ESSENTIAL FISH HABITAT ASSESSMENT

National Pollutant Discharge Elimination System (NPDES)
General Permit No. GEG460000
Offshore Oil and Gas Activities
Outer Continental Shelf
Federal Waters of the Gulf of Mexico

June 7, 2023

U.S. Environmental Protection Agency
Region 4
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1.0 Introduction and Federal Coordination

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) sets forth a mandate for NOAA's National Marine Fisheries Service (NMFS), regional fishery management councils (FMC), and other federal agencies to identify and protect important marine fish habitat. The essential fish habitat (EFH) provisions of the MSA support one of the nation's overall marine resource management goals of maintaining sustainable fisheries. Essential to achieving this goal is the maintenance of suitable marine fishery habitat quality and quantity. The FMCs, with assistance from NMFS, have delineated EFH for federally managed species. Federal action agencies which fund, permit, or carry out activities that may adversely affect EFH are required to consult with NMFS regarding the potential impacts of their actions on EFH and respond in writing to NMFS or FMC with any recommendations.

The MSA, administered by the NMFS and regional FMCs, requires collaboration to stop or reverse the continued loss of fish habitats. Congress mandated the identification of habitats essential to managed species and measures to conserve and enhance this habitat. Under the MSA, Congress directs NMFS and the eight regional FMCs, under the authority of the Secretary of Commerce, to describe and identify EFH in Fishery Management Plans (FMPs); minimize, to the extent practicable, the adverse impacts on EFH; and identify other actions to encourage the conservation and enhancement of EFH.

This EFH assessment was prepared by the EPA to consider the potential effects that the proposed actions may have on EFH under the jurisdiction of the NMFS as required by 50 CFR § 600.920(e)(1). The EPA has determined that the level of detail provided in this EFH assessment is commensurate with the complexity and magnitude of the potential adverse effects of the proposed action as allowed by 50 CFR 600.920(e)(2) and meets the information requirements that all EFH assessments must include according to 50 CFR § 600.920(e)(3). The EPA is providing this EFH assessment for consideration by the NMFS in compliance with the MSA Section 305(b)(2).

The EPA has conducted a comprehensive analysis of all applicable environmental requirements under the National Environmental Policy Act (NEPA); however, a consolidated cooperation process under NEPA is not being used to satisfy the EFH assessment requirements as described in 50 CFR § 600.920(e)(1).[1] The NMFS is a cooperating agency for the NEPA analysis and has provided scientific expertise related to the NEPA analysis for the proposed action including information about: site selection, Endangered Species Act (ESA) listed species, and marine mammal protection. While some information related to the EFH Assessment is within the coordinated NEPA evaluation developed by multiple federal agencies, this EFH Assessment is being provided as a stand-alone document to comply with the consultation process under the MSA.

2.0 Proposed Action

The Regional Administrator of EPA Region 4 is proposing to reissue a National Pollutant Discharge Elimination System (NPDES) general permit for its jurisdictional area in the Outer Continental Shelf (OCS) of the Gulf of Mexico (General Permit No. GEG460000) for discharges in the Offshore Subcategory of the Oil and Gas Extraction Point Source Category (40 Code of Federal Regulations (CFR) part 435, subpart A). The existing general permit was signed on December 21, 2017, and became effective January 20, 2018, and will expire on January 19, 2023. It authorizes discharges from exploration, development, and production facilities located in and discharging to all Federal waters of the Gulf of Mexico seaward of the outer boundary of the territorial seas.

[1] 50 CFR § 600.920(e)(1) states that "Federal agencies may incorporate an EFH Assessment into documents prepared for other purposes such as Endangered Species Act (ESA) Biological Assessments pursuant to 50 CFR part 402 or National Environmental Policy Act (NEPA) documents and public notices pursuant to 40 CFR Part 1500."

3.0 Project Description

As proposed, the NPDES general permit includes best practicable control technology currently available (BPT), best conventional pollutant control technology (BCT), and best available technology economically achievable (BAT) limitations for existing sources and new source performance standards (NSPS) limitations for new sources as promulgated in the effluent guidelines for the offshore subcategory at 58 FR 12454 and amended at 66 Federal Register (FR) 6850 (March 4, 1993 and January 22, 2001, respectively).

Background Information Concerning General Permits
Section 301(a) of the Clean Water Act (CWA or the Act), U.S.C. 1311(a), provides that the discharge of pollutants is unlawful except in accordance with the terms of an NPDES permit. CWA section 402, 33 U.S.C. 1342, authorizes EPA to issue NPDES permits allowing discharges on condition they will meet certain requirements, including CWA sections 301, 304, and 401, 33 U.S.C. 1311, 1314, and 1341.

EPA may issue NPDES permits to operators of individual facilities or general permits to a class of similar dischargers within a discreet geographical area. Issuance of general permits is not controlled by the procedural rules EPA uses for individual permits but is instead subject to section 4 of the Administrative Procedure Act (APA), 5 U.S.C. 553, as supplemented by EPA regulations, e.g., 40 CFR 124.58. EPA must, however, comply with the substantive requirements of the CWA without regard to whether it is issuing an individual or general NPDES permit.

At the time of issuance for the previous NPDES general permit, a 2017 final Environmental Assessment (EA) was published. Prior to that EA, a 2009 Supplemental EIS was published in support of the NPDES general permit that included an authorization to discharge drill cuttings wetted with synthetic drilling fluids. A 1998 Final EIS in support of the 1998 general permit concluded that because of the abundance and sensitivity of the biological resources present from 200 meters of depth and shallower and potential secondary impacts, individual permits for these areas which incorporate permit stipulations on a case-by-case review would be more protective of the numerous biological communities present in the 200-meter water depths or shallower, and help ensure compliance with Section 403(c) of the CWA. This strategy required current, or proposed, oil and gas operations shoreward of the 200-meter water depth to seek individual existing source or new source permits, as appropriate.

