5 Monitoring of Personnel

Organic Vapor Monitor (OVM) badges will be used to assess personnel exposures to benzene and other hydrocarbons. OVM badges are to be placed on personnel identified as having the highest potential for exposure. Air monitoring will be conducted on workers who spend the most time on the deck each day and represent at least 50% of potentially exposed individuals. OVM badges will be analyzed by Bureau Veritas, American Industrial Hygiene Association accredited laboratory, using an OSHA Method 7 for analysis. Results will be communicated to personnel and supervisors via the contact information provided to the Air Monitoring Technician.

6 Data Quality and Documentation Management

- All analytical air samples will be sent to the Industrial Hygiene Lead in the Houston Command Center.
- Bureau Veritas, an AIHA Accredited Laboratory, located in Novi, Michigan will be used to analyze the samples
- The data packets will be reviewed and the data will undergo a data validation process.
- All real-time instruments will be calibrated according to the manufacturer recommendations.
- Calibration will be documented by the Air Monitoring Technician daily and documented on the calibration log.
- Real-time readings will be documented by handwritten notes, handheld PDA, or by the use of data logging capabilities of the instrument, if available.
- Real-time data will be entered onsite and drafts made available upon request.
- The IH Unit Leader in Houston will provide data summaries to the Safety Officer prior to each handover meeting.

7 Qualified Personnel

Personnel who serve as Air Monitoring Technicians or Industrial Hygienists for this response shall be qualified in accordance with their respective organizations' policies to perform initial site surveys and site monitoring using appropriate atmospheric equipment for oil spill response, recovery and remediation activities.

8 Roles & Responsibilities of Air Monitoring Technicians

The Air Monitoring Technician's role is to ensure that personnel performing spill clean-up operations or working on the deck of response vessels are not being overexposed to benzene and other hydrocarbons.

The Air Monitoring Technician's responsibilities include:

- Calibrating air monitoring instruments daily.
- Conducting air monitoring according to the plan and keeping written documentation of results.
- Conducting follow-up air monitoring within 15 minutes to confirm readings when results exceed the action limit.
- Informing the OIM / lead supervisor / captain on the vessel immediately when results exceed action limits, so that the supervisor / captain can implement controls to protect personnel.
- Provide periodic updates of air monitoring results to the lead supervisor / captain on the work site / vessel
- Provide copies of written copies of the air monitoring results to the Industrial Hygiene Unit Leader every 12 hours.

9 Equipment Decontamination

None required under foreseeable conditions.

10 Calibration and Maintenance of Field Instruments

The calibration, usage, and maintenance of field equipment and instrumentation will be in accordance with each manufacturer's specifications or applicable test/method specifications. At least 2 back up AreaRae instruments,1 UltraRae instrument and replacement supplies will be maintained aboard the vessel.

11 Questions or Concerns:

Personnel have been instructed to contact their Supervisor if they have concerns about their health due to changing workplace conditions.

These Questions or concerns shall be directed to the Safety and Health Unit so they can be assessed:

Houston Source Control:

Safety Officer: 281-366-0863

Safety & Health Unit Leader: 281-366-5520

IH Unit Leader: 281-366-6916

Document Authorization Form

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