

PROJECT DESIGN FEATURES FOR PROTECTION OF SENSITIVE RESOURCES GREENS LAKE 3D SWG-2012-00906

- Samson Exploration, LLC (Samson) will coordinate with resource agencies to develop a plan of operations that will minimize impacts to sensitive resources.
- Samson will conduct operations in accordance with all applicable conditions of United States Army Corps of Engineers (USACE) Permit SWG-2012-00906 for the Greens Lake 3D, as well as any additional permit requirements that are incorporated into the requested amendment to the afore-mentioned permit for protection of resources.
- Samson will obtain a permit from the Texas General Land Office (GLO) for state submerged lands and waters and conduct operations in accordance with all GLO permit requirements.
- Samson will prepare an avoidance plan for the project area. This plan will be submitted to the Texas Historical Commission (THC) and the USACE's archaeologist for approval.
- Samson will offset source points at least 50 meters from any known or designated archaeological sites and cemeteries.
- Samson will offset source points from high probability areas unless an archaeological survey is conducted in these areas and any site located as a result of the survey is avoided. Sources in high probability areas will be avoided on private lands whose owners have refused cultural survey.
- Samson will offset source points 400 feet from any known or designated oyster reefs, unless an exception to this buffer distance is approved by the GLO in coordination with Texas Parks and Wildlife Department (TPWD).
- Samson will offset source and receiver points at least 1,000 feet from active rookeries during the nesting season (February 15-September 1).
- Samson will offset source and receiver points from any known locations of threatened and endangered species in accordance with agency requirements.
- Samson will offset source points from streams and the Gulf Intracoastal Waterway.

- Samson will be offset source points from beaches, 1,000 feet seaward and 600 feet landward from the dune line to minimize impacts to nesting sea turtle and recreational users. Samson will coordinate with USFWS and TPWD to develop a monitoring program for location of sea turtle nests during the nesting season (April-September, with peak April-July) and to determine an appropriate offset distance for source holes should any nests be identified within the project area.
- Samson will make least impact equipment selections based on habitat type and substrate conditions.
- Samson will utilize the route of least resistance along source and receiver lines, to the extent practicable, in order to minimize impacts to vegetation and soils.
- Samson will use open water areas for access to the extent practicable.
- Samson will utilize airboats rather than propeller driven boats in any known or visible areas containing sea grass beds.
- Samson will utilize lightweight drilling equipment (i.e. airboats, airboat drills, marsh buggies, marsh buggy drills) in wetland areas to minimize impacts.
- Samson will minimize the number of passes along source and receiver lines to greatest extent practicable.
- Samson will instruct equipment operators to offset paths of vehicles in wetland areas slightly with each pass in order to minimize the likelihood of compaction.
- Samson will re-contour and fill the shot holes to pre-project contours.
- Samson will utilize helicopters for support of recording operations on land to minimize impacts.
- Samson will provide third party monitors in accordance with USFWS requirements to help ensure compliance with SUP conditions within the Brazoria National Wildlife Refuge lands.
- Samson will provide biological monitors while working in areas containing tidal flats. The monitors will have stop work authority. If a piping plover is sighted within the vicinity of the work area, all work will cease until the plover leaves the area.
- Samson will provide third party observers in accordance with GLO permit requirements to ensure appropriate offsets from sensitive resources like oyster reefs, bird rookeries, seagrass beds etc., as well as to assess finfish impacts in bays and bayous. A qualified GLO-approved biologist will be present with each shooter in state waters to assess impacts to fish. Impacts will be recorded by species and size class and reported to the

GLO and TPWD on a weekly basis, with a final summary report provided at the end of operations. The biologists will also observe waters surrounding each source hole for the presence/absence of sea turtles or marine mammals. If a sea turtle or marine mammal is spotted in the vicinity of any source hole, detonation of the hole will be delayed until the animal leaves the exclusion zone.

- Samson will implement several mitigation measures for the protection of marine mammals and sea turtles in the Gulf of Mexico, including ramping up with the airgun boats with low pressure prior to firing at desired pressures and having NMFS-approved observers at all times during operations scanning a maximum 500-meter watch zone for presence/absence of species. The observers will scan from either the gunboat or the chase boat(s). If protected species are observed within this watch zone, operations will be halted until the species of concern moved out of the area, with the exception of bottlenose dolphins (*Tursiops truncatus*). As long observers do not note any unusual or erratic dolphin behavior, during either observation, ramp-up, or operational phases of the project, ramp-up and/or operations will continue. If the airgun is shut down for more than 20 minutes, ramp up procedures will have to occur again prior to firing the airguns at the desired pressure. Ramp-ups will not be limited to daytime hours.
- Observers will also record any notable finfish impacts resulting from airgun operations, though typical scare tactics and finfish monitoring techniques utilized in the bays are not feasible with airgun operations in the Gulf, based on previous project experience.
- Samson will consult with US Coast Guard, GLO, and TPWD to notify all offshore and bay fisheries of the project specifications and schedules to have the least amount of interference of shrimping and oyster harvesting seasons including NOAA Bulletins and Notices to Mariners.
- Samson will utilize communicator boats within the project area and take measures to have high visibility of equipment on the water to reduce interactions between fishermen and seismic operators.