The 2017 EA reviewed available data and studies on discharges from offshore oil and gas facilities within the EPA Region 4 jurisdictional area and discussed the potential short- and long-term impacts for these discharges on benthic communities. In particular, the 2017 EA included additional information regarding the environmental impacts from the 2010 Deep Horizon oil spill, which occurred offshore in Mississippi Canyon lease block 252. The 2017 EA concluded that the spill, did not cause adverse environmental harm to habitats in water depths greater than 200 meters in the Gulf of Mexico within the EPA Region 4 jurisdictional area. The EPA has determined that the information in the 2017 EA is reflective of current conditions in the offshore aquatic environment. As such, based on a review of relevant environmental data and information, the EPA Region 4 has determined that the appropriate level of NEPA analysis for the permit reissuance is a “categorical exclusion.” A “categorical exclusion" under the NEPA means a category of actions which do not individually or cumulatively have a significant effect on the human environment and which have been found to have no such effect in procedures adopted by a Federal agency in implementation of these regulations (Sec. 1507.3) and for which, therefore, neither an environmental assessment nor an environmental impact statement is required (ref. 40 C.F.R. 1508.1(d).

Description of Activities, Facilities and Discharges Subject to the Proposed Draft Permit

The Oil and Gas Extraction Point Source Category (40 CFR part 435 - subpart A) includes facilities engaged in field exploration, development and well production and well treatment. Exploration facilities are fixed or mobile structures engaged in the drilling of wells to determine the nature of potential hydrocarbon reservoirs. A development facility is any fixed or mobile structure engaged in the drilling and completion of productive wells, which may occur prior to, or simultaneously with production operations. Production facilities are fixed or mobile structures engaged in well completion or used for active recovery of hydrocarbons from producing formations.

The proposed general permit will authorize the following discharges to occur in water depths seaward of the 200 meter water depth: drilling muds; drill cuttings; produced water; well treatment fluids; workover fluids; completion fluids; deck drainage, sanitary wastes; domestic wastes, desalinization unit discharges, blowout preventer fluid; fire control system test water; non-contact cooling water; uncontaminated ballast water; uncontaminated bilge water; excess cement slurry; and mud, cuttings and cement at the seafloor. The proposed permits will authorize discharges from facilities engaged in field exploration, development and well production and well treatment, for offshore operations for both existing and new sources occurring seaward of the 200-meter water depth.

4.0 Proposed Action Area

The proposed draft NPDES permit covers existing and new source facilities in the Eastern Planning Area with operations located on Federal leases occurring in water depths seaward of 200 meters, occurring offshore the coasts of Alabama and Florida. The western boundary of the coverage area is demarcated by Mobile and Visoca Knoll lease blocks located seaward of the outer boundary of the territorial seas from the coasts of Mississippi and Alabama in the Central Planning Area (CPA). The eastern boundary of the coverage area is demarcated by the Vernon Basin leases north of the 26$_{o}$ parallel and in water depths seaward of 200 meters. This permit does not cover areas included under Congressional or Presidential moratorium for oil and gas activities in Federal waters.

5.0 Assessment and Ecological Notes on the EFH Fisheries and Species

5.1 EFH Overview

The MSA defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity" (MSA § 3(10)). EFH must be designated for the fishery (16 USC § 1853(a)(7)). The final rule clarifies that every FMP must describe and identify EFH for each life stage of each managed species. The EFH assessment is based on species distribution maps and habitat association tables. In offshore areas, EFH consists of those areas depicted as “adult areas”, “spawning areas”, and “nursery areas”.

According to the final 1998 Environmental Impact Statement, and NEPA documentation prepared in support of subsequent general permit renewals, which discuss the habitat in the eastern portion of the Gulf of Mexico OCS, the coverage area of the draft general Permit is known to support commercially important invertebrates and bottom fishes including penaeid shrimp, stone crab, spiny lobster, grouper, snapper, jack, mackerel and drum. The proposed draft General Permit coverage area consists of a wide variety of marine habitats including soft sands and both low and high-relief live bottom habitat, supporting virtually all of the commercially important fishes and invertebrates in the central, eastern and northern Gulf, including deep-water species.

The seasonal and year-round locations of designated EFH for the managed fisheries are depicted on figures available on the NMFS' Galveston webpage. NMFS selected 27 species from seven existing Fisheries Management Units (FMUs). Table 1 lists the 26 species (plus various coral reef fish assemblages) which are known to reside in Gulf waters and which are managed under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The listed species are considered ecologically significant to their respective FMU, and their collective habitat types occur throughout marine and estuarine waters in the Gulf.

Table 1. Summary of Essential Fish Habitat Species within the Central and Eastern Gulf of Mexico

Species	Life Stage Ecotype	EFH
Brown shrimp Greatest abundance from Apalachicola Bay to Mexico	Eggs Larvae Adults	<110 m, demersal <110 m, planktonic <110 m, silt sand, muddy sand
White shrimp Greatest abundance from Suwannee River to Mexico	Eggs Larvae Adults	<40 m, demersal <40 m, planktonic <33 m, silt, soft d
Pink shrimp Greatest abundance in FL	Eggs Larvae Adults	<65 m, demersal <65 m, planktonic <65 m, sand/shell substrate
Royal Red Shrimp Greatest abundance in terrigenous silt and silty sand and calcareous mud	adults	250-500 m
Red drum Greatest abundance from FL through TX	Eggs Larvae Postlarvae/juvenile Adults	Planktonic Planktonic SAV, estuarine mud bottoms, Marsh/water interface Gulf of Mexico & estuarine mud Bottoms, oyster reef
Red grouper Greatest abundance in eastern Gulf of Mexico (W. FL shelf)	Eggs Juvenile Adults	Planktonic, 25-50 meters Hard bottoms, SAV, reefs Reefs, ledges, outcrops
Black grouper Greatest abundance in eastern Gulf of Mexico	Juvenile Adults	FL estuaries & Gulf of Mexico Rocky coral reefs to 150 m
Gag grouper Greatest abundance in eastern Gulf of Mexico	Eggs Juvenile Adults	Planktonic SAV & oyster beds in coastal lagoons and estuaries Hard bottom, reefs, coral; 10-100 m
Scamp Greatest abundance in eastern Gulf of Mexico	Juvenile Adults	Hard bottoms, reefs; 12-33 m Hard bottoms; 12-189 m
Red snapper Greatest abundance from FLto TX	Larvae Postlarvae/juvenile Adults	Structure, sand/mud; 17-183 m Structure, sand/mud; 17-183 m Reefs, rock outcrop, gravel; 7-146 m
Vermilion snapper Greatest abundance from FL through TX	Juvenile	Reefs, hard bottom, 20-200 m
Gray snapper Greatest abundance in eastern Gulf of Mexico	Larvae Adults	Planktonic SAV, mangrove, sand, mud
Yellowtail snapper Greatest abundance in astern Gulf of Mexico	Juvenile Adults	SAV, mangrove, sand, mud Reefs

Lane snapper Greatest abundance in FL & TXs	Juvenile Adults	SAV, mangrove, sand, mud Reefs, sand, 4-132 m
Greater amberjack Greatest abundance from FL through TX	Juvenile Adults	Floating plans (Sargassum) debris, oil rigs, irregular bottom features
Tilefish Greatest abundance from Florida through Texas	Juvenile Adults	Burrows Rough bottom, 250-350 m
Gray triggerfish Greatest abundance in FL & LA/TX shelves	Eggs Larvae Postlarvae/juvenile Adults	Sand Floating plans, debris Floating plans, debris Reefs>10 m
King mackerel Greatest abundance from FL through TX	Juvenile Adults	Pelagic Pelagic
Spanish mackerel Greatest abundance from FL through TX	Larvae Juvenile Adults	<50 m isobath Offshore, beach, estuaries Pelagic
Cobia Greatest abundance from FL through TX	Eggs Larvae Postlarvae/juvenile Adults	Pelagic Estuarine & shelf Coastal & shelf Coastal & shelf
Dolphin Greatest abundance from FL through TX	Larvae Postlarvae/juvenile Adults	Epipelagic Epipelagic Epipelagic
Bluefish Greatest abundance from FL through TX	Postlarvae/juvenile Adults	Beaches, estuaries, inlets Gulf and estuaries, pelagic
Little tunny Greatest abundance from FL through TX	Postlarvae/juvenile Adults	Coastal & shelf, pelagic Coastal & shelf, pelagic
Stone crab Greatest abundance in estuaries from FL to TX	Larvae Juvenile Adults	Planktonic, moderate-high salinity Shell, SAV Shell, SAV, coral
Spiny lobster Greatest abundance in eastern Gulf of Mexico	Larvae Juvenile Adults	Algae, SAV Sponge, coral Hard bottoms, crevices
Coral Flower Gardens FL Middle Grounds	All stages	

Source: National Marine Fisheries Service (2000, October). Essential Fish Habitat: A marine fish habitat conservation mandate for federal agencies. St. Petersburg, FL.

5.2 Shrimp Fishery

The brown, white and pink shrimp yields in the Gulf are highly dependent upon the abundance and health of estuarine marshes and seagrass beds. The prey species (food source) for these shrimp depend on similar vegetated coastal marshes and seagrass beds.

Brown Shrimp

Brown shrimp are generally more abundant in the central and western Gulf and found in the estuaries and offshore waters to depths of 120 m. Postlarve and juveniles typically occur within estuaries while adults occur outside of bay areas. In estuaries, brown shrimp postlarve and juveniles are associated with shallow vegetated habitats, but also are found over silty sand and non-vegetated mud bottoms. In Florida, adult areas are primarily

seaward of Tampa Bay, and associated with silt, muddy sand, and sandy substrates.

Spawning area: Florida waters to edge of continental shelf; year round
Nursery area: Tampa Bay

White Shrimp
White shrimp are offshore and estuarine dwellers and are pelagic or demersal depending on their life stage. The eggs are demersal and larval stages are planktonic, and both occur in nearshore marine waters. Adult white shrimp are demersal and generally inhabit nearshore Gulf waters in depths less than 33 m on soft mud or silty bottoms. In Florida, white shrimp are not common east or south of Apalachee Bay and are not expected to be impacted by the discharges.

Spawning area: off Mississippi and Alabama; March to October
Nursery area: Mississippi Sound

Pink Shrimp
Juvenile pink shrimp inhabit most estuaries in the Gulf but are most abundant in Florida. Juveniles are commonly found in estuarine areas with seagrass. Postlarve, juvenile, and subadults may prefer coarse sand/shell/mud mixtures. Adults inhabit offshore marine waters, with the highest concentration in depths of 10 to 48 m. According to the NMFS species distribution map, pink shrimp use Tampa Bay from the larval stage until the species matures to the late juvenile stage.

Spawning area: Mississippi, Alabama, and Florida offshore; year round
Nursery area: major nursery areas in Tampa Bay and Florida west coast state waters; summer and fall in the northern Gulf

Royal Red Shrimp
Royal red shrimp are most abundant in the northeastern Gulf in water depths between 270 and 550 m. Little is known about the larvae. Distribution maps were not available by the NMFS for the royal red shrimp due to the limited knowledge and information available for the species. The permitted discharges will take place at or near the surface, thus there should be no impact on the primary EFH.

Spawning area: unknown
Nursery area: unknown

5.3 Red Drum Fishery

Red Drum
In the Gulf, red drum occur in a variety of habitats, ranging from depths of about 43 m offshore to very shallow estuarine waters. They commonly occur in all the Gulf's estuaries where they are associated with a variety of substrate types including sand, mud, and oyster reefs. Estuaries are important to red drum for both habitat requirements and for dependence on prey species which include shrimp, blue crab, striped mullet and pinfish. The GMFMC considers all estuaries to be EFH for the red drum. Schools of large red drum are common in the deep Gulf waters with spawning occurring in deeper water near the mouths of bays and inlets, and on the Gulf side of the barrier islands. The Tampa Bay EFH estuarine map shows red drum juveniles to be abundant or highly abundant in the fall and winter and common in the spring and summer.

Spawning area: Gulfwide from nearshore to just outside state waters, fall and winter
Nursery area: major bays and estuaries including Mobile Bay and Tampa Bay, year round

5.4 Reef Fish

Many species of snapper and grouper (mutton, dog, lane, gray and yellowtail snapper- and red, gag and yellowfin groupers) occupy inshore areas during juvenile stages where they feed on estuarine-dependent prey. As these species mature they generally move to offshore waters and change their feeding habits. However, reef fish species still depend on estuarine species for prey.

Red Grouper
The red grouper is demersal and occurs throughout the Gulf at depths from 3 to about 200 m, preferring 30 to 130-m depths. Juveniles are associated with inshore hard bottom habitat, and grass beds, rock formations, while shallow reefs are preferred for nursery areas. Species distribution maps show that spawning for the red grouper occurs throughout much of the Gulf waters off Florida, including the Florida Middle Grounds. Nursery areas occur within and around the selected site.

Spawning area: Florida continental shelf, well offshore, extending from south of Apalachicola Bay all the way to west of the Florida Keys; April to May
Nursery area: extensively throughout the continental shelf off Florida and along the northern Gulf, year round

Black Grouper
The black grouper occurs in the eastern half of the Gulf. The species is demersal and is found from shore to depths of 170 m. Adults occur over wrecks and rocky coral reefs. Juveniles travel into estuaries occasionally. Species distribution maps for the black grouper indicate that the range of the species occurs within the Gulf, outside of state waters.

Spawning area: throughout eastern Gulf to 170-m depth, spring and summer
Nursery area: probably the same as the red grouper

Gag Grouper
The gag grouper is demersal and is most common in the eastern Gulf, especially the west Florida shelf. Post larvae and pelagic juveniles move through inlets, coastal lagoons and high salinity estuaries in April-May where they settle into grass flats and oyster beds. Late juveniles move offshore in the fall. Adults prefer hard bottom areas, offshore reefs and wrecks, coral and live bottom. The species EFH distribution maps indicate presence throughout the Gulf including estuarine areas.

Spawning area: spawning areas are not specified on EFH maps
Nursery area: pelagic waters until post larvae or juvenile

Scamp
Scamp are demersal and widely distributed in the shelf areas of the Gulf, especially off Florida. Juveniles prefer inshore hard bottoms and reefs in depths of 13 to 36 m. Adults prefer high relief hard bottom areas. The species EFH distribution maps indicate presence throughout the Gulf including estuarine areas. Presence in these areas is based only on records for adults.

Spawning area: spawning area not specified in the EFH maps
Nursery area: nurseries not specified in the EFH maps

Red Snapper
Red snapper is demersal and found over sandy and rocky bottoms, around reefs, and underwater objects in depths to 218 m. Juveniles are associated with structures, objects or small burrows, or barren sand and mud

bottoms in shelf waters ranging from 20 to 200 m. Adults favor deeper water in the northern gulf preferring submarine gullies and depressions, and over coral reefs, rock outcroppings, and gravel bottoms. Spawning occurs in offshore waters over fine sand bottoms away from reefs. Gulf distribution map show red snapper nursery areas within the estuarine waters of the Mississippi Sound, and Tampa Bay offshore of state waters

Spawning area: spawning occurs throughout the Gulf, June to October
Nursery area: extensive throughout the Gulf, year-round**,** including Mississippi Sound and Tampa Bay

Vermillion Snapper
Vermillion snapper are found over reefs and rocky bottom from depths of 2 to 220 m in the shelf areas of the Gulf spawning occurs in offshore areas, with juveniles occupying the same areas as the adults.

Spawning area: EFH maps not available, not specified in literature reviewed
Nursery area: EFH maps not available, not specified in literature reviewed

Gray Snapper
The gray snapper generally occurs in the shelf waters of the Gulf and is particularly abundant in south and southwest Florida. Gray snapper occurs in almost all the Gulf's estuaries but are most common in Florida. Adults are demersal and mid-water dwellers, occurring in marine, estuarine, and riverine habitats. They are found among mangroves, sandy grass beds, and coral reefs, and over sandy muddy bottoms. Spawning occurs offshore, with post larvae moving into estuarine habitat over dense beads of Halodule and Syringodium grasses. Juveniles are marine, estuarine, and riverine found in most types of habitats. They appear to most prefer Thalassia grass flats, marl bottoms, seagrass meadows and mangrove roots. Species distribution maps indicate that nursery areas exist within estuarine areas including the Mississippi Sound and Tampa Bay. Major adult areas are encountered from the Mississippi Sound across Gulf waters to west of Tampa Bay, where year-round adult areas occur within Florida state waters and into the southern half of Tampa Bay.

Spawning area: spawning areas probably exist in the Gulf off many of the nursery areas, but have not been positively identified
Nursery area: found in coastal waters throughout the Gulf, including Mississippi Sound and Tampa Bay

Yellowtail Snapper
Juvenile yellowtail snapper are found in nearshore nursery areas over vegetated sandy substrate and in muddy shallow bays. Thalassia beds and mangrove roots are preferred habitat of the gray snapper. Late Juvenile and adults prefer shallow reef areas. According to the Gulf distribution map, this species has nursery areas within the 3 League Line and Tampa Bay. Spawning and adult areas occur in Gulf waters outside of the 3 League Line through the Florida Middle Ground and southern Apalachicola areas. EFH is not designated in the state waters of Mississippi or Alabama.

Spawning area: west and north of Tampa Bay; spring and summer
Nursery area: throughout the western and southern coast of Florida, including Tampa Bay

Lane Snappers
The snappers seem to prefer mangrove roots and grassy estuarine areas as well as sandy and muddy bottoms. Juveniles favor grass flats, reefs and soft bottom areas, to offshore depths of 33 m. Adults occur offshore at sand bottoms, natural channels, banks, and manmade reef and structures. Gulf distribution maps indicate that the lane snapper use shallow coastal waters including the Mississippi Sound and Tampa Bay and areas outside of state waters as nursery areas.

Spawning area: throughout the adult areas, summer

nursery areas: shallow coastal areas throughout the Gulf including Mississippi Sound and Tampa Bay.

Greater Amberjack
Greater amberjack seems to prefer habitats that are marine but not estuarine. Based on the Gulf distribution maps, greater amberjack occur outside the barrier islands across Gulf waters, and usually over reefs, wrecks and around buoys. Spawning and nursery areas are similar.

Spawning area: throughout the adult areas in most of the Gulf; year round
Nursery area: throughout the adult areas; year round

Lesser Amberjack
Juvenile lesser amberjack are found offshore in the late summer and fall in the northern Gulf, along with smaller juveniles, in areas associated with sargassum. Adults and spawning areas are found offshore year-round in the northern gulf where they are associated with oil and gas rigs and irregular bottom. The Gulf distribution map shows the range of the species throughout much of the Gulf and into the Atlantic coastline.

Spawning area: in adult areas, offshore, in the northern Gulf; year-round
Nursery area: probably similar to adult areas year-round; EFH map not available

Tilefish
Tilefish occur throughout the continental shelf in the Gulf, usually at depths from 50-200 m.

Spawning area: throughout the adult area from March to September
Nursery area: throughout the adult area; year round

Triggerfish
Larval and juvenile gray triggerfish are associated with grass beds, Sargassum and mangrove estuaries. Adults seem to prefer offshore waters associated with reefs. A general species distribution map was not available, however a map showing catches per hour by trolling methods within the Gulf was available from the National Oceanic and Atmospheric Administration (NOAA).[2] This map indicated that there is a record of occupancy for gray triggerfish in state waters of Mississippi/Alabama and Florida.

Spawning area: EFH map not available; assumed to be adult preferred areas offshore
Nursery area: EFH map not available; assumed to be estuarine areas throughout the Gulf

5.5 Coastal Migratory Pelagic Fishery

Collectively, these species are commonly distributed from the estuaries throughout the marine waters of the entire Gulf. However, estuaries are very important, since they contain the major prey base for these species.

King Mackerel
King mackerel are found throughout the Gulf and seldom venture into brackish waters. Juveniles occasionally use estuaries but are not estuarine dependent, and nursery areas occur in marine environments. According to the species distribution map, adult areas are also used for nurseries and spawning (May to November). These areas occur outside of the Mississippi Sound, across state waters, throughout the Gulf and into Tampa Bay.

Spawning area: throughout the Gulf, estuaries and coastal waters in adult areas; May to November
Nursery area: adult areas; year-round**,** marine waters, estuaries used occasionally

Spanish Mackerel

[2] The map is available at: http://christensenmac.nos.noaa.gov/Gulf-efli/gtrigger.gif

Adult Spanish mackerel tolerate brackish to oceanic waters and often inhabit estuaries. Estuarine and coastal waters also offer year-round nursery habitat. Juveniles appear to prefer marine salinities and sandy bottoms. Adults and spawning areas typically occur in offshore areas. According to the species distribution map, EFH for adult and nursery areas occurs throughout the selected site. Spawning areas occur in Gulf waters off the coast of Florida.

Spawning area: waters off the coast on the western (Summer and Fall) and eastern Gulf (Spring and Summer)
Nursery area: coastal waters throughout the Gulf

Cobia

Cobia only occasionally inhabit estuaries. Spawning occurs in nearshore areas and larvae are found in estuarine and offshore waters. Nursery areas are the same as the adult areas which include coastal areas, bays and river mouths. The range of cobia extends throughout the Gulf nearshore areas, with the summer adult areas and year-round nursery areas from the Mississippi Sound into Gulf waters and to the adult area (spring, summer, and fall) and year-round nursery area that extends from just inside Gulf water, halfway into Tampa Bay.

Spawning area: occurs throughout the adult areas except in bays and estuaries in the northern Gulf, Spring and Summer
Nursery area: coastal areas, bays and river mouths

Dolphin (Mahi-Mahi)

Dolphin are primarily an oceanic species, but occasionally enter coastal waters with high enough salinity. They are common in coastal waters of the northern Gulf mainly during the summer months. It is an epipelagic species known for aggregating underneath or near floating objects, especially Sargassum. Spawning occurs throughout the adult areas of the open Gulf year-round, with peaks in early spring and fall. Larvae are usually found over depths of greater than 50 m and are most abundant at depths over 180 m. Adults occur over depths up to 1,800 m, but are most common in waters at 40 to 200 m in depth. Nursery areas are year-round in oceanic and coastal waters where salinity is high.

Spawning: throughout the adult areas in open waters of the Gulf; year-round
Nursery area: throughout the adult areas in open waters of the Gulf; year-round

Bluefish

Bluefish can be found in Gulf estuaries but are more common in estuaries and waters of the Atlantic Ocean. Spawning grounds are located on the outer half of the continental shelf Nursery areas occur inshore along beaches and in estuaries, inlets and rivers. Gulf distribution maps were not available for this species and therefore EFH could not be identified, but may be assumed to include nursery areas within the Mississippi Sound and Tampa Bay.

Spawning area: not specified in literature reviewed, EFH map not available
Nursery area: not specified in literature reviewed; EFH map not available, but probably exists within the Mississippi Sound and Tampa Bay

5.6 Spiny Lobster Fishery

The principal habitat for the spiny lobster is offshore reefs and seagrass. Spiny lobsters spawn in offshore waters along the deeper reef fringes. Adults are known to inhabit bays, lagoons, estuaries, and shallow banks. According to the species distribution map, spiny lobsters use the lower half of Tampa Bay for nursery areas. According to the GMFMC, Tampa Bay seems to be the upper limit for spiny lobster abundance due to the higher salinities found south of the Bay. The Tampa Bay-specific distribution map indicates that spiny lobster

in the Bay are rare. However, the Gulf distribution maps indicate that Tampa Bay is used as an adult area year-round, and as a nursery area.

Spawning area: throughout the adult area, particularly north and south of Tampa Bay; March to July
Nursery area: lower half of Tampa Bay used as nursery; year-round

5.7 Coral and Coral Reefs

The three primary areas in the Gulf where hermatypic corals are concentrated are the East and West Flower Garden Banks, the Florida Middle Grounds, and the extreme southwestern tip of the Florida Reef Tract, the Tortugas Ecological Reserve HAPC and the Pulley Ridge HAPC. A number of other identified areas along the west Florida Shelf, i.e., Long Mound, Many Mounds, North Reed Site, and the West Florida Wall are all on the west Florida shelf in depths of 200-1000 m and contain deep water (low light) coral communities. Results from recent research expeditions indicate that the west Florida shelf may have more deep-water coral coverage than other areas in the Gulf.

5.8 Highly Migratory Species

In addition to the managed fish species described in the previous section, another group of fish with highly migratory habits have also been examined. This group includes billfish (blue marlin, white marlin and sailfish), swordfish, tunas (yellow fin, bluefin and skipjack), and of sharks (black tip, bull, dusky, silky, mako, Atlantic sharpnose, tiger and longfin mako). Most are found beyond the 50, 100 and 200 m contours.

6.0 Assessment of EFH and HAPC in the Gulf

Table 2 shows the categories of Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) for managed species which were identified in the Fishery Management Plan Amendments of the Gulf of Mexico Fishery Management Council and which may occur in marine waters of the Gulf. These habitats require special consideration to promote their viability and sustainability.

Table 2. Essential fish habitat and habitat areas of particular concern in open ocean environments of the Gulf of Mexico identified in Fishery Plan Amendments of the Gulf of Mexico and presence in area affected by the proposed draft General Permit.

Essential Fish Habitat	Presence
Water column	Yes
Vegetated bottoms	Yes
Non-vegetated bottoms	Yes
Live bottoms	Yes
Coral reefs	No; solitary specimens may exist within affected area
Artificial reefs	Yes
Geologic features	Yes
Continental shelf features	Yes
Mississippi/Alabama shelf	Yes
West Florida shelf	Yes
Habitat Areas of Particular Concern	**Presence**
FL Middle Grounds	No: located 50 nautical miles (nmi) east of affected area
FL Keys National Marine Sanctuary	No: located greater than 150 nmi south of the affected area
FL Bay	No: located greater than 150 nmi south of the affected area
Flower Garden Banks National Marine Sanctuary	No: located greater than 300 nmi west of the affected area
Apalachicola National Estuarine Research Reserve	No: located greater than 100 nmi northeast of affected area
Rookery Bay National Estuarine Research Reserve	No: located greater than 100 nmi southeast of affected area
Weeks Bay National Estuarine Reserve	No: located greater than 20 nmi northwest of affected area

Grand Bay, MS	No: located greater than 30 nmi northwest of affected area
Dry Tortugus	No: located greater than 150 nmi south of affected area
Pulley Ridge	No: located greater than 50 nmi east of affected area
Madison-Swanson Marine Reserve	No: located greater than 50 nmi east of affected area

A number of the habitat categories presented in Table 2 are not present in the area affected by the proposed draft General Permit. Impacts on habitats present or potentially present are discussed in the following paragraphs. Descriptions of the habitats were mostly excerpted from the "Generic Amendment for Addressing Essential Fish Habitat Requirements in the following Fishery Management Plans of the Gulf of Mexico."

6.1 Water Column EFH

The major operational discharges resulting from exploration, development and production activities, drilling fluids and produced water, may have a minimum, short term effect on water column EFH.

Drilling Fluids: Federal water quality criteria are compared to effluent concentrations projected for the edge of a 100-m mixing zone to determine the ability of drilling fluid discharges to achieve sufficient mixing and occur at concentrations below criteria in the surrounding waters. The minimum number of dilutions to achieve sufficient mixing for drilling fluids is projected to be 118 (the number of dilutions required to meet the arsenic human health criterion). There appears to be a significant probability that the criteria can be met by the edge of a 100-m mixing zone.

For comparison, the preferred option of a previous BOEM EIS for this development and production project specifies a maximum 400 bbl/hr discharge rate; water depths for the proposed activity area range from approximately 30 m to 150 m. For the generalized drilling fluid modeling approach that had been performed for EPA Region 10, a 500 bbl/hr discharge in a water depth of 20 m resulted in a minimum projected dilution of 1,035; even at a 1,000 bbl/hr discharge rate the available dilution is 655 at a water depth of 20 m and 731 at a water depth of 40 m. For a 1,000 bbl/hr discharge in a 70-m water depth, the dilutions achieved at 100 meters is 1,721, 10-fold greater than the amount required to meet the most stringent Federal water quality criteria in the Gulf of Mexico.

The low toxicity of whole drilling fluids in addition to mud plume dilution of priority pollutants to levels below Federal water quality criteria within a designated 100-m mixing zone is expected to ensure minimal impacts to water column EFH.

Produced Water: Because hypersaline (salinities >150 ppt are not uncommon) produced waters are denser than ambient seawater, they tend to sink rapidly removing itself from most of the water column. Saline produced waters also dilute rapidly upon discharge to well-mixed marine waters. Dispersion modeling studies of the fate of produced water differ in specific details but all predict a rapid initial dilution of discharges by 30- to 100-fold within the first few tens of meters of the outfall, followed by a slower rate of dilution at greater distances. The fate of produced water discharged in the Gulf of Mexico modeled under typical Gulf of Mexico conditions showed that for a median produced water discharge rate of 115 m^3/d (772 bbl/d), a 500-fold dilution was predicted at 10 m from the outfall and a 1,000-fold dilution was predicted at 100 m from the outfall. For a maximum discharge rate of 3,978 m^3/d (25,000 bbl/d), a 50-fold dilution was predicted at 100 m from the outfall.

The most abundant hydrocarbons of environmental concern in produced water are the light, one-ring aromatic hydrocarbons. Because they are volatile, they can be expected to evaporate rapidly from the water following produced water discharge. Studies (see *Ocean Discharge Evaluation for the National Pollution Discharge Elimination System General Permit for the Eastern Gulf of Mexico Outer Continental Shelf*, USEPA, 2003) reported that the maximum concentration of benzene measured in seawater immediately

below the produced water discharge pipe at a production platform in the Buccaneer Field off Galveston, Texas showed a nearly 150,000-fold dilution compared to the concentration of benzene in the produced water effluent. Concentrations of total gaseous and volatile hydrocarbons, including benzene, toluene, ethylbenzene and xylene (BTEX) aromatics decreased from 22,000 ug/l in the effluent, to 65 ug/l at the air-water interface below the outfall, to less than 2 ug/l in the surface water about 50 m away, indicating very rapid evaporation and dilution of the volatile components of the produced water. Concentrations of volatile liquid hydrocarbons discharged with produced water (600 bbl/d) at the Buccaneer Field were reduced on the order of 10^{-4} to 10^{-5} within 50 m from the platform.

BTEX compounds are very volatile with half-lives in the water column of a few hours or days, depending on water temperature and mixing conditions.

The rapid sinking and dilution of produced water should minimize effects to water column EFH. In addition, the rapid volatilization of the light-weight aromatic hydrocarbons reduces the probability of impacts to water column EFH.

6.2 Benthic EFH

6.2.1 Vegetated Bottoms and Non-Vegetated Bottoms

Seagrasses and macroalgae have long been recognized as important primary producers in marine habitats. Due to the depths of the area affected by the proposed draft permit, seagrasses are unlikely to be present. The distribution of benthic algae is ubiquitous throughout the Gulf from bays and estuaries out to depths of 200 m. It is a significant source of food for fish and invertebrates. The wide gently sloping continental shelf, particularly in the eastern Gulf, provides a vast area where benthic species of algae can become established and drift along the bottom and continue to grow even when detached from the substrate. Benthic algae also form large mats that drift along the bottom.

The Gulf of Mexico can be divided into two major sediment provinces, carbonate to the east of DeSoto Canyon and southward along the Florida coast, and terrigenous to the west of DeSoto Canyon past Louisiana to the Mexican border. Fine sediments are also strongly represented on the outer shelf beyond the 80-m isobath. Surface sediments may affect shrimp and fish distributions directly in terms of feeding and burrowing activities or indirectly through food availability, water column turbidity, and related factors. The discharge is expected to be buoyant and the constituents in the wastewater are not expected to come in contact with any non-vegetated bottoms.

6.2.2 Unconsolidated Sediments

Unconsolidated sediments provide habitat for a diverse invertebrate community consisting of several hundred of burrowing species and well as benthic fish and macro-invertebrate communities living directly on the sea floor. These habitats also provide foraging for fishes associated with nearby demersal habitat. Unconsolidated seafloor habitat may affect shrimp and fish distributions directly in terms of feeding and burrowing activities or indirectly through food availability, water column turbidity, and related factors. The small amounts of solid waste deposition predicted from the proposed project should minimize any potential physical impacts to unconsolidated seafloor habitat.

6.2.3 Live Bottoms and Artificial Reefs

Live bottoms are defined as those areas that contain biological assemblages consisting of such sessile invertebrates as sea fans, sea whips, hydroids, anemones, ascidians, sponges, bryozoans, seagrasses, or corals

living upon and attached to naturally occurring hard or rocky formations with rough, broken, or smooth topography favoring the accumulation of turtles and fishes. These communities are scattered across the shallow waters of the west Florida Shelf and within restricted regions of the rest of the Gulf of Mexico. The Florida Middle Ground is probably the best known and most biologically developed of these areas with extensive inhabitation by hermatypic corals and related communities. This area is 160 km west-northwest of Tampa and outside the project area. The faunal assemblages of the eastern Gulf are markedly different from those of the rest of the Gulf. This difference is partially attributed to the calcareous sediments found east of DeSoto Canyon as opposed to the terrigeneous muds and sands of the central and western Gulf and the influence of the upwelling associated with the Loop Current.

Fishes associated with such live bottom habitats include the black sea bass, red grouper, white grunt, gray snapper and black grouper. The discharge is expected to be buoyant and the constituents in the wastewater are not expected to come in contact with the benthos.

Two types of artificial reefs exist in the Gulf of Mexico, those structures intentionally placed in the water to serve as artificial reefs and those structures placed in the water to serve another purpose (oil and gas production) but still providing artificial habitat. Artificial reefs have been used to enhance fishing success in the Gulf of Mexico for many years. When the National Fishing Enhancement Act of 1984 was passed, serious attention was given to artificial reefs as fishery habitat enhancements. Florida has more than 587 sites permitted for artificial reefs on their west coast. Florida has several large general permit areas with one permit for 28,500 ha (70,395 ac). The total area permitted for artificial reefs on the west coast of Florida is 153,400 ha (378,898 ac). Historic materials used on Florida artificial reef sites have been ships, concrete rubble, oil platforms, reef modules, barges, tires, bridge spans, boxcars, car bodies, fiberglass boat molds, buses, obsolete military tanks, and airplanes. These materials are in water depths of 2 to 117 m and provide up to 27 m of relief at some sites. The reef sites off Florida vary in distance offshore, with some being near the beach while the furthest is located 87 km (47 nmi) offshore. Due to the buoyancy of the wastewater plume, it is not expected that wastewater will contact or impact these structures.

6.2.4 Geologic Features of the Continental Shelf and West Florida Shelf

The Gulf of Mexico continental shelf varies in width from about 280 km off southern Florida to about 200 km off east Texas and Louisiana. The shelf narrows to 110 km off southwest Texas. The shelf is widest in southern Florida (300 km) and narrowest off the modern Mississippi River Delta (10 km). East of DeSoto Canyon, the shelf is mainly dominated by a thick accumulation of southeasterly trending carbonate rocks and evaporite sediments. This area has not been influenced by the massive terrigenous regime that has occurred in other parts of the Gulf. The continental shelf (0 - 200 m) occupies about 35.2 percent of the surface area of the Gulf, and provides habitats that vary widely from the deeper waters. The shelf and shelf edge of the Gulf of Mexico are characterized by a variety of topographic features. The value of these topographic features as habitat is important in several respects. Some of these features support hardbottom communities of high biomass and high diversity and an abundance of plant and animal species. These features are unique in that they are small, isolated, highly diverse areas within areas of much lower diversity. They support large numbers of commercially and recreationally important fish species by providing either refuge or food. Specific features in the project vicinity are discussed below in the discussion of the West Florida Shelf.

The west Florida shelf is composed mainly of carbonate sediments. These sediments are in the form of quartz-shell sand (> 50 percent quartz), shell-quartz sand (< 50 percent quartz), shell sand, and algal sand. The bottom consists of a flat limestone table with localized relief due to relict reef or erosional structures. The benthic habitat types include low relief hardbottom, thick sand bottom, coralline algal nodules, coralline algal pavement, and shell rubble. The west Florida shelf provides a large area of scattered hard substrates, some emergent, but most covered by a thin veneer of sand, that allow the establishment of a tropical reef biota in a marginally suitable environment. The only high relief features are a series of shelf edge prominences that are

themselves the remnants of extensive calcareous algal reef development prior to sea level rise and are now, in most cases, too deep to support active coral communities.

Along the west Florida shelf are areas with substantial relief. In an area south of the Florida Middle Grounds, in water depths of 46 to 63 m, is a ridge formed from limestone rock termed the Elbow, and it is about 5.4 km at its widest and has a vertical relief of 6.5 to 14 m. South of Panama City are two notable areas with high relief. The Madison Swanson Marine Reserve are in 66 to 112 m of water and have rock ledges with 6 to 8 m of relief and are covered with coral and other invertebrate growth. The Mud Banks are formed by a ledge that has a steep drop of 5 to 7 m. The ledge extends for approximately 11 to 13 km in 57 to 63 m of water. The "3 to 5s", a series of ledges located southwest of Panama City, occur in water depths of 31 to 42 m of water. The ledges are parallel to the 36.5-m isobath and have relief of 5.5 to 9 m. The features listed above are part of a larger area of shelf-edge reefs that extend along the 75-m isobath offshore of Panama City to just north of the Tortugas which also includes the Twin Ridges, The Edges, Steamboat Lumps Marine Reserve (Koenig et. al: 2000). According to Koenig et. al, the northeastern portion of this area represents the dominant commercial fishing grounds for gag and contains gag and scamp spawning aggregation sites. Two of the areas, Madison Swanson and Steamboat Lumps, were designated as marine reserves on June 19, 2002 for a four-year period to protect a portion of the gag spawning aggregations and to protect a portion of the offshore population of male gag.

Another west Florida shelf region with notable coral communities is bounded by the waters of Tampa Bay on the north and Sanibel Island on the south. The area consists of a variety of bottom types. Rocky bottom occurs at the 18 m contour where sponges, alcyonarians, and the scleractinians *Solenastrea hyades* and *Cladocora arbuscula* are especially prominent.

The Pulley Ridge HAPC is a 100+ km-long series of north-south trending, drowned, barrier islands approximately 250 km west of Cape Sable, Florida. The ridge is a subtle feature about 5 km across with less than 10 m of relief. The shallowest parts of the ridge are about 60 m deep. The southern portion of the ridge hosts an unusual variety of zooxanthellate scleractinian corals, green, red and brown macro algae, and typically shallow-water tropical fishes. The corals Agaricia sp. and Leptoceris cucullata are most abundant, and form plates up to 50 cm in diameter and account for up to 60% live coral cover at some localities. Less common species include: *Montastrea cavernosa, Madracis formosa, M. decactis, Porities divaricata, and Oculina tellena*. Sponges, calcareous and fleshy algae, octocorals, and sediment occupy surfaces between the corals. Coralline algae appear to be producing as much or more sediment than corals, and coralline algal nodule and cobble zones surround much of the ridge in deeper water (greater than 80 m). The fishes of Pulley ridge comprise a mixture of shallow water and deep species with more than 60 species present.

7.0 Federal Action Agency Determination and Mitigation

The implementing regulations of MSA define adverse effect as "any impact that reduces quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.910(a)). Per 50 CFR 600.920(e)(3)), all EFH assessments must include the following information: 1) a description of the proposed action; 2) an analysis of the effects, including cumulative effects, of the proposed action on EFH, the managed species, and associated species, such as major prey species, including affected life history stages; 3) the Federal agency's view regarding the effects of the action on EFH; and 4) proposed mitigation, if applicable.

A description of the proposed action can be found on page 1 of this document. The low salinity of the treated

wastewater and the mode of discharge will result in a buoyant plume spread over the water surface. Any potentially harmful physical characteristics and chemical constituents present at the time of discharge should disperse rapidly as the plume undergoes physical dilution processes. Because the wastewater plume will remain buoyant until all constituents are completely dispersed no mechanism for benthic exposure can be hypothesized. Adverse impacts to any benthic or demersal EFH are, therefore, unlikely to occur as a result of these discharges. The high degree temporal and spatial patchiness with regard to the distribution of plankton assemblages in the water column and the relatively small volume of highly concentrated effluent present within the disposal zone at any time should greatly limit plankton exposure to potentially harmful water quality conditions.

As a result of the analyses presented above, EPA has determined that the minimal short-term impacts associated with the discharge will not result in substantial adverse effects on EFH or managed species in any life history stage, either immediate of cumulative, in the project area. A summary of EPA's findings are presented in Table 3 below. Mitigation measures incorporated into the permit include:
1) The applicant is required to monitor the discharged treated wastewater to determine actual dilution rates achieved. If actual dilution rates are insufficient to meet federal marine water quality criteria in accordance with the Ocean Dumping Criteria (40 CFR Part 227), modifications to the discharge method will be made.
2) The applicant is required to monitor the ammonia concentrations in the treated wastewater and the toxicity of the wastewater. If dilution rates are insufficient to satisfy the requirement of the Ocean Dumping Criteria (40 CFR Part 227), modifications to the discharge method will be made.

Table 3: Summary of Potential Impacts to EFH and Geographically Defined HAPC

EFH	Presence	Impact Assessment	Reason
Continental Shelf Fisheries	Yes	No Significant Impact	No exposure
Coral Reefs and Artificial Reefs	Yes	No Significant Impact	No exposure
Geologic Features	Yes	No Significant Impact	No exposure
Live Bottoms	Yes	No Significant Impact	No exposure
Non-vegetated Bottoms	Yes	No Significant Impact	No exposure
Vegetated Bottoms	Yes	No Significant Impact	No exposure
Water Column	Yes	No Significant Impact	Water quality criteria met for all constituents within mixing zone. Impacts will be of short duration and limited in scope
West Florida Shelf	Yes	No Significant Impact	No exposure to benthic communities
Mississippi/Alabama Shelf	No	No Significant Impact	Not present
Habitat Ares of Particular Concern	**Presence**	**Impact Assessment**	**Reason**
Dry Tortugas	No	No Significant Impact	Avoided
Florida Bay	No	No Significant Impact	Avoided
Florida Keys National Marine Sanctuary	No	No Significant Impact	Avoided
Florida Middle Grounds	No	No Significant Impact	Avoided
Grand Bay, MS	No	No Significant Impact	Avoided
Weeks Bay National Estuarine Reserve	No	No Significant Impact	Avoided
Rookery Bay National Estuarine Reserve	No	No Significant Impact	Avoided
Apalachicola National Estuarine Reserve	No	No Significant Impact	Avoided
Flower Garden Banks National Marine Sanctuary	No	No Significant Impact	Avoided

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Appendix A – reserved
Appendix B – reserved